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State of Forests and REDD+ Activities in Continental South-East Asia



A project implemented by FCG International, Forest Carbon, kartECO and VAFS

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State of Forests and REDD+ Activities in Continental South-East Asia

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Service contract to support the establishment of a prototype of a regional forest observatory in continental South-East Asia, including the countries of Cambodia, Laos, Myanmar/Burma, Thailand and Vietnam.

Abstract

The Regional Forest Observatory in Continental South-East Asia (RFO-SEA) is a platform that acts as an information repository (database and website) for exchanging knowledge and information related to monitoring and reporting on forests in the context of REDD+, as well as the EU Forest Law Enforcement, Governance and Trade (FLEGT) program. More specifically, the RFO-SEA, which at this stage covers the countries of Cambodia, Laos, Myanmar, Thailand and Vietnam, provides information and figures related to the status of forest cover, forest condition and REDD+ implementation at national and regional levels, as well as a summary of the identified drivers of forest cover change in each country.

Utilizing the platform, the RFO-SEA project has produced a Report of the State of Forests and REDD+ in Continental South-East Asia. This report leverages the data and information contained in the RFO-SEA to describe the forest status and progress of REDD+ implementation at national and regional levels. The report showcases the types of information that can be gleaned from the observatory and gives practitioners involved in forest monitoring and REDD+ an understanding of forest status and REDD+ activities in the region. Target stakeholders of the RFO-SEA are national institutions involved in forest monitoring, management and REDD+, as well as development agencies, NGOs and research institutions involved in the REDD+ process.

Key words: forest observatory, REDD+, forest cover, FLEGT (Forest Law Enforcement, Governance and Trade), database, continental South-East Asia

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Executive Summary

Background

The European Commission, through the Joint Research Centre (JRC), has conducted the ReCaREDD project (Strengthening Regional Capacities for REDD+) in Cambodia, Laos and Vietnam since 2013. It provides technical support and training in remote sensing methodologies to national technicians involved in forest monitoring and REDD+. To complement these activities, ReCaREDD has launched a pilot phase to develop a prototype of the Regional Forest Observatory for South-East Asia (RFO-SEA). For this prototyping phase, the geographical focus of the observatory is on continental South-East Asia, covering the countries of Cambodia, Laos, Myanmar, Thailand and Vietnam.

The RFO-SEA, developed during 2016 – 2018, provides information and figures related to the status of forest cover and REDD+ implementation at national and regional levels as well as a summary of the identified drivers of forest cover change in each country included in the database. The RFO-SEA contents are freely accessible through the website www.rfo-sea.org.

Utilizing the platform, the RFO-SEA project has produced a Report of the State of Forests and REDD+ in Continental South-East Asia. This report leverages the data and information contained in the RFO-SEA to describe forest status and REDD+ at national and regional levels in continental South-East Asia. The intent of this report is to demonstrate the utility of the RFO-SEA by showcasing the types of information that can be gleaned from the observatory and give all practitioners involved in forest monitoring and REDD+ an understanding of forest status and REDD+ activities in the region. This first report is intended to serve as precursor for potential regular reporting.

Forests of South-East Asia

Forests produce a number of ecosystem benefits, covering goods and services that benefit people in different ways. These benefits include i) provisioning services (forest goods); ii) regulating and supporting services related to water, soil, climate, agriculture and biodiversity conservation; and iii) cultural services.

Provisioning services, often referred as forest goods, cover timber, fuelwood and non-timber forest products such as food, fiber, and medicinal plants. In continental SE Asian countries these valuable NTFPs include, for instance pine resin, rattan and medicinal plants. These forest goods often create the foundation in South-East Asia for rural livelihoods, SMEs and industry in related processing and marketing sectors.

Additionally, forests produce important regulating and supporting services having effects on the qualities of land, watercourses, atmosphere and biological resources. As elsewhere, in South East Asia these services refer to water, soil, climate, agriculture, biodiversity conservation and cultural services. In the context of climate change, forests work as a carbon sink - they do not only store carbon but continue to sequester it from the atmosphere.

Forests play a significant role in South-East Asia by hosting a home to a rich array of flora and fauna, providing essential resources to the local communities, while also providing

timber for domestic use and local or international trade. As an example, in a country like Laos, 80% of the population rely on forest resources. Also, the forests of South-East Asia are often qualified as some of the most species-rich in the world.

According to FAO statistics (FAO-FRA 2015), the forest area of the five countries covered by the RFO-SEA is 884,310 km², covering 46% of the land area of these countries (Cambodia 54%, Laos 81%, Myanmar 44%, Thailand 32% and Vietnam 48%). However, there is a growing pressure on forests and forest land due to the increasing demand for land and natural resources directly linked to population growth, infrastructure development, and the expansion of industrial agriculture. For instance, the road net development by providing access to markets and remote resources, has also increased opportunities for investment and trade, as well as facilitated the encroachment of loggers or agribusinesses. This issue particularly affects the northwest and southern parts of Laos and northeast Cambodia.

The establishment of cash crop plantations has become a primary driver of forest conversion in Southeast Asia. In the Mekong region, the production of rubber, cashew nuts, coconut and sugar cane has been a major cause of forest conversion while in coastal areas shrimp ponds and agriculture have resulted in the loss of mangroves. In southern Thailand and southern Myanmar, oil-palm plantation establishment has also been an important cause of forest conversion.

As per FAO-FRA 2015, between 2005 and 2015, only Cambodia and Myanmar suffered ongoing forest loss, while Laos and Vietnam experienced forest gains. Thailand's total forest area remained relatively constant during this period. It should be noted, however, that the FAO FRA report is based on self-reported data from each country. Additionally, even the RFO-SEA countries with a stable or increasing forest cover are faced with the loss of natural forests while forest plantation areas increase.

The global land cover maps and datasets produced by the Climate Change Initiative Land Cover project (CCI-LC) of the European Space Agency indicate that the forest cover consistently decreased in Cambodia over the period of 2000 – 2015. Forest loss occurred between 2000 and 2010 also in Laos and Myanmar, before stabilizing for 2010 – 2015. In Thailand, forest cover decreased between 2000 and 2005 but has steadily increased after this year. In Vietnam, forest loss occurred during the first period from 2000 to 2005, but the forest area has mostly been stable after this.

While the trends from national datasets should be considered the most authoritative, the regional datasets still provide value with respect to viewing forest losses and gains across the region through a consistent analytical lens.

Regional REDD+ developments

Vietnam and Cambodia are the most advanced in the region with respect to REDD+ implementation. Both countries benefited from receiving early stage REDD+ readiness support from the UN-REDD programme in addition to the Forest Carbon Partnership Facility (FCPF) from whom both countries have received additional readiness funding in addition to the initial US\$3.6 million readiness grant. Both of the countries have developed national REDD+ strategies, identified implementation arrangements for REDD+, and developed and officially submitted their country's Forest Reference Emission Level (FREL) to the UN Framework Convention on Climate Change (UNFCCC). They still need to better articulate

the Safeguards Information Systems (SIS) and further develop their National Forest Monitoring Systems (NFMS).

Laos and Myanmar are slightly further behind Vietnam and Cambodia when it comes to REDD+ readiness. While the institutional arrangements for REDD+ are in place in both of the countries, they are still undertaking the analytical steps to develop their national REDD+ strategies, develop their Forest Reference Emission Levels (FREL), finalize the safeguard assessments as well as develop their NFMS. Currently Laos is developing its national REDD+ strategy with a draft available for public viewing likely to emerge in early 2018. Both of the countries will submit FRELS to the UNFCCC for technical assessment in early 2018, while the development of the NFMS will continue throughout 2018.

Thailand is the furthest behind of the five countries with respect to REDD+ readiness. While its REDD+ institutions have been established these have met infrequently and primarily only in the context of developing the country's Readiness Plan Idea Note (R-PIN) and Readiness Preparation Proposal (R-PP). Work to develop the country's main REDD+ components is expected to begin in 2018 once R-PP grant funding is released for technical assistance support.

Regional EU FLEGT developments

The EU Forest Law Enforcement, Governance and Trade (EU FLEGT) Action Plan was established in 2003 aiming to reduce illegal logging by strengthening sustainable legal forest management, improving governance and promoting trade of legally produced timber. In developing countries, this principally takes the form of a Voluntary Partnership Agreement (VPA), a legally binding trade agreement, between the EU and the timber-producing country outside the EU to ensure that timber and timber products exported to the EU come from legal sources, while also engendering improvements in regulation and forest governance within the timber-producing country.

Of the five RFO-SEA target countries, Myanmar and Cambodia are still at an early stage in the FLEGT process, focusing on information and consensus building. Myanmar entered the preparation stage for the VPA in 2015, thereafter improving the design of its Myanmar Timber Legality Assurance System (MTLAS) through the commissioning of a gap analysis and initiating in-country dialogues on the VPA process with a broad set of national stakeholders. In Cambodia, the VPA process is even at an even earlier stage with the current focus being on building internal capacity to engage with the VPA process.

Laos, Thailand and Vietnam have progressed to formal negotiations on the VPA with the EU. Laos initiated these negotiations in April 2017, aiming at the completion of this stage still during 2018. Thailand on the other hand started its negotiations in 2013 but due to political instability, these were put on hold until recently; in June 2017, negotiations resumed. Vietnam is the most advanced of the RFO-SEA target countries with its VPA initialled in May 2017. Following this, the EU and Vietnam commenced a final review of the VPA text and annexes to start the procedures to ratify the VPA in 2018.

Information repository

RFO-SEA information repository user-interface is available at <http://www.RFO-SEA.org/geonetwork/>. It has been built using GeoNetwork application with modifications to comply with the RFO-SEA requirements. GeoNetwork user interface is straightforward and

easy to use for end users. Users can upload new data to the information repository database through the user interface without complex database scripts. The interface also has a powerful search tool embedded, which allows users to easily find the data that they are looking for in the database.

Abbreviations and Acronyms

CARPE	Central Africa Regional Program for the Environment (USAID)
CCBC	Climate, Communities, and Biodiversity Certification
CCR	Climate Change Response
CMS	Content Management System
COP	The United Nations Climate Change Conference / Conference of the Parties
DEVCO	Directorate-General for International Cooperation and Development (of European Commission)
DMP	Data Management Plan
ECD	European Commission Delegation
EIA	Environmental Impact Assessment
ER-PD	Emission Reduction Program Document
ER-PIN	Emissions Reduction Project Idea Note (ERPIN)
ESMF	Environment and Social Management Framework
EU	European Union
FC	Forest Carbon (PT Forest Carbon Consultants Indonesia)
FCG	Finnish Consulting Group (FCG International)
FCPF	Forest Carbon Partnership Facility
FFI	Flora & Fauna International
FLEGT	Forest Law Enforcement, Governance, and Trade
FMU	Forest Management Unit
FORMIS	Forest Management Information Systems Project
FREL	Forest Reference Emission Level (FRL)
GIS	Geographical Information System
GHG	Green House Gas(es)
ICT	Information and communications technology
JRC	Joint Research Centre (the European Commission's science and knowledge service)
JV	Joint Venture
LED	Low-Emission Development
LULUCF	Land Use, Land Use Change, Forestry

LUP	Landuse Plan(ning)
M&E	Monitoring and Evaluation
MONREC	Ministry of Natural Resources and Environmental Conservation (of Myanmar)
MRV	Measurement, Reporting and Verification
NFI	National Forest Inventory
NFIS	National Forest Inventory and Statistics
NGO	Non-Government Organization
OFAC	Observatoire des Forêts d'Afrique Centrale (Observatory of Central African Forests)
PA	Protected Areas (The Law on Protected Areas , Cambodia)
PHP	An open-source server-side scripting language
ReCaREDD	Strengthening National and Regional Capacities for Reporting on the Mitigation Actions of the Forest Sector
REDD	Reducing Emissions from Deforestation and Forest Degradation in Development Countries
REDD+	Reducing Emissions from Deforestation and Forest Degradation, and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks
RFO	Regional Forest Observatory
REL	Reference Emission Level
R-PP	Readiness Preparation Proposal (to FCPF)
SEA	South-East Asia
SESA	Strategic Environmental and Social Assessment
SME	Small and Medium Sized Enterprises
SRV	Socialist Republic of Vietnam
TOR	Terms of Reference
TmFO	The Tropical managed Forest Observatory
UNFCCC	UN Framework Convention on Climate Change
UN-REDD	The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
USAID	United States Agency for International Development
VAFS	Vietnamese Academy of Forest Sciences
VPA	(FLEGT) Voluntary Partnership Agreement

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1 Introduction

1.1 Background

Reducing emissions from deforestation and forest degradation (REDD+) is a mechanism developed by Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Cambodia, Laos, Myanmar, Thailand and Vietnam are all in the process of establishing national REDD+ programs to address the impacts that changes in land-use and forest management are having on climate change, biodiversity conservation, and the livelihoods of forest dependent communities. To better understand the contribution of REDD+ interventions on reductions in GHG emissions – and for reporting on the latter – these countries, as well as sub-national REDD+ programs are required to collect, process and analyse various datasets (satellite imagery, forest inventories, drivers of deforestation, mitigation activities, etc.) to establish their Forest Reference Emission Levels (FRELs) and Monitoring, Reporting and Verification (MRV) systems. Doing this, however, is hindered by the ability of governmental, non-governmental, multilateral and civil society organizations to produce, access and share existing and emerging REDD+ relevant information and datasets.



The European Commission, through the Joint Research Centre (JRC), has conducted the ReCaREDD project (Strengthening Regional Capacities for REDD+) in Cambodia, Laos and Vietnam since 2013. It provides technical support and training in Remote Sensing methodologies to national technicians involved in forest monitoring and REDD+ in these countries. To complement these activities, ReCaREDD has launched a pilot phase to develop a prototype of a Regional Forest Observatory.

A consortium led by FCG International (FCG), in partnership with kartECO and Forest Carbon, has developed the observatory in collaboration with the Vietnamese Academy of Forest Science (VAFS).

For this prototyping phase, the geographical focus of the observatory is on continental South-East Asia, namely in Cambodia, Laos, Myanmar, Thailand and Vietnam.

1.2 Objectives of the Regional Forest Observatory

The Regional Forest Observatory for South-East Asia (RFO-SEA) is a regional platform that acts as an information repository (database and website) for exchanging knowledge and information related to monitoring and reporting on forests in the context of REDD+, including aspects related to the EU Forest Law Enforcement, Governance and Trade (FLEGT) program. The targeted stakeholders are the national institutions involved in forest monitoring and management as well as REDD+, but also other stakeholders involved in the REDD+ process, including, for instance NGOs and research institutes.

1.3 Report of the State of Forests and REDD+ in continental South-East Asia

This report, leverages the data and information contained in the RFO-SEA to describe forest status and REDD+ at national and regional levels in continental South-East Asia. The intent of this report is to demonstrate the utility of the RFO-SEA by showcasing the types of information that can be gleaned from the observatory and give all practitioners involved in forest monitoring and REDD+ an understanding of forest status and REDD+ activities in the region. This first report is intended to serve as a precursor for potential regular reporting on the status of regional forest cover and REDD+ for the region. As a tangible output of the RFO-SEA, the report will act as a communication tool to engage with stakeholders.

Following this Introduction, Section 2 provides greater detail on the history and objectives of the RFO-SEA. Section 3 then provides a regional overview on: (i) the importance of forests in S.E. Asia; (ii) forest cover status; and (iii) the status of REDD+ and FELGT implementation. Sections 4 through 8 describe the status of forest management, REDD+ implementation and forest cover in each of the five countries covered by the RFO-SEA before describing the contents of the RFO-SEA's Information Repository in Section 8 and offering some concluding remarks in Section 9.

To quantify forest cover at the regional level, the report uses a global forest cover map to give a consistent and comparable view of forest cover change within the region. At the national level, the report uses the best available national forest cover map or the official published figures by the respective governmental agencies in charge of forest management and monitoring.

2 Regional Forest Observatory for South-East Asia (RFO-SEA)



Initiated in late 2016, the prototyping of a Regional Forest Observatory for South-East Asia is now complete and the website freely accessible at: www.rfo-sea.org. The RFO-SEA was officially launched in March 2018 and promoted to potential users and stakeholders. This next phase of the RFO-SEA will focus on seeking a partner to host and sustain the RFO-SEA.

The RFO-SEA's vision is to promote knowledge sharing and transparency through a collaborative effort. As such, the RFO-SEA is populated via shared data and information from government agencies, multilateral and bilateral institutions, INGOs/NGOs and the academic sector. By providing relevant information on forest status and REDD+, the RFO-SEA aims to:

- i. Support practitioners to understand local, national, and regional land-use change dynamics;
- ii. Support coordination between projects and facilitate dialogue between partners; and,
- iii. Foster regional cooperation and an integrated approach on forest and land-use issues.

A similar regional observatory has been developed in Central Africa through the OFAC (Forest Observatory of Central Africa (www.observatoire-comifac.net)).



The Observatory, **RFO-SEA**

The Regional Forest Observatory for South-East Asia, called **RFO - SEA**, is intended to be a platform to share knowledge on the regional status of forests and REDD+. The RFO - SEA will act as a repository for maps, statistics, GIS layers, reports, and scientific papers stored in a database and accessible through a user-friendly website.

The implementation of the RFO-SEA prototype started with a screening of key stakeholders in the region to assess their interest in the RFO-SEA content and approach, which informed the final design of the RFO-SEA. The database and website were developed with the support of VAFS and in regular communication with JRC. The data and information were sourced from contributing stakeholders or other freely available sources.

The RFO-SEA is composed of three main components:

1. A general website which provides information on the status of forests and REDD+ in each country;
2. A geoportal; and
3. An information repository.

The RFO-SEA provides information and figures related to the status of forest cover and REDD+ implementation at national and regional levels as well as a summary of the identified drivers of forest cover change in each country. This overview is linked to source documents available in the RFO-SEA's information repository.

The geoportal provides geographical information that will help users to comprehend forest cover and forest cover change dynamics at regional, national, or local levels. It also provides information on land-use and management, for example the location of protected areas. Finally, it provides global information on landscapes such as soil type or average rainfall or fire occurrence.

Practitioners who work on mapping forest cover change can use the RFO-SEA geoportal as a comparison tool. As such, they can verify if forest cover change trends given by their own maps match with other provided datasets in the portal or assess which forest cover type was affected by deforestation.

The information repository is a knowledge pool with relevant documents related to: the implementation status of REDD+ in each country; forest monitoring, especially forest cover change; relevant forestry and REDD+ projects from the region; methodologies; and, technical guidance. For the most part, this data is stored in standard pdf format so that end users can access it easily. The majority of REDD+ relevant literature was sourced from the UNFCCC, FCPF, UN-REDD or national REDD+ websites. The information repository provides access to country's latest officially submitted reports such as FREL reports, R-PPs or REDD+ National Strategies. Relevant studies or academic publications regarding forest monitoring are available in the repository. The repository also provides the material produced and collected in the context of the ReCaREDD project.

3 Forests of South-East Asia



3.1 Values of forests in South-East Asia

Ecosystem services are the benefits people obtain from ecosystems. Forests produce a number of ecosystem benefits, covering goods and services that benefit people in different ways. These benefits include i) provisioning services (forest goods); ii) regulating and

supporting services related to water, soil, climate, agriculture and biodiversity conservation; and iii) cultural services. Contents of these services are given below.

Provisioning services – forest goods

Key provisioning services – also known as forest goods – provided by forests in SE Asia include:

- Timber
- Fuelwood
- Non-timber forest products such as food, fiber, and medicinal plants (in continental SE Asian countries valuable NTFPs include e.g. pine resin, rattan and medicinal plants).

In SE Asia, forest goods often lay the foundation for rural livelihoods, SMEs and industry in related processing and marketing sectors. An example of forest industry and related export regarding Vietnam is given in Box 1 below.

Vietnam was the world's fourth-largest wood and wooden product exporter in 2015, after China, Germany and Italy. In 2015 export turnover reached \$6.9 billion, up 10.7 per cent compared to 2014. During recent years the growth has remained level at 8 to 10 per cent. Even though a part of the required raw material is imported, this production is mainly based on timber grown and harvested in Vietnam.

According to the Ho Chi Minh City Handicraft and Wood Industry Association (HAWA), the export of wood and wooden products saw better performance than other key export sectors.

The US, China, Japan and the EU remained the largest markets.

Wooden furniture accounted for the majority of exports. Labor-intensive products previously dominated the market but enterprises have now become involved in product design, accelerated the application of advanced technology in processing, and improved management skills and services.

Figures from the Vietnam Timber and Forest Product Association show that in 2000 there were only 741 wood and wooden product enterprises in the country but the number increased to 3,934 by 2015. Given its potential the wood and wooden products processing industry is one of Vietnam's most valuable export industries.

(Vietnam Economic Times, 2.2.2016)

Box 1. Wood and wooden products export of Vietnam

According to a 2015 International Tropical Timber Organization (ITTO) report, Myanmar produced about 6 million m³ of logs in 2014 with a total export value of primary timber products being about 1.78 billion US dollars. In addition to Vietnam and Myanmar, forestry and forest industry largely contribute to livelihoods and economies of other continental South-East Asian countries, too.

Regulating & supporting services

Forests produce many regulating and supporting services that have effects on the quality of land, watercourses, atmosphere and biological resources. In South East Asia, as elsewhere, these services refer to water, soil, climate, agriculture, biodiversity conservation and cultural services.

Regarding water, forests have an important role regulating water quality and quantity, recharging groundwater and reducing flooding (frequency and damage), mitigating sea level rise and storm surges. Moreover, forests stabilize soil, control erosion and reduce the potential for landslides.

In the context of climate change, forests work as a carbon sink - they store carbon and continue to sequester carbon from the atmosphere. Forests also regulate rainfall and temperatures and provide shade and shelter. For agriculture, forests provide pollination services and pest control.

With regards to biodiversity conservation, forests provide habitat for biodiversity. Biodiversity supports other ecosystem services (resilience of forests and their services, pollination, forest products, and cultural services). Biodiversity values are affected by species richness, presence of threatened or endemic species and connectivity with other forests.

Concerning cultural services, forests support (eco-)tourism, attract tourists (e.g. wildlife spotting, bird-watching, hiking). They also have cultural and spiritual value (sacred and historical sites) and recreational values, providing access to nature, pleasant landscapes and peaceful areas.

3.2 State of the forests

There is a growing pressure on forests and forest land due to increasing demands for land and natural resources directly linked to population growth, infrastructure development, and the expansion of industrial agriculture. For instance, while road development provides access to markets and remote areas while also increasing opportunities for investment and trade, it has also facilitated encroachment by loggers and the expansion of agribusinesses into forests. This issue has particularly affected the northwest and southern parts of Laos and northeast Cambodia.

The establishment of cash crop plantations has become a primary driver of forest conversion in Southeast Asia. Deforestation and loss of canopy cover has been particularly intense in Myanmar. Smaller scale forest loss in Laos, Viet Nam, and Cambodia has also been recorded. In the Mekong region the production of rubber, cashew nuts, coconut and sugar cane has been a major cause of forest conversion, while in coastal areas shrimp ponds and agriculture have resulted in the loss of mangroves. In southern Thailand and southern Myanmar, oil-palm establishment has also been an important cause of forest conversion. Greater details on the specific drivers impacting each target country of the RFO-SEA are provided in the respective country profiles.

According to the 2015 FAO Global Forest Resources Assessment (FRA) report, in 2015, total forest area in the target countries covered by RFO-SEA was 884,310 km² or 46% of the whole extent of the five countries.

Table 1. Forest area in 2005, 2010 and 2015. (FAO, 2015)

Forest cover	2005		2010		2015	
Country	Area (km ²)	%	Area (km ²)	%	Area (km ²)	%
Cambodia	107,310	61	100,940	57	94,570	54
Laos	168,700	73	178,160	77	187,610	81
Myanmar	333,210	51	317,730	48	290,410	44
Thailand	161,000	32	162,490	32	163,990	32
Vietnam	130,770	42	141,280	46	147,730	48
Total	900,990	47	900,600	47	884,310	46

Biogeosciences 11/2014 reports a change in tropical forest cover of entire Southeast Asia from 268.0 million hectares in 1990 to 236.3 million hectares in 2010 ¹. Regarding the five countries currently covered by RFO-SEA, as per the dataset given in Table 1 above, between 2005 and 2015 only Cambodia and Myanmar suffered ongoing forest loss, while Laos and Vietnam experienced forest gains. Thailand's total forest area remained relatively constant during this period. It should be noted, however, that the FAO FRA report is based on self-reported data from each country, which often is not reliable due to poor quality. For example, the datasets leveraged in Myanmar to report to the FRA were considered of too low a quality to be used for the country's FREL. Additionally, if data is not available, FAO uses previous data to make projections to arrive at a figure for the subsequent period. This is known to be the case for Laos where the forest area trends between 2002 and 2010 were used to arrive at a value for 2015. As such, the FAO FRA numbers, while informative, must be considered with caution.

