Report

Social forestry and climate change in the ASEAN region

RECOFTC

In cooperation with

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Social forestry and climate change in the ASEAN region: Situational analysis 2020

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Social forestry and climate change in the ASEAN region

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Foreword

Welcome to the fourth and final report in a series documenting the changes in social forestry since 2010 in relation to climate change mitigation and adaptation. The series captures the progress made by Member States of the Association of Southeast Asian Nations (ASEAN) and the Swiss Agency for Development and Cooperation (SDC) through an initiative called the ASEAN-Swiss Partnership on Social Forestry and Climate Change (ASFCC).

For almost a decade, RECOFTC has implemented the ASFCC project with five partners: ASEAN Working Group on Social Forestry (AWG-SF); the Center for International Forestry Research (CIFOR); Non-Timber Forest Products Exchange Programme (NTFP); Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA); and the World Agroforestry Centre (ICRAF). Together, we supported ASEAN Member States in their efforts to develop, reform and implement social forestry policies.

The results were remarkable. However, our work is far from done. As detailed in this report, people living in ASEAN Member States continue to experience the detrimental effects of deforestation, poverty, inequality and climate change. Now, they face the added threats of pandemic disease such as COVID-19 and devastated economies. Indeed, social forestry has never been more important.

The role of social forestry in addressing these challenges is clear. Research shows that we must protect our forests if we are to reduce the risks of zoonotic pandemics, which are diseases that spread from animals to people. It also confirms that indigenous and local communities are the best stewards of forests. Indeed, through social forestry, we contribute to achieving most of the Sustainable Development Goals of the United Nations' Agenda 2030 and the goals of the Paris Agreement on climate change. Moreover, we build the planet's and humanity's resilience to crisis.

We have reason to be optimistic. The number of hectares managed by indigenous and local communities under social forestry has doubled in Member States over the past decade. This growth created new opportunities for people to overcome poverty, protect their forests and help the world win the battle against climate change. If Member States are able to reach the social forestry targets they set for themselves for 2030, the total area of forests managed by local communities in ASEAN will exceed 30 million hectares. That is almost a 500 percent increase in two decades. Their success is crucial to the security of ASEAN Member States and of other countries in the Asia-Pacific region and around the world.

ASEAN Member States are more vulnerable to climate change than many other parts of the world because they have large rural populations that depend on climate-sensitive agriculture. As temperatures rise, droughts, floods, heatwaves, and other extreme weather events are becoming more frequent and intense. According to this report, these issues will be exacerbated in light of regional trends. The economies of Member States are growing rising rapidly, but at an uneven pace. This development has put more pressure on natural resources and further marginalized local communities and Indigenous Peoples. Deforestation and conflict over forested landscapes are increasing.

By empowering communities to manage and protect forests through social forestry, Member States can draw carbon out of the atmosphere, support sustainable livelihoods, improve food security and reduce climate-driven disasters. But business as usual will not produce the scale and effectiveness of social forestry outcomes required to overcome the climate crisis. Member States will need to overcome some pressing challenges detailed in this report, including insecure tenure rights; inadequate incentives to manage forests; weak legislative frameworks; low institutional capacity and poor governance; and limited funding.

This situational analysis provides a baseline for future initiatives. It suggests that multilateral organizations, the private sector, governments and nongovernmental organizations must increase their investments in social forestry. They must continue to develop strong, legitimate partnerships based on trust, accountability, transparency and mutual respect. The report also suggests taking a cross-sector and integrated approach to social forestry, linking it to other policy areas within the ASEAN region. Finally, it recommends that governments must focus on creating strong and clear forest tenure for local communities and Indigenous Peoples.

As we go forward, we can build on 10 years of experience. Today, we know that social forestry provides a foundation for designing and managing sustainable and inclusive

multi-functional landscapes. We understand that it enables us to build diversified, resilient and more inclusive local economies. When implementing social forestry processes, we are confident that we can inspire mutually beneficial transformational changes. Moreover, we recognize that social forestry leads to reduced illegal activity and lowers the cost of achieving climate change targets and those of the Sustainable Development Goals.

We at RECOFTC aim to build on these lessons and look forward to the next step in the social forestry journey. We are grateful to all who contributed to the 10-year partnership between ASEAN and SDC. The tremendous gains in social forestry would not have been possible without the countless hours of the AWG-SF and the individuals and organizations of ASFCC.

David Ganz
Executive Director
RECOFTC

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Lastly, we are immensely grateful to the SDC and to the people of Switzerland for their partnership, advice and investment in social forestry in the Member States of the Association of Southeast Asian Nations (ASEAN).

Abbreviations

ASEAN	Association of Southeast Asian Nations
MAFF	Ministry of Agriculture, Forests and Fisheries (Cambodia)
MNRE	Ministry of Natural Resources and Environment (Malaysia)
MOECF	Ministry of Environmental Conservation and Forestry (Myanmar, now MONREC)
MOEF	Ministry of Environment and Forestry (Indonesia)
MOE	Ministry of Environment (Cambodia)
MOF	Ministry of Forestry (Indonesia and Myanmar)
MONRE	Ministry of Natural Resources and Environment (Lao PDR and Viet Nam)
MONREC	Ministry of Natural Resources and Environmental Conservation (Myanmar, formerly MOECF)
REDD+	Reducing Emissions from Deforestation and Forest Degradation, plus the sustainable management of forests and the conservation and enhancement of forest carbon stocks
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation

Executive summary

Forests play a crucial role in the fight against global climate change. The communities that live in and around forests are well-placed to carry out climate change mitigation and adaptation strategies. The Association of Southeast Asian Nations (ASEAN) recognizes that social forestry enables communities to manage forests sustainably. It also helps them deliver on economic, social and environmental goals, including mitigation and adaptation. This has motivated ASEAN leaders to study and understand social forestry's role in climate change and to strengthen its presence in the region.

This is the final report in a four-part series documenting the changing status of social forestry in the ASEAN region since 2010. The reports were prepared for decision-makers in ASEAN Member States across all sectors. Their purpose is to demonstrate the role social forestry plays in climate change mitigation and adaptation.

The climate crisis

The ASEAN region is highly vulnerable to the impacts of climate change. Many countries are experiencing an increase in the severity and number of extreme climate events, such as flooding, heatwaves, droughts, typhoons and monsoons. With the exception of Singapore and Brunei, Member States are among the 50 countries worldwide reporting the most serious weather-related events. The majority of ASEAN's economies depend on climate-sensitive sectors like agriculture. They also have large rural populations that rely on access to land, water, forests, fisheries and other natural resources. Despite strong economic growth in the region, wealth inequality is rising. This leaves marginalized communities increasingly vulnerable to the impacts of climate change.

Scientists have made several worrying projections for the region. Average annual temperatures across the region will increase 2°C by mid-century and 4°C by the end of the century. Total average rainfall will stay broadly the same but the intensity of individual rainfall events will increase significantly. Droughts and water shortages will also increase. Sea-level rise will heighten the growing risk of coastal inundation. For these reasons, mitigating and responding to climate change is a major concern for the ASEAN community.

Role of forests in ASEAN

Forests in the ASEAN region cover more than 193 million hectares, which is 1.9 million square kilometres or 44 percent of the land area. They have a vital role in the lives of many people and contribute to national economic development and environmental stability. The region's forests help reduce the impacts of extreme weather events. They lessen the severity of flooding, storm impacts, heatwaves and drought, and provide natural resources that aid recovery. Forests and forest soils are dynamic sinks of carbon. These carbon stocks must be conserved if greenhouse gas emission targets agreed upon at the 2015 Paris Agreement conference are to be realized. The Paris Agreement builds upon the United Nations Framework Convention on Climate Change (UNFCCC), which was ratified in 1994. The UNFCCC unites all nations in a common cause to undertake ambitious efforts to combat climate change and adapt to its effects.

Conversion and degradation of natural forest lands for commercial uses, such as agricultural plantations or mining, persists. These activities release millions of metric tonnes of carbon into the atmosphere. Forest cover in the region has declined by almost 7 million hectares, or 3.4 percent, since 2013. There have been significant reductions in Cambodia, Indonesia, Malaysia and Myanmar. Primary forests and peat soils, which typically hold the most carbon, are reducing at a dramatic rate. In 2014, the most recent year for which data are available, 43 percent of greenhouse gas emissions from the ASEAN region came from land-use change and forestry. The region accounted for 52 percent of global emissions from this source. Clearly, ASEAN forests and how they are managed are of critical importance at the national, regional and global levels.

Achievements and challenges for social forestry

Across the region, governments, civil society and the private sector are increasingly recognizing that local people must participate in sustainable forest management. They are

essential players in securing environmental services such as carbon storage, water regulation and biodiversity conservation. Social forestry delivers a wider range of benefits than top-down forest management, and the benefits are relevant beyond forest landscapes. For example, it can deliver green infrastructure in urban and peri-urban landscapes, agroforestry in agrarian landscapes and mangrove rehabilitation in coastal landscapes.

There are now almost 14 million hectares of forest managed under the various forms of social forestry practised in ASEAN countries. This is double the area since 2010. Cambodia, Indonesia, Myanmar, the Philippines, Thailand and Viet Nam have set national targets for transferring forest areas to local communities in the coming decade[1]. Collectively, these targets amount to just over 30 million hectares, or 15 percent of the region's forest land. As of mid-2019, 46 percent of this area was transferred to community management.

Efforts to scale up and accelerate progress on social forestry are hard won. Some recent progress has been made to strengthen legal and policy frameworks for social forestry at the national level. However, the primary challenges of social forestry in the region remain. These include insecure tenure, inadequate legislative frameworks, poor governance, limited institutional and technical capacities, insufficient financial resources and weak incentives for communities.

Future priorities for social forestry in ASEAN

Business as usual will not deliver social forestry solutions needed to contribute to climate change mitigation and adaptation, socioeconomic development and environmental sustainability. Achieving secure tenure and strengthening the rights of people who depend on forests has the potential to deliver the biggest gains. These gains go beyond climate change adaptation and mitigation to encompass broader social and economic development in these communities.

Developing and maintaining viable and resilient social forestry systems is not easy. It requires a cohesive set of economic, social and environmental policies that must be delivered in an integrated way. It then requires a landscape-based approach to policy implementation, in which the cross-sector role of necessary interventions is fully understood.

This report proposes three recommendations for developing social forestry solutions to climate change in the ASEAN region over the next critical 10 years:

- Increase investment in social forestry
- Take a cross-sector and integrated approach to social forestry and its links to other policy areas
- Achieve strong and clear forest tenure

Introduction

Background

This is the final report in a four-part series documenting the changing status of social forestry in the ASEAN region over the last decade. The reports were prepared for decision-makers in the ASEAN Member States across all sectors. All four are structured in a similar way to help readers compare information and draw conclusions of the changes over time.

The initial report was published in 2010. It was based on data presented in FAO's Global Forest Resource Assessment 2010 (RECOFTC, 2011). The first situational analysis was published in 2014. It presented data on forests, social forestry and climate change at national and regional levels. The data was provided by national governments through the ASEAN Social Forestry Network Learning Group (RECOFTC, 2014b). The second situational analysis was published in 2017. It provided updated national government data, identified trends and explored how the ASEAN Economic Community, which was established in 2015, impacted forests and the development of social forestry.

This final report documents the changing status of social forestry in the ASEAN region since 2017 as well as over the past 10 years. It explores social forestry's changing role, need and potential for tackling climate change mitigation and adaptation. It outlines opportunities and challenges for social forestry and climate change. And it offers recommendations on social forestry development in the future.

The data in this report were provided and validated primarily by the country focal points of the ASEAN-Swiss Partnership on Social Forestry and Climate Change (ASFCC).[2] The data are not standardized across all countries. They reflect the different definitions, indicators and data collection methodologies used in each national context. They are supplemented with information from other government sources, institutions and publications wherever possible.

This report should be read in conjunction with another publication by RECOFTC and ASFCC entitled Tenure arrangements in ASEAN: Achieving secure tenure to successfully deliver social forestry. Tenure arrangements in ASEAN is a guide to understanding tenure arrangements in ASEAN. It looks at the opportunities and challenges of the different arrangements. It also identifies ways forward to help achieve secure tenure that supports social forestry.

Figure 1: The ASEAN region

The Association of Southeast Asian Nations (ASEAN)

The ASEAN is a regional coordination body of 10 countries: Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam. It facilitates economic growth, social progress and cultural development in its Member States. It promotes peace, stability, security and improved living standards in the region. Member States collaborate on matters of common interest, such as agriculture, industry, trade and research.

The ASEAN region covers an area of approximately 433 million hectares, or 4.3 million square kilometres. In 2017, the combined population of the 10 ASEAN countries was 642.1 million (ASEAN Secretariat, 2018) with approximately 47.5 percent living in rural areas.[3] The region's population has been expanding by about 1.2 percent per year since 2015 (ASEAN Secretariat, 2018). The proportion of people living in rural areas is decreasing.

The region has surpassed the Millennium Development Goals (MDGs) target of reducing poverty to 23.5 percent. Despite the reduction in overall poverty, income inequality has risen in most countries in the region (ASEAN Secretariat, 2018).

Forests in the ASEAN region

Millions of people in ASEAN rely on a range of forest products and services that underpin their livelihoods, well-being and customary practices.

In the past, local people were largely left out of decision-making processes and did not enjoy the benefits accruing from forest use. They had no stake in the conservation of forest resources, which led to failures in forest management. Governments, the private sector and civil society now recognize that genuine participation of local people is an essential component of sustainable forest management. It is also important for maintaining the environmental services provided by healthy forests, such as carbon storage and biodiversity conservation (RECOFTC, 2013).

Social forestry in the ASEAN region

Social forestry refers to a broad range of forest management models that place local people at the centre of decision-making processes. In the ASEAN region, social forestry is officially referred to as community forestry, village forestry, community-based forestry or community-based forest management. In addition to these legally recognized systems, there are also informal and traditional forms of social forestry. These include farm forestry or swidden-agroforestry systems, practised by communities, households and individuals. Social forestry takes place in natural, secondary and degraded forests, in mangrove or tree plantations, and in both publicly and privately owned forests. The term 'local people' refers to people living in the vicinity of a forest who have economic, social or cultural relationships with it. They can include indigenous peoples and ethnic minorities, as well as individuals, households and communities (RECOFTC, 2013).

Box 1: Terminology used in this report

Forest	Land with standing trees of a specified canopy cover that reach a certain height when mature
Forest land	The area of land legally defined as forest land by the government, regardless of its current land cover
Forest cover	The area of standing trees in publicly managed forests
Forest cover change	Temporary increases or decreases in forest cover
Deforestation	Permanent loss of forest
Social forestry	The broad umbrella term used to describe various methods of involving local people in forest management
Total land area	Total area of land, excluding inland waterways, such as lakes or rivers

Source: Adapted from FAO, 2016b and RECOFTC, 2013.

Social forestry development in the ASEAN region

Formal social forestry systems were developed during the 1970s and 1980s. During this time, stakeholders began to critique centralized models of forest management. These models did not include local participation and the benefits of the forests were not distributed fairly. Consequently, forest resources were rapidly depleting. Social forestry has since developed significantly in terms of its objectives, legal foundations, land area and impacts. Its early objectives focused narrowly on forest conservation and subsistence. It now has broader goals that support human well-being, including income generation, enterprise development and climate change mitigation and adaptation. This reflects the growing recognition that local people are more motivated to invest their time and resources in sustainable forest management when they receive tangible benefits from the forest.

The various mechanisms of social forestry practised in the region provide local people with legal or customary rights to manage and use forest resources in a sustainable way. These mechanisms essentially make them custodians of the forest and gives them a vested interest in maintaining healthy, productive forests that can continue to provide multiple functions. These include meeting subsistence needs, providing opportunities for income generation, maintaining biodiversity and supporting spiritual or cultural practices.

Climate change in the ASEAN region

The region is highly vulnerable to the impacts of climate change (ASEAN Secretariat, 2019; Raitzer et al., 2015). It has an extensive coastline, two large archipelagos and four major river deltas. All these areas are considerably vulnerable to the impacts of storms and sea-level rise. The economies of most Member States are highly dependent on the climate-sensitive sectors of agriculture and forestry. Their large rural populations rely on land, water, forests, fisheries and other natural resources that are vulnerable to the impacts of climate change.

All Member States except Brunei Darussalam and Singapore ranked among the world's 50 countries with the most severe weather-related impacts between 1997 and 2016. Three of them landed in the top 10 (Eckstein, Hutfils and Winges, 2019). Myanmar was the third-most severely affected, the Philippines was fifth and Viet Nam was ninth.

The worst of the region's increasing climate events in recent decades occurred in 2011. More than 900 people were killed and 9 million others affected by extreme monsoon rains, typhoons and storms (USAID, 2011). Destructive typhoons have affected the Philippines in the past eight years, with 2018 the worst year on record. A particularly intense monsoon season in 2019 led to extensive flooding in Cambodia, Lao PDR and Thailand. It caused tremendous loss of life, displaced populations and damaged crops and infrastructure. Extremely intense rainfall caused severe flooding in Jakarta in January 2020. Parts of the region have also experienced heatwaves and periods of drought over the past five years.[4]

Box 2: RECOFTC definition of community forestry

RECOFTC defines community forestry as a broad concept that includes all aspects, initiatives, sciences, policies, institutions and processes that are intended to increase the role of local people in governing and managing forest resources. It consists of informal, customary and indigenous as well as formal or government-led initiatives. Community forestry covers social, economic and conservation dimensions in a range of activities, including decentralized and devolved forest management, smallholder forestry schemes, community-company partnerships, small-scale forest-based enterprises and indigenous management of sacred sites of cultural importance. This broad definition includes all mechanisms in which people participate in forest management, from village-based groups to individual management, and covers all types of activities undertaken in connection with a forest or forest land, from the management of natural forests to plantations. Community forestry is a conceptual term, which is also known as social forestry, village forestry, participatory forestry, community-based forest management and people-centred forestry.

Source: Adapted from FAO, 2016b and RECOFTC, 2013.