A different dataset to understand regional forest cover trends in the five RFO-SEA countries, are the global land cover maps produced by the Climate Change Initiative Land Cover project (CCI-LC) ² of the European Space Agency. Figure 1 provides an example of these land cover maps. The CCI-LC maps can be considered as a more robust dataset to make comparisons between countries over time due to the consistency in the underlying imagery used and the land cover interpretation methods employed. Nevertheless, its low resolution of 300 meters may impact its ability to identify small-scale deforestation event and thus under-estimate slightly the deforestation. As such, they cannot be considered as authoritative as nationally produced datasets.

¹ H.-J. Stibig et al.: Change in tropical forest cover of Southeast Asia from 1990 to 2010 (<https://www.biogeosciences.net/11/247/2014/>)

² <http://maps.elie.ucl.ac.be/CCI/viewer/index.php>

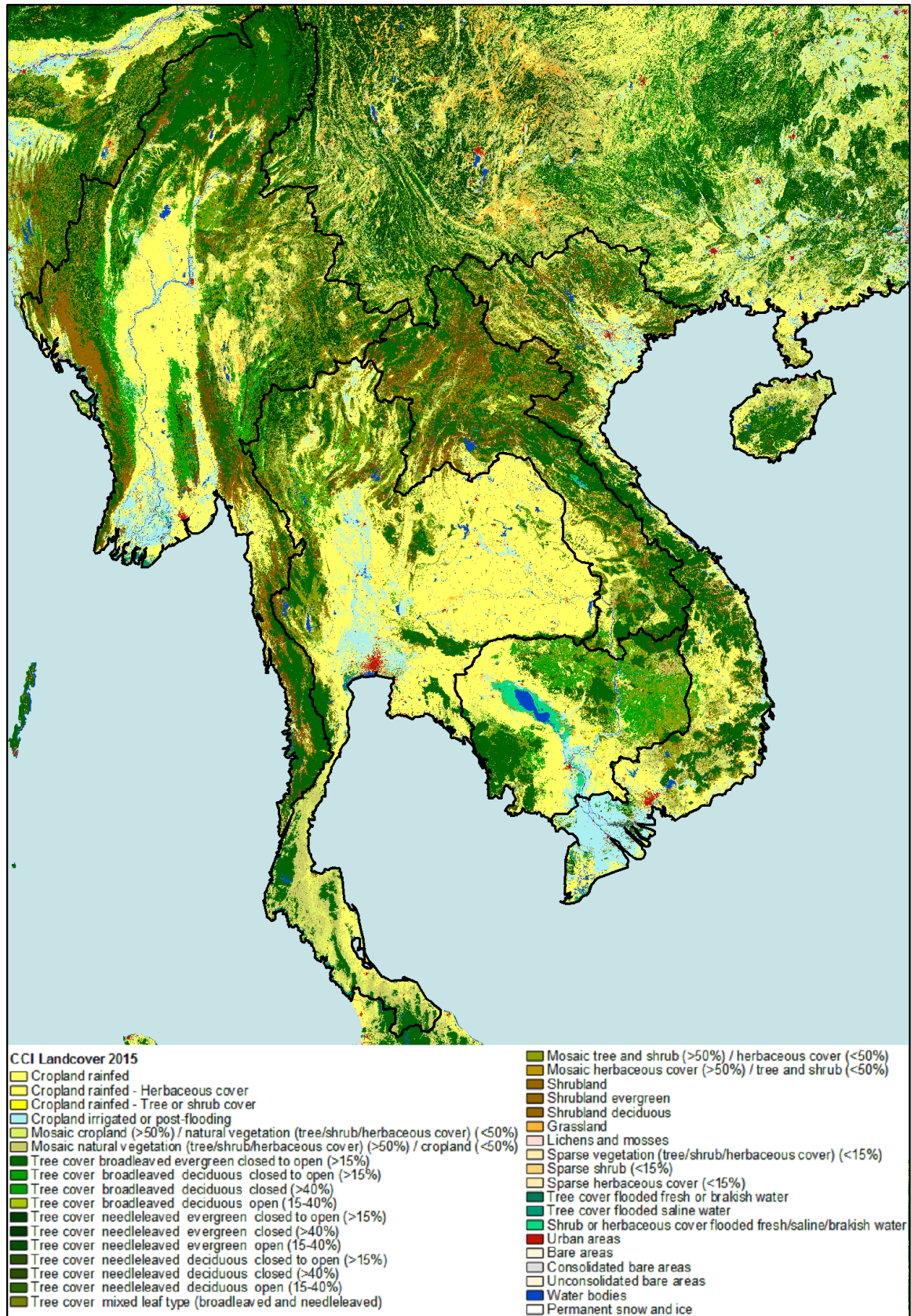


Figure 1. Land cover 2015. (ESA, 2016)

As per the CCI-LC dataset as shown in **Table 2**, total forest cover consistently decreased over the 2000 – 2015 period in Cambodia. Forest loss occurred between 2000 and 2010 in Laos and Myanmar, before stabilizing for the 2010 – 2015 period. In Thailand, forest cover decreased between 2000 and 2005 before but steadily increased after this year. In Vietnam, forest loss occurred during the first period, but the forest area was mostly stable after this.

Table 2. Forest cover area from CCI-LC maps. (ESA, 2016)

Forest Cover Area (km ²)	2000	2005	2010	2015
Cambodia	91,839	87,038	85,161	83,714
Laos	131,495	129,808	128,862	129,151
Myanmar	344,390	343,716	343,154	344,042
Thailand	129,193	128,194	128,816	130,202
Vietnam	119,083	115,971	115,976	115,320
Total	816,000	804,726	801,969	802,430

The CCI-LC dataset is consistent with forest cover trends identified in national datasets for Cambodia and Thailand. The CCI-LC dataset appears to overestimate the stabilization of forest cover in Laos and Myanmar compared to national datasets, while also not capturing the greater forest gains achieved in Vietnam during this period. While the trends from national datasets should be considered the most authoritative, the regional datasets still provide value with respect to viewing forest losses and gains across the region through a consistent analytical lens. Sections 4 through 8 provide a greater discussion of the forest cover trends in each of the five RFO-SEA target countries.

Figure 2 illustrates where deforestation and reforestation occurred between 2000 and 2015 according to the CCI-LC dataset. In Vietnam, deforestation was most evident in the Central Highlands and Central Coast areas. Here, degraded forests were replaced by forest plantations, mostly rubber in the Central Highlands and acacia in the Central Coast. This reforestation trend in the Central Highlands is visible on the map; the other notable area of reforestation in Vietnam is in the South Central Coast. In Cambodia, the majority of deforestation occurred in the Central Plains area due to the establishment of commercial plantations in economic land concessions. The Cardamoms mountain range was also impacted by deforestation on its edge. The visible reforestation occurred in only a few spits and corresponds to the establishment of plantations. In Myanmar, forest located in the south, in the Tenasserim range, was heavily impacted by deforestation due to agriculture expansion, oil palm plantations and the development of infrastructure.

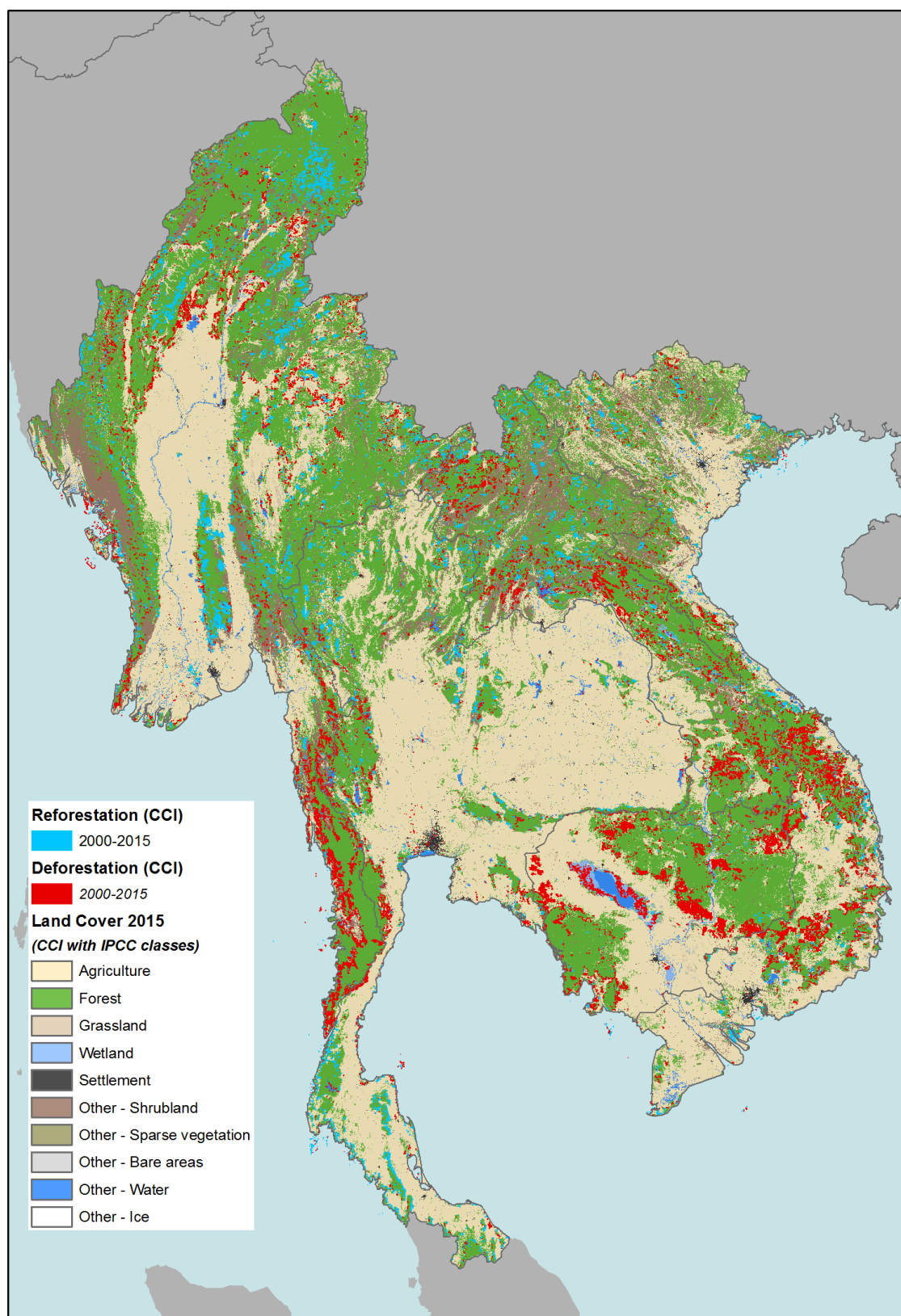


Figure 2. Deforestation and reforestation 2000-2015 from CCI Land cover maps. (ESA, 2016)

In Thailand, deforestation occurred in the northern provinces as well as in the proximity to the Myanmar border. It is known that in Thailand reforestation programs supported by the government have mostly counter-balanced the loss. Reforestation comes most likely from plantations in the south and reforestation of degraded land in the mountainous area in the north. In Laos, the implementation of rubber plantations, starting in the mid-2000 lead to deforestation in the north-west and south-east provinces fueled largely by Chinese and Vietnamese investors. The growth of these plantations, as well as the regeneration of former shifting cultivation areas are the likely cause of the observed reforestation in the north. The development of numerous hydropower projects, encouraged by national policies supporting the development of Laos as an exporter of power, caused deforestation. Small-scale shifting agriculture, which is still practiced throughout Laos but particularly in the northern parts, also causes encroachment into forest areas.

It should also be noted, that in all countries forest quality is being lost, even in countries where forest cover appears to be stable or increasing. This is due to the concurrent loss of natural forests while forest plantation areas increase.

3.3 Regional REDD+ developments

The Warsaw Framework for REDD+, a series of seven decisions adopted at the COP 19 held in Warsaw, Poland, in November 2013, is the most important guidance under the UNFCCC for developing countries on REDD+ implementation. Between the Warsaw Framework for REDD+ and previous decisions on REDD+ adopted by the COP, it is possible to summarize the main features that a country must have in place to receive results based payments for REDD+. These are:

- **National REDD+ Strategy or Action Plan:** A national REDD+ strategy or action plan addressing the drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and REDD+ safeguards including the full and effective participation of relevant stakeholders, inter alia indigenous peoples and local communities.
- **Safeguards:** A system for providing information on how the REDD+ safeguards under the Cancun Agreement are being promoted and supported when implementing REDD+ activities. Taking into account national circumstances and respective capabilities, and recognizing national sovereignty and legislation, relevant international obligations and agreements, and respecting gender considerations, the safeguards information systems should provide transparent and consistent information that is accessible by all relevant stakeholders and updated on a regular basis. The systems should build upon existing systems, be implemented at the national level and also be transparent and flexible to allow for improvements over time.

- **Forest Reference Levels:** A national forest reference emission level (FREL) and/or forest reference level (FRL) or as an interim level a sub-national FREL/FRL. These reference levels form the basis to assess a country's REDD+ performance. FREL/FRLs should be developed in a manner consistent with IPCC guidance, take national circumstances into account, be built iteratively if necessary, and use data and information that is transparent, complete, consistent and accurate. FREL/FRLs are to be submitted to the REDD+ secretariat to be technically assessed as a pre-requisite to being eligible for results based payments.

Although the term FREL/FRL is used extensively throughout UNFCCC COP REDD+ decisions, no formal distinction between the two has been provided. An FREL is generally understood to include only emissions from deforestation and forest degradation, while a FRL includes all of the potentially eligible REDD+ activities, including both emissions by sources and removals by sinks (i.e. enhancement of forest carbon stocks).

Box 2. Forest Reference Level (FRL) and Forest Reference Emission Level (FREL)

- **National Forest Monitoring System:** A robust and transparent national forest monitoring system to monitor, measure and report on changes in forest carbon. National forest monitoring systems should be flexible, allow for improvement and build upon existing systems, as appropriate. They should reflect the phased approach of REDD+ implementation and enable the assessment of different types of forest in the country according to national definitions, including natural forest. They may also provide relevant information to the safeguards information systems (SIS). As with the development of FREL/FRLs, the data and information provided by national forest monitoring systems should be transparent, consistent over time, and suitable for measuring, reporting and verifying, taking into account national capabilities and capacities.

REDD+ readiness is typically described as one of the three phases of REDD+ as countries move along a process towards increasingly being prepared to achieve emission reductions from REDD+ activities and receive results based payments. These three phases are outlined below in Figure 3 including an assessment of where each of the five countries covered by the RFO-SEA falls along the various phases.

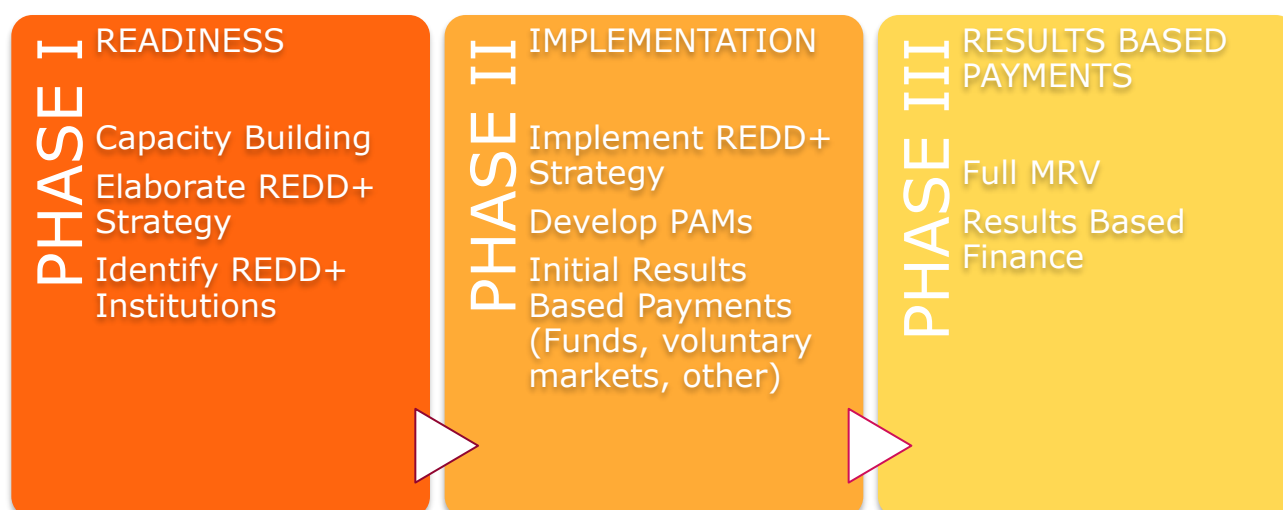


Figure 3. Three phases of REDD+

Vietnam and Cambodia are the most advanced in the region with respect to REDD+ implementation. Both countries benefited from receiving early stage REDD+ readiness support from the UN-REDD programme in addition to the FCPF from whom both countries have received additional readiness funding in addition to the initial US\$3.6 million readiness grant. Both countries have developed national REDD+ strategies, identified implementation arrangements for REDD+, and developed and officially submitted their country's FRL to the UNFCCC. These are notable achievements and place both countries well on their way towards establishing the necessary components under the Warsaw Framework to receive results based REDD+ payments. Both countries need to better articulate their SIS and further develop their NFMS, activities that both countries are currently undertaking.

Laos and Myanmar are slightly further behind Vietnam and Cambodia when it comes to REDD+ readiness. While the institutional arrangements for REDD+ are in place in both countries, they are still undertaking the analytical steps to develop their national REDD+ strategies, develop their FRL, finalize their safeguard assessments, as well as develop their NFMS. Laos is further ahead in the development of its national REDD+ strategy with a draft available for public viewing likely to emerge in early 2018, while this will likely emerge in late 2018 for Myanmar. Both will submit FRLs to the UNFCCC for technical assessment in early 2018, while the development of the NFMS will continue throughout 2018. As such, important progress has been made to date in both countries and further gains will be made following the disbursement of the additional readiness grant from the FCPF in Laos and the ongoing support of the UN-REDD program in Myanmar.

Thailand is the furthest behind of the five countries with respect to REDD+ readiness. While its REDD+ institutions have been established these have met infrequently and primarily only in the context of developing the country's R-PIN and R-PP. Thailand's R-PP readiness grant was only signed in 2016 and disbursement of these funds to kick-start the REDD+ readiness process has been slow to date. Work to develop the country's main REDD+ components is expected to begin in 2018 once R-PP grant funding is released for technical assistance support.

3.4 Regional EU FLEGT developments

The EU Forest Law Enforcement, Governance and Trade (EU FLEGT) Action Plan was established in 2003 aiming to reduce illegal logging by strengthening sustainable legal forest management, improving governance and promoting trade in legally produced timber. In developing countries, this principally takes the form of a Voluntary Partnership Agreement (VPA) – a legally binding trade agreement – between the EU and timber-producing country outside the EU. The purpose of the VPA is to ensure that timber and timber products exported to the EU come from legal sources, while also engendering improvements in regulation and forest governance within the timber-producing country.

The central part of a VPA is the legality assurance system (LAS) which is designed to identify, monitor and license legally produced timber, to ensure that only legal timber is exported to the EU. A timber LAS usually includes five elements:

- a definition of what constitutes legal timber;
- a procedure for verifying control of the supply chain;
- tools for verification and the capacity to use them;
- licensing by a national authority; and
- an independent audit.

The negotiation of a VPA follows the process outlined in Figure 4 below.

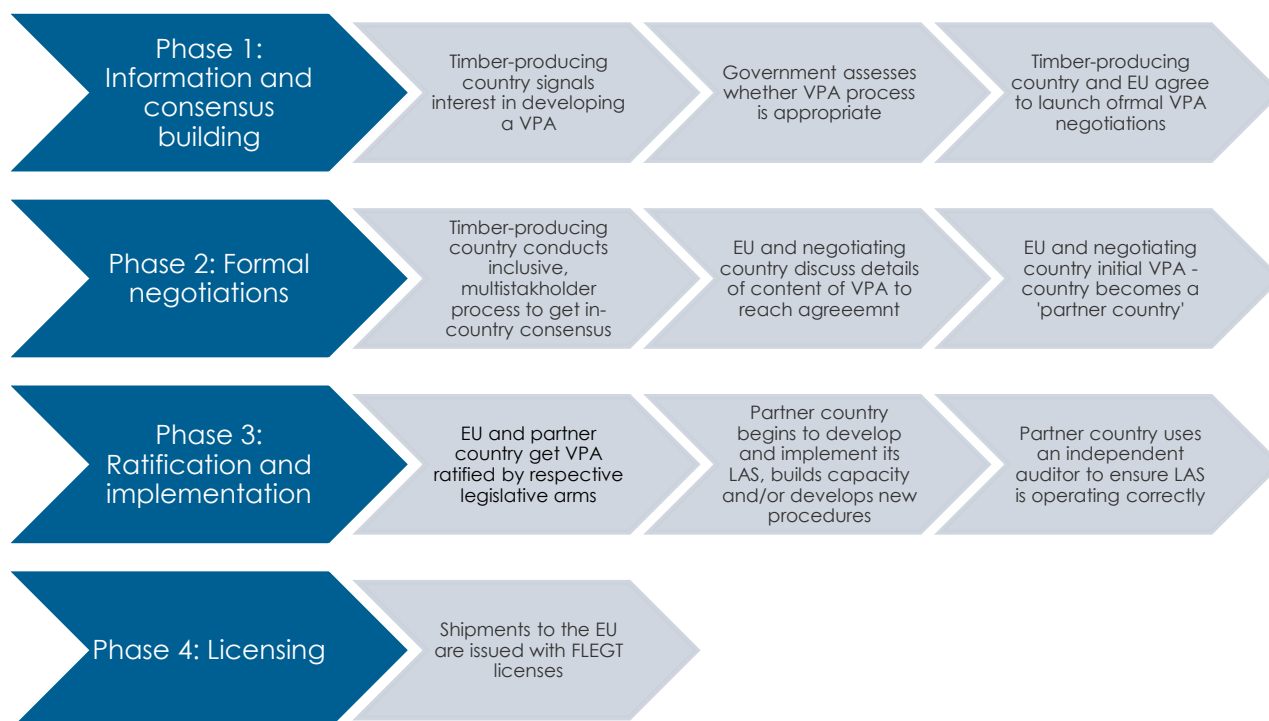
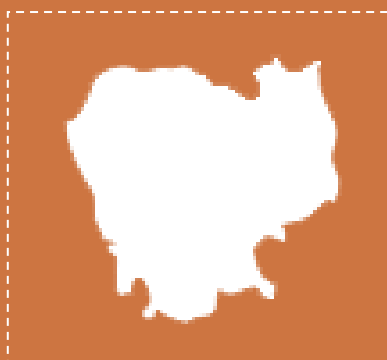


Figure 4. Summary of the EU FLEGT VPA process

Of the five RFO-SEA target countries, Myanmar and Cambodia still fall within Phase 1. Myanmar entered the preparation stage for a VPA in 2015 and has been focusing its efforts on improving the design of its Myanmar Timber Legality Assurance System (MTLAS) through the commissioning of a gap analysis and initiating in-country dialogues on the VPA process with a broad set of national stakeholders. Formal negotiations have not yet begun with the EU, however. In Cambodia, engagement is at an even earlier stage with the current focus being on building internal capacity to engage with the VPA process.

Laos, Thailand and Vietnam all fall within Phase 2, albeit at different stages within this phase. Laos initiated formal VPA negotiations in April 2017 and has a goal for negotiations to be complete by 2018. Thailand on the other hand started its negotiations in 2013 but due to political instability these were put on hold until recently; in June 2017 negotiations resumed. Vietnam is the most advanced of all RFO-SEA target countries with its VPA initiated in May 2017 following over six years of negotiations. The next step will be for Vietnam and the EU to ratify the VPA.

4 NATIONAL STATUS: Cambodia



4.1 Institutional context

Previously, forests in Cambodia were managed by the Forest Administration (FA) and Fisheries Administration (FiA), part of the Ministry of Agriculture, Forestry and Fisheries (MAFF). However, under sub-decree No. 69 on the Transfer of the Protected Forest, Forest Conservation and Production Forest Areas, and Economic Land Concessions between MAFF, and MoE (Ministry of Environment), dated 28 April 2016, the protected forests are now under the management of the MoE.

The Permanent Forest Estate (PFE) is under the jurisdictional management of MAFF, including the management over flooded and mangrove forests, while the MoE is responsible for managing Protected Areas, including the core area of the Tonle Sap.

The main relevant law governing the forestry sector is the 2002 Forestry Law. It provides for the management, use, harvesting, conservation and development of all forests (planted or natural) within the Kingdom of Cambodia.

The policy objectives of the forestry sector under the PFE are synthesized into an overarching strategic framework set out in the National Forest Programme 2010-2029 published in 2010 which acknowledge the objective to attain 60% of forest cover by 2015.

Recent ministerial changes in 2016 and 2017 have transferred all protected areas plus additional areas designated as Biodiversity Conservation Corridors from MAFF to MoE, while Economic Land Concessions previously under MoE have been transferred to MAFF. More than four million ha have been transferred between the two ministries. Registration and demarcation in the field have yet to be done.

4.2 REDD+ and EU FLEGT National status

4.2.1 REDD+

Cambodia was an early proponent of project-based REDD+ approaches with two REDD pilot projects officially approved as early as 2008 (Oddar Meanchey Community Forests) and 2009 (Seima Protection Forest). At the national level, Cambodia developed a national road map for REDD+ Readiness in 2009 and 2010 as a basis to prepare its UN-REDD National Programme Document and R-PP for the FCPF. Cambodia was approved to become a UN-REDD National Programme in March 2011 and the programme ran until June 2015 (including a 6-month extension). In parallel, Cambodia submitted its R-PP to the FCPF in 2011 which was approved for readiness funding subject to the submission of a revised R-PP which was submitted in March 2013. Implementation of R-PP activities began in March 2014. Cambodia's mid-term report to the FCPF in 2016 requested an additional US\$5 million in Readiness funds to be used between 2017 and 2020. An additional US\$5.2 million was made available from the FCPF in September 2017. To date, Cambodia has not submitted an ER-PIN requesting participation under the FCPF's Carbon Fund.

Institutionally, REDD+ is governed by the National Council on Sustainable Development (NCSD), which was established to address development issues at the highest policy levels and to mainstream sustainable development principles into the national policy framework that will have a positive impact on the governance and management of forest resources. The NCSD chairs the National REDD+ Taskforce, the inter-ministerial body with the responsibility to further REDD+ Readiness and implementation in Cambodia. To provide technical inputs to the REDD+ process, four Technical Working Groups have been established on REDD+ demonstration, safeguards, benefit sharing and MRV. Additionally, Cambodia has a REDD+ Consultation Group as well as a Gender Group. Day-to-day management of the REDD+ process for the majority of the REDD+ readiness phase fell to the REDD+ Taskforce Secretariat within the FA under MAFF. However, the recent ministerial reshuffling means the REDD+ Taskforce Secretariat will be transferred to the GDANCP under MoE. This is expected to happen shortly.

Cambodia finalized its National REDD+ Strategy (NRS) in 2015 and presented this to the international community at the COP 21 in Paris in December 2015. Following this, the NRS began a process of validation with national stakeholders; the NRS has been endorsed by both the MoE and MAFF and currently sits with the National Council of Ministers for final endorsement; this is likely to happen in early 2018. The NRS identifies all key drivers of

deforestation and forest degradation, includes priority measures to address forest loss and outlines the institutional arrangements to implement these measures. This is now being operationalized into a NRS Action Plan.

While potential environmental and social impacts of the NRS were considered in the development of the NRS, at present, the Environment and Social Management Framework (ESMF) to address and monitor potential safeguard triggers has not yet been developed; this will happen following the finalization of national Environment and Natural Resources Code (ENRC). A policy and legal review has been completed identifying Cambodia's existing safeguard mechanisms in the context of developing the SIS for which a design approach exists, although the actual system has not yet been developed.

The Cambodia Forest Reference Level (FRL) has been completed, endorsed by the Royal Government of Cambodia (RGC), and was submitted to the UNFCCC for technical review in December 2016. The initial technical assessment by UNFCCC was completed in March 2017 and the FRL will be reviewed and updated based on the technical comments and feedback from UNFCCC. No performance against this FRL, however, has yet been assessed.

An initial NFMS has been developed with the intent to improve this over time. Currently, the NFMS focuses primarily on data necessary for MRV. Land cover change assessments for 2016 are currently being finalized as well as work to improve biomass models. Trainings to conduct a national forest inventory have been completed, including training on forest inventory data management, and data processing and reporting for MRV Technical Team.

Sub-national REDD+ demonstration activities primarily take the form of VCS REDD+ projects in Cambodia. In addition to the Oddar Meanchey and Seima projects, additional REDD+ demonstration projects include the Southern Cardamom REDD+ Project, Kulen Promtep Wildlife Sanctuary project, and a Joint Crediting Mechanism REDD+ Project in Prey Lang. The Oddar Meanchey project made some early stage sales to Microsoft in mid-2013, while the Seima Protection Forest project more recently secured a pre-sale of emission reductions to the Disney Corporation in 2016 generating US\$2.6 million for the project.

4.2.2 EU FLEGT

Of the five RFO-SEA countries, Cambodia is the least advanced with regards to engaging with the EU FLEGT process and negotiating a VPA. Initial contact between the EU and Cambodia regarding the VPA process occurred in 2010 and was followed by an agreement to conduct a joint study on understanding the timber flows and control in Cambodia which was published in 2014. Since this time little progress has been made to enter into the formal VPA process with only limited capacity building efforts to better understand the process occurring to date. No known projects or programs to support Cambodia's accession into the EU FLEGT are known.

Table 3. Key Active Multi/Bilateral REDD+ & FLEGT initiatives: Cambodia

Name	Focus
Forest Carbon Partnership Facility	Supporting national level REDD+ Readiness
Project for Facilitating the Implementation of REDD+ Strategy and Policy (CAM-REDD)	Technical cooperation project for facilitating the implementation of REDD+ Strategy and Policy

4.3 Forest management and conservation

The Permanent Forest Estate (PFE) is under the jurisdiction of the Forest Administration (FA). The Forest Law sets the Ministry of Agriculture, Forestry and Fisheries with the tasks of classifying, registering and setting boundaries for all forests in the Permanent Forest Estates. They are managed in accordance with the National Forest Management Plan.

The PFE is sub-divided into Permanent Forest Reserve (PFR) and Private Forest. The PFR is composed of Production Forest, Protection Forest, and Conversion Forestland. According to the Forest Law, Private Forests shall be maintained by their owners.

Production Forests are managed to ensure sustainable production. This category contains Forest Concessions and Community Forests. The Protection Forests are protected for the value of their ecosystem and natural resources. Conversion Forestland is forest yet to be allocated in one of the other categories.

Two systems of concession exist in Cambodia involving forests. Economic land concessions (ELCs) and forest concessions are long-term leases allowing different kinds of activities. Forest concessions are granted through public bidding and should not exceed 30 years.

Community forests cannot be sold or granted as economic land concessions (ELCs). However, several ELCs have been located within the boundaries of protected areas.

In February 2016, the Prime Minister announced a jurisdictional reform for natural resources management, which focused on redefining the roles of MAFF and MoE with MoE having a primary mandate for protection and conservation of natural resources, and MAFF focusing on the developmental aspects. Accordingly, the issuance of sub-decree No. 69 in May 2016, transferred all protected areas (13 areas of Protection and Conservation Forest) from MAFF to MoE, 5 areas of Production Forest from MAFF to MoE to be reallocated as Protected Forest, and all 73 Economic Land Concessions from MoE to MAFF.

In January 2017, 1.4 million ha of land have been designated as Biodiversity Conservation Corridors and transferred from MAFF to MoE. This increases the land under the authority of MoE to around 7 million hectares. The sub-decree for how these new lands will be managed has yet to be developed.

With the changes, Cambodia has approximately 40% of the national territory under protection. There are however, significant challenges in terms of management and many PAs are under heavy pressure. Already before the changes made in 2017 the status is that

out of 51 protected areas, none of them have a management plan and only one has been zoned according to the Law on Protected Areas 2008 (PA Law).

Under the 2006 Fisheries Law, inundated forests and mangrove areas outside of PAs are managed and regulated by the Fisheries Administration, set out in the Strategic Planning Framework for Fisheries 2010-2019.

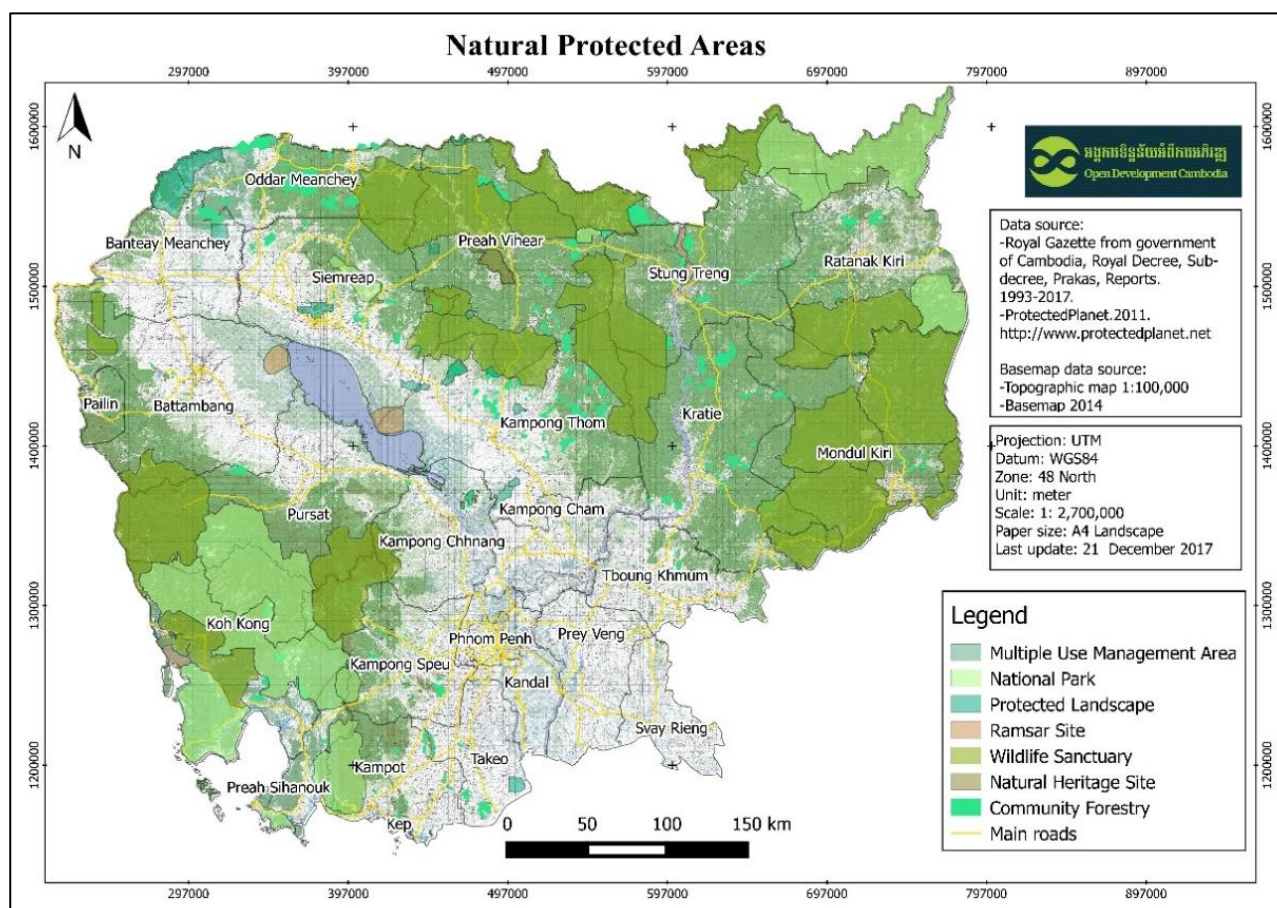


Figure 5. Protected areas in Cambodia. (Source: Open Development Cambodia³, 2017)

4.4 Drivers of forest change

Before the 1970s, Cambodia's forest area remained relatively constant. Since the 1970s, forest area began to decline due to the effects of the Vietnam War, as Cambodia suffered from an unstable political situation and logging.

Starting in the 1990s, as a result of rapid economic growth and weak environmental regulations, 60% of the country was leased to the private timber industry, which led to widespread deforestation and forest degradation. Land speculation driven by high prices also contributed to accelerated forest clearing in recent years. In particular, economic land concessions for the production of rubber, sugarcane, cassava and more recently biofuel

³ <https://opendevelopmentcambodia.net/>

crops have led to substantial deforestation and displacement of forest-dependent populations.

The 2001 Land Law formalized the legal framework for granting concessions for economic purposes. An economic land concession, or ELC, is a long-term lease that allows the beneficiary to clear land in order to develop industrial agriculture.

From 1996 to 2013 MAFF granted 121 ELCs (Economic Land Concession) covering 1,230,364 hectares of forest in 17 provinces, in which 39 local companies covered 609,377 ha, and 82 international companies covered 620,987 ha. MAFF reported that 135,322 ha of these concessions were plantations for rubber, palm oil, cashew nut, cassava or used to raise cattle.

Forest degradation is also caused by unsustainable fuel wood collection and charcoal production. The latter is more damaging as it requires green wood and, in some regions, is more profitable than agriculture. Due to a lack of alternative energy sources, wood is the primary energy source for most rural and some urban households. Uncontrolled logging has also resulted in forest degradation.

Lack of government capacity in remote areas to adequately manage forests is a major underlying condition leading to deforestation and forest degradation.

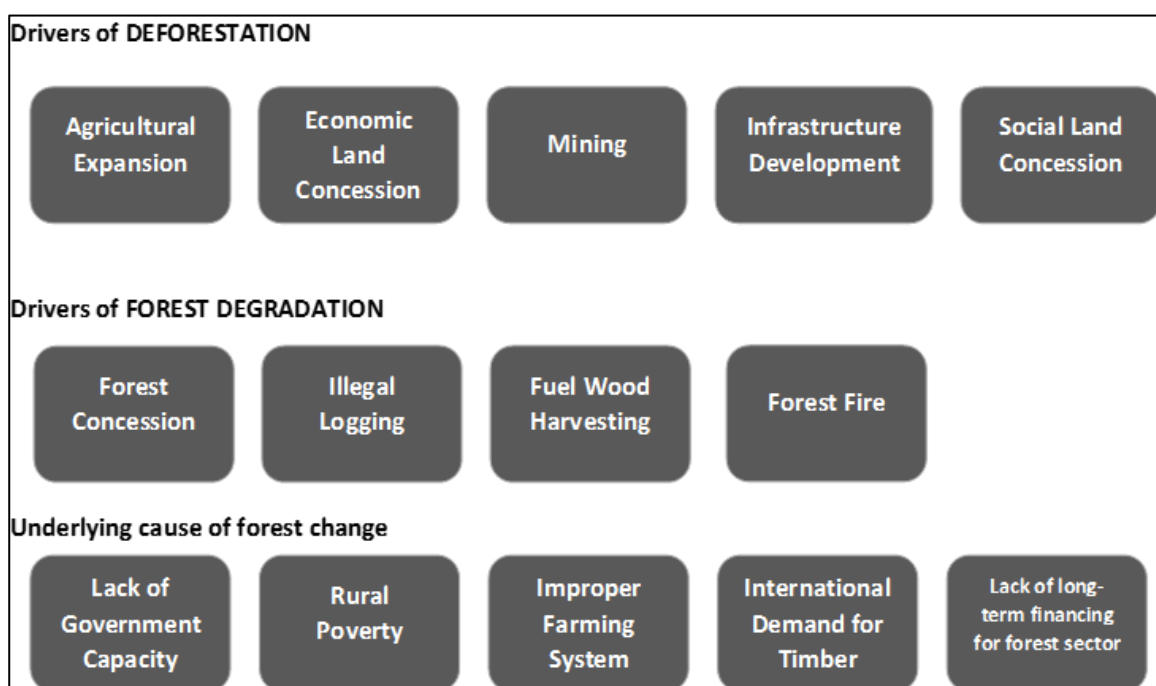


Figure 6. Drivers of forest change in Cambodia. (Source: adapted from Delux C. 2015)

4.5 Forest status

4.5.1 Forest types

Historically, various forest maps produced in Cambodia have made use of different forest type descriptions. Implementation of the REDD+ program and the establishment of the FRL however requires a consistent classification system. The one adopted for this purpose is described in the FRL and is compatible with IPCC land-use classes (see Table 5).

Table 4. Forest definition in Cambodia. (Royal Government of Cambodia, 2016c)

Forest Definition
Forest is the unit of natural ecosystem or plantation in wetlands, low lands and dry lands which are covered by natural stands or plantation trees with a height of at least 5 meters on an area of at least 0.5 ha and with a canopy of more than 10 %
For REDD+, rubber, oil palm and perennial crops are excluded from this definition

The main forest classes are distinguished with the support of leaf phenology which can be identified with remote sensing imagery. Thus, evergreen forest, semi-evergreen forest and deciduous forest are identified with this ecological criteria. Flooded forest, mangrove and pine forest all have very different ecologies and species composition from the three former types and can be identified easily.

Table 5. Forest types in Cambodia. (RGC, 2016c)

IPCC Land Use Categories	Land Use/Cover Categories	Description/Comment
Forest	Evergreen forest	Forest with trees maintaining their leaves during the whole year
	Semi-evergreen forest	Forest with variable percentages of evergreen and deciduous trees
	Deciduous forest	Dry mixed deciduous forest and dry Dipterocarp forests
	Pine trees	Forest dominated by coniferous trees
	Pine plantation	
	Tree plantation	This class includes the following type: teak, eucalyptus, acacia, jatropha and others
	Mangrove forest	
	Rear mangrove	Salt tolerant species but only infrequent floods
	Flooded forest	
	Bamboo	
Crop land	Rubber plantation	
	Oil palm	
	Paddy field	

IPCC Land Use Categories	Land Use/Cover Categories	Description/Comment
	Crop land	Arable and tillage land, and agro-forestry systems where vegetation falls below the thresholds used for the forest land category
Grassland	Grassland	Grasslands are characterized as lands dominated by grasses rather than large shrubs or trees. It is crucial that the rainfall is concentrated in six or eight months of the year, followed by a long period of drought when fires can occur.
	Wood shrub	Areas dominated by evergreen and deciduous woodland with a height less than 5 meters
Wetlands	Water	
Settlements	Built-up area	
	Village	
Other	Rock	
	Sand	

Evergreen forest is mainly found in the Cardamom mountains in the west of the country, while semi-evergreen forests are distributed in Ratanakiri province which borders Laos and Vietnam. Deciduous forests are found predominantly in Mondul Kiri province in the south-east. Flooded forests are located around the Tonle Sap.

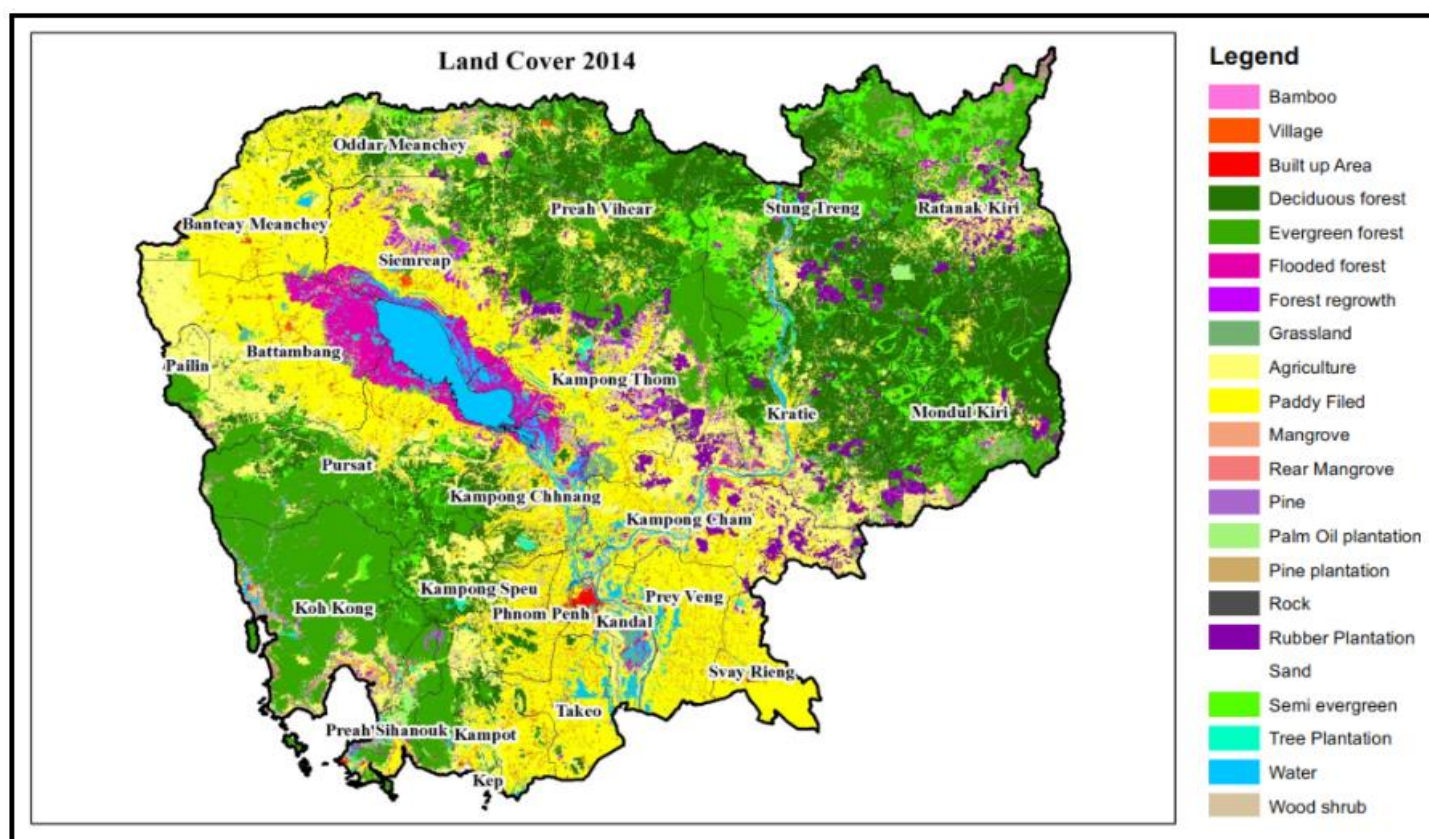


Figure 7. Land cover 2014 in Cambodia. (RGC, 2016c)

4.5.2 Current and historical forest cover

The figures and map shown below in Table 6 and Figure 8 are sourced from a published booklet produced by the Forestry Administration in 2016 with the support of the UN-REDD program.

Table 6. Forest status summary for Cambodia. (RGC, 2016c)

Forest Area			
Total Forest Cover (2014) 8,518,173 ha			Forest covers 46.9 % of Cambodia
Forest Cover Change Trend			
DECREASE	Forest area 2010: 10,451,912 ha	2010-2014: - 483,435 ha/year	2010-2014: - 4.6 %/year

While the current forest cover is still relatively high, Cambodia lost a considerable amount of forest over the last two decades, and the pace of land use and forest conversion has accelerated.