Mitigating and responding to climate change is therefore a major urgent concern for the ASEAN community. Observed changes in the region's climate are outlined in Section 3 and regional and national initiatives on climate change are presented in Section 4.

Links between forests, social forestry and climate change

Forest resources reduce the impacts of natural disasters. They are critical for maintaining environmental stability and resilience to severe weather events. They can mitigate climate change, provide opportunities for climate change adaptation, and contribute to national economic development and poverty alleviation.

Forests and forest soils are both sources and sinks of the greenhouse gases carbon dioxide, methane and nitrous oxide. In its Global Forest Resources Assessment 2015, FAO estimated that the world's forests store 296 gigatonnes of carbon, averaging at 74 tonnes of carbon per hectare in living biomass alone (FAO, 2015). This significant resource must be conserved if the goals of containing greenhouse gas emissions agreed at the Paris UNFCCC conference are to be achieved.

However, over the past 25 years, the carbon stocks in forest biomass have decreased by almost 11.1 gigatonnes. That is equivalent to a reduction of 442 megatonnes per year, or about 1.6 gigatonnes of carbon dioxide. This reduction is driven by forest conversion to agriculture, expanding human settlements and road networks, multiple mining and hydropower projects and forest degradation (FAO, 2018).

From 2007 to 2016, forestry and other land uses accounted for 13 percent of anthropogenic carbon dioxide emissions, 5 percent of methane emissions and 3 percent of nitrous oxide emissions (IPCC, 2019b). Tropical deforestation and associated land-use change release net emissions of an estimated 2.6 gigatonnes of carbon dioxide per year. Some 29–39 percent of it is driven by international trade (Pendrill et al., 2019).

Globally, communities have legal or official rights to at least 513 million hectares of forest, which contain an estimated 37.7 billion tonnes of carbon (Stevens et al., 2014). Social forestry is based on the principle that the people who rely most directly on forest resources for their long-term well-being are more likely to manage them in a sustainable manner. It is most effective when people have secure, long-term forest management rights and can generate benefits from managing it sustainably. When management rights are weak, unclear and insecure or the forest provides limited benefits, people are often motivated to extract products unsustainably. This leads to forest degradation and deforestation and, consequently, increased carbon dioxide emissions. Studies show that when local people's forest management rights are recognized and protected, rates of deforestation and degradation can be reduced (Chhatre and Agrawal, 2011; Porter-Bolland et al., 2011; Skutsch and Solis, 2010). In this context, weak rights for forest communities are both a land-rights problem and a climate change problem (Stevens et al., 2014).

Progress since the last situation analysis

The previous situational analysis was published in 2017. Since then, the area of forest managed by local people increased to 13.9 million hectares, or approximately 7 percent of the region's forest land. There have also been notable developments in the legal and policy frameworks relating to social forestry:

In 2016, Indonesia streamlined its process of transferring forest to local communities. This led to a marked rise in the area of social forests.

In 2018, Myanmar issued a new Forest Law, a Community Forestry Strategy and Community Forestry Instructions. They improve the legal and institutional framework for community forestry and place increased attention on forest enterprise development and income generation.

In 2019, after a long process that started almost 30 years ago, Thailand finally passed its Community Forest Bill. The bill allows people living in and around reserved forests, outside of conservation areas, to legally participate in forest management.

In 2019, Lao PDR and Viet Nam revised their forest laws. Viet Nam's Forest Law will strengthen the recognition of customary rights and practices and the rights of households and communities in production forests (Dinh, 2019).

Summary of the 2020 status of forests and social forestry

National forest definitions

Forests in ASEAN are defined at the national level (Table 1). In general, a forest is considered to be land with standing trees that have a specified canopy cover and are capable of reaching a certain height when mature.

Table 1: Definition of forests in the ASEAN countries

Country	Definition of forest
Cambodia	Forest is the unit of the natural ecosystem or plantation in the form of wetland, lowland or dryland, covered with natural stands or plantation trees with a minimum height of 5 metres on an area of at least 0.5 hectares, with a canopy of more than 10 percent. Plantations, such as rubber, oil palm, teak, acacia and eucalyptus, and other kinds of trees that fall under this criteria are also classified as forest.
Indonesia	The National Forestry Law (41/1999) defines forest as a "unified ecosystem in a landscape dominated by tree communities, found in the natural world." The Decree of the Minister of Forestry of Indonesia, No.14/2004 defines a forest as an area of "land spanning more than 0.25 hectares, with trees higher than 5 metres at maturity and a canopy cover of more than 30 percent, or trees able to reach these thresholds in situ." Indonesia also has a working definition under its National Forest Reference Emissions Level, which defines forest as "land area of more than 6.25 hectares, with trees higher than 5 metres at maturity and a canopy cover of more than 30 percent" (MOEF, 2018). Social forestry is officially permitted in land legally designated as forest area, which is defined as land maintained as permanent forest.
Lao PDR	The Land Law of 2003 and the Forestry Law of 2007 state that forest and forest resources occur in lands designated by the government as forest lands as well as in areas outside forest lands and include both stocked and temporarily unstocked forests. The government's definition of forests is trees with a diameter at breast height of more than 10 centimetres, minimum crown density of 20 percent and a minimum area of 0.5 hectares. According to an unofficial translation of the Forest Law of 2019 from the Department of Forestry, a forest consists of various tree species growing naturally or planted in an area of more than 0.5 hectares, with crown cover at more than 20 percent.
Malaysia	The government uses the Food and Agriculture Organization of the United Nations (FAO) definition of land area greater than 0.5 hectares, with trees higher than 5 metres and a minimum 10 percent canopy cover or trees able to reach these thresholds in situ. Data on forest cover include the permanent reserved forests, state land forests, national parks, wildlife and bird sanctuaries and rubber plantations (FAO, 2010b).
Myanmar	Forest area is land with tree crown cover or equivalent stocking level of more than 10 percent and an area of more than 0.5 hectares. The trees should reach a minimum height of 5 metres at maturity in situ (MAF, 2005).
Philippines	The Department of Environment and Natural Resources defines a forest as land area greater than 0.5 hectares, with a tree crown of more than 10 percent and trees capable of reaching a height of 5 metres at maturity. Young natural stands and forestry plantations in which trees have yet to reach 10 percent crown and 5 metres in height are included as forests as well as temporarily unstocked areas that are expected to revert to forest. The definition includes rubber plantations, bamboo, palm and fern formations, forest nurseries, seed orchards, forest roads and firebreaks. Coconut and oil palm plantations are not included (DENR, 2005).

Thailand	The existing forest area is defined as land spanning more than 0.6 hectares that can be classified using Landsat data, at 30 metres resolution. It does not include land predominantly under agriculture or urban land use (FAO, 2010b). Forest cover assessments include natural forests, secondary and planted forests and the following forest types: tropical evergreen, mixed deciduous, dry dipterocarp, swamp forest, inundated forest, beach forest, pine forest, bamboo forest and mangrove forest.
Viet Nam	The national definition of forest is an area of at least 0.5 hectares, with trees higher than 3 metres and a canopy cover of 0.3 hectares or growing stock that exceeds 30 cubic meter per hectare (FAO, 2010b). Assessments of forest cover include natural forests of timber, bamboo, mangrove, mixed and rocky mountain forest and plantations of timber, bamboo, mangrove and other specialty species (FAO, 2015).

Source: Updated from RECOFTC, 2014.

Status of forest land, forest cover and forest cover change in ASEAN countries

Based on data provided by the country focal points of ASFCC in mid-2019, the total area of land defined as forest land in the region measures nearly 196 million hectares. This represents 45 percent of the total ASEAN land area. Forest cover for the region is an estimated 193 million hectares, or 44 percent of the total land area. Forest cover in the region has declined by approximately 1 million hectares per year since 2013.

Table 2: Forest land and forest cover in ASEAN countries, 2010–2019 (hectares)

	Baseline 2010*	Situational analysis 2013	Situational analysis 2016	Situational analysis 2019
Forest land	n.a.	252,535,074	245,159,968	195,831,984
Forest cover	213,322,300	199,975,262	196,141,865**	193,181,108

Note: The 2013 data were published in the 2014 situational analysis report and the 2016 data were published in 2017. n.a.=not available. *= Data from 2010 are from the Global Forest Resource Assessment. Data in subsequent years were provided by the ASEAN–Swiss Partnership on Social Forestry and Climate Change focal points in each country. **=The figure for forest cover for ASEAN in 2016 was amended, based on an adjustment to the figure for Indonesian forest cover.

Source: Data provided by the Country Focal Points to the ASFCC.

Box 3: A note on data comparability

The data in this report is from government sources provided by national focal points of the ASEAN-Working Group on Social Forestry. Data gaps were supplemented with other data from forest ministries and departments published in official reports or on departmental websites.

Different countries, government departments and institutions use different definitions for varying purposes. Care must be taken when analyzing and comparing the data presented.

Definitions of forest, forest land and forest cover vary from country to country. This may entail the inclusion of different tree species (rubber trees or palms), forest types (natural or plantation), stocked and unstocked forests and various thresholds of canopy density. Different reports use different definitions of forests. For example, the FAO Global Forest Resources Assessment and the Reducing Emissions from Deforestation and Forest Degradation, plus the sustainable management of forests and the conservation and enhancement of forest carbon stocks (known as REDD+). Different government departments and agencies may use different forest definitions, land classifications or data collection techniques, resulting in different figures provided by institutions from the same country. Forest definitions also change over time due to new laws or policies, technological advances or improved inventory from remote sensing, data collection and analysis techniques. Therefore, apparent changes in the data may not necessarily be reflected by actual changes on the ground and vice versa.

Forest cover change

Table 3 shows the changes in forest cover in each country between 2010 and 2019, as reported for the baseline report and situational analysis reports of 2014, 2017 and 2020.

Cambodia, Indonesia, Malaysia and Myanmar reported significant reductions in forest cover since 2013. In Cambodia, forest cover fell sharply between 2013 and 2016, but the rate of change appears to have slowed since 2016. Since 2013, forest cover has decreased by about 4 million hectares, or 4.5 percent, in Indonesia; by nearly 2.7 million hectares, or 8.4 percent, in Myanmar; and by 2.3 million hectares, or 11 percent, in Malaysia.

Lao PDR is reporting a marked increase in forest cover of nearly 4.2 million hectares since 2013. Forest cover in the Philippines, Thailand and Viet Nam appears to be fairly stable, with a slight increase since 2013. There were no data available for Brunei Darussalam in 2019. Singapore's forest cover remains unchanged.

Forest cover change reveals only part of the story. All countries in the Mekong subregion5 are experiencing forest degradation to various degrees. Although the forest area in Lao PDR and Viet Nam is increasing, both countries are losing their primary forests at a dramatic rate (Gritten et al., 2019).

Table 3: Forest cover, 2010–2019

Country	Baseline 2010 hectares	Situational analysis 2013 (hectares)	Situational analysis 2016 (hectares)	Situational analysis 2019 (hectares)
Brunei Darussalam	380,000	322,195	322,195	No data
Cambodia	10,094,000	10,363,789	8,985,901	8,742,401
Indonesia	94,432,000	89,630,000	89,630,000	85,622,000
Lao PDR	15,751,000	9,550,000	9,550,000	13,732,282
Malaysia	20,456,000	20,450,514	20,160,329	18,123,501
Myanmar	31,773,000	31,733,000	30,472,505	29,041,000
Philippines	7,665,000	7,168,400	6,839,718	7,014,154
Singapore	2,300	2,300	16,347	16,347
Thailand	18,972,000	17,200,000	16,365,664	16,398,128
Viet Nam	13,797,000	13,515,064	13,796,506	14,491,295
Total	213 322 300	199,935,262	196,139,165*	193,181,108

Note: The 2013 data were published in the 2014 situational analysis report and the 2016 data were published in 2017. *= The figure for forest cover in Indonesia presented in the 2017 situational analysis was adjusted.

*= The figure for forest cover in ASEAN in 2016 presented in the 2017 Situation Analysis was amended based on the adjustment to the figure for Indonesian forest cover.

Source: Data provided by the Country Focal Points to the ASFCC.

Table 4: Forest land, forest cover and forest cover change in ASEAN countries, 2019

Total	Country area	Land area	Designated forest land		Forest cover			Average annual rates of forest cover change		
	Hectares	Hectares	Hectares	% Land area	Hectares	% Land area	% forest land	Average hectares/ year	Period	% Forest cover
Brunei Darussalam	526,532	526,532	235520	45%	No data	No data	No data	No data	No data	No data
Cambodia	18,103,500	17,650,000	8,742,401	48%	8 742 401	49.5%	100%	-121,750	2014–2016	1.39%
Indonesia	190,456,900	181,156,900	120,600,000	67%	85 622 000	47.3%	71%	-439,439	2017–2018	0.51%
Lao PDR	23,680,000	23,310,367	16,317,257	70%	13 732 282	58.9%	84%	-51,975	2005–2015	0.38%
Malaysia	33,062,139	33,062,139	18,123,501	55%	18 123 501	54.8%	100%	-0.0034	2013–2017	0%
Myanmar	67,658,000	65,755,000	17,123,400	25%	29 041 000	44.2%	170%	-546,400	2010–2015	1.72%
Philippines	30,000,000	29,817,000	15,805,825	53%	7 014 154	23.5%	44%	34,864	2010–2015	0.51%
Singapore	71,910	71,000	16,347	23%	16 347	23.0%	100%	No data	No data	No data
Thailand	51,764,592	51,089,000	No data	No data	16 398 128	32.1%	No data	+53,112	2017–2018	0.32%
Viet Nam	34,793,026	33,123,078	16,240,000	49%	14 491 295	43.7%	89%	+134,787	2006–2018	0.30%
Total	**450,116,599**	**435,034,484**	**212,968,731**	**45%**	**193 181 00**	**44.41%**	**98%**	**-1,159,564**	**No data**	**No data**

Status of social forestry in the ASEAN region

National definitions and mechanisms of social forestry

Each Member State has developed its own laws, policies and models of social forestry to engage local people in forest resource management (Table 5). The objectives range from protecting forests and providing for household subsistence needs to producing commercial timber and non-timber forest products. Social forestry is also being implemented in line with other initiatives. These include payment for ecosystem services in Viet Nam and REDD+ in Cambodia, Indonesia and Viet Nam.

In most countries, a forest management package of rights and responsibilities is transferred to local people for a specific period. These rights typically include decision-making powers, domestic and commercial use of non-timber and timber products, and the right to lease, inherit, transfer or use land as collateral. In Malaysia, social forestry projects take place in forests managed by State Forest Departments or by forest concession holders for community development and poverty reduction.

Table 5: National definitions or models of social forestry and legal or policy documents

Country	National definition or model of social forestry	Legal or policy documents
Cambodia	Community forests are considered to be public property. Communities are granted rights to access, use, manage, protect and benefit from forest resources in a sustainable manner. A community forest is defined as "the forest plantation of a community or state forest, where the right is granted to a local community living in or near the forest to manage and utilize the forest in a sustainable manner, between the Forest Administration and a local community."	Forestry Law, 2002 Sub-Decree #79 on Community Forestry Management, 2003 Ministry of Agriculture, Forestry and Fisheries Guidelines on Community Forestry (Prakas), 2006 Protected Area Management Law, 2008
Indonesia	"Social forestry is a sustainable management system implemented in state forests or customary forests, undertaken by local communities or legal customary communities as the main stakeholders, in order to increase their prosperity, ensure environmental balance and social cultural dynamics," in the form of village forests, community-managed forests, community plantation forests, community forests, customary forests and forestry partnerships (Ministerial Decree 83/2016). Social forestry refers to sustainable forest management systems implemented within a forest area or titled forest (adat) lands by members of local communities or adat community groups. It is intended to facilitate improvements to the local welfare, environmental balance and socio-cultural dynamics through the establishment of village forests, community forests, community plantation forests, private forests, adat forests and forestry partnerships (MOEF, 2018).	Ministry of Environment and Forestry Ministerial Decree 83/2016 Ministerial Decree 699/1998 on Community Forest Management Forest Minister Decree (No. 31/2001) on Administration of Community Forestry Regulation of the Minister of Forestry (No. 1 Menhut-II/2004) Ministerial Regulation No. 37, 2007 Ministerial Regulation No. 49, 2008 provides the legal basis for community forests (hutan kemasyarakatan)
Lao PDR	Village forestry, piloted by the Forest Management and Conservation Project, is the official model of social forestry in Lao PDR. It is defined as a "partnership between the State and organized villagers for the management of designated forests in order to sustain the flow of benefits, which are fairly shared by the villagers and the rest of the national community." Village forestry focuses on natural forests and is a process that includes a range of approaches to people-oriented forest management and various levels of community participation.	Forestry Law, 2005 Forestry Strategy to 2020

Malaysia	Malaysia is in the process of developing regional and national definitions of social forestry and a national social forestry road map. Social forestry takes a different form in each state: In Sabah, social forestry is defined as "management and protection of forest and afforestation of degraded land, with the purpose of contributing towards environment, social and rural development" (Sabah Forest Department). In Sarawak, social forestry takes the form of community participation in agroforestry projects. In Peninsular Malaysia, social forestry focuses on recreation, education and the greening of urban areas.	The National Forest Act, 1984 The Sabah Land Ordinance, 1930 Sarawak Land Code
Myanmar	The revised 2016 Community Forest Instructions define community forestry as "all kinds of forestry operations for sustainable forest management in which local people are involved. The term covers afforestation and reforestation activities from small scale to commercial scale to create job opportunities and income; to produce fodder; to stabilize the ecosystem and to enhance environmental conditions." This new definition represents a significant shift in focus from providing for basic subsistence needs towards supporting livelihood and enterprise development.	Forest Law, 2018 Forestry Policy, 1995 Community Forestry Instructions, 2016 and 2019
Philippines	Community-based forest management is the national strategy to ensure sustainable management of forest resources. It promotes social justice and improved well-being of local communities and stronger partnerships between local communities and the Department of Environment and Natural Resources (FMB, 2004). Ancestral domain planning and management and issuance of a Certificate of Ancestral Domain Title or Certificate of Ancestral Land Title is covered under the 1997 Indigenous People's Rights Act.	Executive Order No. 263, 1995 Indigenous People's Rights Act, 1997

Thailand	The Royal Forest Department's Forest Sector Master Plan (1992) describes community forests as "forests that people, groups of people or community organizations care for and manage for their shared benefits." Community forest means land and/or forest land that is legally permitted for communities, together with forestry officers, to participate in managing forestry activities under the relevant laws and regulations. They can also set up their own policies concerned with culture, beliefs, religious and other traditions. This management aims to provide sustainable forest use for the community. The 2019 Community Forest Bill indicates community forest is forest outside protected areas or state-owned forest outside protected areas that have been approved for community forest registration. The community works with the government to support conservation, reforestation, management, maintenance and use of forest resources, services and biodiversity in an ecologically balanced and sustainable manner.	Forest Sector Master Plan, 1992 Thai Constitution draft Community Forestry Bill, 2007
Viet Nam	Community forest management is "any managerial arrangement in which local people share collective responsibility and benefits from managing natural forests, inside their community boundaries, for which they have long-term customary and/or legal rights of entitlement" (Wode and Bao, 2009).	Forest Protection and Development Law, 1991 Land Law, 2003 Forest Protection and Development Law, 2004

Source: Updated from RECOFTC, 2017.