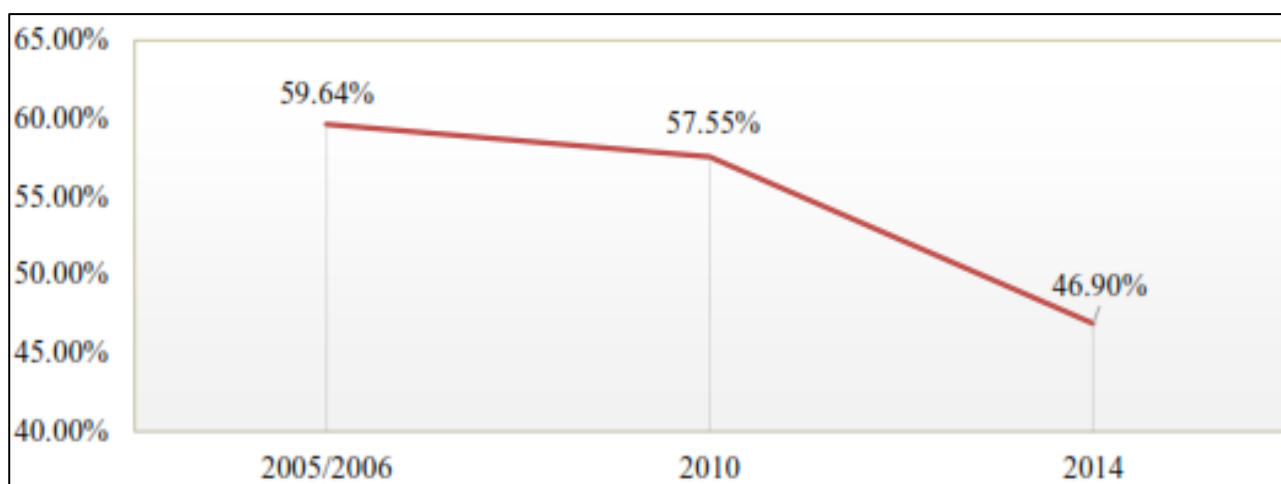


Figure 8. Forest cover change in Cambodia from 2005 to 2014. (RGC, 2016c)

During the period from 2005 to 2010, forest loss occurred mostly in the western part of the country in hilly zones and along the mountain ranges where evergreen and semi-evergreen forests are located. Changes to both evergreen and deciduous lowland forests have also been recorded in the flatlands. Furthermore, forest change hotspots are frequently located in areas bordering Laos, Thailand, and Vietnam. The last period from 2010 to 2014 saw an increase in forest loss, as displayed in Figure 8; forest cover which represented 57.55% of Cambodia's total area in 2010, was only 46.9% four years later. Forest loss as illustrated in Figure 9 occurred mainly in Oddar Meanchey, Kratie, Konpong Speu provinces and along the road that goes from Stung Treng to Ratanakiri provinces.

Forest Type	AGB (tC/ha)
Pine Plantation	47
Mangrove	70.5
Rear Mangrove	77.55

4.5.4 FREL/FRL Summary

The scale of the FRL is nation-wide. The FRL considers only deforestation and afforestation and accounts only for CO₂ emissions. The considered carbon pools are summarized in the table below.

Table 8. Carbon pools considered to calculate Cambodia's FRL. (RGC, 2016a)

Carbon Pool	Included
AGB	YES
BGB	YES
Soil organic carbon	NO
Dead wood	NO
Litter	NO

Cambodia takes an approach based on the historical average of net emissions from deforestation and afforestation for eight years from 2006 to 2014 to construct its FRL. Average annual emissions during the historical reference period were assessed to be 79,245,643 tCO₂/year; this is what is projected over the FRL period of 2014 – 2018.

Table 9. Total Annual CO₂ Emissions and Removals (t CO₂ / year) FRL reference period. (RGC, 2016a)

Period	Removals (tCO ₂ /year)	Emissions (tCO ₂ /year)	Net Emissions and Removals (tCO ₂ /year)
2006-2010	-6,626,046	34,148,629	27,522,583
2010-2014	-20,298,825	151,267,528	130,968,703
Average 2006-2014	-13,462,436	92,708,079	79,245,643

5 NATIONAL STATUS: Laos



5.1 Institutional context

Forests in Laos are under the jurisdiction of the Department of Forestry (DoF) under the Ministry of Agriculture and Forestry (MAF). The 8th National Socio-Economic Development Plan (2016-2020), the National Forest Strategy to the Year 2020 and the (Intended) Nationally Determined Contributions (NDC) include the commitment to increase forest cover to 70% by 2020 through sustainable forest management as well as reforestation and afforestation measures. The main law related to forestry in Laos is the 2007 Forestry Law. It defines all natural forestland, including communal village forestland, as the ultimate property of the national community, which is being represented by the State. In 2012, the Prime Minister's Order 13/PM suspended the consideration and approval for new investment projects related to mining prospecting and exploration, rubber and eucalyptus plantation concession, due to the expansion of concessions to the significant detriment of forests. In 2016, the Prime Minister's Order 15/PM, aimed to combat illegal logging by prohibiting the export of round and sawn timber as well as semi-finished products. Only finished wood products can now be exported.

5.2 REDD+ and EU FLEGT National status

5.2.1 REDD+

Laos became actively involved with REDD+ in 2008 with the submission of its R-PIN to the FCPF. Its R-PP was approved in 2010 and a US\$ 3.6 million Readiness Preparation grant approved in 2014. The delay to move from approved R-PP to the approval of the grant was primarily due to a ministerial reshuffling that resulted in a lack of clarity over forest management responsibility, specifically with regards to REDD+. Laos contracted a Technical Assistance team in 2016 to support with the implementation of the Readiness Preparation grant. In its mid-term report in 2016, Laos requested the FCPF for an additional US\$4.575 million in Readiness funds to be used between September 2017 and August 2020 which has been accepted although the grant agreement not yet been officially signed.

Laos is also engaging with the FCPF under the Carbon Fund. Its ER-PIN was selected for provisional inclusion into the pipelines of both Tranche A and Tranche B of the Carbon Fund at the thirteenth Carbon Fund meeting in October 2015. A revised ER-PIN was submitted in February 2016 and a Letter of Intent signed in July 2016. Laos anticipates submitting its ER-PD in January 2018.

In addition to its engagement with the FCPF, Laos is a recipient of \$30 million from the Forest Investment Program to pilot REDD+ interventions. Laos has also benefited from the ongoing support of several REDD+-specific donor programs, including the Climate Protection through Avoided Deforestation (CliPAD) program, funded by KfW and GIZ, and the Sustainable Forest Management and REDD+ Program (F-REDD), funded by JICA. Targeted, in-kind support is also provided by FAO, primarily for the development of the country's ER-PD submission.

Institutionally, REDD+ in Laos is overseen by the REDD+ Taskforce, an inter-ministerial body chaired by the Vice Minister of MAF and representing 8 different ministries as well as the National University of Laos. Technical inputs and guidance to the REDD+ Taskforce is provided by six Technical Working Groups, representing the following key topical areas: legal framework, land tenure, MRV/REL, safeguards, benefit sharing, and law enforcement. While the REDD+ Taskforce meets irregularly, the TWGs, with coordinating support from the R-PP Technical Assistance team and other donor agencies, meet regularly to discuss and progress technical matters. Secretarial and day-to-day management of REDD+ in Laos is delegated to the REDD+ Division under the Department of Forestry. Additionally, seven Provincial REDD+ Taskforces (PRTF) and Provincial REDD+ Offices (PRO) have been established.

The development of the National REDD+ Strategy is currently underway. An assessment and analysis of land use changes at the national level has been undertaken, drivers and strategic REDD+ interventions prioritized, and assessments conducted on the forest law and policy as well as natural resource rights and land tenure. This has led to the development of a draft strategy that is currently undergoing stakeholder consultations and verification. In tandem with the development of the National REDD+ Strategy, a Strategic Environmental and Social Assessment (SESA) report analysing the social and environmental impacts of the strategy has been drafted and the associated ESMF currently under development.

At the subnational level, draft Provincial REDD+ Action Plans have been developed for the six provinces comprising the ER-Program and will form the basis for elaborating the ER-PD's strategic interventions.

With respect to developing the country's FRL/FREL, several of the most important building blocks are in place. The Second National Forest Inventory was completed in 2017 which will inform the development of Tier 2 emission factors. Furthermore, national, wall-to-wall mapping for the years 2005, 2010 and 2015 has been completed, providing the necessary data inputs to generate activity data for the FRL/FREL. A preliminary FREL was developed for the ER-PIN and will be updated with the newly available activity data and emission factors in the ER-PD. Construction of the national FRL/FREL is completed and was submitted to UNFCCC in January 2018.

Development of the NFMS has made limited progress to date. Design of the MRV system has been completed and it currently houses historical data necessary to generate activity data. However, broader elements of the NFMS, including the SIS and links to local level forest monitoring are still in the design stage.

To date, Laos has not received any REDD+ results based payments at the project, sub-national or national level. One VCS validated project exists in Laos, although this has not yet achieved any credit sales.

5.2.2 EU-FLEGT

The Department of Forest Inspection under the Ministry of Agriculture and Forestry is the national focal point for developing the VPA, partnering closely with the Ministry of Industry and Commerce and the Ministry of Natural Resources and Environment, as well as other government agencies, civil society organisations, academia, the timber processing industry, and other stakeholders. In February 2012, the Government of Laos announced its interest in negotiating a VP and in October 2013 the Ministry of Agriculture and Forestry opened a Forest Law Enforcement, Governance and Trade (FLEGT) Standing Office with support from Germany's Agency for International Cooperation (GIZ). However, authorization for formal negotiations was not granted by the Prime Minister until June 2015 after which Laos quickly set up its negotiating structure – establishing a National Steering Committee and appointing a Chief Negotiator. In October 2015, Laos communicated to the EU its readiness to negotiate and the first negotiation round took place in April 2017. The FLEGT Technical Working Group, at its meeting on 15 December 2016, finalized key parts of the draft timber legality definition, and the National Steering Committee has approved the scope of the Voluntary Partnership Agreement (VPA) to include all export markets and the domestic market, the main timber sources: 1) Production forest, 2) conversion forest, 3) plantation, 4) village use forest, and a wide product scope.

Table 10. Key Active Multi/Bilateral REDD+ & FLEGT initiatives: Laos

Name	Focus
Forest Carbon Partnership Facility	Supporting national level REDD+ Readiness
Climate Protection through Avoided Deforestation (CliPAD)	GIZ and KfW co-funded project to provide policy advice and capacity development supporting the establishment of the national and provincial REDD+ framework and REDD+ planning processes. At the local level, mitigation activities are piloted and pro-poor REDD+ mechanisms and sustainable financing models are developed.
Sustainable Forest Management and REDD+ Program (F-REDD)	JICA funded project aiming to strengthen capacity for clarification of REDD+ strategy and improve forest resource information with the purpose to promote sustainable forest management (SFM)
ProFLEGT	Joint initiative of the Lao Government and German development cooperation, this GIZ project supports the VPA negotiation process between the EU and Laos.
FAO-EU FLEGT Programme	FAO-EU FLEGT Programme supported projects include practical activities which will inform the development of robust yet realistic legality standards and their verification. Identified priorities to be addressed in Laos include increasing understanding of the VPA and TLAS concepts and the opportunities the VPA process provides. It aims to support activities bridging the considerable gap between the legal and regulatory framework and legal compliance or law enforcement practices on the ground, and document current informal practices, limitations of verification processes and the challenges and barriers facing smallholders, communities and SME in legality compliance.

5.3 Forest management and conservation

Forest plays a crucial role in Laos. According to the Forestry Strategy to 2020 (published in 2005), forests contributed 3.2 % of GDP in 2001. Around 80% of the population relies on the forest for timber, fuel, food, fibre, medicines and other products. In rural areas, NTFPs often provide more than half a family's total income.

The national Forestry Law identifies three categories of state forests based on their functions. About 14.5 million ha (more than 50% of the country's land area) is delineated as state forest. All of these forest areas may include land cover that is not forest.

Table 11. Forest categories in Laos according to 2007 Forestry Law. (GoL, 2007)

Category	Functions
Conservation forests and national protected areas (NPAs)	Conservation of nature; preservation of plant and animal species as well as forest ecosystems and other sites of natural, historical, cultural, tourism, environmental, educational and scientific research importance. These are subdivided into total protection zones (all land uses prohibited), controlled use zones (permanent agriculture, non-commercial logging and collection of forest products allowed), corridor zones (collection of forest products allowed) and buffer zones (non-commercial logging and collection of forest products allowed).
Protection forests	Protection of the environment; protection from natural disasters; prevention of soil erosion; protection of water resources, riverbanks, roadsides and soil quality; the protection of strategic areas for national defence. These are subdivided into total protection zones (all land uses prohibited) and controlled use zones (permanent agriculture, non-commercial logging and collection of forest products allowed).
Production forests	Natural and planted forests that serve the purpose of production of timber and other forest products to satisfy business demands and the requirements of national socioeconomic development and people's livelihoods. These are subdivided into forest management areas (devoted to timber extraction) and village-use zones (permanent agriculture, non-commercial logging and collection of forest products allowed).

Village forests are poorly recognized and not included in the three forest types as described in the current version of Lao forest law. Village forests are considered as forest lands within Provinces and Districts, and are not classified as Production, Protection or Conservation where timber can be harvested and sold. Village use forests are the forest areas located within village areas and allocated for village management, preservation and utilization according to the land and forest allocation plan.

Table 12. Summary of forest category areas managed at national level in Laos. (Source: FIPD 2016 and GoL 2010)

Forest Category	Number	Area (ha)	Estimated Forested Area (ha) (GoL 2010)	Estimated Forested Area (%)
Conservation Forest	24	3,878,560	2,370,000	61
Protection Forest	49	7,482,109	2,570,000	34
Production Forest	51	3,094,510	1,300,000	42
Total		14,455,179	6,240,000	43

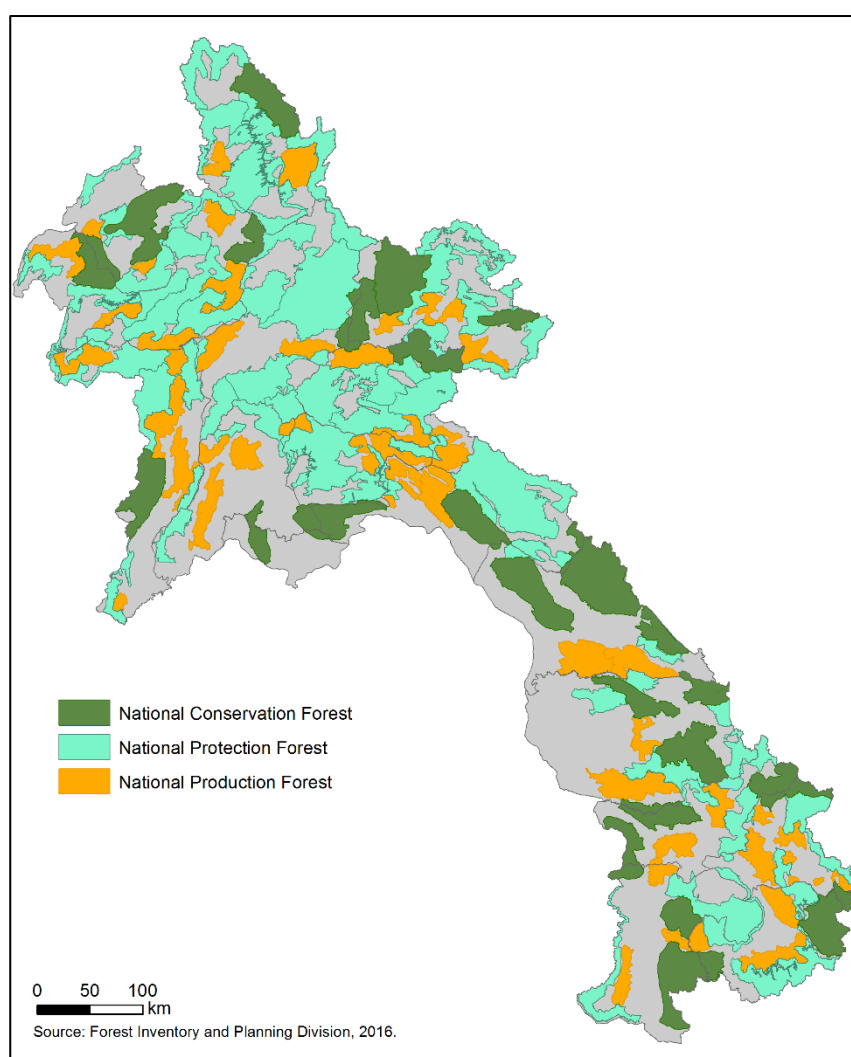


Figure 10. Map of forest categories in Laos. (FIPD, 2016)

5.4 Drivers of forest change

The R-PP to FCPF submitted in 2010 identifies nine drivers of forest cover change:

Drivers of DEFORESTATION



Drivers of FOREST DEGRADATION

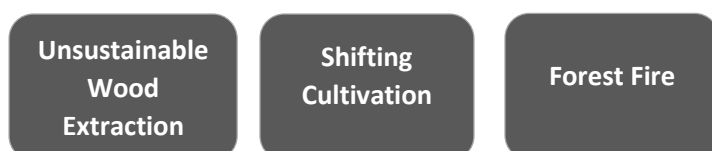


Figure 11. Direct drivers of forest cover change in Laos. (GoL, 2010)

A study conducted in 2011 in Northern Laos also identified indirect drivers of forest change:

Indirect drivers of forest change



Figure 12. Indirect drivers of forest cover change in Laos. (Wildlife Conservation Society and GIZ, 2015)

The main drivers of deforestation have been identified as conversion to agricultural land and plantation crops (including timber trees and rubber), by commercial companies and smallholders, and for mining and infrastructure development. There has also been and will continue to be expansion in hydro-power generating capacity. A recent study conducted in 2017 with the support of satellite imagery in the context of FCPF identified that main large scale (for change > 20ha) drivers are shifting agriculture, agriculture expansion and tree plantations. Shifting agriculture was identified as the predominant driver in the northern part of the country while tree plantations are the main driver in the South. Agricultural expansion occurs throughout the country.

Smallholder agricultural expansion is similar to shifting cultivation in terms of agents of deforestation and the dynamics of forest loss, except that the crops planted are typically cash crops such as maize and cassava or perennial crops such as rubber. These are, generally planted on more accessible land which uses the land permanently so that it does not revert to forest, unlike with shifting cultivation where the abandonment of the land after rice cultivation allows some areas to regenerate to forest.

The drivers of degradation are primarily illegal logging, unsustainable wood extraction and shifting cultivation. The latter is considered as degradation so long as it is done on a rotation basis and there is a fallow period that allows secondary forest to regenerate. In this way, overall forest stock is reduced, but not the forest area. Illegal logging activities are driven by their high profitability and are facilitated by weak law enforcement and control.

5.5 Forest status

5.5.1 Forest types

The Forest Inventory and Planning Division (FIPD) under DoF, produces the national Forest Type Map.

Table 13. Forest definition in Laos. (GoL, 2018)

Forest Definition
Forest Current Forest means the natural forest and forest plantation which having a tree cover with a crown density of at least 20 %, the area more than 0.5 ha, and DBH more than 10 cm.

The land/forest classification system of the country applies two levels of classification. Level 1 consists of seven classes including "Current Forest" and "Potential Forest" among others. Level 2 further classifies the Level 1 current forest class into six natural and plantation classes. The relation between the national land/forest classification system and the land-use category definition of the IPCC is illustrated in Table 14 below.

Table 14. Land and forest classification system in Laos. (GoL, 2018)

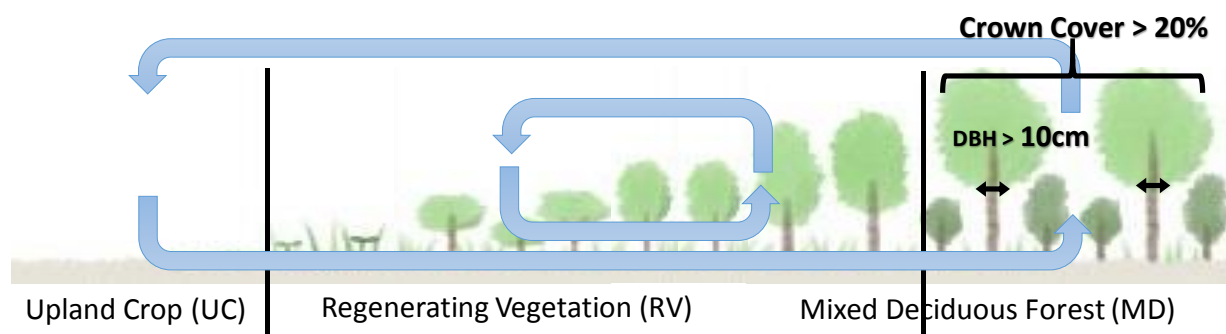
IPCC Land Use Categories	Land Use/Cover Categories	
	Level 1	Level 2
Forest	Current Forest	Evergreen Forest
		Mixed Deciduous Forest
		Dry Dipterocarp Forest
		Coniferous Forest
		Mixed Coniferous and Broadleaved Forest

IPCC Land Use Categories	Land Use/Cover Categories	
	Level 1	Level 2
	Potential Forest	Forest Plantation
		Bamboo
		Regenerating Vegetation
Grassland	Other Vegetated Areas	Savannah
		Scrub
		Grassland
Cropland	Cropland	Upland Crop
		Rice Paddy
		Other Agriculture
		Agriculture Plantation
Settlements	Settlements	Urban Areas
Other	Other Lands	Barren Land and Rock
		Other Land
Wetland	Above-ground Water source	River
		Wetland

Current forest refers to areas that meet the forest definition (Table 13. Forest definition in Laos) while potential forest includes regenerating vegetation that does not yet match the definition of forest.

Upland Crop and Regenerating Vegetation are predominately considered to be stages of the shifting cultivation cycle, and these lands are considered to re-grow and recover through natural vegetative succession as illustrated in Figure 13. Slash-and-burn cycle and land/forest classes For the purpose of REDD+, in line with the IPCC definition (2003) which describes that forest land can be "vegetation that currently fall below, but are expected to exceed, the threshold of forest land category." Regenerating Vegetation is classified as "Forest Land". Upland Crop is classified as "Cropland" as they are used, even temporarily, for cropping at the time of mapping.

The total area of Upland Crops (UC), Regenerating Vegetation (RV) and Mixed Deciduous Forest (MDF) account for nearly 70% of the land of Laos. Due to the prevalence of shifting cultivation in Laos and particularly in the northern region, large areas of land are shifting between these three different land/forest classes. Accurate interpretation of the transition events from UC (i.e. non-forest land) to RV (i.e. forest land temporarily un-stocked and does not meet the definition as forest) and then to MD, through satellite imagery presents a technical challenge. The classification of these land/forest classes can have significant impact on uncertainty.



Among the stages of shifting cultivation, UC is the stage of the land immediately after being slashed-and-burnt for cropping and is relatively easy to classify due to the lack of, or reduced, vegetation cover. RV and MD are continuous phases of regeneration in many cases, and old RV and young MD have very similar colour tone and texture on satellite imagery, thus, distinguishing the two in a single satellite image is technically challenging.

Figure 13. Slash-and-burn cycle and land/forest classes. (GoL, 2018)

The predominant forest type in Laos is mixed deciduous and can be found throughout the country. In this forest type, half of the species would be deciduous, with bamboo also being present.

Evergreen forest is a richer and denser type of forest found in higher elevated areas such as the Annamite mountains along the Laos-Vietnam border or in the north-west in Bokeo province. Various species of rosewood trees like *Pterocarpus Pelatus* are usually the target of illegal loggers.

Dry Dipterocarp forest are commonly found in flat land with shallow soil and is composed of rather small trees that are fire resistant (*Dipterocarpus Obtusifolius*). This forest type is found in the south of the country in Savannakhet, Salavan, Champassak and Sekong provinces.

Coniferous forest and mixed coniferous and broadleaved forest can be found in very specific places in the country such as Xiengkhouang plateau, the Nakai plateau and Sekong province near the Vietnamese border.

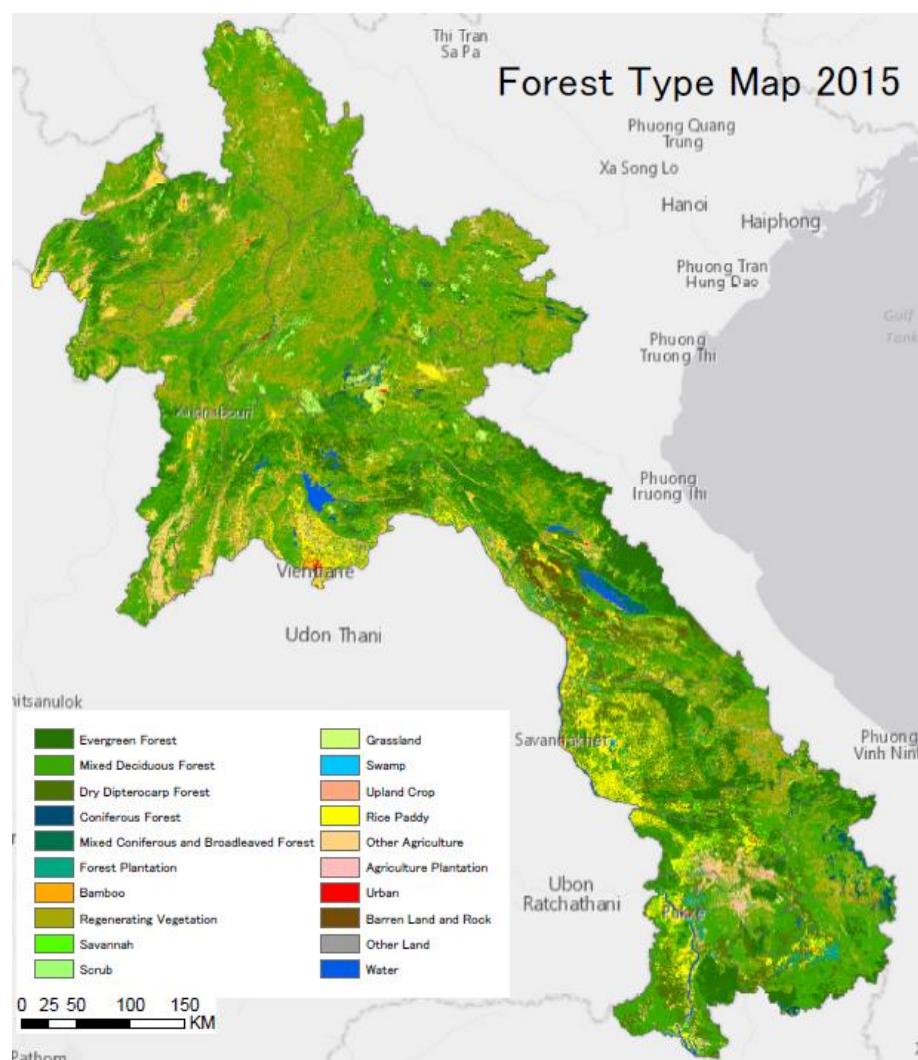


Figure 14. Forest and Land cover map 2015 – Laos. (GoL, 2018)

Regenerating vegetation is mainly found in the northern part of the country where shifting cultivation practices are dominant.

Plantation forests which have considerably expanded during the last decade, only represent 1% of the current forest. Rubber plantations have been developed in the north (Luang Namtha and Oudomxay provinces) and in the south (Champassak and Attapeu provinces) respectively by Chinese and Vietnamese investors. Acacia or Eucalyptus plantations were developed for the need of the paper industry mainly in the central provinces like Bolikhamxai and Khammouane provinces.

5.5.2 Current and historical forest cover

The Table 1. Forest area in 2005, 2010 and 2015. (FAO, 2015) that displays figures from the FAO Forest Resources Assessment could be misleading for Laos as first FAO uses its own forest definition (10% canopy cover) and secondly the figure for 2015 is an extrapolation of the trend observed between 2002 and 2010. In reality forests in Laos are decreasing in extent and in quality mainly because of the expansion of agricultural land pushed by the

emergence of cash crops, such as maize, and the development of infrastructure and logging.

Table 15. Forest status summary for Laos. (FIPD, 2016).

Forest Area			
Forest land (Current forest and potential forest): 19,531,889 ha		Forest land: 84.7 %	
Current Forest (2015) 13,369,408 ha		Current forest: 58 %	
Potential Forest (2015) 6,162,481 ha		Potential Forest: 26.7 %	
Forest Cover Change Trend			
DECREASE	Current Forest area 2005: 13,875,422 ha	2005-2015: - 50,601 ha/year	2005-2015: - 0.4 %/year

The figures displayed in Table 15. Forest status summary for Laos come from the national forest type maps. A detailed look reveals that while areas considered as forest covers 84.7% of the country, current forest represents only 58%, with this class of forest seeing a regular decrease of its area of -0.4% per year. These deforestation figures do not illustrate the impact of logging on the degradation of forest resources which is known to be occurring at high rates in Laos.

For the purpose of the REDD+ MRV, the national land and forest classification explained in Table 14. Land and forest classification system in Laos is condensed into five strata. Such simplified stratification will help reduce uncertainty of emissions and removals while balancing the accuracy of sampling and the cost/efforts required. The forest stratification used for the construction of the FREL/FRL includes the following five types of forest land and non-forest land and the historical figure is shown in Table 16. Historical area of stratified land cover in Laos:

- Evergreen Forest has distinctly high carbon stocks (200.0tC) and is separated as an independent stratum – Stratum 1.
- Mix Deciduous Forest, Conifer Forest and Mixed Coniferous and Broadleaved Forest will form one stratum on the basis of similarity in carbon stocks per hectare (87.7tC, 92.6tC, 114.7tC). – Stratum 2.
- Dry Dipterocarp Forest will form one stratum due to the difference in carbon stock from other forest classes (43.2tC), and also due to the fact that they are mostly distributed in the low-lands and prone to conversion to other land use – Stratum 3.
- Forest Plantation, Bamboo and Regenerating Vegetation will form one stratum on the basis of similarity in average carbon stock (37.2tC, 24.4tC, 17.4tC) – Stratum 4.
- The remaining 12 non-forest classes form one stratum – Stratum 5.

Looking at historical figures, the strata 1, 2 and 3 which are current and natural forest types as opposed to plantation, are decreasing significantly, with strata 2 losing more than 50,000 ha every year.

Table 16. Historical area of stratified land cover in Laos. (GoL, 2018)

IPCC Land Use Class	Strata	2005		2010		2015	
		Area (ha)	%	Area (ha)	%	Area (ha)	%
Forest Land	Strata 1	2,618,169	11.40%	2,613,226	11.30%	2,605,557	11.30%
	Strata 2	9,961,368	43.20%	9,721,635	42.20%	9,437,688	40.90%
	Strata 3	1,272,006	5.50%	1,215,712	5.30%	1,188,198	5.20%
	Strata 4	6,183,370	26.80%	6,042,075	26.20%	6,300,445	27.30%
	Sub-total	20,034,913	86.90%	19,592,648	85.00%	19,531,888	84.70%
Other	Strata 5	3,019,344	13.10%	3,461,610	15.00%	3,522,370	15.30%
Total		23,054,258	100%	23,054,258	100%	23,054,258	100%

As described in Table 18. Description of Activity Data for Laos and shown in the Figure 15. Map of Activity Data (Deforestation, Forest Degradation, Reforestation and Forest Regeneration) in Laos for the period 2005-2010 and 2010-2015 below in yellow, deforestation is the conversion of any forest land strata into non-forest strata, stratum 5. During the first period 2005-2010, deforestation occurred with the expansion of corn especially in the north-east (Xamneua province) and the west (Vientiane and Sayabouly province) which converted large areas of regeneration vegetation to cropland. The development of large infrastructure like the Nam Theun II hydropower dam in Khammouane province flooded forested areas. Rubber plantation were developed on degraded forest land in the south of the country. During the period 2010-2015, the expansion of cash crop reached a plateau that resulted in less regenerating areas converted into cropland. However, the pace of deforestation of current forest types remained constant.

Table 17. Activity data per period in Laos. (GoL, 2018)

Activity	Area (ha)	
	2005-2010	2010-2015
Deforestation	719,348	320,381
Reforestation	277,082	259,621
Forest Degradation	242,890	297,004
Forest restoration	85,896	107,381

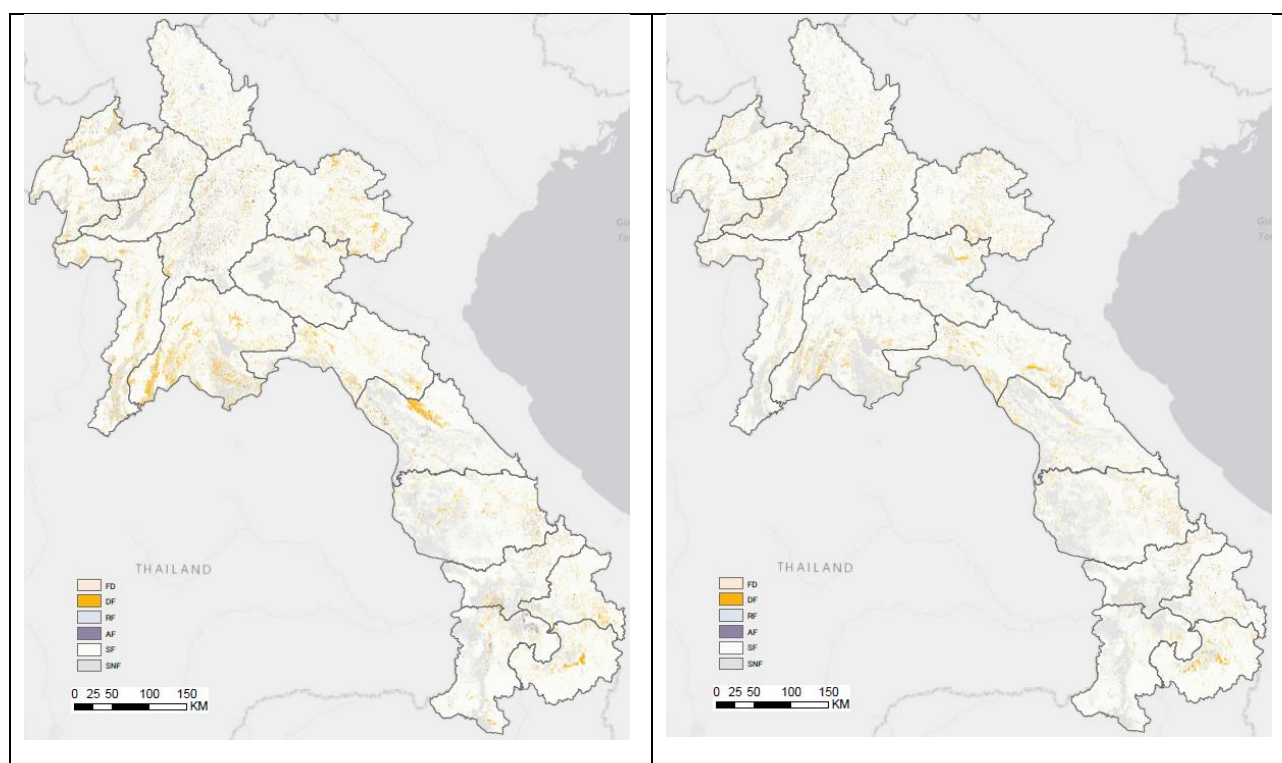


Figure 15. Map of Activity Data (Deforestation, Forest Degradation, Reforestation and Forest Regeneration) in Laos for the period 2005-2010 and 2010-2015. (GoL, 2018)

5.5.3 FREL/REL Summary

The reference period of the FREL/FRL is 10 years, from 2005 to 2015. The scale of the FREL/FRL is national wide and only CO₂ is considered. The tables below summarize the activities considered as well as the carbon pools included.

Table 18. Description of Activity Data for Laos. (GoL, 2018)

Activities	Description
Emissions from deforestation	A deforestation event is a change of a forest land stratum to a non-forest land stratum. The total emissions from deforestation account for approximately 34% of all forest-related emissions in the reference period (2005-2015).
Emissions from forest degradation	A degradation event is a change within forest land strata from a higher biomass stratum to lower biomass stratum, and also through measurement of tree stumps as a proxy indicator of logging activities The total emissions from forest degradation account for approximately 66% of all forest-related emissions in the reference period (2005-2015). Estimated emissions from selective logging represent 41% of total emissions from forest degradation.

Activities	Description
Removals from forest enhancement (Restoration)	A restoration event is a change within forest land stratum from a lower biomass stratum to a higher biomass stratum (in IPCC terms, "forest land remaining forest land"). This is often a result of regrowth of the RV (Stratum 4) to other natural forest classes.
Removals from forest enhancement (Reforestation)	A reforestation event is a change of non-forest stratum (Stratum 5) to forest land strata (Strata 1-4). This is often a result of a non-forest land (Stratum 5) being converted into the Plantation class, or regenerating into the RV (both Stratum 4).

Table 19. Carbon pools considered in calculation of FREL/FRL in Laos. (GoL, 2018)

Carbon Pool	Included
AGB	YES
BGB	YES
Soil organic carbon	NO
Dead wood	NO
Liter	NO

The Table 20 below displays the average annual historical emissions and removal for the reference period, 2005-2015. The average historical emissions aggregates the emissions from deforestation, forest degradation and also an estimation of emissions from selective logging. Net average annual historical emissions which are projected forward for the FREL are 26,575,895 tCO₂e.

Table 20. Proposed FREL/FRL for Laos. (GoL, 2018)

Emissions/Removals	tCO ₂ e/year
Average historical emissions	+ 34,106,431
Average historical removals	- 7,530,536
Net Average historical emissions	+ 26,575,895

5.5.4 Carbon stocks

The Lao National Forest Inventory and Planning Division conducted its second ever National Forest Inventory during the dry seasons of 2016 and 2017 with the purpose of updating biomass and carbon stock values for five forest classes: evergreen forest (EF), mixed deciduous forest (MDF), mixed coniferous broadleaf (MCB), coniferous forest (CF) and dry

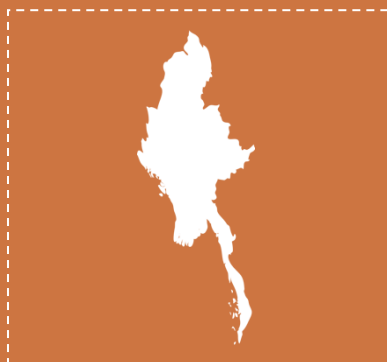
dipterocarp forest (DD). FIPD teams surveyed a total of 642 plots of which 420 forest plots were utilized in the carbon stock calculation.

A specific survey was conducted to estimate the carbon stock of this class. For bamboo and plantations, carbon stocks were respectively taken from the Northern Central Coast region of Vietnam and from the IPCC database.

Table 21. Carbon stocks per strata. (GoL, 2018)

Strata	tC/ha
Strata 1 (EG)	200.0
Strata 2 (MD/CF/MCB)	88.1
Strata 3 (DD)	43.2
Strata 4 (P/B/RV)	17.9
Strata 5 (NF)	4.9

6 NATIONAL STATUS: Myanmar



6.1 Institutional context

The Ministry of Natural Resources and Environmental Conservation (MONREC) is responsible for managing all forestlands in the country including the Permanent Forest Estate (PFE) and Public Forests. MONREC develops the forest policy and legal frameworks and coordinates Climate Change related policy analysis and development.

Myanmar has two key forestry laws and policies in place: the 1992 Forest Law, and the 1995 Forest Policy. The 1992 Forest Law supports conservation initiatives, sustainable forestry practices, socio-economic benefits, and encourages private sector and community participation in forest management. The Forest Policy focuses on sustainable production, satisfying basic needs, institutional strengthening, improvements in efficiency, forest and biodiversity protection, and participatory forestry.

6.2 REDD+ and EU FLEGT National status

6.2.1 REDD+

Between July 2012 – August 2013 Myanmar undertook a process to develop a REDD+ Readiness Roadmap in partnership with the Regional Community Forestry Training Centre (RECOFTC) and with the support of the Government of Norway and UN-REDD targeted funds. This roadmap became the basis to guide early stage REDD+ Readiness and formed the basis of an application to become a full UN-REDD National Programme. Additional targeted support of US\$1,115,000 from UN-REDD was used between 2014 – 2015 to support implementation of the Readiness Roadmap. Myanmar prepared its Expression of Interest to become a UN-REDD National Programme in 2015; this was approved at the 15th meeting of the UN-REDD Policy Board in November 2015. The UN-REDD National Programme was launched in early 2017 and will run until 2020.

Institutionally, under the overall guidance of the Ministry of Natural Resources and Environmental Conservation (MONREC), the Myanmar REDD+ Taskforce manages and coordinates the readiness process. The REDD+ Taskforce is composed of members from

MONREC, the Ministry of Agriculture, Livestock and Irrigation (MoALI), Ministry of Home Affairs (MoHA) and the Myanmar Environment Rehabilitation-conservation Network (MERN). The REDD+ Taskforce is supported operationally by a REDD+ Taskforce Office within the Forest Department. The REDD+ Taskforce draws on the technical inputs from three Technical Working Groups (TWGs) that together form the REDD+ Stakeholder Network. The three TWGs are on: drivers and strategies; stakeholder engagement and safeguards; and national forest monitoring systems and forest reference emission levels/forest reference levels.

Through support from the UN-REDD program, Myanmar has made reasonable progress on the development of its REDD+ National Strategy. A draft strategy has been elaborated outlining key interventions to address the various drivers of deforestation and forest degradation. The strategy is now undergoing stakeholder consultations and is likely to be available for wider public viewing by late 2018.

The assessment of safeguard impacts of the REDD+ National Strategy is expected to occur once this is finalized and the elements of the strategy identified. This will also lead to the identification of the key safeguard components to be integrated into the SIS.

Myanmar expects to develop its preliminary FREL for submission to the UNFCCC by early 2018. Due to the lack of national wall-to-wall forest and land cover maps, this will be elaborated based on a sampling approach that integrates both global forest cover datasets with available national datasets and extrapolating trends. In the absence of a NFI, Myanmar will make use of conservative assumptions for emission factors. An NFI will be conducted over the next several years.

Limited progress has been made in Myanmar to date on the development of the NFMS. While national institutions and historical data is available on which to build the NFMS, a lack of financial resources and limited technical skills has impeded progress. Development of the NFMS is a priority of the UN-REDD programme.

6.2.2 EU FLEGT

Myanmar entered the preparation phase for a VPA with the EU in 2015. This has been undertaken under the guidance of a FLEGT-VPA Interim Task Force (ITF) representing relevant government, civil society and private sector stakeholders. In early 2016, the Myanmar Forest Certification Committee (MFCC), supported by the Food and Agriculture Organization of the United Nations (FAO), commissioned a multi-stakeholder, participatory gap analysis of the current Myanmar Timber Legality Assurance System (MTLAS) to document the existing MTLAS and describe some of the gaps observed between the MTLAS and existing international frameworks and best practice for standards and assurance systems. This report was published in 2017. An executive committee is expected to be established in early 2018 to engage in formal VPA negotiations.

Table 22. Key Active Multi/Bilateral REDD+ & FLEGT initiatives: Myanmar

Name	Focus
UN-REDD	Supporting national level REDD+ Readiness

6.3 Forest management and conservation

Administratively, Myanmar defines its PFE to be comprised of three components:

- Reserved Forests. These are forests gazetted for timber production by the state;
- Protected Public Forests. These are forests that are gazette for production of timber and other products for use locally; and
- Protected Areas (PA).

The PFE accounted for 28.9% of the total area of the country in 2015. Most of the forest outside the PFE, lies on land designated as "Vacant, Fallow and Virgin" (VFV). Only 60.4% of the PFE has forest cover. The Forest Policy states that Myanmar's protected area must cover at least 10% of the total land area of the country. Data reported to the FAO in 2015 indicates that 4.46 million ha of forest (~6.8% of its land area) are located within protected areas.

Table 23. Forest categories area in Myanmar. (GoM, 2018b)

Category	Cover type	Area (hectares)	% of country area
Inside PFE	Forest	11,799,238	17.4
	Other land use	7,526,245	11.1
	Water bodies	209,364	0.3
	Total Area	19,534,847	28.9

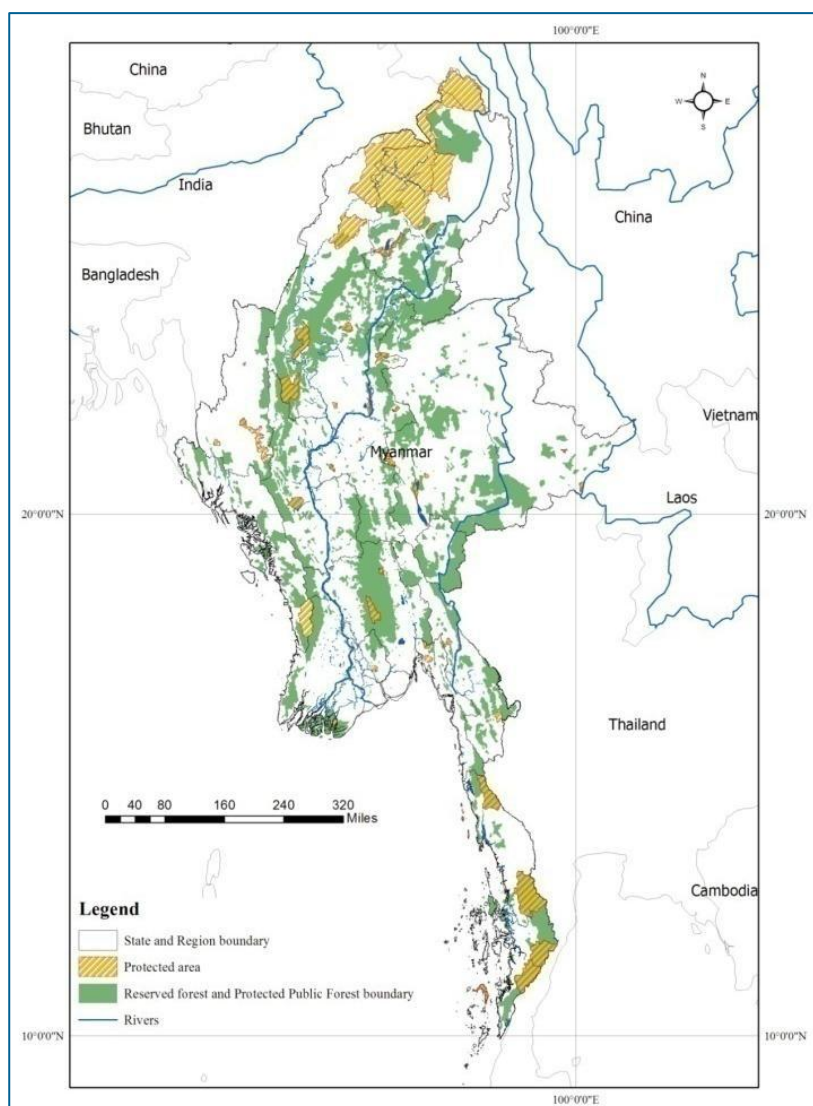


Figure 16. Map of forest category in Myanmar (GoM, 2018b)

Although tenure over forested land generally lies with the government, other tenure arrangements also exist, as outlined below:

- Community forests (CF). The most recent version of the Community Forestry Instructions (2016) specify that CF can be established in Reserved Forest, Protected Public Forest, Buffer Zones of Protected areas and Land under the management of government agencies, or owned by private individuals and non-governmental organizations (NGOs). The Forest Department may issue a permit for Community Forest Enterprise with the aims of adding value to the current land and freely trade forest products through commercialization. The Forestry Master Plan (2001) set a target of 920,000 ha under CF's by 2030. Currently there are 116,700 ha. To meet the target will require nearly 67,000 ha/year to be established from now until 2030, compared to a current average of 2,810 ha/year.
- Village-owned fuelwood plantations. The Forest Department has established 183,000 ha of such plantations in the period 1981-2016 on Permanent Forest Estate land. These are also known as "Village supply plantations".

- Privately-owned plantations. The National Reforestation and Rehabilitation Programme has set a target of expansion of privately-owned forest plantations by 8,100 ha, annually. Up to March 2017, private plantations amounted to 56,100 ha of teak and 35,700 ha of non-teak species.

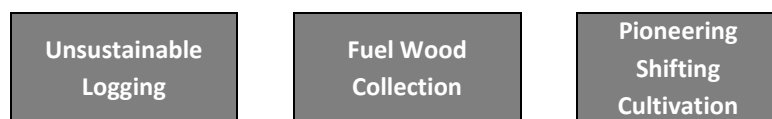
6.4 Drivers of forest change

Presented below are the main direct and underlying drivers of deforestation impacting Myanmar's forests, as identified in Myanmar's 2013 REDD+ Readiness Roadmap.