Progress on social forestry in the ASEAN region

Social forestry policies in ASEAN countries

Between 2016 and 2019, many significant forest policy developments on social forestry were instituted across the region. They were designed to empower local communities to protect, manage and receive benefit from forests in a sustainable way.

- In 2016, the Indonesian government streamlined the process of issuing forest management licenses. It also announced a plan to allocate 12.7 million hectares of state forest for community management through five social forestry mechanisms. Since 2016, there has been a notable increase in the transfer of forest and the area of forest managed by local communities.
- Lao PDR passed a Forest Law in 2019. The official translation was not available at the time of writing. Early drafts suggest the new law will allow communities to sustainably harvest timber from village forests for commercial purposes.
- Myanmar strengthened its legal and institutional foundations for community forestry by revising the Community Forestry Instructions in 2016 and 2019. The government also revised the Forest Law in 2018 and developed the Community Forestry Strategy 2018-2030. Together, these revisions placed a new emphasis on developing livelihoods and community-based enterprises. The Climate Change Strategy and Action Plan, 2016–2030 recognized community forestry's potential for building resilience to climate change in rural communities.
- After a contested process that lasted many years, Thailand's Community Forestry Bill was passed in May 2018 and went into effect in May 2019. The law formalizes the right of local people to use forest resources in forest areas outside protected areas.
- In Viet Nam, a new Law on Forestry came into effect in January 2019. It addresses forest degradation, declining biodiversity and strengthen customary and household forest management rights.

This regional policy framework reflects the progression of social forestry objectives from an early focus on forest protection, conservation and local subsistence. It now recognizes that local people will invest in social forestry and use forest resources sustainably when they are legally entitled to benefit. These revised policies are a substantial step forward. Their effectiveness will depend on how they are put into practice through corresponding guidelines, regulations, institutional arrangements and resource allocation (RECOFTC, 2020).

Social forestry area

There are now approximately 13.9 million hectares of forest managed under the various forms of social forestry practised in ASEAN countries. The area of forest managed by local people in ASEAN doubled between 2010 and 2019. The pace of social forestry formation increased between 2017 and 2019.

The governments of Cambodia, Indonesia, Myanmar, the Philippines, Thailand and Viet Nam have set national targets for transferring forest land to local communities. Collectively, these targets amount to slightly more than 30 million hectares, or 15 percent of the region's forest land. As of mid-2019, all six countries are making steady progress towards their national targets. Viet Nam reached its national target in 2016.

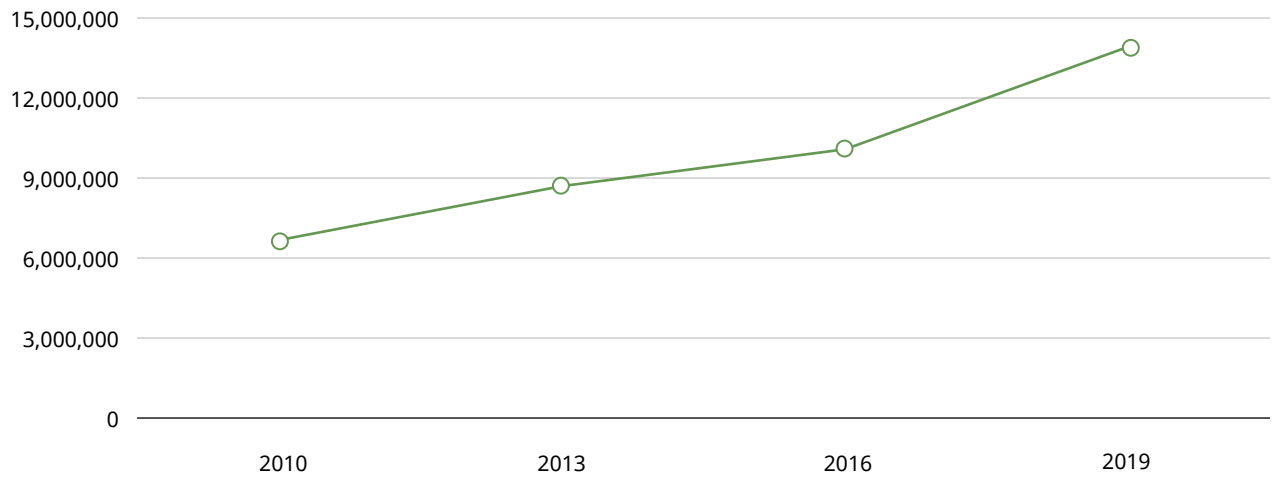
In Lao PDR, there are no available data on the area of land given over to village forestry. However, the number of village forests was reported to be 1,110 in November 2019.6

Establishing a social forestry site is only the first step in the process of developing effective social forestry mechanisms. It is thus only one indicator of progress. It is also necessary to look at how successful social forestry is in practice. For example, do local people and forest agencies have the capacity and resources to develop, implement and monitor community-based forest management plans? Is social forestry able to achieve its objectives, especially those relating to reversing deforestation and forest degradation, supporting rural livelihoods and contributing to climate change mitigation and adaptation?

Social forestry in practice

Examples from the region demonstrate that, in places where social forestry is effective, local communities enjoy a range of benefits. They experience improved livelihoods and more opportunities to generate income. Forest degradation is reduced and its condition and productivity is increased. They also see enhanced biodiversity and ecosystem services as well as strengthened institutional capacity, women's empowerment and human rights. In Myanmar (Box 4) studies have found that community forestry has the potential to reduce poverty, support livelihood diversification and adaptive capacity, and contribute to food security (Lin et al., 2019; Feurer, Gritten and Than, 2018).

Figure 2: Forest area managed by local people in ASEAN, 2010–2019 (hectares)



Source: Data provided by the Country Focal Points to the ASFCC.

Table 6: Forest area managed by local people in ASEAN countries, 2010–2019 (hectares)

Country	Baseline 2010	Situational analysis 2013	Situational analysis 2016	Situational analysis 2019	Target		% achieved 2019
					hectares	year	
Cambodia	113,544	183,725	296,240	362,209	2,000,000	2029	18%
Indonesia	33,000	143,065	642,646	3,073,676	12,700,000	2019	24%
Myanmar	41,000	42,148	113,765	289,168	919,000	2030	31%
Philippines	2,985,000	4,018,952	4,018,952	4,904,920	9,000,000	2008	54%
Thailand	196,667	500,000	750,457	1,180,512	1,600,000	2025	74%
Viet Nam	3,300,000	3,809,320	4,256,375	4,111,848	4,000,000	2020	103%
Total community forestry area	6,669,211	8,697,210	10,078,435	13,922,333	30,219,000	-	46%

Note: The 2013 data were published in the 2014 situational analysis report and the 2016 data were published in 2017.
Source: Data provided by the Country Focal Points to the ASFCC.

Box 4: Strengthening community land rights through community forestry in Myanmar

Community forestry in Myanmar is helping communities secure tenure rights, improve their livelihoods and manage forest resources sustainably. It is also promoting women's empowerment and strengthening the rights of ethnic minorities.

After they obtained community forestry certificates, some ethnic groups demarcated their traditional land by creating community forest boundaries with live trees and putting up signs. Establishing official community forests helps reduce encroachment, illegal practices and unsustainable harvesting by outsiders. Community forestry certificates allow local communities to pursue equity and justice through legal avenues, a path that they have often been historically denied.

When local communities participate in forest management activities and patrol their forests to prevent illegal logging, hunting and wildfires, they are more empowered to fight for their rights.

Often, women do not participate in public events or local politics. If they do, it's generally in a supporting capacity. Community forestry programs promote and create spaces where women can participate as decision makers. Consequently, women who may have traditionally remained silent in public spaces can share their knowledge and contribute to forest management programs. In addition to promoting the right to govern, women's participation in decision making is vital to securing other economic, civic and social rights.

Source: See RECOFTC, 2017, https://www.recoftc.org/stories/enhancing-human-rights-through-responsible-community-forestry-case-myanmar (accessed 30 November 2019).

Challenges for social forestry in ASEAN and future need

Since 2010, notable progress has been made to improve the legal and policy frameworks for social forestry at the national level. In most countries, the area of land managed by local communities is increasing.

However, there are a number of issues that need to be resolved in order for social forestry to reach its full potential. There are often inconsistencies between various sector policies and laws that create confusion and conflicts in implementation. For example, Myanmar's 2018 Vacant, Fallow and Virgin Land Management Law falls under the Ministry for Agriculture, Livestock and Irrigation. It conflicts with the establishment of Protected Public Forests led by the Forest Department. In many cases, the administrative processes for allocating and securing land rights to local people remains complicated, overly bureaucratic, time-consuming and expensive. Local communities and the Forest Departments lack sufficient resources to scale up the process (Box 5).

Communities also find it challenging to access financial capital to invest in developing forest enterprises. This is because banks tend to not view community forest certificates as a legally secure form of collateral (RECOFTC, 2019). For these reasons, establishing and effectively managing social forestry is often dependant on external support. Forest lands allocated to local people are often severely degraded (FAO, 2016a) and may require a number of years to regenerate to a productive level (FAO, 2016a; RECOFTC, 2013; Broadhead and Izquierdo, 2010). For these reasons, local people are hesitant to invest their time, energy and financial resources in social forestry, especially in the initial stages.

Social forestry mechanisms can be particularly effective in reducing forest degradation resulting from unsustainable harvesting practices. When forest resources and harvesting are managed by communities, improvements in both forest quality and carbon stocks typically result (Skutsch and McCall, 2012). Today, 7 percent of the region's forest land is managed by local people and targets are in place to increase this to 15 percent by 2030. Social forestry is clearly fundamental for reducing the region's emissions from forest degradation and increasing carbon storage.

Social forests are critically important for supporting disaster risk reduction and enhancing the resilience and adaptation of local people. Healthy forests provide food, nutrition, water, shelter and income-generating opportunities that become essential safety nets in times of hardship. Forests can help reduce some of the impacts of climate change. For example, coastal mangrove forests reduce the risk of sea-water inundation and the impact of extreme weather events on coastal communities. In addition, local people increase their skills and experience by engaging in natural resource management.

Box 5: Establishing a community forest in Myanmar

Establishing an official community forest involves a number of stages. First, the Forest Department must survey the proposed community forest. The community must then draft and submit a community forestry management plan for the Forest Department's approval. Once the certificate is granted, the Forest Department regularly monitors the group's management of the forest.

The community of Kanyin Chaung, a village in Thayetchaung Township Tanintharyi near Dawei, has approximately 1,900 inhabitants. They began establishing a community forest in 2007 in an effort to prevent charcoal burners from accessing the nearby mangrove forest. At the time the community initiated the process, the Forest Department did not have sufficient budget to carry out land surveys and other necessary tasks. It took almost 11 years to officially establish the community forest.

Much-needed support for the process was provided by an external organization, the Wildlife Conservation Society. The society paid for the land surveys, government employee transportation and community forest users' training. Eventually in 2018, the Community Forest User Group of 269 members was granted a certificate to manage the 205 hectares (508 acres) of mangrove forest.

Source: Frontier Myanmar, 24 August 2019, www.myanmarwaterportal.com/news/1456-the-right-to-community-forest-in-tanintharyi-region.html (accessed 29 December 2019).

This contributes to increased levels of social and human well-being and local adaptive capacity (Lin et al., 2019).

ASEAN Member States are already experiencing impacts from climate change. They face extreme rainfall and flooding, longer and more frequent droughts and more intense storms, storm surges and coastal flooding. Given the need to respond to the challenge of climate change by 2030 (IPCC, 2018), the protection, sustainable management and expansion of the region's forests has never been more urgent.

Summary

- Forest cover in ASEAN was an estimated 193 million hectares in mid-2019.
- Forest cover has declined by nearly 6.8 million hectares since 2013, or by an average of around 1 million hectares a year (2013–2019).
- Forest cover change only reveals part of the story. Many countries are also experiencing forest degradation. Even in countries where forest cover is reported to be rising, such as the Lao PDR and Viet Nam, the area of primary forest and closed forests is decreasing (Gritten et al., 2019).
- The area of forests managed by local people is increasing but at different speeds and with different levels of success in each country.
- Success is not only measured in terms of land area. It is also measured by the ability of local people to derive economic and environmental benefits and enhanced resilience to climate change from social forestry.
- Supportive policies, financial resources, understanding of rights and obligations, local capacity of communities and governments, access to markets and secure access to healthy and productive forests are all needed to ensure the effectiveness of social forestry.
- Recent policy developments indicate that social forestry is no longer viewed as simply a mechanism for providing products that provide for the basic needs of local communities. There is a notable shift towards social forestry for income generation and enterprise development as well.

Evidence of climate change in the ASEAN region

Evidence of climate change in the region

The evidence and scientific consensus on anthropogenic climate change has been growing for more than two decades. The Intergovernmental Panel on Climate Change (IPCC) draws together specialist researchers from all continents. It has published a series of reports that are widely recognized as authoritative and reliable. The Panel's *Climate Change Fifth Synthesis Report* (IPCC, 2014) is the most comprehensive assessment of climate change undertaken thus far. It has been supplemented by two special reports on the impacts of global warming of 1.5°C above pre-industrial levels (IPCC, 2018) and on climate change and land use (IPPC, 2019a). These and other reports show that the global changes in the climate system observed in the past 100 years are evident in the ASEAN region.

Long-term weather patterns in the region are changing. More erratic rainfall patterns and higher average temperatures are leading to more severe periods of drought and flooding. Rainfall patterns in the region are naturally highly seasonal, but records show they are becoming increasingly erratic and unpredictable. Many countries have experienced the late arrival of the rainy season including Lao PDR, Myanmar and Cambodia. In Indonesia, the rainy season has become shorter and ends earlier. The intensity of rainfall is increasing, with more rain falling in a shorter period of time. This is increasing the risks of flooding and landslides and making less water available for irrigation and other uses.

All Member States have experienced an increase in average, minimum and maximum temperatures since 1950. The IPCC estimated that human activities have caused a rise of approximately 1°C above pre-industrial levels in the region. The frequency of hot days and nights is increasing, while the number of cold days and nights is decreasing.

Extreme weather events, such as heat waves, droughts, storms, rainfall and flooding, appear to be increasing in intensity and frequency. In 2015 and 2016, these weather patterns were exacerbated by a strong El Niño, resulting in the most severe drought and water shortages the region has experienced in recent decades.

Indonesia, Malaysia, Myanmar and Thailand have reported increases in the outbreaks of forest fires. The thick smoke generated by these fires has become a regular seasonal health hazard in some Member States. In the summer of 2019, they caused more than 200,000 respiratory infections and prompted more than 1,500 schools in Malaysia to close (*The Economist,* 2019).

Mean sea levels have been rising at an accelerating rate, amplifying the impact of more severe cyclones. This is leading to inundation of salt water and increasing erosion in coastal areas, including in the region's mangrove forests. The major centres of population or government located in the coastal areas of many of the ASEAN Member States are also affected.

These changes are already having an adverse effect on agricultural production, rural livelihood systems, natural resources and people's health and prosperity. The impacts of climate change are exacerbated by human-made factors, such as upstream hydrological projects, land conversion and poorly planned infrastructure developments.

Table 7: Observed climate change in the ASEAN region

Country	Temperature	Hot and cold days and nights	Precipitation	Extreme weather events
Cambodia	Mean annual temperature increased by approximately 0.18°C per decade from 1960 to 2003, with greater increases in the dry season (November–April). Greater extremes between maximum and minimum temperatures in the past decade.	Frequency of hot days (13%) and nights (17%) increased from 1960 to 2003. Cold days (5%) and nights (13%) decreased over the same period.	There was no consistent change in mean annual rainfall from 1960 to 2003 for the country as a whole but there was a high level of year-to-year variability. The wet season in eastern regions starts later than it did before 1960.	Flooding and drought are more frequent.
Indonesia	Mean annual temperature increased by 0.04°C per decade from 1985 to 2015. Dry season increase of 1°C. Wet season increase of 0.5°C over the past 50 years.	Frequency of hot days and hot nights increased significantly between 1960 and 2006, especially during the driest months (July–September), by 24% and 26%, respectively. At the same time, the frequency of cold nights decreased by 6.8%.	Average annual precipitation decreased 3% every 30 years between 1901 and 2013, but the trend reversed, with a 12% increase from 1985 to 2015. In southern regions, wet season rainfall increased although annual rainfall decreased. In northern regions, dry season rainfall decreased but annual rainfall increased. The rainy season is shorter and ends earlier.	There is a trend towards an increase in extreme events. While droughts occurred once every four years before 1960, they are now reported to occur every three years. Incidence of forest fires has increased.
Lao PDR	Temperatures increased on average by 0.1°–0.3°C each decade from 1951 to 2000. The highest average temperature increased by 1°C from 1996 to 2003.	No data available	Annual rainfall decreased by 160 millimetres over the past 50 years. Rainfall patterns have become erratic. North and central regions had low rainfall in 1998 and high rainfall in 2003. Central provinces have higher rainfall. Onset of wet season has delayed, but rains start earlier in some northern provinces and later in some southern provinces.	From 1990 to 2015, the country experienced 21 extreme floods and storms, each of which had widespread impacts on crops, livestock and livelihoods of approximately half a million people.