Drivers of DEFORESTATION



Drivers of FOREST DEGRADATION



Underlying cause of forest change

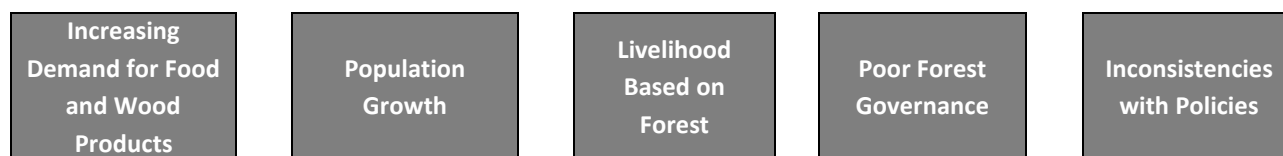


Figure 17. Drivers of forest change in Myanmar. (GoM, 2013)

A growing population and the increasing demand for food, wood products and other commodities from domestic and international markets put pressure on remaining forest resources and are driving rapid land-use change in favour of agriculture and extractive industries.

Remaining intact forests are being exploited for maximum short-term gain at the cost of long-term sustainability. For example, large portions of mangrove forest were converted by aquaculture industries between 1990 and 2010. Additionally, farmers seem to be adapting to political and economic reforms by shifting from agriculture to commercially more viable and beneficial cash crops like rubber.

Most large-scale plantations in Myanmar grow rubber, sugar cane or palm oil. While total plantation area is still relatively limited, expansion is concentrated in a few states/regions with high local impacts on forest ecosystems and biodiversity. A good example are oil palm plantations in southern Tanintharyi. This region is the only part of the country that has the climate and conditions for their large-scale development and management; their establishment has impacted around 400,000 ha of pristine forest. Bokpyin and Tanintharyi townships jointly lost more than 75,000 ha of intact forest to oil palm plantation establishment between 2002 and 2014. By 2017, rubber plantations expansion reached around 650,000

ha. It followed investments from Thailand and Malaysia especially in the states bordering Thailand (Mon, Kayin and Tanintharyi) and in the north-east in Kachin and Shan states.

The increasing production of corn which follows the growth of the livestock sector is a cause of deforestation like in Shan State. Shifting cultivation while decreasing since 2000 may still occur in uplands and impact forested areas.

Mining activity, while being a driver of forest cover change since 2000, in Kachin, Sagaing and Mandalay states, is not expected to expand and cause further deforestation in the coming years. However, infrastructures development, particularly the hydropower sector will have an increasing impact on forested areas.

Illegal logging is taking place in many states and/or regions, although the hotspot appears to be Kachin state, as timber (and charcoal) are being exported to China illegally.

6.5 Forest status

6.5.1 Forest types

Table 24. Forest definition in Myanmar. (GoM, 2018a)

Forest Definition

Myanmar uses an adaptation of the FAO definition of forests: "Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent or trees able to reach these thresholds in situ". Mangroves are included, but perennial agricultural plantations such as oil palm and rubber are not.

The forests are distributed over three climatically distinct regions (i.e. tropical, subtropical and temperate) with eight major forest types and several subtypes defined by the occurrence of certain dominant species or species groups (e.g. dipterocarps) or specific edaphic conditions:

Tropical types:

- Evergreen Hardwood Forests (including mangroves)
- Mixed Evergreen and Deciduous Hardwood Forests
- Dry Deciduous Hardwood Forests

Subtropical types:

- Hardwood Rainforests
- Mountain Forests (including Pine Forests)

Temperate types:

- High Mountain Hardwood Forests
- High Mountain Conifer Forests
- High Mountain Subalpine Scrub Forests

The most abundant forest type in Myanmar is the tropical Mixed Evergreen and Deciduous Hardwood Forest which, in both its upland and lowland subtypes, is known for the occurrence of teak and other valuable timber species such as ironwood. Other common forest types are the Subtropical and Temperate Mountain forest formations and Tropical Dry Deciduous forest. However, no recent study provides a contemporary assessment of the distribution of the different forest types.

The Mixed Evergreen and Deciduous Hardwood Forests have been the main target of commercial timber logging in Myanmar, while Subtropical forests, often scattered on slopes and tops of mountains (e.g. in Chin and Shan states) have been traditionally affected by shifting cultivation carried out by local communities. In recent years, commercial logging has expanded to Evergreen Hardwood Forests in lowlands, for example in Tanintharyi. The Tropical Dry Deciduous Hardwood Forest, concentrated in the Central Dry Zone, are also under human influence, including conversion to agriculture, and firewood harvesting.

Myanmar also describes its forests in terms of their canopy coverage. Forests with more than 40% canopy cover are defined as “closed forests”, while those with between 10% and 40% canopy cover are defined as “open forest”.

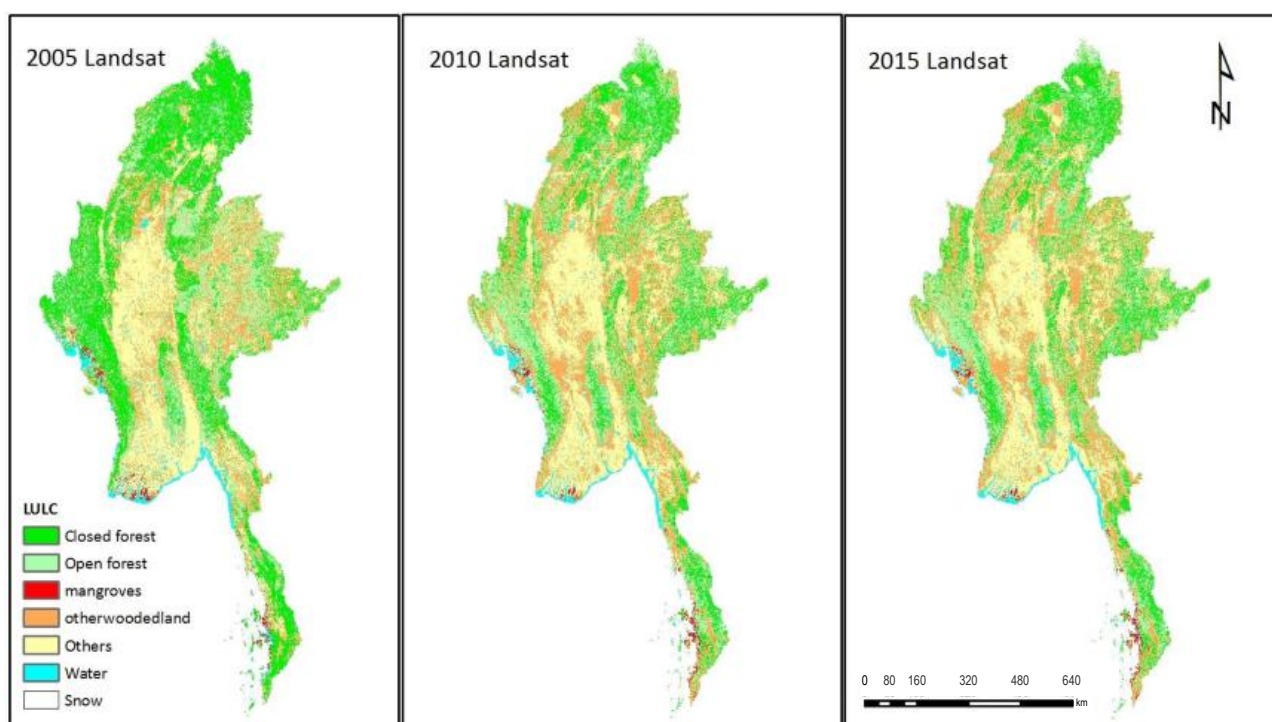


Figure 18. Myanmar historical forest cover maps. (GoM, 2018a)

6.5.2 Current and historical forest cover

New and rapid political and economic changes in Myanmar are increasing the pressures on the country's forests.

The best recent forest cover map available has been produced by ECODEV-ALARM which results are outlined below. With a forest cover of 42,365,729 ha or 63% of the country, Myanmar still maintains substantial forest cover compared to other Southeast Asian

countries, However, only 38% of these forests can be considered intact (meaning forest that has a canopy cover greater than 80%)

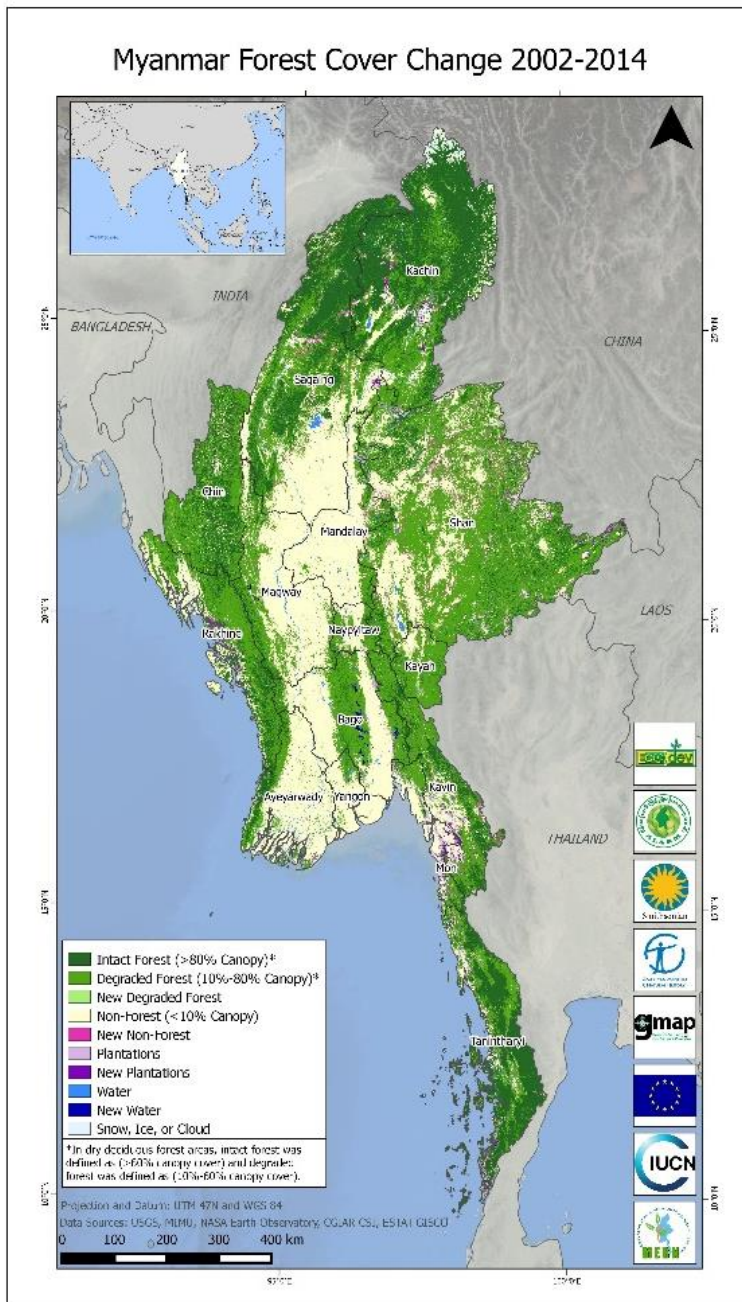


Figure 19. Map of forest cover change in Myanmar between 2002 and 2014. (ALARM, 2016)

Between 2002 and 2014, intact forests declined at a rate of 0.94% annually, totalling more than 2 million ha of forest loss. Losses can be extremely high locally, such as townships that are hotspots for intact forest loss in Shan, Sagaing, Kachin, and Tanintharyi.

Table 25. Forest cover summary for Myanmar. (ALARM, 2016)

Forest Area			
Total Forest Cover (2014) 42,365,729 ha Source: ECODEV-ALARM, 2016			63 %
Forest Cover Change Trend			
DECREASE	Forest area 2002: 43,962,183 ha	2002-2014: - 133,038 ha/year	2002-2014: - 0.3 %/year

6.5.3 FREL/REL Summary

The scope of Myanmar's FREL is national level. Initially, Myanmar prioritized two of the five REDD+ activities as the focus of the country's first FREL/FRL submission; deforestation and enhancement of forest carbon stock through afforestation/reforestation. However, the current FREL/FRL considers only deforestation.

Three carbon pools of Above Ground Biomass (AGB), Below Ground Biomass (BGB) and Litter are included in this FREL, using allometric equations derived from district forest management. One National Emission Factor was used as an uncertainty test is needed for forest type stratification and national data sources are currently insufficient for this purpose.

Table 26. Carbon pools considered in Myanmar for the calculation of FREL/FRL. (GoM, 2018a)

Carbon Pool	Included
AGB	YES
BGB	YES
Soil organic carbon	NO
Dead wood	NO
Litter	YES

The current FREL/FRL considers only CO₂. The reference period is 2005 to 2015.

The amount of deforestation (forest loss) during the reference period has been estimated using a sample-based approach. This approach was preferred to the use of the wall-to-wall maps shown in Figure 18. Myanmar historical forest cover maps. The basis for the sample-based approach were the tree cover 2000 and tree cover loss 2000-2015 maps developed by the University of Maryland.⁴ A stratified random sampling generated 1,884 locations

⁴ <http://earthenginepartners.appspot.com/science-2013-global-forest>

where the forest change was surveyed by visual interpretation with the software Collect Earth⁵ that leverages Google Earth, Landsat and Bing imagery. The results of this survey were area estimates for forest and non-forest cover for each year and thus area estimates for deforestation. The final bias-corrected estimated forest loss is 387,527 ha per year over the period 2005-2015.

It should be noted that the accuracy of the estimated loss is rather low with producer's and user's accuracy being respectively 0.44 and 0.21. The estimated forest loss differs significantly from the figures shown by the FAO-FRA (see Table 1. Forest area in 2005, 2010 and 2015. (FAO, 2015) or the ECODEV-ALARM map (Table 25. Forest cover summary for Myanmar.) which are respectively 428,000 ha/year and 133,038 ha/year. Still, the sample-based area estimates for forest loss was assessed as the most reliable figure.

In conclusion, Myanmar proposes an initial FREL by using the historical average of emissions during the reference period from 2005 to 2015 which was obtained by multiplying the bias-corrected area of annual deforestation with the national Emission Factor (EF) of 125.43tCO₂e per ha, which is based on inventory results in 40 districts.

Annual CO₂ emission from deforestation during the historical reference period 2005-2015 have been estimated as 48,607,511 tCO₂ per year.

⁵ <http://www.openforis.org/tools/collect-earth.html>

7 NATIONAL STATUS: Thailand



7.1 Institutional context

The Royal Forest Department (RFD) of Thailand was founded in 1896 to consolidate the exploitation of forests. As a result, all forests were taken into public ownership from the feudal chiefs to be managed by the Government. With the creation of the Ministry of Natural Resources and Environment in 2002, the RFD was divided into three Departments:

- The RFD responsible for forests outside Protected Areas,
- The Department of Natural Parks, Wildlife and Plant Conservation (DNP) responsible for the Protected Areas,
- The Department of Marine and Coastal Resources (DMCR) which manages coastal flora and fauna, including mangrove forests outside Protected Areas through conservation and rehabilitation.

All the departments are under the supervision of the Ministry of Natural Resources and Environment (MONRE).

Thailand has promulgated many forest laws which have been effective to control and define the processes for forest protection and forest resource management with the aim of sustainable utilization of forest resources. At present, there are six forest laws being employed to regulate the forestry activities as follows:

- Forest Act B.E. 2484 (1941) and subsequent amendment B.E. 2532 (1989),
- National Park Act B.E. 2504 (1961),
- National Reserved Forest Act B.E. 2507 (1964) and subsequent amendments B.E. 2522 (1979) and B.E. 2528 (1985),
- Wildlife Preservation and Protection Act B.E. 2535 (1992),
- Forest Plantation Act B.E. 2535 (1992),
- Chainsaw Act B.E. 2545 (2002).

The 12th National Economic and Social Development Plan (NESDP 2017-2021) set a target for the forest cover to 40% of the country area.

7.2 REDD+ and EU FLEGT National status

7.2.1 REDD+

Thailand was selected as a FCPF REDD Country Participant in 2009 following the submission of its R-PIN in early 2008. A delay of five years ensued before Thailand submitted its R-PP in March 2013 which was accepted provisionally subject to revisions which were received in November 2013. The Readiness Preparation Grant was signed in June 2016, unlocking \$3.6 million to support the development of REDD Readiness in Thailand.

At the institutional level, REDD+ is overseen in Thailand by the inter-ministerial REDD+ Taskforce established in 2010 and headed by the Department of National Parks, Wildlife and Plant Conservation (DNP). In addition to serving as the REDD+ policy making agency to develop national REDD+ strategy options for REDD+ readiness in Thailand, the REDD+ Taskforce is tasked with establishing a number of Technical Working Groups (TWGs) and overseeing the REDD+ Office and REDD+ Information Center. The REDD+ Office is the implementing agency charged with facilitating, implementing and promoting all REDD+ activities. The DNP's Director of the Forest and Plant Conservation Research Office will lead the REDD+ Office and draw the membership from DNP, Royal Forest Department (RFD), Department of Marine Coastal Resources (DMCR) and Forestry Industry Organization (FIO). The REDD+ Information Center, on the other hand, is a multi-ministerial center charged with heading all REDD+ carbon registry activities in Thailand. Despite the existence of these REDD+ institutions, these are only active on a limited basis.

Due to the fact that approval of the FCPF readiness grant only occurred recently, Thailand has made only limited progress on achieving REDD+ readiness. It is expected that the development of the national REDD+ strategy will commence in early 2018 once R-PP funds begin to be spent, after which the assessment of potential safeguards the strategy triggers can be assessed and key indicators to be monitored and reported in the SIS identified.

Whilst Thailand does not yet have a FRL/FREL or a NFMS, the expectation is that these should not be too difficult to establish due to the high technical capacities and extensive data already available in Thailand, including an advanced forest monitoring system and existing national forest inventory data. The main challenges to pull the NFMS together will be to establish consistent definitions and parameters for forest types for both the activity data and emission factors, as well as coordinating the different agencies currently involved with forest monitoring.

7.2.2 EU FLEGT

Thailand officially entered into the VPA process in September 2013. Also, in 2013, Thailand established a multi-stakeholder as-hoc working group (AHWG) to develop the VPA legality definition and is now also tasked with developing all VPA annexes. The same year also saw Thailand found its Thai-EU FLEGT Secretariat Office (TEFSO) within the Royal Forestry Department. The military coup in 2014 put the prospect of negotiations on hold until 2015 when the European Commission and Thai government agreed that technical negotiations could resume. 2016 saw TEFSO and the AHWG continue to develop the VPA annexes and

in December of the same year the Thai Cabinet approved moving towards full negotiations. In mid-2017 the first face-to-face negotiations between Thailand and the EU took place.

Table 27. Key Active Multi/Bilateral REDD+ & FLEGT initiatives: Thailand

Name	Focus
FCPF	Supporting national level REDD+ Readiness
FAO EU FLEGT	FAO-EU FLEGT Programme's support to Thailand has largely focused on strengthening TEFSO and Civil Society Organisations (CSOs) to facilitate, and substantively engage in, the VPA process. FAO FLEGT's support also covers technical inputs for the development of Thailand's TLAS and other technical VPA annexes.

7.3 Forest management and conservation

In 2013, there were 1,221 National Forest Reserves that cover 23 million ha. The RFD manages 11.8 million ha of forest lands, which consist of National Forest Reserves (10.12 million ha) and Permanent Forest Estates outside NFRs (1.68 million ha). The DNP manages national parks, wildlife sanctuaries, watersheds, and other protected areas, some of which overlap the boundaries of National Forest Reserves. The table below outlines the forest lands managed by the DNP and the RFD.

Table 28. Forest areas under jurisdiction of DNP, RFD and MoA. (NEPCON, 2017)

Conservation Type	Jurisdiction	Number	Area (ha)	% of the country
Degraded land within National Forest Reserve	Ministry of Agriculture		5,220,000	10.18
National Forest Reserve	RFD		10,120,000	19.74
National Forest Reserve (Area that overlaps with National parks and Wildlife Sanctuary)	DNP		7,690,000	15.00
National Forest Reserve		1.221	23,000,000	44.85
Permanent Forest Estate	RFD		1,680,000	3.28
National Park	DNP	127	6,220,000	12.13
Wildlife Sanctuary	DNP	58	3,660,000	7.13
No Hunting Area	DNP	60	523,304	1.02

Conservation Type	Jurisdiction	Number	Area (ha)	% of the country
Forest Park	DNP	113	123,671	0.24
Botanical Garden	DNP	16	4,137	0.01
Arboretum	DNP	55	4,265	0.01

NFR are divided into 3 zones:

- Conservation Forest Zone (Zone C): covers existing protected forest areas declared in the royal decrees and cabinet resolutions (wildlife sanctuaries, national parks, watershed classification 1, mangrove conservation areas). Some of this area remains occupied by permanent agriculture, shifting cultivation, and associated human settlements.
- Economic Forest Zone (Zone E): was set aside for buffer zones, commercial tree plantations, mining, and other economic development activities. Some of these lands are in degraded forest areas.
- Agricultural Zone (Zone A): is a portion of the national forest reserve deemed suitable for agriculture. These areas are being allocated to farmers by the Agricultural Land Reform Office (ALRO).

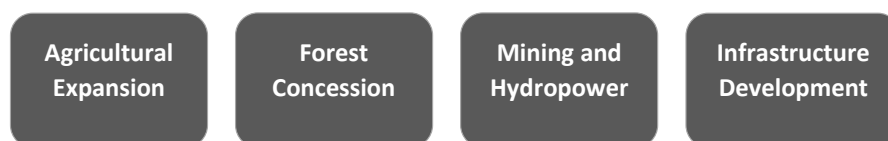
Although there are communities residing in Protected Areas (national parks and wildlife sanctuaries) and national Reserved Forests, community forestry can be legally conducted in Reserved Forests only by virtue of Section 19 of National Reserved Forest Act 1964 and it must be jointly done by communities and forestry officers. For the Protected Areas, the intention of the law is to protect river sources and manage national forest and natural resources and biodiversity. Therefore, community forestry is not allowed in the Protected Areas.

In the 1970s, looking for ways to address the country's rampant deforestation, the Thai government officially recognized community forestry as a tool for sustainable forest management. By 1989, an estimated 8,000 sites existed, and today there are more than 10,000. The Ministry's Royal Forest Department, responsible for all forests not in protected areas, has long supported community forestry and has a sub-department that supports communities in legalizing sites. In contrast, the Ministry's National Park, Wildlife, and Plant Conservation Department, responsible for protected-area forests, has largely worked to prevent community forestry in protected areas, operating under the exclusionary National Park law. As of 2010, the Royal Forest Department had formally recognized and registered around 7,000 community forests, all outside of protected areas, and it is actively seeking to register more.

7.4 Drivers of forest change

The revised R-PP submission to the FCPF in 2013 identifies the following drivers of forest cover change:

Drivers of DEFORESTATION



Drivers of FOREST DEGRADATION



Underlying cause of forest change



Figure 20. Drivers of forest change in Thailand. (RTG, 2013)

Policies adopted since the first NESDP to the sixth (from 1961 to 1991) promoted in priority the economic development of the country. Therefore allocation of forest concessions, or concessions for mining sector and infrastructure development impacted forest resources. In addition, the promotion of intensive commercial monoculture crops resulted in the expansion of agricultural land.

Forest degradation has mainly been caused by illegal logging, harvesting of non-timber forest products for commercial purposes and uncontrolled forest fires. Figures from the RFD in 2012 showed that fires resulted in 5,475 ha of forest loss mainly in the north and north-east parts of the country.

Illegal logging and the timber trade are extremely profitable due to strong timber demand in East and Southeast Asia, high prices and the existence of high value species, such as *Dalbergia cochinchinensis* (price about US\$ 5,000 per m³). The Department of National Parks reported an increase in the value of confiscated *D. cochinchinensis* between 2009 -2012, from US\$ 1 million in 2009 to more than US\$ 4 million in 2012.

7.5 Forest status

7.5.1 Forest types

Table 29. Forest definition used in Thailand. (NEPCON, 2017 and FAO 2010 Forest Resources Assessment Thailand)

Forest Definition

Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. The definition excludes eucalyptus plantations, or trees planted primarily for non-timber use such as agroforestry systems, fruit orchards, rubber and palm plantations.

Forests in Thailand are rich in biodiversity; they possess approximately 7% of the world flora and fauna. There are more than 2,000 species of flora and fauna that are endemic only to Thailand.

There are two main types of forests in Thailand: evergreen forest and deciduous forest.