Malaysia	Mean temperature increased 0.25°C per decade for Peninsular Malaysia, 0.2°C per decade for Sabah and 0.14°C per decade for Sarawak.	No data available	Peninsular Malaysia experienced decrease in rainfall in from 1998 to 2007, compared with 1961–1990. Dry years are more frequent and intense. In Malaysian Borneo, rainfall increased from 1998 to 2007, compared with 1961–1990.	Extreme weather, including strong winds, rainfall intensity, monsoon and flash flooding, is increasing. The co-occurrence of dry spell and heavy rainfall within the same year is an emerging weather pattern.
Myanmar	Increasing temperatures, with highest temperatures recorded in March, April and May 2010.	Significant increase in warm nights.	Reduced duration of wet season and decrease in monsoon intensity from 1960 to 2009.	Monsoon season became shorter and arrived later after 1977. Increase in forest fires.
Philippines	Mean temperature increased 0.65°C between 1951 and 2010. Maximum temperature rose by 0.36°C and minimum temperature by 1°C.	Increasing number of hot days. Decreasing number of cool nights from 1951 to 2010.	Mean annual rainfall and the number of rainy days have increased since 1960. Intensity and frequency of extreme rainfall appears to be increasing in many parts of the country.	Recorded floods and storms have risen, from fewer than 20 during 1960–1969 to nearly 120 in 2000–2008.
Thailand	Mean minimum temperature increase of 1.1°C since 1961. Mean maximum temperature increased by 0.7°C since 1961.	Increase in hot days and nights. Decrease in cool days and nights.	No clear trend in rainfall patterns, but rain appears to have increased over the past decade.	Increasing incidence of forest fires.
Viet Nam	Mean annual temperature has risen 0.4°–0.7°C since 1960. Increase was greater in the dry season and in the South.	Increase in frequency of hot days (8%) and hot nights (13%) since 1960. Decreased frequency of cold days (3%) and nights (10%) since 1960.	Increasing rainfall trends noted in Mekong Delta since 1976. Decreasing trends of annual rainfall noted in Red River Delta from 1961 to 2000.	Typhoons becoming stronger and tracking further south.

Source: USAID, 2019, 2017a-c; WHO, 2015a-f; MFAN, 2018; Tang K, 2018; McSweeney et al., 2008a-b; UNDP country profiles for Cambodia and Viet Nam; RIMES, 2011a-c; Lao PDR National Adaptation Programme of Action, 2009; WWF, 2007; Hadley Centre, 2011; IFPRI, 2011; Malaysia Intended Nationally Determined Contributions, 2015; Myanmar DMH, 2012; The Met Office, 2013; PAGASA, 2011; Schaefer, 2003; Vu, 2011; RECOFTC, 2012.

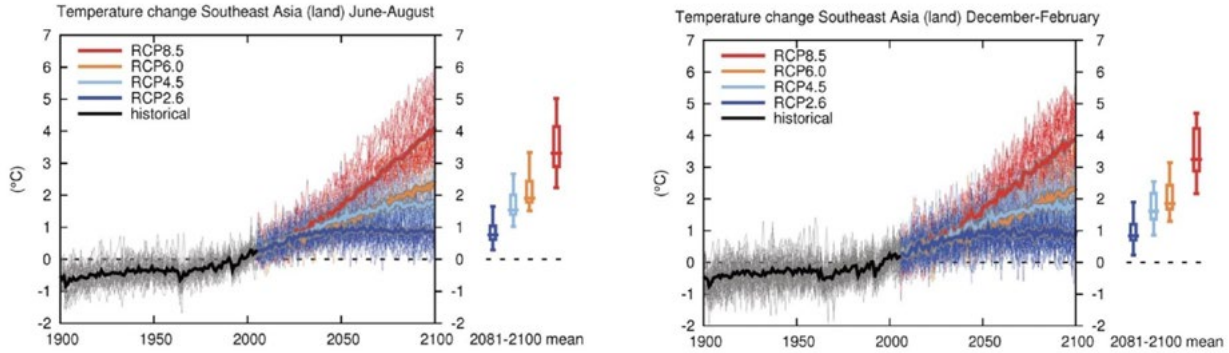
Climate change projections

The most recent authoritative projections for the region as a whole are contained in IPCC's *Atlas of Global and Regional Climate Projections* (IPCC, 2013). It predicts that average annual temperatures will increase across the whole region (Figure 3), with the greatest warming occurring in mainland Southeast Asia. Annual rainfall totals across the region are projected to stay broadly the same. The intensity of individual rainfall events is projected to intensify significantly as shown by the rising height of the spikes in Figure 4 (IPCC, 2013).

Individual country projections are available for several Member States from the Southeast Asia Climate Analysis and Modelling Framework (Met Office, 2014). The strongest annual warming is likely to occur in mainland Southeast Asia, with fairly uniform warming throughout the seasons. Regional surface air temperature is expected to rise by 2°C by mid-century and by 4°C by the end of the century. Some countries, including Cambodia and Thailand, could experience an increase of up to 5°C (Met Office, 2014).

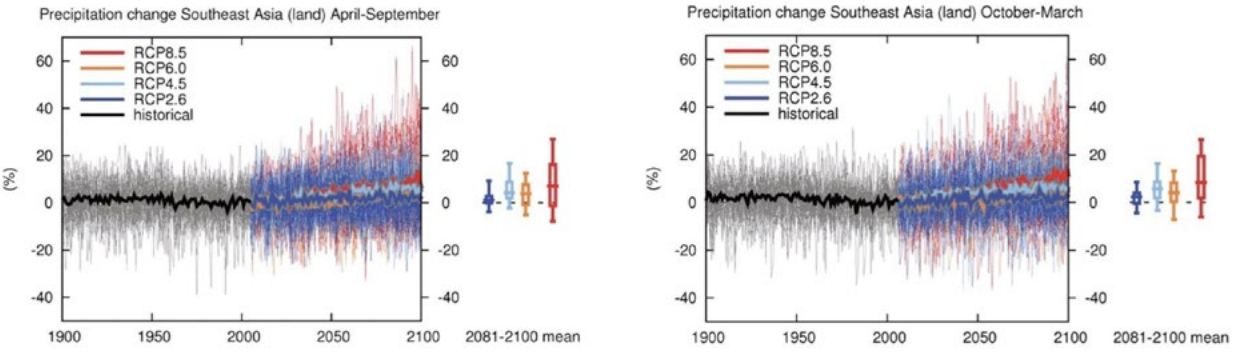
Two different trends in rainfall patterns are likely. In Myanmar, Thailand, Lao PDR, northern Viet Nam and the Philippines, the summer monsoon season is projected to intensify. Rainfall increases of up to 40 percent, or 20–60 millimetres per day, is predicted across northern Viet Nam, Lao PDR, parts of Thailand, China and the northern Philippines. The maritime continent encompasses southern parts of Cambodia, Viet Nam and all of Malaysia and Indonesia. This area is predicted to experience a significant reduction in the frequency and intensity of rainfall from June to August. Seasonal rainfall will increase from March to May and from September to November. The southern Philippines is predicted to see drier climate throughout these seasons (Met Office, 2014).

Figure 3: Projected changes in temperature in Southeast Asia, 2050 and 2100



Source: IPCC, 2013.

Figure 4: Projected changes in precipitation in Southeast Asia, 2050 and 2100



Source: IPCC, 2013.

During this century, melting ice sheets and glaciers in Antarctica, Greenland and other areas will cause the sea level to rise globally between 0.5 and 2 metres. The rise will depend on the level of greenhouse gas emissions and the dynamics of the Antarctic ice sheet (Kulp and Strauss, 2019). The ASEAN region has more than 50 coastal cities, which together have more than half a million inhabitants (Overland et al., 2017). Chronic flooding or permanent inundation is highly likely to occur in low-lying coastal areas. Recent re-analysis of coastal land levels found that significant populated areas in several Member States will by threatened by such flooding by 2100. This includes Bangkok, Jakarta, Yangon and the Red River and Mekong Deltas, the Tonle Sap Lake, and significant areas of South Sumatra, South Kalimantan and northern Java.[7]

Impacts on forests and social forestry

Climate change is expected to affect forest area, health and biodiversity. Increased temperature, water availability and changes in seasons and rainfall patterns will affect forest conditions. This will potentially benefit some species while endangering the survival of others. Extreme weather events can affect forest composition and structure and, in severe cases, can cause large-scale tree mortality (Deb et al., 2018). In areas with severe water shortages, conditions may become unfavourable and some forests could face diebacks (PAGASA, 2011). In Cambodia, for example, more than 4 million hectares of lowland forests are projected to be exposed to a longer dry period. The current four to six months dry period will increase to between six to eight months by 2050 (RGC, 2015).

Forests and trees may be damaged by extreme weather conditions, including drought, fires, floods and storms. Rising sea levels and salt water intrusion will affect low-lying river deltas and mangrove ecosystems. This will change salinity levels and species composition and reduce mangrove growth rates. As mangrove trees naturally migrate towards land, they will likely come up against infrastructure and human activities, which will inhibit their adaptive capacity (FAO, 2012). There may be more dry periods and higher temperatures, especially during the warm phase of El Niño events. This will increase the risk of forest fires and outbreaks of disease, pests and invasive species that negatively affect trees, crops and biodiversity.

The species composition and forest structure of many forest ecosystems is likely to change. There will be unpredictable impacts on fauna, including new pests and diseases (FAO, 2008). Forest ecosystem services and timber and non-timber forest products will be affected by these changes, posing new challenges to forest managers (Deb et al., 2018; FAO, 2012).

Wang et al. (2018) surveyed regional experts about the impacts of climate change on forests in the Asia-Pacific region. The 87 responses from Southeast Asia cited flooding as the most significant cause of harmful impacts. This was followed by drought and freshwater shortage, forest disturbance, fire hazard and rising sea levels.

The threats to forests posed by climate change tend to be accentuated by deforestation activities. Forest loss, or conversion to less biodiverse and more productive forestry systems, usually disrupts the hydrological and nutrient cycles on which trees depend. Fragmentation of forest cover reduces the capacity of forest ecosystems to adapt to long-term change or recover from severe events (Deb et al., 2018).

REDD+ and other sustainable forest management programs in the region have determined that the changing climate may affect social forestry systems in a number of ways. Communities dealing with flooding, drought and other impacts often have fewer resources to invest in good forestry management practices. Traditional systems of management may struggle to adapt to changing forest environments and new pests and diseases. Displaced populations may put additional pressure on already overstretched forest resources, leading to overexploitation. Many governments now understand that policies must reflect the potential well-managed forests have to enhance resilience to climate change and natural disasters. Stronger policies may increase public interest in community forests and attract new resources, such as Payment for Forest Ecosystem Services (PFES) (FAO, 2019a).

The region's forests need conditions that maintain their long-term plant and soil health and biodiversity, which will be delivered by following sustainable forest management principles. (FAO, 2019b). The policy solutions for the region that will provide this are summarized in the third *Asia-Pacific Forest Sector Outlook Study* report (FAO, 2019a). These solutions include using technology to monitor forest conditions and target management activities and providing appropriate financial mechanisms and high-value markets to support climate change adaptation. Others are improving

forest governance systems and stakeholder participation and integrating forestry policies with those of other sectors. The steps being taken to implement these measures are described in the next section.

Summary

- Land-use change and forests are the most significant sector for greenhouse gas emissions in the ASEAN region.
- Forest ecosystems are likely to change, and social forestry will have to adapt.

Climate change mitigation and adaptation strategies at the national level

The ASEAN region's greenhouse gas emissions

The Climate Analysis Information Tool (CAIT) is maintained by the World Resources Institute. It provides data on greenhouse gas emissions by country going back to 1990. According to CAIT, Member States generated 3,774 megatonnes of carbon dioxide in 2014, the most recent year for which data are available. Of these total emissions, land-use change and forestry accounted for 43 percent, energy generation 37 percent and agriculture 12 percent. This illustrates the important role the forest sector plays in climate change mitigation. Land-use change and forestry emissions have been relatively static in the past 20 years. Emissions from other sources have been steadily rising.

ASEAN Member States were responsible for 7.7 percent of all global emissions in 2014 and 52 percent of global emissions from land use and forestry.[8] This again illustrates the significance of this sector in the region.

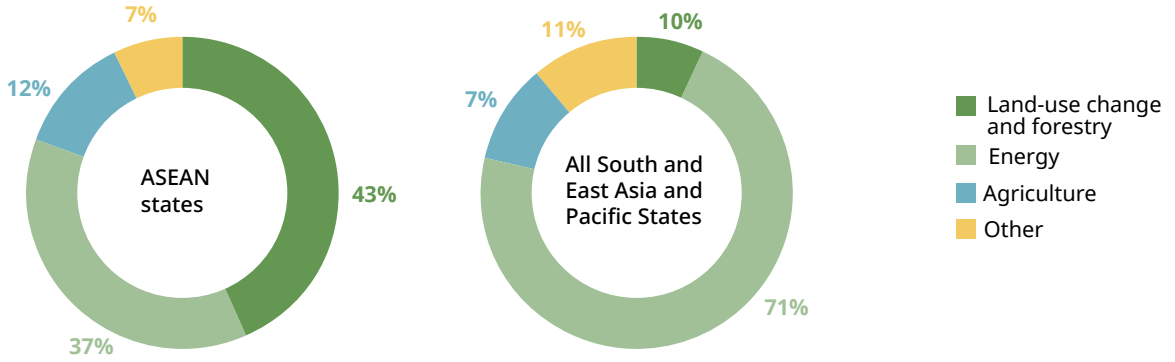
Indonesia has the highest level of national greenhouse gas emissions among Member States (Figure 7 and Table 8). The majority of these emissions are from forest fires, conversion of high-carbon peat soils, and land-use change and forestry, especially land conversion. In Indonesia and Lao PDR, the land-use change and forestry sector produces more than 60 percent of total emissions. Land-use change and forestry in Malaysia, the Philippines and Viet Nam are net carbon sinks, absorbing more greenhouse gases than they produce (CAIT Climate Data Explorer, 2019).

Table 8: Greenhouse gas emissions in ASEAN countries, 2014 (megatonnes carbon dioxide)

Country	Land-use change and forestry	Agriculture	Energy	Other	Total including land-use change and forestry	Land-use change and forestry as % of total
Brunei Darussalam	0.55	0.15	18.62	0.44	19.76	2.8%
Cambodia	23.78	19.35	8.25	1.24	52.62	45.2%
Indonesia	1,682.17	165.61	526.99	96.87	2,471.64	68.1%
Lao PDR	18.07	8.1	1.75	1.7	29.62	61.%
Malaysia	-129.02	14.28	245.98	56.65	187.89	-68.7%
Myanmar	105.11	66.51	28.33	12.54	212.49	49.5%
Philippines	-60.3	53.17	102.01	26.46	121.34	-49.7%
Singapore	0.04	0.1	46.5	5.78	52.42	0.1%
Thailand	15.97	63.04	261.12	34.25	374.38	4.3%
Viet Nam	-18.35	62.53	167.24	40.53	251.95	-7.3%
Total	1,638.02	452.84	1,406.79	276.46	3 774.11	43.4%

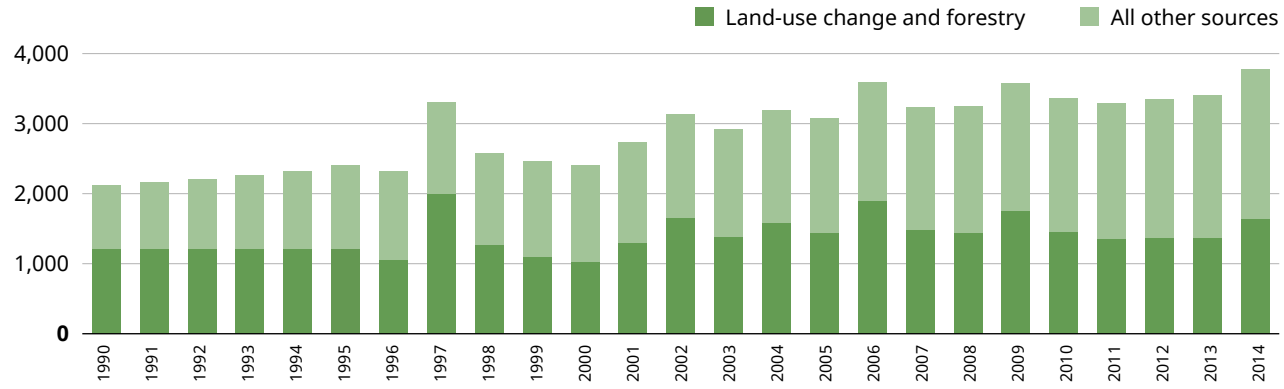
Source: CAIT Climate Data Explorer, accessed 12 November 2019.

Figure 5: Greenhouse gas emissions by sector for ASEAN Member States and other regional states, 2014



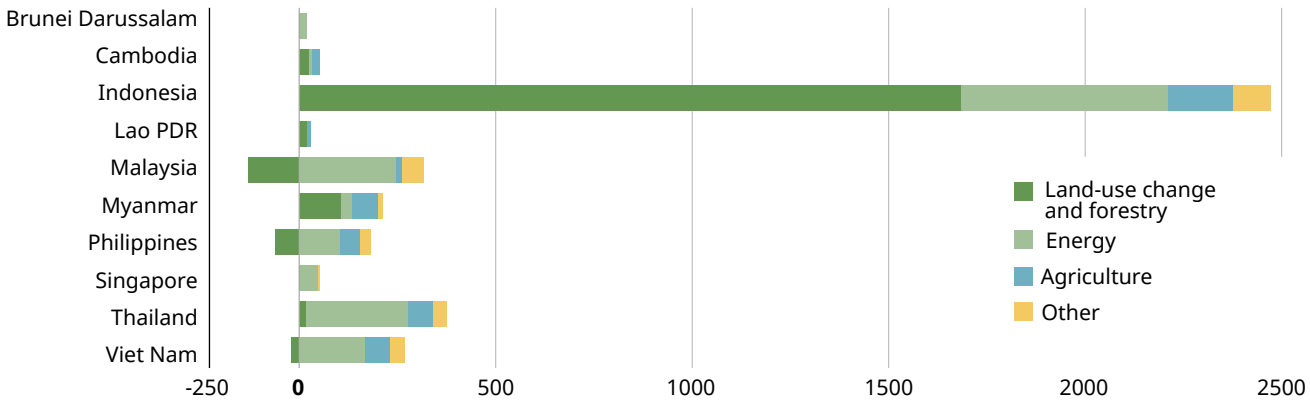
Source: CAIT Climate Data Explorer, accessed 12 November 2019. cait.wri.org

Figure 6. Change in greenhouse gas emissions in ASEAN Member States, 1990–2014 (megatonnes of carbon dioxide)



Source: CAIT Climate Data Explorer, accessed 12 November 2019

Figure 7: Greenhouse gas emissions by country, 2014 (megatonnes of carbon dioxide)



Note: Bars showing negative values indicate net accumulation and sequestration of carbon.
Source: CAIT Climate Data Explorer, accessed 12 November 2019.

ASEAN initiatives on climate change

ASEAN leaders have recognized the role of forests in climate change mitigation and adaptation in several policy statements (Table 9). Joint statements related to climate change were issued in 2007, 2009, 2010, 2011, 2014, 2015, 2016, 2017 and 2018. They expressed the ASEAN common position and commitment to address climate change through national and regional actions.

In April 2015, the ASEAN Heads of State signed the Declaration on Institutionalizing the Resilience of ASEAN Communities and Peoples to Disasters and Climate Change. The declaration commits to a range of measures to reduce vulnerability to disasters and climate-related risks. It acknowledges the importance of mainstreaming disaster risk management and climate change adaptation into policy-making at local, national and regional levels.

The Declaration on Post-2015 Environmental Sustainability and Climate Change was adopted in November 2015 (ASEAN Secretariat, 2015). It recognizes the need to quickly implement climate change mitigation and adaptation measures in line with national policies. It emphasizes the need to take an integrated and holistic approach for strategic decision-making to address environmental issues in the region. It also acknowledges the significance of ASEAN's role in addressing environmental sustainability challenges.

In October 2018, the ASEAN ministers of agriculture signed the Multi-sectoral Framework for Climate Change: Agricultural and Forestry Towards Food and Nutrition Security and Achievement of Sustainable Development Goals. The framework is structured around eight strategic objectives:

- Mainstreaming climate change policies at regional, national and local levels
- Strengthening scientific knowledge
- Ensuring Nationally Determined Contributions in agriculture and forestry sectors are acheived
- Integrating climate change mitigation and adaptation responses through landscape approaches
- Building institutional capacity
- Strengthening knowledge management mechanisms
- Providing and strengthening platforms for developing and advancing ASEAN common interests
- Securing climate change financing to support initiatives for food and nutritional security and sustainable development

Table 9: ASEAN declarations and commitments on climate change and forests

Year	Policy commitment
2007	Singapore Declaration on Climate Change, Energy and the Environment
2008	Common Position on Reducing Emissions from Deforestation and Forest Degradation (REDD+) to United Nations Framework Convention on Climate Change Conference of Parties 14
2009	Singapore Resolution on Environmental Sustainability and Climate Change
2010	Statement on Joint Response to Climate Change
2011	Statement on Joint Response to Climate Change
2012	ASEAN Action Plan on Joint Response to Climate Change
2014	ASEAN Joint Statement on Climate Change
2015	ASEAN Joint Statement on Climate Change to Conference of Parties 21
2015	Declaration on Post-2015 Environmental Sustainability and Climate Change
2015	Declaration on Institutionalizing the Resilience of ASEAN and its Communities and Peoples to Disasters and Climate Change
2016	ASEAN Joint Statement on Climate Change to Conference of Parties 22
2017	ASEAN Joint Statement on Climate Change to Conference of Parties 23
2018	ASEAN Joint Statement on Climate Change to Conference of Parties 24
2018	ASEAN Multi-sectoral Framework for Climate Change: Agricultural and Forestry Towards Food and Nutrition Security and Achievement of the Sustainable Development Goals

In May 2019, representatives of the ASEAN Member States attended a workshop hosted by the government of Thailand. It was one of the activities the ASEAN Working Group on Climate Change. The workshop was titled Strengthening Climate Resilience of ASEAN Member States Through Experience Sharing and Lessons Learned on Progress of Climate Change Adaptation Activities. It provided a platform for ASEAN countries to share knowledge and experiences about vulnerability and risk assessments, climate change adaptation and best practices. Its goal was to encourage ASEAN countries to address common concerns, develop shared visions and identify possible collaboration in climate change adaptation.

National mitigation and adaptation strategies

As highlighted in Figure 5, the land-use change and forestry sector is the region's largest source of greenhouse gas emissions and is critical for effective mitigation. Most countries have now developed national policies or strategies on climate change mitigation and adaptation. The majority of the policies do not specifically refer to social forestry. Some mention the need for community-based approaches and respecting the rights of local people. Others discuss building capacity at the local level and increasing the resilience of local communities and ecosystems. Examples include:

- Cambodia's Strategic National Action Plan for Disaster Risk Reduction 2019–2023
- Indonesia's National Action Plan on Climate Change Adaptation
- Lao PDR's National Adaptation Programme of Action
- Myanmar's National Climate Change Policy, Strategy and Action Plan
- Philippines' Strategy for Climate Change Adaptation, 2010–2022, and the National Framework Strategy on Climate Change, 2010–2022
- Thailand's Master Plan on Climate Change, 2013–2050, and the 11th National Economic and Social Development Plan, 2011–2015
- Viet Nam's National Climate Change Strategy

National forest strategies that reduce deforestation and forest degradation, promote reforestation and afforestation, and conserve ecosystems also contribute to national mitigation targets. The economies and livelihoods of Cambodia, Indonesia, Lao PDR, Malaysia and Viet Nam rely heavily on forest resources. In these countries, measures will be needed to ensure that forest ecosystems can successfully adapt to changes in the climate. Forest-based communities will have to increase their capacity to modify management practices and diversify livelihood systems.

Table 10 provides an overview of climate change mitigation and adaptation strategies and policies and their relevance to forests and social forestry. It also includes forest sector policies and programs that contribute to mitigation and adaptation.

Table 10: Forests in national mitigation and adaptation strategies

Country	Strategies, policies and programs	Mitigation and/or adaptation	Relevance to forests and social forestry
Brunei Darussalam	National Forestry Policy	Mitigation	▪ Increases the gazetted forest reserve from 41% to 55% of total land area
Cambodia	Climate Change Strategic Plan, 2014–2023	Mitigation and adaptation	▪ Enhances carbon sinks; recognizes the need for community-based approaches, such as payments for ecosystem services and participatory land-use planning, to build resilience of critical ecosystems, biodiversity, protected areas and cultural heritage sites
	National Adaptation Programme of Action	Adaptation	▪ Includes proposals for community agroforestry in deforested watersheds, community mangrove restoration and sustainable use of natural resources, and community-based agroforestry in coastal areas
	Draft REDD+ National Strategy	Mitigation and adaptation	▪ Entails three REDD+ demonstration projects supporting more than 27 community forests and protecting more than 300,000 hectares of forests
	National Forest Programme, 2010–2029	Mitigation and adaptation	▪ Increases forest cover to 60%; increases area of community-managed forests to 2 million hectares by 2030

Indonesia	National Action Plan for Mitigation	Mitigation	■ Recognizes sustainable forest management, biodiversity conservation and forest rehabilitation
	Forest Clearance Moratorium, 2011, 2013, 2015	Mitigation	■ Temporarily prevented new forest clearance permits being granted in primary forests and peat swamps
	National Action Plan for Reducing Greenhouse Gas Emissions, 2011–2014	Mitigation	■ Entails 13 action plans in the forest sector, including increasing the social forestry area to 2.5 million hectares by 2014; reducing forest fires; improving management of essential ecosystems; conserving protected forests; promoting forest plantation businesses; and creating business partnerships in 250,000 hectares of community forests
	National Action Plan on Adaptation, 2013	Adaptation	■ Includes a target to increase the quantity and quality of forest cover in priority areas
	National REDD+ Strategy, 2012	Mitigation	■ Cites at least 35 demonstration and pilot projects underway
Lao PDR	National Strategy on Climate Change, 2010	Mitigation and adaptation	■ Includes forestry as a sector for mitigation and adaptation
	National Adaptation Programme of Action	Adaptation	■ Includes projects on strengthening capacity of village foresters in forest management
Malaysia	National Policy on Climate Change, 2009	Mitigation and adaptation	■ Mentions forests as a theme for policy harmonization, research and development, and for promoting a low-carbon economy; does not include detailed strategies or actions
Myanmar	National Climate Change Strategy and Action Plan, 2001–2030	Mitigation and adaptation	■ Cites actions to protect forests and enhance their contribution to climate resilience, including in Theme 2, Management of natural resources for healthy ecosystems, and Theme 4, Increase access to climate-resilient and low-carbon technologies and practices
	National Climate Change Policy, 2019	Mitigation	■ Cites the commitment to enhance greenhouse gas sinks and reduce emissions due to deforestation and forest degradation, through sustainable management of forests and land-use planning
	National Programme on Reforestation and Restoration of Degraded Forests	Mitigation and adaptation	■ Promotes community forestry, agroforestry and livelihoods generally; promotes community forestry, restoration planting, livelihood improvement, cyclone shelters and income generation in mangrove areas
	National Forest Master Plan, 2002–2031	Mitigation	■ Aims for preservation of natural forest cover; reduction of deforestation; increases reserved forest and protected public forest to 30% and protected areas to 10% of total land area
	National Land-Use Policy, 2016	Mitigation and adaptation	■ Protects customary land rights; promotes people-centred development, participatory decision-making and sustainable land management
	National Adaptation Programme of Action, 2012	Adaptation	■ Includes a project on adapting community forestry landscapes and associated community livelihoods to a changing climate, particularly the increase in the frequency and intensity of extreme weather events

Philippines	National Framework Strategy on Climate Change, 2010–2022	Adaptation	■ Represents a road map to address climate change; includes strengthening adaptation of natural ecosystems and human communities
	Philippines Strategy for Climate Change Adaptation, 2010–2022	Adaptation	■ Aims to increase adaptive capacity of communities and resilience of natural ecosystems; focuses on biodiversity, forestry, coastal and marine resources, fisheries, land and agriculture
	National Disaster Risk Reduction and Management Law, 2010	Adaptation	■ Aims to increase resilience in the face of natural disasters and mitigate their impacts
	National Greening Program	Mitigation and adaptation	■ Aims to plant 1.5 billion trees from 2011–2016 for mitigation, poverty reduction and alternative livelihoods; 50% of the trees are to be forest species for timber production and protection, with the remaining 50% agroforestry species
	Enhanced National Greening Program	Mitigation and adaptation	■ Aims to rehabilitate all the remaining unproductive, denuded and degraded forest lands, estimated at 7.1 million hectares, from 2016 to 2028
	Master Plan for Climate Resilient Forestry Development	Mitigation and adaptation	■ Proposes programs and strategies to strengthen resilience of forest ecosystems and communities to climate change and to respond to demands for forest ecosystem goods and services and promote responsive governance
Singapore	National Climate Change Strategy, 2012	Mitigation and adaptation	■ Not available
Thailand	Master Plan on Climate Change, 2013–2050	Mitigation and adaptation	■ Outlines short-, medium- and long-term measures to address mitigation, adaptation and cross-cutting issues; refers to ecosystem-based adaption, community participation; promotes the rights of community forest groups
	National Strategy for Climate Change Mitigation, 2008–2012	Mitigation	■ Outlines an initial framework for measures to reduce emissions from deforestation and degradation
	Eleventh National Economic and Social Development Plan, 2011–2015	Mitigation and adaptation	■ Identifies climate change as a risk to natural resources, including forests, biodiversity, coastal resources and wetlands; proposes development of a greenhouse gas registry, a carbon fund and a system for monitoring, reporting and verification; emphasizes the role of communities in planning and decision-making on natural resource management
	National Adaptation Plan	Adaptation	■ As part of the 2018–2037 Thailand Strategy, and based around six priority sectors identified in the 2015–2050 Climate Change Master Plan, addresses forests in water management and natural resource management
	National Forestry Policy, 1985	Mitigation	■ Maintains and expands national forest cover to 40% of the country's land area, comprised of 25% protected forest and 15% production forest

Viet Nam	National Target Programme on Climate Change	Mitigation and adaptation	▪ Cites potential priority for increasing forest cover from 37% in 2005 to 47% in 2015 to increase carbon dioxide absorption
	National Climate Change Strategy	Mitigation and adaptation	▪ Increases forest cover to 16 million hectares, or 47%, by 2020; enhances community capacity for adaptation
	Action Plan for Adaption and Mitigation in Agriculture and Rural Development	Mitigation and adaptation	▪ Increases forest cover to 16 million hectares, or 47% by 2020; calls for planting trees to protect dyke systems
	Socio-Economic Development Plan, 2011–2015	Mitigation and adaptation	▪ Increases forest cover to 47% by 2020; emphasizes response to sea-level rise and vulnerability of low-lying coastal regions
	National Green Growth Strategy	Mitigation	▪ Accelerates afforestation and reforestation and promotes investment to increase forest cover to 45% by 2020; ▪ Improves forest quality, enhances carbon sequestration capacity by forests and increases standing biomass and secure timber production and consumption; calls for programs to reduce greenhouse gas emissions through REDD+ and sustainable forest management in conjunction with diversifying livelihoods of rural people
	National REDD+ Action Programme, 2012	Mitigation	▪ For 2011–2015, calls for developing and operationalizing pilot mechanisms, policies, organizational systems and technical capacity to ensure effective management, coordination and operation of REDD+; Prime Minister approves the National REDD+ Action Programme in 2012; ▪ for 2016–2020, calls for effective management, coordination and operation of projects and activities under the National REDD+ Action Programme; reduction of emissions through REDD+; increase of sequestration by forests; achievement of target of 20% emission reduction in the agricultural sector by 2020; sustainable management and development of forest resources; increase of national forest cover to 44–45%; conservation of biodiversity; and diversification and improvement of livelihoods
	Law on Natural Disaster Prevention and Control, 2013	Adaptation	▪ Prohibits activities that increase the risk of natural disasters, especially cutting down protection forests

Nationally Determined Contributions

In 2015, 196 Parties, including all ASEAN Member States, signed the Paris Agreement to set the world on a course towards sustainable development. Its aim is to limit global warming to 1.5 to 2 degrees C above pre-industrial levels. The Parties also agreed to a long-term goal to increase the ability to adapt to the adverse impacts of climate change and foster climate resilience. Additionally, they agreed to work towards making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Nationally Determined Contributions (NDCs) are at the heart of the Paris Agreement and are vital for achieving these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each Party to prepare, communicate and maintain the successive NDCs that it intends to achieve (UNFCC, 2020).

The commitments outlined in the NDCs are an important starting point in the global efforts to reduce the impacts of climate change. However, they are currently not sufficient to limiting warming to the threshold of 1.5° to 2°C above pre-industrial levels.

The NDCs of Brunei Darussalam, Cambodia, Lao PDR, Myanmar, the Philippines and Viet Nam include pledges and emissions reduction targets related to their forestry sectors. Indonesia's contributions mentions social forestry as a mechanism for sustainable forest management to reduce emissions. Indonesia, Myanmar and Thailand include social forestry as part of their priorities for adaptation to enhance the resilience of ecosystems to climate change. The contributions commitments of the ASEAN Member States on adaptation and mitigation are outlined in Table 11.