The evergreen forest is subdivided into tropical evergreen forest, pine forest, and mangrove and beach forest:

- Tropical evergreen forest is found all over the moist part of the country. This type of forest is also subdivided into the tropical rain forest, the semi-evergreen forest and the hill evergreen forest:
 - o Tropical rain forest is characterized by a very rich flora and very dense undergrowth. This type of forest is commonly found in the Southern and the Eastern regions where rainfall is above 2,000 millimetres. The predominant species (the top store species) are, for example, *Dipterocarpus* spp, *Hopea* spp, *Lagerstroemia* spp, and *Shorea* spp,
 - o Semi-evergreen forest is scattered all over the country where the rainfall is between 1,000-2,000 millimetres. The predominant species are *Dipterocarpus* spp, *Hopea* spp, *Diospyros* spp, *Azadirachta* spp, *Terminalia* spp, and *Artocarpus* spp.
 - o Hill evergreen forest is found on the highlands (above 1,000 meters elevation). The presence of mosses and lichens on trees and rocks is the indicator of this forest type. The predominant species are oaks (*Quercus* spp) and chestnuts (*Castanopsis* spp and *Lithocarpus* spp).
- Pine forest has two species of tropical pines, *Pinus merkusii* found in the northern and the western part of the Central region, where the soil is poor, and *P. kesiya* found only the highlands of the Northern and Northeastern regions.
- Mangrove forests occur along the coastal areas of the Eastern, Central and Southern regions. The predominant species are *Rhizophora* spp, *Xylocarpus* spp, *Avecennia* spp, *Bruguiera* spp, and *Nypa* spp.
- Beach forests occur along the sandy coastal plains especially in the eastern coast of the Southern region. The main species in this type of forest are *Diospyros* spp, *Croton* spp, *Lagerstroemia* spp and *Casuarina* spp.

Deciduous forest is characterized by the presence of deciduous tree species and is commonly found throughout the country. It is subdivided into the mixed deciduous forest and the dry dipterocarp forest.

- Mixed deciduous forest is commercially among the most valuable forest of Thailand with *Tectona grandis*, *Xylia kerrii*, *Pterocarpus maritimus*, *Azadirachta xylocarpus* and *Dalbergia* spp (rose wood) as the dominant species.

- Dry dipterocarp forest is commonly found in the dry area (rainfall below 1,000 millimetres) with sandy soils. The predominant species are mainly Dipterocarpaceae such as *Dipterocarpus tuberculatus* and *D. obtusifolius*.

DNP reported in 2007 that the most common forest types were tropical evergreen forest (66%, including hill evergreen forest and dry evergreen forest), mixed deciduous forest (8%), dry dipterocarp forest (7%) and pine forest (6%).

In addition to the evergreen and mixed deciduous forest types, in 2007, the country had about 2.5 million hectares of plantations (about half of which are rubber plantations, which are considered to be agricultural crops). Rubber planting has been actively promoted by the Government since the 1960s and the total area reached 1,906 million ha in 2005 and 2.377 million ha in 2007, of which 75% is found in the Southern region, 10% in the Eastern region and 14% in the Northeast region.

7.5.2 Current and historical forest cover

The forest cover reported by the DNP in 2013 was 16,339,126 ha. This figure with those displayed in the table below confirm that forest cover is increasing in Thailand. However, the Figure 2. Deforestation and reforestation 2000-2015 from CCI Land cover maps, which illustrates the regional deforestation from global historical land cover maps, showed that deforestation in Thailand occurred essentially between 1995 and 2005 near the border with Myanmar and principally in two locations, the south of Mae Hong Song province and in Kanchaburi province.

Forest increase comes from government policies that support reforestation of degraded forest areas through tree planting campaigns. The first NESDP in 1965 initiated this effort and by 2012, 650,000 ha were planted (LEAF, 2015). Also, recent efforts to enact the legislation enabled the RFD to retrieve forest land from illegal encroachment. Between 2010 and 2012, 17,530 ha were retrieved principally from the northern regions (7,188 ha).

Table 30. Forest cover summary for Thailand.

Forest Area			
Total Forest Cover (2015): 16,347,969 ha			31.6 %
Source: Department of Natural Parks, Wildlife and Plant Conservation-2016			
Forest Cover Change Trend			
INCREASE	Forest area 2005: 16,100,000 ha 2015: 16,399,000 ha Source: FRA - FAO, 2015.	2005-2015: + 29,900 ha/year	2005-2015: + 0.19 %/year

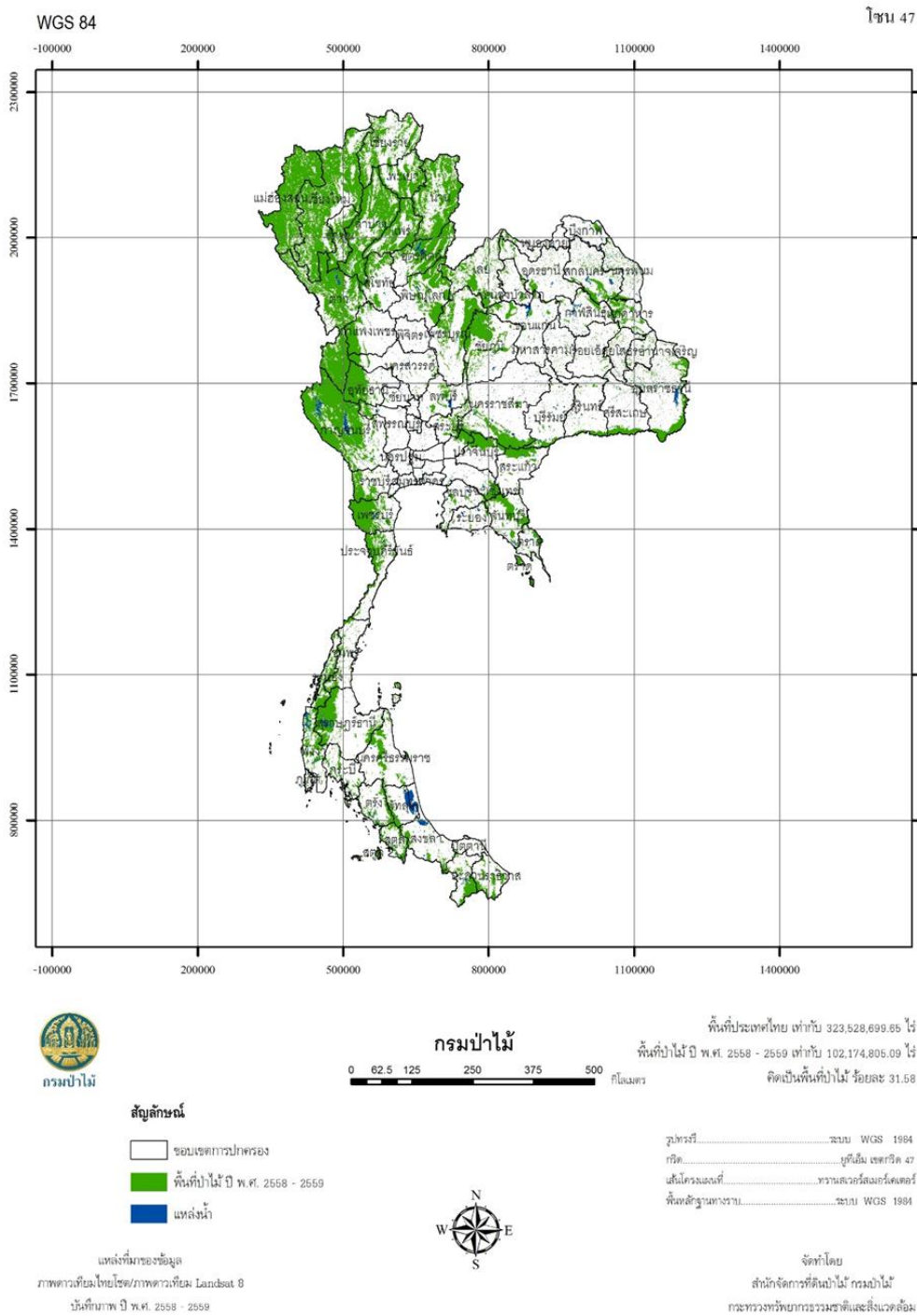
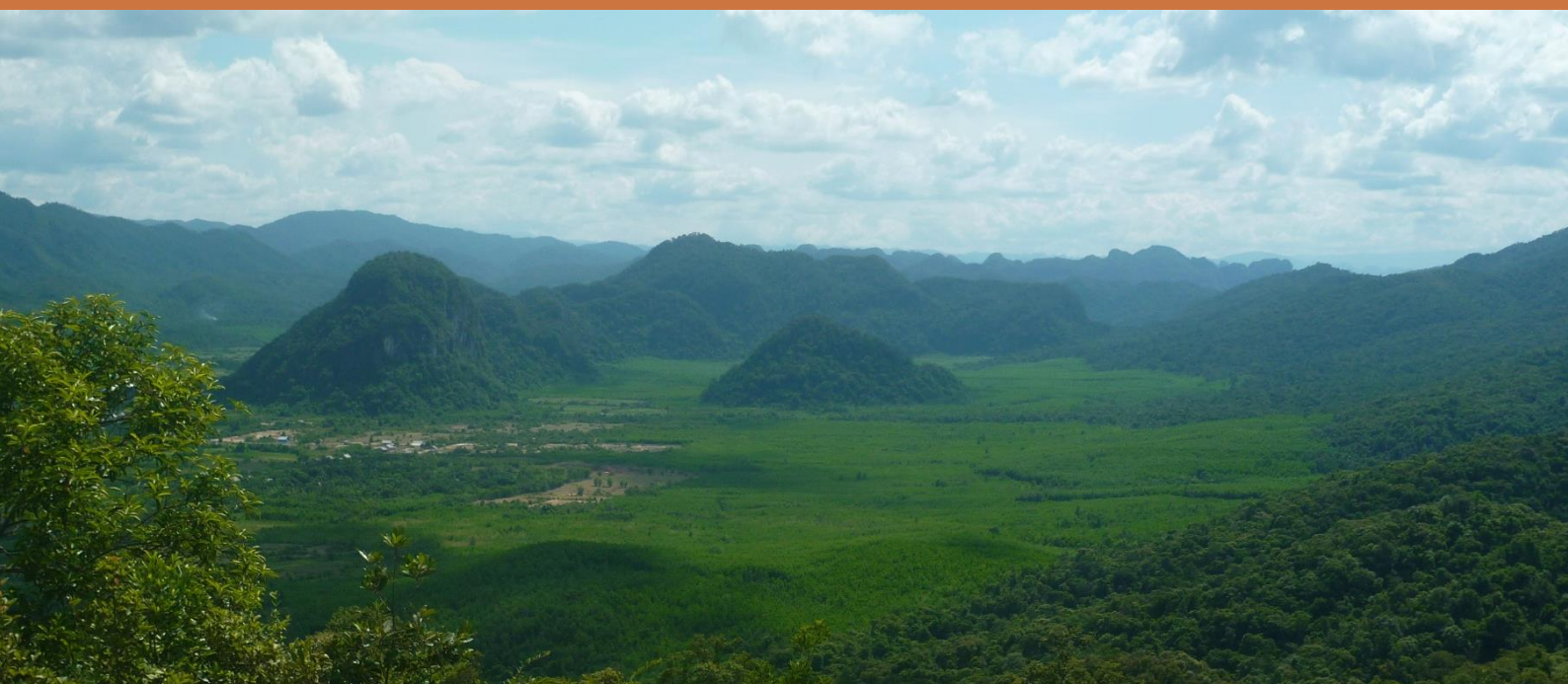


Figure 21. Forest cover map of Thailand in 2015-2016. (Source: DNP, 2016)

7.5.3 FREL/REL Summary

As outlined in Chapter 7.2.1, Thailand has not yet developed its FREL/FRL.

8 NATIONAL STATUS: Vietnam



8.1 Institutional context

The forest in Vietnam (SRV, Socialist Republic of Vietnam) is managed by the Vietnamese Forestry Administration (VNFOREST), which is under the Ministry of Agriculture and Rural Development (MARD). Management is governed by the 1992 Law on Forest Protection and Development, last amended in 2004.

Between 1998 and 2010, in order to halt deforestation and increase forest cover to 43% by 2010, the government implemented publicly funded forestry projects under the Five Million Hectares Reforestation Program (Program 661). The results from the program have been mixed⁶. Although it has gone a long way in meeting its targets for protection forest, it has fallen below its expectations for regeneration, particularly for plantations. Consequently,

⁶ Vietnam R-PP Readiness Preparation Proposal, 2011

Program 147 “support for development of forest plantations” (2007-2015) which focuses on production forests was introduced.

The Land Law (2003) clarifies the framework for forestry land tenure and enables the allocation of forest land to communities as well as to individual households. In 2005, the Forest Protection and Development Law recognizes distinct categories of forest ownership, with varying responsibilities and rights for forest management.

8.2 REDD+ and EU FLEGT National status

8.2.1 REDD+

Vietnam was the earliest REDD+ mover in the region, submitting an ER-PIN to the FCPF already in March of 2008, only a few months after the FCPF formally launched at the 2007 Bali COP. A Readiness grant was approved for Vietnam by the FCPF in March 2011 subject to the submission of a revised R-PP. Vietnam resubmitted its revised R-PP in November 2011 and the Readiness Grant Agreement was signed in 2012. Vietnam's 2015 mid-term progress report requested an additional US\$5 million of Readiness funds from the FCPF which were granted in October 2016.

During this time, Vietnam also became a UN-REDD National Programme. The UN-REDD's Policy Board approved Vietnam in March 2009 and the programme ran until June 2012. Phase II of UN-REDD programme began in July 2013 and is expected to run until the end of 2018.

In order to receive results-based payments for performance, Vietnam submitted an ER-PIN to the FCPF Carbon Fund in May 2014. This was selected for inclusion into both Tranche A and B of the Carbon Fund in June 2016 and a Letter of Intent (LOI) signed in January 2015. Vietnam's first ER-PD was submitted in November 2016 and a revised version resubmitted in November 2017. The ER Programme focuses on six provinces: Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien Hue.

In addition to multi-lateral support, Vietnam has benefited from a number of REDD+ specific initiatives, that have helped Vietnam become one of the most advanced REDD+ countries globally. These include:

- Sustainable Natural Resource Management Project (SNRM Project), funded by JICA
- Provincial Government Support for the Preparation and Implementation of REDD+ Pilot Activities in Quang Binh, funded by GIZ
- Delivering Environmental and Social Benefits from REDD+ in South East Asia (MB-REDD) funded by SNV
- REDD+ Planning Implementation in Dien Bien (SUSFORM-NOW), funded by JICA
- REDD+ Pilot Implementation in Dien Bien (SUSFORM-NOW), funded by JICA
- Vietnam Forests and Deltas Programme, funded by USAID
- Forest Management Information Systems Project (FORMIS), funded by the Ministry of Foreign Affairs of Finland

Until November 2017, the National REDD+ Steering Committee (NRSC) was the ultimate body with responsibility for managing the REDD+ readiness process and overall implementation. This responsibility has now been passed to National Target Programme for

Sustainable Forest Management headed by the Deputy Prime Minister and deputized to the Minister of Agriculture and Rural Development (MARD). As with the National REDD+ Steering Committee, this is a multi-sectoral body. Day-to-day management for the REDD+ process is delegated to the Vietnam REDD+ Office (VRO) which sits within VNFOREST in MARD. Six Technical Working Groups (TWGs) have also been established on: i) REDD+ governance; ii) MRV; iii) REDD+ financing and benefit distribution; iv) local implementation; v) private sector engagement; and vi) safeguards.

Vietnam began development of the first National REDD+ Action Programme (NRAP) as early as 2011, with official endorsement of this NRAP coming from the Prime Minister in 2012. This NRAP was to govern the period between 2011 – 2020 and be implemented in two phases: 1) 2011 - 2015 with a focus on awareness raising, capacity building and pilot activities in at least 8 provinces; and 2) 2016 - 2020, where Vietnam will extend its capacity building efforts, accomplish technical and institutional requirements for implementing REDD+ and implement demonstration activities at the national scale. A review of progress in the NRAP implementation was carried out at the end of the first phase of the NRAP (2011 – 2015) and determined that a revision of the NRAP was necessary to better guide REDD+ implementation, particularly with regards to developing mitigation strategies that went beyond the forest sector and engaged additional sectors. Revision of the NRAP occurred in 2016 and the revised NRAP was given Prime Minister approval in April 2017. Following this, Vietnam is now in the process of developing a National REDD+ Investment Plan (NRIP) for the period 2017-2020.

With the support of the UN-REDD Phase II program, as well as the FCPF and other donor REDD+ projects, Provincial REDD+ Action Plans (PRAPs) have also been developed in the six provinces forming the ER Program. Whilst developed primarily to support the development of the ER-PD and came before the revision of the NRAP, these PRAPs now need to be updated to better align with the revised NRAP.

To date, work on safeguards in Vietnam has included the conduct of a legal study on Vietnam's existing safeguards-relevant policies, laws and regulations (PLRs) and the extent to which they are consistent with the scope and content of the Cancun safeguards. An assessment of the extent to which these PLRs are being implemented in practice was conducted in 2016. In addition, a considerable amount of work was carried out to provide a national "clarification" or "interpretation" of the Cancun safeguards in accordance with Vietnam's national context including through extensive consultations with the STWG-SG. Finally, a framework design document was produced for Vietnam's Safeguard Information System (SIS) in late 2016. Development of the SIS currently remains in its early stages.

It should be noted that under the auspices of the first FCPF grant assessments of the environmental and social impacts of the ER Programme were conducted, resulting in a SESA (Strategic Environmental and Social Assessment) and ESMF (Environment and Social Management Framework). Under the additional FCPF readiness funding, a SESA of the revised NRAP is now also being conducted.

Vietnam was one of the first countries globally to submit a FREL/FRL to the UNFCCC for technical assessment in January 2016. Based on feedback from the technical assessment the FREL/FRL was revised throughout 2016 and final, revised version submitted in December 2016. In addition to the national FREL/FRL, a reference emission level (REL) and reference

level (RL) for the ER Programme area was also developed and incorporated into the ER-PD submission. For both of these submissions, the methodological approach is outlined and the historical data is made available and adjustments for national circumstances explained transparently, consistent with UNFCCC guidance. Vietnam is currently attempting to assess performance against its FREL up to the year 2016.

With respect to the development of its NFMS, Vietnam is able to make use of its existing Forest Resources Monitoring System, which has undergone a digitization process under the Forest Management Information Systems Project (FORMIS), as the basis for its activity reporting. For the MRV component of the NFMS, Vietnam has a number of existing government programs and initiatives that can contribute to the generation of the necessary activity data and emission factors, including the National Forest Inventory Monitoring and Assessment Program (NFIMAP), National Forest Inventory and Statistics (NFIS) or Annual Forest and Forestland Monitoring Report Program (AFLMRP). Seeking clarification on which system to use for MRV purposes and establishing the institutional linkages to aggregate the relevant information are currently under development.

To date, Vietnam has not benefited from any form of results-based payments for REDD+ performance.

8.2.2 EU FLEGT

Vietnam began negotiating its VPA with the EU in November 2010. For Vietnam, negotiations were led by the Vietnam Administration of Forestry (VNFOREST) under the Ministry of Agriculture and Rural Development. Following this, in 2001, Vietnam established an inter-ministerial FLEGT-VPA Steering Committee to support these negotiations.

Additionally, also in 2011, Vietnam established two Working Groups: one to prepare the timber legality definition and another to prepare the legality assurance system. These Working Groups included representatives from government, industry association and one international NGO. Vietnamese civil society was not, however, party to the negotiations and was only able to provide inputs through public consultations. In response, local NGOs established a VNGO FLEGT Network in 2012 to promote and coordinate civil society inputs in the process.

In November 2016, six years after beginning negotiations, Vietnam and the EU agreed, in principle, on the content of the VPA before initialling the VPA in May 2017. Both Vietnam and the EU will now have to complete the procedure for signing and ratifying the VPA in line with their internal procedures.

1. **Legal framework.** The programme provides advisory support for the drafting of legal documents, including for conservation-oriented financing mechanisms (payment for environmental services, PFES), protected area management, and sustainable forest management. It also contributes the lessons learned from the projects in the provinces (incl. Phong Nha-Khe Bang project in Quang Binh Province) to the REDD+ process at the national level.
2. **Development of institutional capacity.** The programme assists the partner ministry in implementing the National Capacity Development Plan for Protected Area Management. The Department of Nature Conservation is supported to introduce

information management systems to improve forest ranger patrolling strategies in protected areas ("SMART" Tool). Experiences drawn from the certification of two forestry companies are being used to contribute to the development and implementation of a national sustainable forest management plan, and to strengthen the capacities of service providers to enable them to assist additional forestry companies with certification.

3. **Timber legality (VPA FLEGT and TLAS).** The programme is advising the partner within the context of FLEGT negotiations, including the design of timber legality assurance systems. The project will also provide support to strengthen the capacities of the verification authorities.

Table 31. Key Active Multi/Bilateral REDD+ & FLEGT initiatives: Vietnam

Name	Focus
FCPF	Supporting national level REDD+ Readiness
UN-REDD Phase II	Supporting national level REDD+ Readiness
Sustainable Natural Resource Management Project (SNRM Project), funded by JICA	<ul style="list-style-type: none"> • Supporting policies for storing biodiversity information in NBDS which is indispensable for implementation of biodiversity conservation policy • Aiming for Forest Monitoring System using tablet-PC developed by JICA to be adapted as officialized system in the country cooperating with provinces and other Development Partners. • Building capacity that enables full implementation of REDD+ activities at the national level as well as the provincial level in the northwest. • Supporting the implementation of Collaborative Management in Lam Dong province, in a manner consistent with UNESCO's MAB Programme.
Conservation and sustainable use of forest biodiversity and ecosystem services, GIZ	<p>Legal framework. Advisory support for the drafting of legal documents, including for conservation-oriented financing mechanisms, protected area management, and sustainable forest management. Contributes lessons learned from projects in provinces (incl. Phong Nha-Khe Bang project in Quang Binh Province) to the REDD+ process at the national level.</p>

Name	Focus
	<p>Development of institutional capacity. Assists partner ministry in implementing the National Capacity Development Plan for Protected Area Management. The Department of Nature Conservation is supported to introduce information management systems to improve forest ranger patrolling strategies in protected areas. Contributes to the development and implementation of a national sustainable forest management plan, and to strengthen the capacities of service providers to enable them to assist forestry companies with certification.</p> <p>Timber legality (VPA FLEGT and TLAS). Advising partner within the context of FLEGT negotiations, including the design of timber legality assurance systems. Provides support to strengthen the capacities of the verification authorities.</p>
FAO EU FLEGT	FAO-EU FLEGT Programme has coordinated closely with GIZ and other stakeholders to support key interventions necessary to develop the systems, laws and regulations needed for successful VPA implementation. FAO FLEGT is also collaborating closely with UN-REDD in Vietnam, which has provided support to developing central elements of Vietnam's Timber Legality Assurance System (TLAS).

8.3 Forest management and conservation

The overall objective of forest management in Viet Nam, as defined in the Viet Nam Forestry Development strategy 2006-2020, is to sustainably manage 16.24 million ha zoned for forest land and increase forest cover to 47% by 2020.

As of 2016, Viet Nam had 14.4 million ha of forested land, covering 41% of the total country, including 10.2 million ha of natural forests and 4.2 million ha of plantation forests.

Forest types in Vietnam are classified into three categories: Special-use Forest, Protection Forest and Production Forest.

- Protection forests are used to: protect water resources, catchments and land; prevent erosion and desertification; mitigate natural disasters; and regulate climate. Protection forests include: watershed; wind-, sand- and wave-break; sea encroachment and environmental protection forest subcategories.

- Special-use forests (SUFs) are used mainly to preserve nature (as a national park, nature reserve or a species habitat conservation area), representative ecosystems, plant and animal gene pools; for research purposes; to protect historical, cultural relics and landscapes; and to provide resort and tourism services. They also often have a dual purpose of acting as a watershed protection forest.
- Production forests are used mainly for production of timber and NTFPs. Production forests include natural, plantation and seed forests.

Table 32. Breakdown of forest categories by forest type. (SRV, 2017)

Forest Management Areas (ha)	Forest Category			Outside Forest Categories	Total Area Forest Type (ha)
	Special - use	Forest protection	Forest production		
Type of forest/Forest Category					
Natural forest	2,055,270	3,871,422	3,915,643	399,806	10,242,141
Plantation forest	82,062	666,430	2,756,413	630,636	4,135,541
Total Area Forest Category (ha)	2,137,332	4,537,852	6,672,056	1,030,442	14,377,682

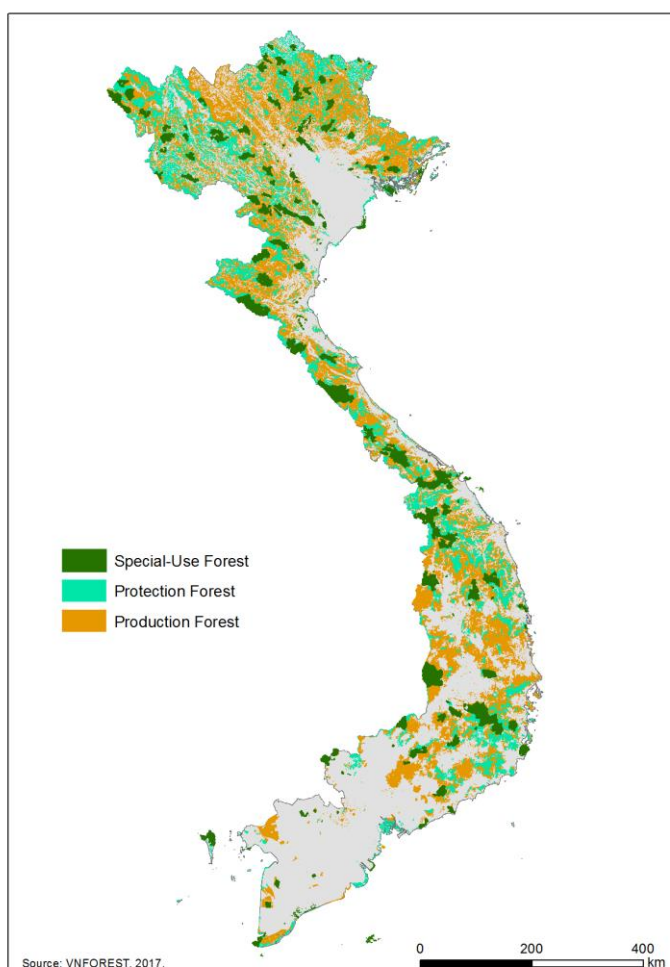


Figure 22. Map of forest category in Vietnam. (VNFOREST 2017)

In Vietnam, all forest lands are officially claimed as state property. The government allocates land use rights to different economic entities, such as:

- State-owned forest management board (FMB) authorized to manage special-use forests and protection forests,
- State-owned forestry enterprises (SFE) mandated to manage protection and production forests,
- Individual households,
- Communities,
- Commune People's Committee (CPC)
- Army units,
- Other economic entities that are authorized to manage protection and production forests.

In 2014, SFEs manage 1.9 million ha of forests (accounting for 14% of total forests), of which 75% is natural forests and the remainder are plantations.

FMBs control nearly 4.2 million ha of forests (34% of total forests), primarily special-use forests and protection forests for biodiversity conservation and environmental protection purposes. The proportion of natural forest under FMB management is 85%.

Around 3.4 million ha of forests (approximately 24%) have been allocated to individual households, of which 55% are natural forests.

CPCs currently manage around 2.3 million ha (16% of the total forests), of which 1.9 million ha are natural forests. The government gives CPCs rights to temporarily manage some forestlands, which they have not yet allocated to other entities.

Registered communities and other group of local communities manage around 1.13 million ha (8% of forests).

Table 33. Breakdown of forest management entities (MARD 2014).

Management Entity	% of forest land
Forest Management Board	34
State-owned Forestry Enterprise	14
Individual Household	24
Communities	4
Commune People's Committee	16
Army	2
Other Economic Entity	2
Other	4

8.4 Drivers of forest change

Currently, the main direct drivers of deforestation and degradation are generally agreed to be: (i) conversion to agriculture (particularly to industrial perennial crops); (ii) unsustainable logging (notably illegal logging); (iii) infrastructure development; and (iv) forest fires.

Drivers of DEFORESTATION

Conversion to
Agricultural
Land

Infrastructure
Development

Drivers of FOREST DEGRADATION

Unsustainable
Logging

Forest Fire

Underlying cause of forest change

National
Economic
Growth

Weak Forest
Governance and
Land Management

Increased Demand
for Forest and
Agriculture Product

Figure 23. Drivers of forest change in Vietnam. (SRV, 2011a)

Agricultural expansion is predominantly for cassava and perennial cash crops. Most of the recent expansion in the perennial industrial crops such as coffee or cashew has concentrated particularly in two places, the Central Highlands and the Southeast regions. In the Central Highlands, between 1990 and 2000, the area for coffee plantations increased from 50,000 to 500,000 hectares.

In 2009, Vietnam started to promote the development of rubber on poor and degraded areas. However, in the Central Highlands, the conversion of forest land to rubber plantations led to large scale deforestation as the criteria defining poor forest were poorly followed by provincial administration authorities. The country has already surpassed its national target on rubber production and its policy is now the stabilization of the area under production, as well as to stop conversion of natural forests

Tree plantations which often occurred on degraded natural forest areas, have played a crucial role in Vietnam's forest transition. Nationally, there are over 1.1 million ha of acacia plantations for wood production, managed on 5 to 10 years rotation cycles. In Thanh Hoa province, the area of tree plantations increased from 87,100 ha in 2001 to 180,300 ha in 2014.

To support the country's development, transport infrastructure and hydropower dams were built. The building of roads in remote rural areas has often, inadvertently created the means by which otherwise inaccessible timber has become transportable and marketable. The

road network in Vietnam have more than doubled in length between 1990 and 2010. Dams impacted forested area; On the Dong Nai river, several dams destroyed more than 15,000 ha of forest.

The underlying drivers of deforestation are the overall country's demographic and economic growth which led to an increased demand for products from forest and agriculture.

Unsustainable exploitation and encroachment has been identified as the main drivers of forest degradation. Timber harvesting (legal and illegal) occurred in both plantations and natural forests and has led to a reduction of biodiversity values and forest stocks. Encroachment can be caused by shifting cultivation practices which are still implemented by farmers in Central Highlands but also in the provinces bordering Laos in the North-West and North Central Coast.

More than 6 million hectares of forests in Vietnam are associated with having a high fire risk. According to VNFOREST, from 2002 to 2010, there were 704 forest fires leading to 5,081.9 ha of forest cover lost.

The underlying causes of forest degradation and especially illegal logging are multiple. First illegal logging is driven by the increased demand for timber and its high profitability. Then it is facilitated by the lack of forest monitoring and enforcement at local level as well as issues in forest delineation and allocation of adequate use-rights to local communities.

8.5 Forest status

8.5.1 Forest types

The Table 34 below shows the forest definition provided by the Circular 34 (2004) and used in Vietnam for the calculation of the FREL/FRL.

Table 34. Forest definition in Vietnam. (SRV, 2016)

Forest Definition

A forest is an area of at least 0.5 ha, with a canopy cover of 10% and with trees that reach more than 5 meters height

New forest plantations of timber trees and newly regenerated forests of forest plantations are identified as forests if they reach the average height of over 1.5 meters for slow-growing species, and over 3.0 meters for fast-growing species and a density of at least 1,000 trees per hectare.

The classification system identifies seventeen land cover classes of which twelve are forest types. The distinction between rich, medium and poor forest is based on average timber stock, respectively more than 200 m³/ha, between 100 and 200 m³/ha, and less than 100 m³/ha.

Table 35. Forest types in Vietnam. (SRV, 2016)

Forest type and other land cover
Evergreen broadleaf forest - rich
Evergreen broadleaf forest - medium
Evergreen broadleaf forest - poor
Evergreen broadleaf regrowth forest
Deciduous forest
Bamboo forest
Mixed wood and bamboo forest
Coniferous forest
Mixed broadleaf and coniferous forest
Mangrove forest
Forest on rocky mountain
Plantation forest
Rocky mountain without forest
Barren land planned for forestry
Water
Residential area
Other land

The evergreen broadleaf forest is the dominant forest type in Vietnam. According to Table 37 and the NFIS (National Forest Inventory and Statistics) figures, when considering all evergreen broadleaf forest sub-types (rich, medium, poor and regrowth), it represents nearly 50% of all forest cover. This type has a diverse ecology with a multi-storey forest structure dominated by Dipterocarpacea species. It is mainly located along the border with Laos in the Annamite range, and in the northern provinces.

Deciduous forest representing 4% of the forest cover is mainly located in the south of the country in Dak Lak and Gia Lai provinces.

Bamboo forest and mixed woody and bamboo are found in areas where shifting cultivation is practiced in the North-west of the country like Nghe An province. It represents respectively, 2.5% and 0.5% of the forest cover.

Forest on rocky mountain which represents 6% of the forest cover is principally forest on limestone which can be found in the north and north central regions like in Phong Nha-Ke Bang special-use forest.

Coniferous forest can be found in the south like in Lam Dong province with main specie being *Pinus merkusii* and in the north, close to Chinese border with *Fokienia hodginsii* as main specie. Coniferous forest represents only 1% of forest cover.

Plantation forest represents 27% of total forest cover with rubber, acacia and pine as main species.

8.5.2 Current and historical forest cover

To monitor forest cover change, the Forest Inventory and Planning Institute (FIPI) produced the NFI maps (National Forest Inventory) for the years 1990, 1995, 2000, 2005, 2010. To support the REDD+ national strategy and the development of the FREL these maps have been revised by JICA and UN-REDD.

For the period going from 2010 to 2016, the most recent dataset regarding forest is the National Forest Inventory and Statistics (NFIS), which is a national survey monitored by MARD and implemented by the following institutions: FIPI, VAFS Vietnamese Academy of Forestry Science (VAFS) and the Vietnamese National Forestry University (VNFU). NFIS has a very different approach than the NFI which is fed by maps produced with remote sensing techniques. NFIS is implemented at the provincial level and collates information from forest rangers for each forest units in regards with forest status, function, cover, ownership, management etc. This data is then aggregated at the provincial and national level to provide overall statistics on forest status in the country.

Table 36 below displays official figures published by VNFOREST in 2017, taken from NFIS statistics, on the forest cover as of end of 2016. Natural forest covers 10,242,141 ha while plantation forest covers 4,135,541 ha which includes 745,749 ha of young plantations that do not reach the minimum canopy cover of the forest definition. Therefore, the total forest cover is 13,631,934 ha which represents 41.19% of the country. Another official document from VNFOREST states that national forest cover as of end of 2010 was 13,030,939 ha, or 39.5% of the country. According to these two reports, the forest cover increase rate is 0.8%/year over the 2010-2016 period. For the previous period 2000-2010, according to NFI figures, the forest cover increase reached 1.44%/year.

Table 36. Forest cover summary for Vietnam. (SRV 2016 and SRV 2017)

Forest Area			
Total Forest Cover (2016): 13,631,934 ha			41.19%
Total Forest: 14,377,682 ha Source: NFIS 2016	Natural Forest 10,242,141 ha	Plantation Forest (include young plantations that do not reach forest cover definition) 4,135,541 ha	
Forest Cover Change Trend			
INCREASE	2010: 13,030,939 ha 2016: 13,631,934 ha Source: NFIS	2010-2016 + 100,166 ha/year	2010-2016: + 0.8%/year
	Forest area 2000: 11,939,000 ha 2010: 13,661,000 ha Source: NFI	2000-2010: + 172,200 ha/year	2000-2010: + 1.44%/year

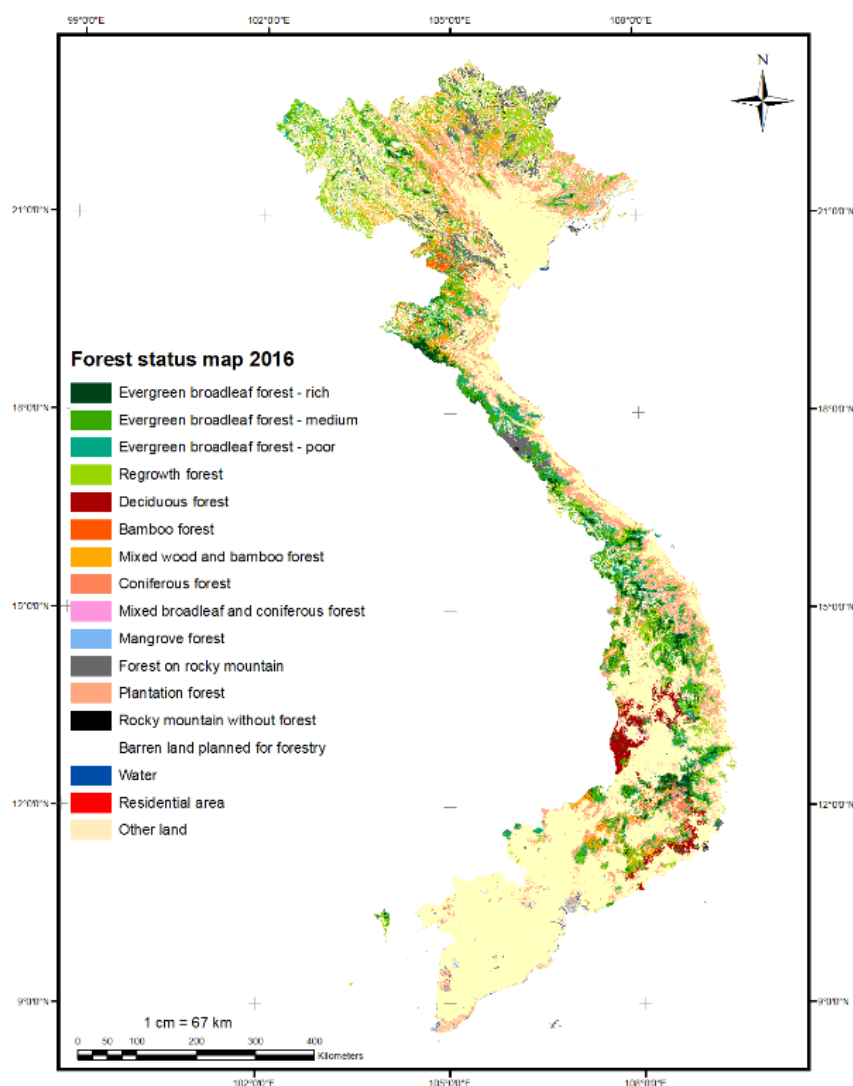


Figure 24. Map of forest status in Vietnam in 2016. (Source: Computed from VNFOREST, 2017)

Table 37 below displays the figures from the NFI maps that were used for the FREL/FLR calculation. The NFIS figure comes from a geographical layer provided by VNFOREST in 2017 and were reclassified into the NFI classes by the RFO-SEA.

The overall national forest cover increases are due mostly to the development of commercial plantations (Acacia, Eucalyptus, Pine, Rubber). Nevertheless, dense natural forests are shrinking and suffer from degradation. For instance, deforestation occurred at high rate in Central Highland and South Central Coast regions. For instance, according to NFI figures provide in Table 37 below, in 1995 Rich Evergreen Broadleaved Forest was 856,000 ha and decreased to 681,000 ha in 2010. In the meantime, forest plantation increased from 994,000 ha to 3,122,000 ha.

Table 37. Historical forest cover area in Vietnam. (SRV, 2016 and SRV, 2017)

National Forest Inventory (NFI) - Four Cycle Maps					National Forest Inventory and Statistics (NFIS)
Forest and Other Land Cover Area (1,000 ha)	1995	2000	2005	2010	2016
Evergreen Broadleaved Rich forest	856	804	693	681	703
Evergreen Broadleaved medium forest	2004	1889	1783	1674	1831
Evergreen Broadleaved poor forest	1918	1785	1621	1581	1510
Evergreen broadleaf regrowth forest	2399	2699	3283	3654	3119
Deciduous forest	751	722	665	646	576
Bamboo forest	526	547	490	441	363
Mixed woody and bamboo forest	734	751	751	748	1165
Coniferous forest	172	177	164	162	123
Mixed woody and coniferous forest	64	56	54	53	65
Mangrove forest	199	178	134	142	61
Rocky mountain forest	740	749	759	757	903
Woody plantation	994	1582	2343	3122	3939
Non-forest rock	232	224	207	205	75
Bushes and grass land	7748	7039	6042	4688	2318
Water body	824	846	851	870	66
Residential area	1498	1569	1669	1798	
Agriculture land, other land	11356	11399	11507	11796	16200
Total	33015	33016	33016	33018	33018
Summary					Summary
Forest	11357	11939	12740	13661	14359
Natural Forest	10363	10357	10397	10539	10420
Forest Plantations	994	1582	2343	3122	3939
Bare Land	7980	7263	6249	4893	2392
Agriculture and other land	13678	13814	14027	14464	16266
Total	33015	33016	33016	33018	33018

Comparing NFI and NFIS which are produced with two different approaches, should be taken with caution. However, it can still illustrate the overall trend. According to NFIS,

between 2010 and 2016, the sum of natural forest decreased from 10,539,000 ha to 10,420,000 ha while forest plantations increased from 3,122,000 ha to 3,939,000 ha.

8.5.3 FREL/REL Summary

The scale of Vietnam's FREL/FRL is national. It considers CO₂ and the following activities:

- Deforestation: Activity of conversion of forests to non-forest land.
- Degradation: Activity resulting in a downward shift in terms of carbon stock between forest types, including Evergreen broadleaf forest volume-based sub-types of "rich, medium, and poor" (based on the average standing volume per ha) and other forest types (deciduous, bamboos etc.)
- Reforestation: Activity of land use change from non-forest land to forest land.
- Restoration: Activity resulting in upward shift of carbon stock between forest types, including Evergreen broadleaf forest volume-based sub-types of "rich, medium, and poor" (based on the average standing volume per ha) and other forest types (deciduous, bamboos etc.)

Table 38. Carbon pools considered in Vietnam for FREL/FRL. (SRV, 2016)

Carbon Pool	Included
AGB	YES
BGB	YES
Soil organic carbon	NO
Dead wood	NO
Liter	NO

The historical emissions/removals for the three periods, 1995-2000, 2000-2005, 2005-2010 shows that there is no clear trend on the historical emissions/removals. Therefore, the average of historical emissions/removals during the reference period will be used as for Vietnam's FREL/FRL.

The proposed FREL for Viet Nam (Average of gross emissions) is **59.96 million tCO₂e/year** and the proposed FRL (Average of removals) is **-39.6 million tCO₂e/year**.

8.5.4 Carbon stocks

Activities were implemented as a series of work undertaken through the UN-REDD Programme for Vietnam with technical assistance from FAO, towards the improvement of country-specific emission factors for Viet Nam.

These activities were conducted by five national institutes and organization, namely, Forest Inventory and Planning Institute (FIPI), North-west Sub-FIPI, Center for Forest Inventory and Consultancy (CFIC), Viet Nam Forestry University (VFU), Tay Nguyen University (TNU), and the Research Center for Forest Ecology and Environment (RCFEE, under VAFS) as coordinator.

The Table 39 below presents the national average carbon stocks for each forest type for the period 2005-2010. For the calculation of the FREL/FRL, the emission factors were derived from carbon stocks specific to the agro-ecological region and the NFI cycle.

Table 39. Carbon stock per forest type in Vietnam. (SRV, 2016)

National average carbon stocks AGB + BGB (tC/ha) per forest type - Cycle IV 2005-2010			
Code	Forest Type	Carbon Stock (tC/ha)	Uncertainty (at CI 95%)
1	Evergreen broadleaf rich	140	3
8	Coniferous	95	11
2	Evergreen broadleaf medium	75	1
9	Mixed broadleaf-coniferous	67	45
10	Mangrove	58	-
7	Mixed wood and bamboo	42	7
3	Evergreen broadleaf poor	32	3
5	Deciduous Forest	31	8
4	Evergreen broadleaf regrowth	26	6
11	Limestone forest	19	83
12	Plantation	16	13
6	Bamboo	15	11



8.6 Interface and use

RFO-SEA information repository user-interface is available at: <http://www.RFO-SEA.org/geonetwork/>

The information repository user-interface is built using GeoNetwork which is straightforward and easy to use for end users. Users can upload new data to the information repository database through the user interface without any complex database scripts. The user interface also has a powerful search tool embedded which allows users to easily find the data that they are looking for in the database.

The main functionalities of the information repository user-interface are:

- Powerful search tools with indexing
- Filtering by geographical location, document type, document date, etc.
- Catalogue services with CSW (Catalog Service for the Web) available. Allows integration and linking to other geoportals, websites and information repositories
- Metadata editor for creating standard metadata for the datasets in the RFO-SEA system
- Metadata viewer for accessing the metadata records
- Integration to the website and the geoportal
- Administrative tools for configuring and modifying the information repository

8.7 Content by country and type

Table 40. Main document of the information repository.

		Cambodia	Laos	Myanmar	Thailand	Vietnam	Regional
REDD+	REDD+ UNFCCC	FRL submission 2016	FREL/FRL submission 2018	FREL/FRL submission 2018		FREL/FRL submission 2016	
	REDD+ FCPF	R-PP 2013	R-Package 2018		R-PP 2013	ER-PD 2018	
	REDD+ Projects	Presentation SEIMA project – WCS 2017					
	National REDD+ Strategy	Draft of National REDD+ Strategy 2016		Draft 2018			
Forest Status	Drivers of forest change	Drivers of Forest change in Cambodia – LEAF 2015	REDD+ Context – Cifor 2013		Forest Inventory 2006		
Methodology	National Forest Inventory		ClipAD mapping priority jurisdiction - 2013			Tree Allometric equation	
	Forest mapping	Land cover and classification system – Brun 2013		Myanmar Forest cover change 2002-2014			

		Cambodia	Laos	Myanmar	Thailand	Vietnam	Regional
Technical Guidance							ESA CCI Product User Guide Delta rNBR Background IMPACT new features Sentinel-2 download guidance
Academic papers		REDD+ and forest restoration – Erasmus University 2016				PFES in Lamdong 2017	
Institutional text	Forest law	Forest Law 2002	Forest Law 2007	Forest Law 2003	Forest Act 1941	Law on forest protection and development 2004	

9 Conclusion

Forests play a crucial social, environmental and economic role in South East Asia, including the five target countries of the RFO-SEA. They harbour one of the richest pools of biodiversity in the world, including a number of endemic and critically endangered species, while also being an important driver of economic activity. For the more rural communities in the region, forests are an integral part of their livelihoods through the provision of food, fibre and fuel.

Forests in the five target countries of the RFO-SEA, however, are under high pressure, largely due to rapid economic development, population growth and limited capacities to fully manage the large forest estates in each country. Across the region, the expansion of agricultural lands, establishment of commercial plantations such as rubber and acacia, the proliferation of infrastructure projects such as road networks, mines and hydropower dams, all occur at the expense of forests. Unsustainable logging, both legal and illegal further damages forest ecosystems.

Overall, the region is seeing a decrease in forest cover and quality. While in countries like Vietnam and Thailand forest cover is stable or increasing, this is due, largely, to monoculture plantations, while natural forest continues to be degraded. Laos has seen a stabilization of its forest cover but degradation caused by illegal logging continues to be an issue. Deforestation occurs in Myanmar at a stable rate while Cambodia's rate of deforestation is accelerating.

All five countries are engaging with the REDD+ process albeit each is at a slightly different stage of REDD+ Readiness. Vietnam and Cambodia are the most advanced in the region with respect to REDD+ implementation. Both countries have developed national REDD+ strategies, identified implementation arrangements for REDD+, and developed and officially submitted their country's FREL to the UNFCCC. Lao PDR and Myanmar are slightly further behind Vietnam and Cambodia when it comes to REDD+ readiness. While the institutional arrangements for REDD+ are in place in both countries, they are still undertaking the analytical steps to develop their national REDD+ strategies, develop their FREL, finalize their safeguard assessments, as well as develop their NFMS. Lao PDR is further ahead in the development of its national REDD+ strategy with a draft available for public viewing likely to emerge in early 2018, while this will likely emerge in late 2018 for Myanmar. Both will submit FRELS to the UNFCCC for technical assessment in early 2018, while the development of their NFMSs will continue throughout 2018. Thailand on the other hand is at a much earlier stage and is only expected to begin its REDD+ Readiness process in earnest in 2018.

As for EU FLEGT, progress towards establishing VPAs with the EU are similarly at various stages of development. Vietnam leads the way here again and is the furthest ahead with VPA negotiations complete and currently moving towards ratification and implementation. Laos and Thailand have only just begun the VPA negotiating process, while in Myanmar and Cambodia this is yet to begin. Myanmar is actively seeking to put in place the relevant institutions and is engaging in a stakeholder consultation process to prepare discussions in anticipation of the FLEGT process. Cambodia, however, is in its infancy with regards to engaging with the FLEGT process.

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