Table 11: Nationally Determined Contributions

Country	Forests for mitigation	Pledges	Forests for adaptation
Brunei Darussalam	✓	✓	■ Reduce total energy consumption by 63% compared with business-as-usual scenario, and increase power generation from renewable energy to 10% by 2035
			■ Reduce carbon dioxide emissions by 40% by 2035, compared with the business-as-usual scenario
			■ Increase gazetted forest reserves from 41% of the total land area to 55%
			■ Increase forest protection for preventing floods, stabilizing slopes and supporting fresh water supply
Cambodia	✓	x	■ Reduce emissions to 3,100 gigatonnes of carbon dioxide by 2030, compared to baseline emissions of 11,600 gigatonnes of carbon dioxide
			■ Increase forest cover to 60%, or 4.7 tonnes of carbon dioxide per hectare per year, by 2030
			■ Reclassify 2 million hectares of forest as community forest as part of measures to reduce emissions in the forestry sector
Indonesia	✓	✓	■ Reduce greenhouse gas emissions to 26% by 2030 from business as usual, and by up to 41% with international assistance
			■ Enforce moratorium on new forest clearance permits in primary forests and peat soils and strengthen forest protection and reduce deforestation and forest degradation
			■ Include social forestry as part of sustainable forest management to achieve emissions reduction targets and support the resilience of ecosystems and landscapes
Lao PDR	✓	✓	■ Increase forest cover to 70% of land area, or 16.6 million hectares, by 2020, which equals a reduction in emissions of 60,000–69,000 kilotonnes of carbon dioxide by 2020
			■ Increase the share of renewable energy to 30% of energy consumption by 2025, which equals 1.5 million kilotonnes of carbon dioxide by 2025
			■ Call for 63 kilotonnes of carbon dioxide per protected area by 2020 in the rural electrification program
			■ Improve road network and public transport equal to 33 kilotonnes of carbon dioxide per protected area and 158 kilotonnes of carbon dioxide per protected area, respectively.
			■ Call for 16,284 kilotonnes of carbon dioxide per year from 2020 to 2030 in hydropower development

			■ Recognize that forestry-based actions will provide co-benefits for mitigation and adaptation, such as increasing carbon sinks, helping to prevent flooding, soil erosion and landslides and protecting biodiversity and ecosystem services
			■ Refer to the forestry strategy to 2020 objectives, including sustainable community forest management for mitigation and poverty reduction
Malaysia	x	x	■ Reduce greenhouse gas emissions intensity of gross domestic product by 35% by 2030, relative to 2005, or up to 45% with international assistance
Myanmar	✓	✓	■ Increase the area of reserved forest and protected public forest to 30% of total land area and protected area systems to 10% of total land area
			■ Preserve natural forest cover and reduce deforestation to maintain the mitigation contribution from the forest sector
			■ Increase capacity for sustainable forest management
			■ Preserve natural forest cover and reduce deforestation to maintain the mitigation contribution from the forest sector
			■ Increase capacity for sustainable forest management
			■ Increase resilience of mangrove forests
			■ Lower carbon energy development
			■ Include restoring degraded and sensitive forest areas through community-based reforestation in current and planned adaptation efforts
Philippines	✓	✓	■ Reduce greenhouse gas emissions by approximately 70% by 2030, relative to its business-as-usual scenario of 2000–2030, conditional on receipt of external finance and technical assistance
			■ Recognize that forests contribute to both adaptation and mitigation, but specific actions in the forest sector are not outlined in detail
Singapore	x	x	■ Reduce emissions intensity by 36% by 2030 from 2005 levels, through domestic efforts
			■ Stabilize emissions to peak around 2030
Thailand	x	✓	■ Reduce greenhouse gas emissions by 20% from the projected business-as-usual scenario by 2030 and by up to 25% with international assistance
			■ Include sustainable management of community forests to promote food security at the community level
			■ Increase forest cover to 40% through local community participation, especially in headwater and mangrove forests, to enhance adaptive capacities of related ecosystems
Viet Nam	✓	x	■ Reduce greenhouse gas emissions by 8% from the projected business-as-usual scenario by 2030 and by up to 25% with international assistance
			■ Increase forest cover to 45%
			■ Mention community-based adaptation using indigenous knowledge

The role of social forestry in mitigation and adaptation

Case studies show that practical social forestry initiatives support mitigation and build resilience in communities. Examples include:

- Supporting the implementation of national reforestation programs
- Reducing deforestation and forest degradation through community-based initiatives
- Managing and reducing the spread of forest fires through collaboration
- Restoring mangrove forests to enhance their protective functions through community-based initiatives
- Measuring and monitoring forest carbon stocks
- Increasing the resilience of forest ecosystems at a landscape scale
- Contributing to more diverse livelihoods, increased food security and income generation

The governments of Cambodia, Myanmar, Philippines, Thailand and Viet Nam are implementing large-scale national reforestation programs to reduce deforestation and land degradation. These programs engage community forest managers and social forest groups in tree planting and forest protection activities. Their objectives are to restore degraded forests, produce raw materials, strengthen rural livelihoods and contribute to climate change mitigation by sequestering and storing carbon.

Cambodia's Forest and Landscape Restoration Programme uses the Restoration Opportunities Assessment Methodology (ROAM) developed by IUCN and the World Resources Institute. ROAM is a framework for identifying and analyzing areas that are primed for forest landscape restoration. It is also used to determine specific priority areas at a national or sub-national level. In Cambodia, it is used to identify and deliver projects in pilot sites in Kampong Thom, Preah Vihear and Siem Reap provinces (Jia et al., 2018). Preparatory studies on payment for ecosystem services schemes to finance reforestation have been undertaken in the Kulen Mountains and Khba Chhay National Park (FAO, 2016d).

In Thailand, the Royal Forest Department has distributed between 50 million and 150 million tree seedlings a year since 2011. They are delivered to urban and community forest areas for enrichment planting (Karam et al., 2012). By encouraging communities to plant drought-tolerant and food-producing species, the initiative also helps build resilience at the local level (RECOFTC, 2014b).

Viet Nam has had considerable success in

Box 6: Forest restoration in Myanmar

Myanmar recorded a 22.5 percent decrease of its intact forest between 2002 and 2014. Mangrove forests especially suffered, with a 64 percent decrease in the Delta's mangrove cover between 1978 and 2011, mainly from agricultural expansion and charcoal production.

The government initiated an ambitious plan to restore 1.2 million hectares of forest cover by 2026, mostly through its National Rehabilitation and Restoration Plan. This would amount to a 2 percent increase in forest cover. It would deliver significantly more because it would stall deforestation from logging. Myanmar has the third highest deforestation rate in the world, roughly 1 percent loss per year for the past 100 years.

IUCN conducted a national Restoration Opportunities Assessment Methodology mapping process from January 2017 to January 2018. It was funded by DFID's International Forestry Knowledge program and The Nature Conservancy.

The importance of community forestry for people's livelihoods in the country is clear, with 91 percent of households depending on community forestry products, such as wood, non-timber forest products, nipa palm and mud crabs. Livelihood strategies in developing countries in particular have huge dependence on natural resources, often derived from community forestry. Greater accessibility to community forestry membership can help decrease poverty.

Sources: Feurer, Gritten and Than, 2018; Li et al., 2018.

involving local people in forest landscape restoration over several decades. In the process, forestry has become an important economic sector, contributing to higher employment, improved livelihoods and poverty reduction. In the 1990s, Viet Nam initiated two major forest restoration programs. From 1992 to 1997, the Greening Barren Hills Programme rehabilitated open lands and barren hills and protected existing forests to promote natural regeneration. It resulted in approximately 400,000 hectares of new plantations and 300,000 hectares of regenerated forests. Between 1998 and 2010, the 5 Million Hectare Reforestation Programme restored approximately 1.2 million hectares of protection and special-use forests and 500,000 hectares of production forest plantations (FAO and RECOFTC, 2016). As a result, forest cover increased from 28 percent in 1995 to 40 percent in 2012 (VNFOREST, 2015).

Forest degradation and deforestation tend to be the result of different processes (Skutsch and McCall, 2012). Deforestation is often driven by external economic or political forces, such as demand for land, agricultural plantations, infrastructure or resource-extraction projects. Governments often place these forces as a higher priority than social forestry. For example, in Oddar Meanchey Province in Cambodia, communities have been unable to prevent military operations close to the border with Thailand encroaching on their community forest lands (Lang, 2016; Yeang and Brewster, 2012).

The main causes of forest degradation in ASEAN tend to be unsustainable harvesting for subsistence purposes or unregulated plantation forestry. When the management of plantation forestry is improved and sustainable harvesting practices are adopted through social and community forestry, forest quality and carbon stocks improve. Therefore, social forestry approaches are considered to be more effective in reducing forest degradation and enhancing carbon stocks than in reducing deforestation (Skutsch and McCall, 2012).

Various projects in the region are developing and demonstrating the capacity of local communities to manage and monitor carbon stocks in their community forest. The aim of the projects is to facilitate low-cost locally based carbon monitoring, reporting and verification activities. Projects and studies in Indonesia, Lao PDR, Thailand and Viet Nam have demonstrated that local communities can measure carbon stocks proficiently. However, as of April 2013, only six of 50 carbon projects validated by the Climate, Community and Biodiversity Alliance in Southeast Asia involved local stakeholders in monitoring forest biomass, biodiversity and livelihoods (Danielsen et al., 2013).

Joint mitigation and adaptation

Box 7: REDD+ in Cambodia

In 2017, the Cambodian government approved its National REDD+ Strategy. The strategy marks a major milestone in the country's transition from REDD+ Readiness Phase to REDD+ Implementation. The Action and Investment Plan for implementing REDD+ brings together existing policies in Cambodia to develop a coherent and coordinated policy framework. In so doing, the framework is better prepared to achieve the National REDD+ Strategy objectives. The plan sets up the investment framework needed to reach the objectives. It also highlights the most appropriate financial tools for a program or project.

Using the Forest Carbon Partnership's Facilities (Phase II), the program also seeks to resolve gender issues and promote women's empowerment. These are seen as essential for implementing effective REDD+. In March 2019, the Forest Carbon Partnership Facility held a two-day workshop to enhance the capacity of government institutions and non-government organizations to tackle gender equality barriers in REDD+, particularly in decision-making processes. The workshop prompted the Secretary of State to provide more gender training activities for national staff and mobilize resources to support gender-focused activities in the environmental sector.

The government has made efforts to advance the forest monitoring system to improve land-use planning and overall sustainable forest management. During the first quarter of 2019, group efforts were made to finalize nationwide geo-information mapping, which showed a one percent decrease in deforestation from 2016 to 2018.

Source: UN-REDD Programme, 2019.

through social forestry

In policy terms, climate change mitigation and adaptation have usually been considered distinct and separate activities. Mitigation aims to reduce the level of greenhouse gases in the atmosphere. Adaptation aims to reduce vulnerability and respond to the impacts of climate change. Since 2014, trade-offs between the two approaches were anticipated, and there was concern that focusing on adaptation would derail efforts on mitigation (RECOFTC, 2016c). However, the urgent nature of the climate change challenge and the rising concentration of atmospheric carbon dioxide has changed that. There is now growing recognition that adaptation and mitigation must be addressed simultaneously, and synergies between the two approaches must be found.

Article 5 of the Paris Agreement encourages the signatories to adopt joint mitigation and adaptation approaches for the sustainable management of forests and incentivizing, when appropriate, the associated non-carbon benefits that arise (UNFCCC, 2015). Social forestry approaches have huge potential to link mitigation and adaptation efforts because of the multiple benefits that frequently result with healthy and sustainably managed forests. These benefits include carbon sequestration and storage, or mitigation. They also include ecosystem protection services that support adaptation, such as natural flood management, water storage and aquifer recharge, erosion control and enhancing the resilience and recovery of biodiversity from extreme events (FAO, 2012). Forests can provide timber, fuel, forest foods and other products that can be used, consumed or sold for income. When they do, they become a safety net for people whose agricultural livelihoods are affected by drought, floods, storms or other events (Seymour, undated).

Community-based mangrove restoration is a clear example of how social forestry can contribute to both mitigation and adaptation goals. It also demonstrates how measures to adapt ecosystems to climate change directly benefit communities. Healthy mangrove ecosystems store large amounts of carbon. They provide physical protection to coastal communities from tropical storms and strong waves. They also support diverse coastal livelihoods by providing fish, crabs, shrimp and other products. There are a number of projects taking place in Myanmar, Thailand and Viet Nam that are supported by various organizations. These initiatives are contributing to national mitigation targets and helping to build climate resilience at the community level (RECOFTC, 2014b).

One example of a joint mitigation and adaptation

Box 8: Successes in the Philippines' National Greening Program

Deforestation has caused major biodiversity loss in the Philippines. Between 1934 and 1990, the country lost 10.9 million hectares of forest cover.

The National Greening Program was established in 2011. It promotes reforestation, reduces poverty, promotes food security, creates alternative livelihoods and enhances climate change mitigation. Between 2011 and 2018, the program reforested more than 1.9 million hectares of area, which is 108 percent of its original target. It also planted more than 1.5 billion seedlings, employed more than 670,000 personnel and directly or indirectly generated nearly 5 million jobs. By the end of 2012, the program had sequestered 38.9 megatonnes of carbon. FAO ranked the program as providing the fifth-largest gain in forested area in any country between 2010 and 2015.

The National Greening Program has made a significant contribution to reforestation and carbon capture. It has indirectly improved the quality of water in rivers and farmland irrigation and reduced the threat of flooding. It has also set a foundation for a strong wood-products economy. The program has mobilized youth and local communities to restore and manage forests. By providing alternative livelihoods and benefit sharing with local communities, it has motivated them to protect their reforested lands.

Source: Ahmed, 2018.

project is the Where the Rain Falls project in northern Thailand, supported by the Raks Thai Foundation. The project developed a range of adaptation and mitigation models for communities, including an improved system of terraced rice farming and distribution of fuel-efficient stoves to reduce wood consumption. The project's aim was to demonstrate that climate change adaptation and mitigation can and should be considered together (RECOFTC, 2014b).

Challenges

Despite the enormous value social forestry can offer to climate change mitigation and adaptation, a number of issues limit its ability. to do so. Most national policy-makers do not understand social forestry's potential role and therefore do not make it a prominent feature in their national climate change strategies (Table 10). In part, this reflects the sector, or siloed, nature of policy development, which is an inevitable consequence of large bureaucracies. The result is that social forestry is not closely linked to other policy areas, such as agroforestry, agriculture and rural development. Policy-makers outside social forestry departments do not recognize social forestry's potential to simultaneously advance climate change, sustainable development and economic and social development agendas in rural areas.

Forests allocated to local people as community forests are often severely degraded (FAO, 2016a). It can take a number of years for these forests to regenerate sufficiently to provide a level of forest products that can benefit local communities (FAO, 2016a; RECOFTC, 2013; Broadhead and Izquierdo, 2010).

Local people do not always receive adequate compensation for their participation in forest restoration or forest protection activities. For example, villagers participating in the Oddar Meanchey REDD+ project in Cambodia have received little or no money or other benefits for patrolling and protecting their community forest (Lang, 2016). In some cases, local people are considered to be nothing more than forest labourers rather than active participants in forest planning, management and decision-making processes (RECOFTC, 2013; Maryudi, 2012).

The wider legal and fiscal policy framework needed to support vibrant social forestry economies is still not well developed. This framework must move beyond a permit system that allocates limited rights and decision-making powers to local people. It must also facilitate, incentivize and monitor good forest management.

There have been notable developments in legislation to protect and promote social forestry in recent years in Member States, including Indonesia, Lao PDR, Myanmar and Thailand. However, more needs to be done to support investment and encourage the market structures that will allow social forestry to flourish (FAO, 2019a). Measures include further expansion of supply chain initiatives. Examples include:

- The European Union Forest Law Enforcement, Governance and Trade (FLEGT) Facility
- Payment for Forest Ecosystem Services (PFES) schemes in watersheds
- Direct government investment in social forestry on state lands
- Well-regulated mechanisms for enabling private investment

Box 9: Regional forest observatory project

The Regional Forest Observatory for Southeast Asia is hosted at the Vietnamese Academy of Forest Science and currently provides services to Cambodia, Laos, Myanmar, Thailand and Vietnam.

The project began by screening actors in the region to assess their interest in the content and approach of the project. The geoportal houses geographic information that helps users understand forest cover and change at the regional, national or local levels. It also collects information on land use and management, soil type, average rainfall and fire occurrence. The project can be used as a comparison tool for forest cover change by practitioners. It is a knowledge pool that can be accessed easily to view the latest official reports, such as the forest reference emissions levels reports and the REDD+ national strategies.

Source: Ferrand et al., 2018.

These challenges and solutions need to be addressed before social forestry is scaled up and implemented effectively.

Summary

- Forestry and social forestry are not currently a central feature of mitigation and adaptation strategies in ASEAN Member States.
- The full potential of social forestry, including its economic and social benefits, and its ability to act as a safety net are not fully emphasized in forestry interventions.
- Social forestry can deliver something different to other forestry mechanisms.

Country summaries

The following section provides summaries of the situation in all the ASEAN Member States except Brunei Darussalam and Singapore, which do not have social forestry programs. Each summary adheres to the same structure. A table provides statistics relevant to social forestry and climate change, and is followed by the following sections:

- National forest definition and classification
- Analysis of forest data: Changes and trends
- Social forestry policies and programs
- Status of social forestry
- Challenges facing social forestry
- Impacts of climate change
- Climate change mitigation and adaptation strategies
- Forests and social forestry in climate change mitigation and adaptation

Community forestry has developed over the years in Cambodia, pictured above, including in areas surrounding the Prey Lang forest.

Cambodia

Total population	15,626,000 in 2016*	
Rural population	11,956,000 in 2016	70% of population
Total country area	18,103,500 hectares	
Land area (excluding inland water bodies)	17,650,000 hectares	
Forest land	8,742,401 hectares in 2016	48.14% land area
Forest cover	8,742,401 hectares in 2016	48.14% of land area
Production forest	2,300,000 hectares in 2016	26% of forest land
Protected forest (soil and water conservation)	No data	-
Protected forests (biodiversity conservation)	No data	-
Forest cover change	-1.34% 2014–2016	
Forest carbon stocks	78,953,951 tonnes of carbon dioxide in 2016	
Community-managed forests (with community forestry agreement)	■ Community forests approved by the Ministry of Agriculture, Forestry and Fisheries: 484 community forests, covering 437,255 hectares ■ Community forestry agreements signed: 439 community forests, covering 362,209 hectares ■ Community protected areas: 168 areas covering 285,609 hectares	
Community forestry policies and programmes	■ National Forest Policy, 2002 Forestry Law, 2002 ■ Community Forestry Sub-decree, 2003 ■ Community Forestry Guideline, 2006 ■ National Forestry Programme, 2010–2029 ■ Community Forestry Programme, 2010 ■ National Protected Area Strategic Management Plan, 2017–2031	
Climate change mitigation and adaptation targets, policies and programmes	■ Cambodia Climate Change Strategic Plan, 2014–2023 ■ Cambodia National REDD+ Strategy, 2017–2026	

Note: *=Estimated population by residence.
Source: CSES, 2016; Forest Cover 2016 (MOE).

National forest definition and classification

The national definition of forest is a "unit of natural ecosystem or plantation in the forms of wetland, lowland and dryland covered with natural stands or plantation trees with a height from 5 metres on an area at least 0.5 hectares and with a canopy of more than 10 percent." Plantation crops, such as rubber, oil palm, teak, acacia and eucalyptus, and other kinds of trees that fall under the defining criteria are classified as forests. The definition of forest used under the national REDD+ program also includes forest regrowth and areas under afforestation or reforestation. Rubber, oil palm plantations and perennial crops are excluded from this definition (MOE, 2018).

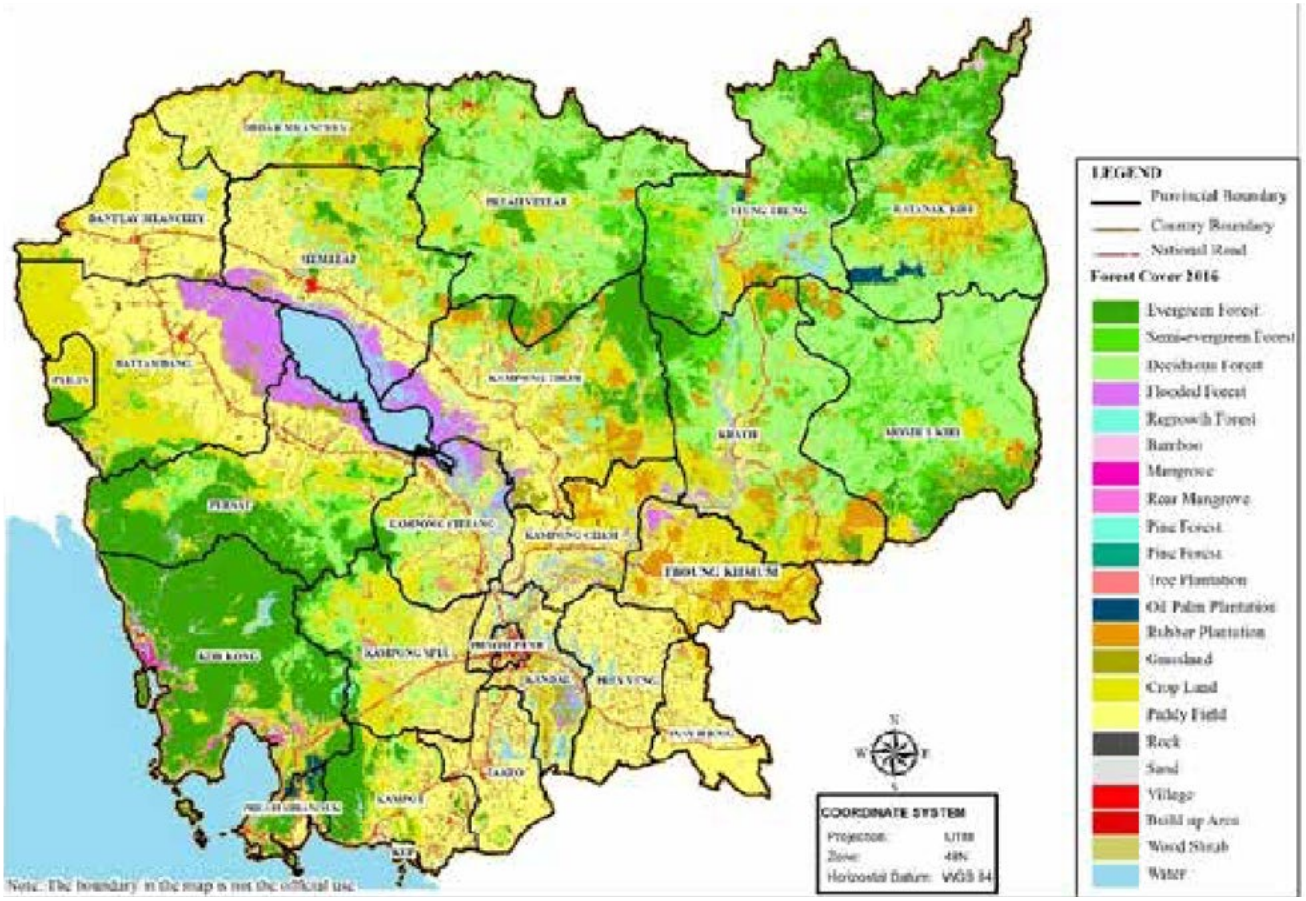
Analysis of forest data: Changes and trends

Cambodia covers a total area of 181,035 square kilometres, or 18.1 million hectares. It is categorized as a least developed, low-income country. Relative peace and stability over recent decades have put increasing pressure on the country's natural resources. Cambodia still has one of the highest levels of forest cover in Southeast Asia. However, the area of forest has reduced significantly over the past 30 years, particularly between 2010 and 2014, as shown in Figure 9 (MOE, 2018).

According to a satellite assessment of land use and forest cover carried out in 2016, forest amounted to more than 8.7 million hectares, equivalent to 48.14 percent of the country's total land area.9 If the area of oil palm and rubber plantations are omitted, forest cover stands at 8.2 million hectares, or 45.05 percent of the country's total area. Natural forests, including evergreen, semi-evergreen, deciduous, flooded, bamboo and mangroves, are estimated to cover more than 8.1 million hectares, or 44.8 percent of total land area (MOE, 2018).

According to Cambodia's national forest cover assessments, forest cover in 2010 was nearly 10.4 million hectares, equal to 57.07 percent of the total land area (RCG, 2014). In the six years between 2010 and 2016, forest cover fell by 1.6 million hectares, at an average rate of 231,626 hectares per year. The allocation of forest land as economic land concessions for industrial agriculture development was one key driver of forest degradation and loss between 2003 and 2014 (Forest Trends, 2015). Although the forest

Figure 8: National land use in Cambodia, 2016

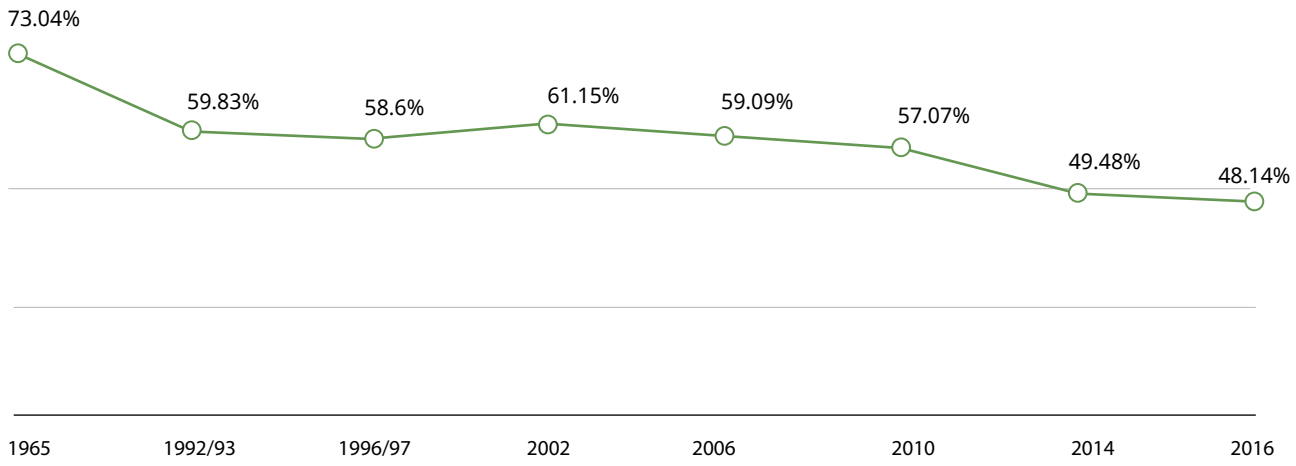


Source: MOE, 2018, Cambodia Forest Cover 2016, March 2018

area continues to decline, recent data reveals that the rate of change may have slowed since 2014. From 2010 to 2014, the country lost an average of 344,472 hectares per year, but by 2014 to 2016, this had fallen to approximately 121,750 hectares per year.

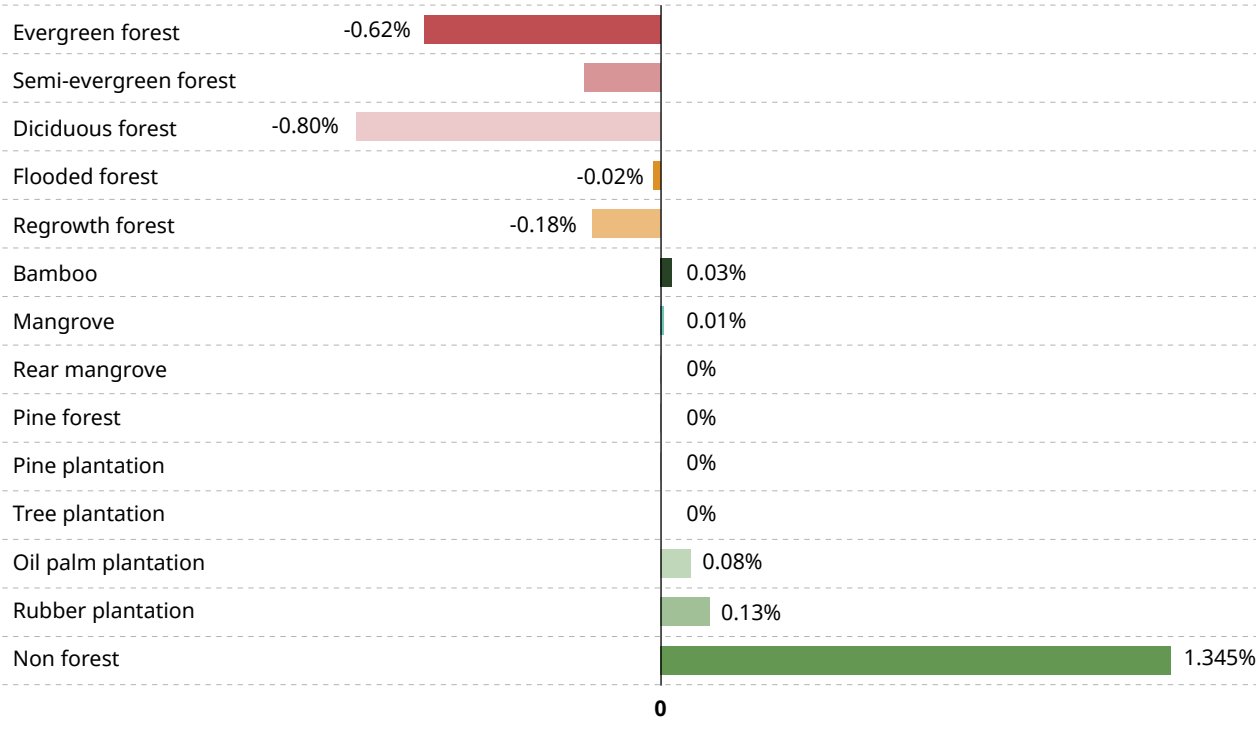
Figure 10 indicates that evergreen, semi-evergreen, deciduous, flooded and regrowth forests continue to decline, while the area of oil palm and rubber plantations has increased. Non-forest area, which includes urban areas, field crops, fallow or barren land and other human-impacted areas, has increased by 242,763 hectares, or 1.34 percent, in two years (MOE, 2018).

Figure 9: Forest cover in Cambodia, 1965–2016 (including oil palm, rubber and tree plantations)



Source: Adapted from MOE, 2018.

Figure 10: National land-use change in Cambodia, 2014–2016



Source: MOE, 2018.

The government recently reclassified some areas of protected forest, conservation areas, production forests and economic land concessions. These were reallocated between the Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries (MAFF) to strengthen the effectiveness and management functions of the two ministries (MOE, 2018). As per Sub-Decree No. 34 (2016), the Ministry of Environment is now responsible for environmental protection, biodiversity conservation and sustainable use of natural resources in all forestry and fisheries protection and conservation areas previously under MAFF. MAFF is now responsible for managing economic land concession areas that were previously under the jurisdiction of the Ministry of Environment.

Some additional land was also designated as protected area, bringing the total number to 51 protected areas covering approximately 7.5 million hectares (MOE, 2018). At the provincial level, the Provincial Community Forestry Coordination Committee and community protected areas are now under the Ministry of Environment. The transfer of conservation areas from MAFF to the Ministry of Environment doubled the area of protection under its jurisdiction. This will require considerable additional capacity and resources to safeguard the protected areas for the future (MOE, 2017).

Social forestry policies and programs

The 2002 Forest Law provides the regulatory platform and legal framework for community forestry in Cambodia. In 2003, a Community Forestry Sub-Decree was issued as a guide for establishing and managing community forests. The community forestry guidelines (prakas) were issued in 2006 to clarify the process for determining, legalizing and managing community forests.

The 2010–2029 National Forest Programme aims to increase the level of forest cover to 60 percent of the total land area. It set a target of 2 million hectares of forest to be allocated as community forests by 2029 by establishing approximately 1,000 community forests (Forest Administration, 2010). The National Community Forestry Programme Coordination Committee coordinates ministerial planning and activities. It also coordinates relevant initiatives carried out by the government, civil society organizations or development agencies.

The rights of indigenous communities to use forests are guaranteed under the Land Law of 1992. The law gives the government the right to grant collective land titles to indigenous communities. The collective land titles provide tenure to traditional agricultural lands and forest areas used for shifting cultivation through (Forest Trends, 2015).

The 2017–2031 National Protected Area Strategic Management Plan was introduced in June 2017. One of its four objectives is to expand community participation and benefits (MOE, 2017). The 2018–2032 Production Forest Strategic Plan aims to strengthen forest governance. It provides for sustainable production of timber and non-timber forest products through reforestation, forest re-habitation and sustainable management. It also promotes active participation of rural communities in forest management and strengthens collaboration and institutional capacity.

Status of social forestry

Community forestry in Cambodia has increased steadily since 2007 (Table 12). In 2018, a total of 636 community forests had been established. MAFF formally approved 484 of them, covering a combined area of 437,255 hectares. Of those, 439 forests covered an area of 362,209 hectares with an approved community forestry agreement in place. However, only 85 had an official community forestry management plan (CFMP). There were also 168 Community Protected Areas (CPAs) covering an area of 285,609 hectares.

Table 12: Number of official community forests in Cambodia, 2007–2018

	2007	2010	2012	2014	2016	2018
Community forestry established	253	428	455	485	580	636
Community forestry approved by the Ministry of Agriculture, Forestry and Fisheries	37	233	291	364	404	484
Community forestry agreement	11	115	243	320	368	439
Community forestry management plan	0	0	1	2	73	85

Source: Presentation at 13th ASEAN Working Group on Social Forestry, 2–3 July 2019, Bandar Seri Begawan, Brunei Darussalam.

Challenges facing social forestry

The establishment and approval of community forests has been slowly and steadily progressing. However, as of 2018, only 18 percent of the targeted 2 million-hectare area had been reached. As noted, only 85 of the 636 community forests had an approved community forestry management plan in place. One reason for this slow progress is the perception that the government can terminate the community forestry agreement if the land is required for another purpose. In addition, the requirements of the community forestry management plans are overly technical and demanding for communities and local government staff. Local capacity to develop, submit and verify these plans is limited, and trainings are often poorly attended. The incentives for communities to invest in developing the plan appear to be weak, particularly because many community forests are located in degraded forests with limited production capacity. The lack of funding available for forest protection, without a management plan, means that efforts to control illegal logging are minimal. The Forest Administration also lacks formalized operational guidelines and the technical and financial capacity to review management plans at national and local levels. And as a result, the process to approve the management plan can take a number of years (Gritten et al., 2015).

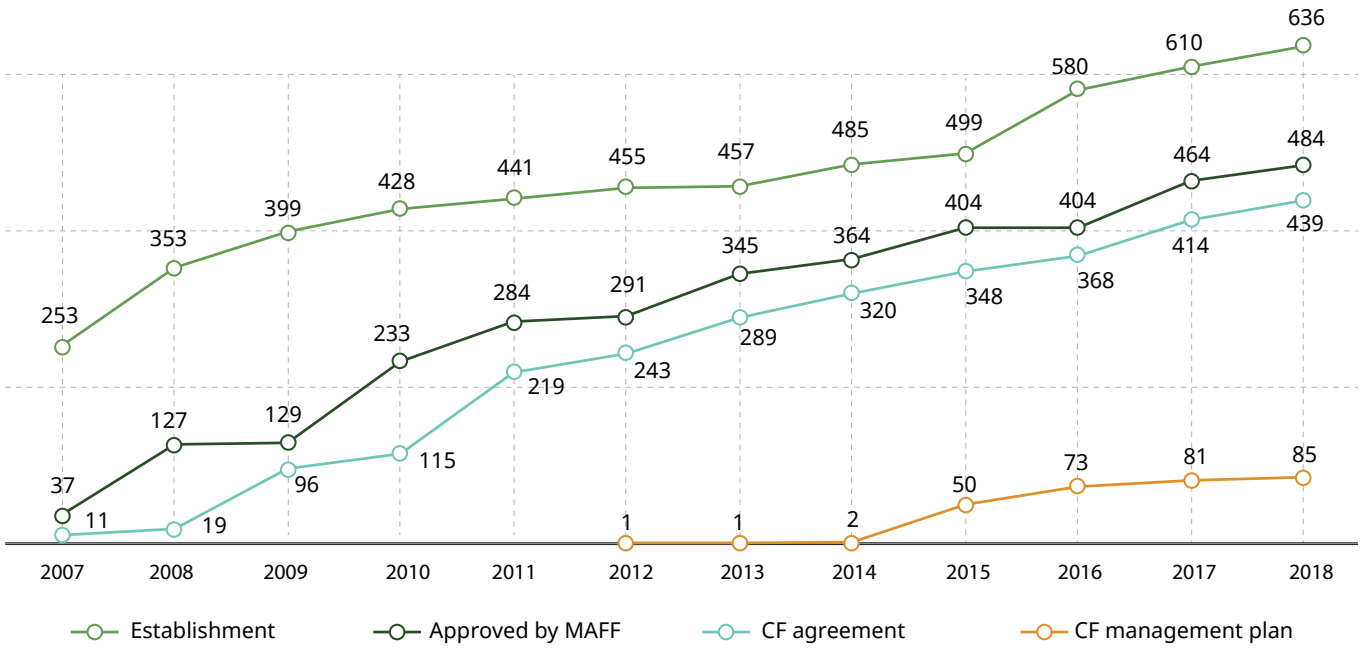
Drivers of deforestation

From 1997 to 2002, deforestation in Cambodia was mainly associated with smallholder agriculture on the boundaries between forest and non-forest landscapes (IFSR, 2004). A marked increase in deforestation between 2004 and 2013 appears to be associated with large-scale agri-industrial plantations that have been given economic land concessions on forest lands. By the end of 2013, 2.6 million hectares, about 14 percent of the country's territory, reportedly had been allocated to various land concessions. More than 80 percent of the concessions have been allocated in production forest or protected areas that were under forest cover as late as 2010. All major forest areas have been subject to encroachment by the concessions to varying degrees. The concessions are considered to be the main form of encroachment into remaining areas of good forest. For example, 30,000 hectares, or approximately half of the Seima Protected Forest's high-biomass evergreen forests, were excised for economic land concessions in 2012 (Forest Trends, 2015).

Impacts of climate change

Cambodia is one of the most climate-vulnerable countries in the world. It ranks as the 19th most affected country from extreme weather events occurring between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019). Since 2010, Cambodia experienced more frequent

Figure 11: Number of official community forests in Cambodia, 2007–2018



Source: Presentation at 13th ASEAN Working Group on Social Forestry, 2–3 July 2019, Bandar Seri Begawan, Brunei Darussalam.

and severe floods, droughts and storms, which presented significant challenges to the country's socioeconomic development (RGC, 2015). The mean annual temperature has increased by 0.8℃ since 1960, particularly in the dry season. The frequency of hot days and hot nights has increased considerably, while cold days and nights have decreased (McSweeny, New and Lizcano, 2008a).

Average annual temperatures are projected to increase by 1° to 2.6° .C by 2050. The frequency of hot days is projected to increase by up to 49 percent and hot nights by up to 68 percent by 2060. An increase in the intensity of heavy rainfall events of 1–15 percent by 2050 is likely. Projected changes in average annual precipitation are less certain. Climate changes are projected to result in a potentially shorter, or shifted, rainy season by 2085. There will be drier conditions in April and May and wetter conditions in October and November (World Bank, 2011).

Up until 2050, most lowland forests are projected to have a longer dry period, particularly forest areas located in northeastern and the southwestern regions. More than 4 million hectares of lowland forest currently have a water deficit period of between four and six months. These areas will become exposed to a greater water deficit period of between six and eight months or more (RGC, 2015).

The rainy season arrived late in 2015 and 2016. In 2016, the country experienced record high temperatures and its most severe drought in decades. This caused water shortages affecting agriculture, fisheries and livelihoods in 18 of the 24 provinces. There was an increase in forest fires, most notably in the flooded forests around the Tonle Sap Lake. A combination of natural and human-made causes, such as building upstream dams and using fire to clear land, resulted in forest fires that destroyed approximately 230,000 hectares of flooded forests (Phnom Penh Post, 2016b).

Climate change mitigation and adaptation strategies

Cambodia's emissions are the lowest among the Member States. Greenhouse gas emissions for 2014 were estimated at 52.6 megatonnes of carbon dioxide. Almost half, or 45 percent, were derived from the land-use change and forestry sector (CAIT Climate Data Explorer, 2019). In its NDCs, Cambodia outlined potential actions to achieve a maximum reduction of 3,100 gigatonnes by 2030, compared with its baseline emissions of 11,600 gigatonnes of carbon dioxide (RGC, 2015).

Efforts to mainstream climate change into national and subnational planning include the 2014–2023 Cambodia Climate Change Strategic Plan, and associated ministerial action plans. These plans outline the country's adaptation needs and provide road maps for removing carbon from economic sectors and enhancing carbon sinks. Cambodia's Green Growth Policy and Roadmap to stimulate the economy include developing low-carbon options, creating jobs, protecting vulnerable groups and improving environmental sustainability.

Cambodia is prioritizing adaptation actions that also have mitigation benefits. These include restoring the natural ecology system to respond to climate change, especially through community-based adaptation, and implementing management measures that help protected areas adapt to climate change (RGC, 2015).

Cambodia's National Adaptation Programme of Action proposed 39 projects, of which 20 were high priority, focusing on water resources and agriculture. Data from the UNFCCC indicates that four projects are being implemented under the Least Developed Country Fund at a cost of approximately US$ 56 million. These projects focus on water resource management, building resilience of vulnerable communities and increasing food security. There appears to be limited focus on community forestry.

Apart from the organizations involved in field pilots for REDD+ project development, civil society buy-in into the REDD+ process has been limited. Most civil society groups take a rights-based approach. They perceive REDD+ as overly technical, government-driven and administration-heavy, rather than resolving the underlying environmental and social problems at hand (Forest Trends, 2015).

Forests and social forestry in climate change mitigation and adaptation

The Cambodian forest is an important carbon sink, containing 464 megatonnes of carbon (RGC, 2013). To deliver the planned increase in forest cover, forest areas will be reclassified with the aim of reducing deforestation. This will include 2 million hectares of community forests and 300,000 hectares of concession areas that will be reclassified as protected and production forests.

Cambodia plans to engage with the FLEGT Action Plan to improve forest governance and promote legal trade in verified timber. These activities could result in an estimated combined emissions reduction of 4.7 tonnes of carbon dioxide per hectare per year (RGC, 2015).

The Cambodia Climate Change Strategic Plan recognizes the need to include community-based approaches in their strategies. Examples include payment for ecosystem services and participatory land-use planning. These approaches help ensure climate resilience of

critical ecosystems, biodiversity, protected areas and cultural heritage sites (RGC, 2013). This is reflected in the National Forest Programme target to increase the area of community forests to 2 million hectares by 2030.

Cambodia initiated its REDD+ readiness in 2012 and has made significant progress in meeting UNFCCC requirements for achieving milestones for readiness. The National REDD+ Strategy was developed and endorsed by the government in late 2017. A Forest Reference Level was completed and submitted to the UNFCCC in late 2016. The design of a national forest monitoring system was completed. Significant policy analysis and consultations were undertaken to design and establish a safeguards information system.

There are three voluntary REDD+ projects taking place in the country: the Oddar Meanchey Community Forest, the Keo-Seima Wildlife Sanctuary in Mondulkiri and the Cambodia-Korea Tumring-REDD+ Project. These projects work with 50 forest communities and cover 300,856 hectares of forests. They are projected to generate combined emissions reductions of approximately 30 megatonnes of carbon dioxide over the lifetime of the projects (Table 13). In June 2016, the Walt Disney Company purchased 360,000 tonnes of carbon credits valued at US$2.6 million from the Keo-Seima Wildlife Sanctuary in a bid to offset its global carbon footprint (*Phnom Penh Post*, 2016a).

Cambodia is benefiting from the community-based REDD+ Programme that provides small grants to communities and indigenous peoples for readiness activities. To date, 13 projects have been initiated. Some projects support community forest management committees and conserve and restore community forests. Others help communities acquire land titles for forest areas they manage and promote alternative livelihoods to reduce deforestation. More than 90 non-government organizations and local communities have received training on REDD+. Lessons learned from the community-based REDD+ projects will inform the development of a national REDD+ action plan (UN-REDD Programme, 2018a).

In 2017, the UN-REDD Programme supported the completion of the National REDD+ Strategy, which has been endorsed by MAFF. It also supported the elaboration of the national Forest Reference Level submitted in January 2017 and the technical assessment process completed in 2017. The revised Forest Reference Level will be finalized in 2018.

The National Forest Management Strategy design is complete and its implementation is now stronger with improved data and institutional capacity. Safeguard systems are yet to be fully designed but a proposal for a national approach to the safeguards information system has been developed. The program has also strengthened capacities to develop a national forest inventory. The inventory trials were undertaken in conservation areas and production forest sites in two jurisdictions.

The UN-REDD Programme supported Cambodia as it revised its national forest inventory field manual, updated the Open Foris Collect database and field forms and developed the Open Foris Calc scripts for data analysis. It coordinated training events to enhance government capacity on forest inventory, data entry and data analysis. The latest national forest inventory field manual was translated into Khmer to increase accessibility.

Table 13: Summary of voluntary REDD+ projects in Cambodia

Project	Area (Hectares)	Communities	Estimated emissions reduction
Oddar Meanchey Community Forest	63,831	13 community forests	8.2 megatonnes of carbon dioxide over 30 years
Keo-Seima Wildlife Sanctuary	166,983	20 villages	14 megatonnes of carbon dioxide over 10 years
Cambodia-Korea Tumring REDD+	70, 042	14 community forests 17 villages	8–9 megatonnes of carbon dioxide over 30 years

Indonesia

Total population	269,000,000 in 2019	
Rural population	25,670,000 in 2018	9.66% of total population
Total country area	187,781,000 hectares	
Land area (excluding inland water bodies)	120,385,700 hectares	64% of land area
Forest land	93,500,000 hectares	45% of land area
Forest cover	85,622,000 hectares (inside forest area)	71% of forest land
Production forest	68,836,337 hectares	57% of forest land
Protected forest (soil and water conservation)	22,101,271 hectares	18% of forest land
Protected forests (biodiversity conservation)	29,661,015 hectares	25% of forest land
Forest cover change	439,439 hectares per year (0.37%) between 2017 and 2018	
Forest carbon stocks	No data	
Community-managed forests (with community forestry agreement)	3,073,676 hectares 662,333 households 5,615 permits	
Social forestry policies and programs	▪ Community Forests (Hutan Kemasyarakatan) ▪ Village Forests (Hutan Desa) ▪ Community-based Forest Plantation (Hutan Tanaman Rakyat) ▪ Forestry Partnership Kemitraan Collaborative Forest Management (Pengelolaan Hutan Bersama Masyarakat) ▪ Customary Forest (Hutan Adat) ▪ Smallholder Private Forests (Hutan Rakyat)	
Climate change mitigation and adaptation targets, policies and programs	▪ First Nationally Determined Contributions on forestry sector's business as usual in 2030 is 714 megatonnes of carbon dioxide. ▪ Unconditional mitigation is 217 megatonnes of carbon dioxide. ▪ Conditional mitigation is 64 megatonnes of carbon dioxide.	

National forest definition and classification

Indonesian law defines a forest as a "unified ecosystem in a landscape dominated by tree communities found in the natural world" (National Forestry Law 41/1999). A follow-on Decree of the Minister of Forestry of Indonesia, No. 14/2004, defines a forest as "land spanning more than 0.25 hectares, with trees higher than 5 metres at maturity and a canopy cover of more than 30 percent, or trees able to reach these thresholds in situ." A working definition under the National Forest Referencee Emissions Level says a forest is "a land area of more than 6.25 hectares, with trees higher than 5 metres at maturity and a canopy cover of more than 30 percent" (MOEF, 2018).

Analysis of forest data: Changes and trends

Indonesia's designated forest area (*kawasan hutan*) covers 120.6 million hectares, or

63 percent of the nation's land area. Production forests (*hutan produksi*) make up 57 percent of the forest area. Conservation forests (*hutan konservasi*) make up 18 percent of biodiversity conservation. Protection forests (*hutan lindung*) protect the remaining 25 percent of soil and water resources (MOEF, 2018).

Indonesia's forests have suffered from deforestation for decades due to legal and illegal timber extraction, conversion to other uses, such as agriculture, and extractive industries, such as mining. As part of its NDCs, Indonesia aims to reduce forest loss to 325,000 hectares per year between 2020 and 2030.

Recent data published by the Indonesian government indicate that the rate of forest loss has slowed from 680,000 hectares in 2016 to 480,000 hectares in 2017 (MOEF, 2018). This may be due to a combination of measures to reduce deforestation. They include strengthened law enforcement to prevent land clearance and forest fires; peatland restoration to reduce forest fires; and forest certification systems and chains of custody to ensure the legality of timber.

In addition, there are fewer forest fires due to reduced hot and dry weather linked to El Niño events. A moratorium preventing the allocation of new concessions in primary forests and peatlands has been in place since 2011. This is reported to have contributed to a 45 percent drop in forest loss inside the moratorium areas (MOEF, 2018). However, these figures have been challenged by conservation groups and non-government organizations.[10]

Extensive forest fires in 2015 resulted in the loss of approximately 1.1 million hectares of forests both inside and outside the forest area. The 2019 fire season was the worst since 2015. An initial report from the Center for International Forestry Research indicated that 1.6 million hectares of forest may have burned.[11]

Social forestry policies and programs

Social forestry in Indonesia can take place in both state forest and private land (Table 15). The objectives of social forestry in the country are to alleviate poverty, promote sustainable livelihood and reduce deforestation. They include ending forest land conflicts by giving local communities the opportunity to engage in forest management. Social forestry has also been promoted as an inclusive way to mitigate climate change through REDD+.

Prior to the 1990s, the government believed that people living in and around forests did not make significant contributions to forest management. This began to change during the early 1990s. Between 2007 and 2013, a series of regulations were initiated to support the role of local communities in forest management.

The government has embarked on a massive land reform program that has two major components: agrarian land reform and social forestry. Local people will be given control of 12.7 million hectares of land, or about 12 percent of the nation's land area, through five social forestry mechanisms.

The Agrarian Reform Programme (Tanah Objek Reformasi Agraria) targets 9 million hectares of land for the distribution and formalization of land ownership rights to landless farmers and smallholders. This includes approximately 4.1 million hectares of unproductive forest land and 400,000 hectares of abandoned palm oil plantations on Hak Guna Usaha (Right of Exploitation) land as well as abandoned tea plantations in western Java. Under the Social Forestry Programme, the government said it would grant rights to use and manage more than 12.7 million hectares, or 10 percent of the total forest area, of state forest lands to local communities by 2019. There is no confirmation yet on whether it was done (Resosudarmo et al., 2019).

Table 14: Social forestry models in Indonesia

State forest land		**Non-state forest land**	
Community forests	Hutan kemasyarakatan	Customary forest	Hutan adat,
Village forests	Hutan desa	Smallholder private forest	Hutan rakyat
Community plantation forests	Hutan tanaman rakyat		
Forestry partnerships	Kemitraan kehutanan		
Collaborative forest management	Pengelolaan hutan bersama masyarakat		

Status of social forestry

The process of granting local communities legal rights to forest resources proceeded relatively slowly from 2007 to 2014, with few permits being issued. As of 2016, only 642,646 hectares of forests were managed by local communities. In 2016, the government streamlined the process of issuing forest management licenses. This resulted in a notable increase in the area of forest managed by local communities. In May 2019, 5,615 permits were issued to 662,333 households to manage nearly 3.1 million hectares of forest.

Challenges facing social forestry

A range of challenges exist for social forestry in Indonesia. These include confusing and contradictory policies, ineffective communication and limited access to decision-making processes for local people. Forest-dependant people do not have a good understanding about the legal basis, rights, obligations and processes relating to social forestry. They have limited experience, low investment capacity and weak negotiating and decision-making skills (Rakatama and Pandit, 2020). The process of registering social forestry involves complex and lengthy designation and licensing processes and overly complicated management requirements once rights are granted (Resosudarmo et al., 2019).

Conflicts often exist between and within communities over forest boundaries, access rights and forest management rights. The benefits of social forestry projects sometimes go to more wealthy or influential community members instead of the intended beneficiaries, which leads to conflicts (Rakatama and Pandit, 2020; Evans, 2019). More accurate data on land ownership and more effective local institutions are needed to resolve competing land claims.

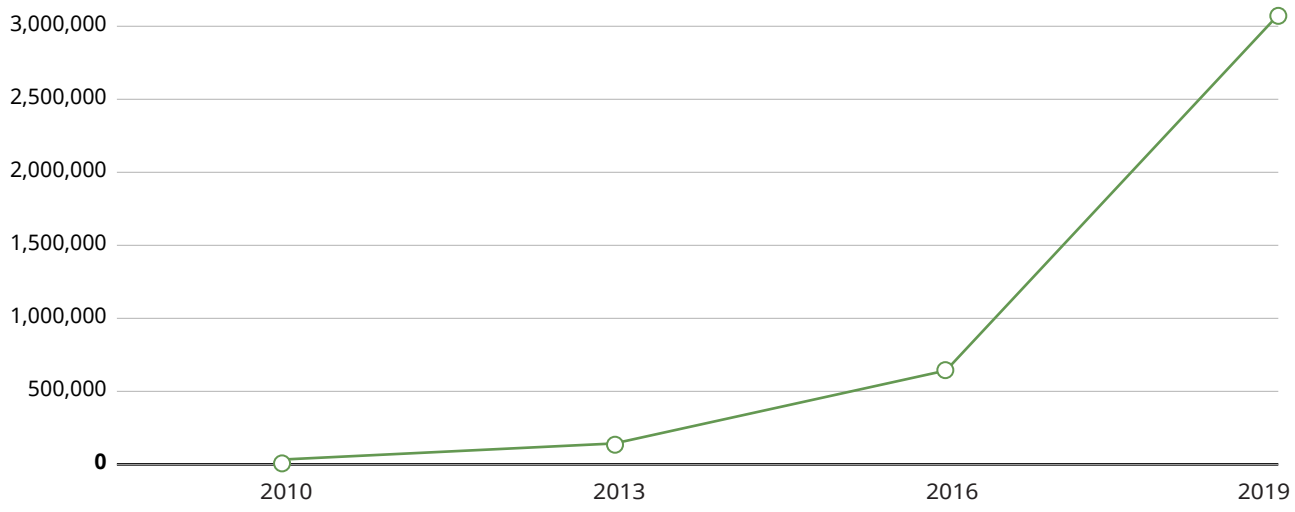
Impacts of climate change

Indonesia is an archipelago with a coastline of 81,000 kilometres and a large expanse of low-lying areas. It is highly vulnerable to sea-level rise. Flooding, increased high waves, storm surges and salinization of coastal aquifers will likely impact lowland forests and agriculture (MFAN, 2018; IFPRI, 2011). Indonesia was ranked the 69th most affected country in the world from extreme weather events that occurred between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019).

Surface temperatures have increased at a rate of 0.04°C per decade over the past 30 years. Reported total temperature increases ranged from 0.64°C for 1960–2006 to 0.76°C for 1985–2005. Between 1960 and 2006, the frequency of hot days increased by 24 percent and hot nights by 26 percent. The most significant increases took place during the driest months of July through September. At the same time, the frequency of cold nights decreased by 6.8 percent.

Total annual rainfall increased by 12 percent since 1980, with the greatest increases in northern regions. There were some decreases in southern regions. The proportion of rainfall occurring during the wet season has increased, suggesting increased intensity of dry and wet seasons. The frequency of intense one-day and five-day rains has decreased, indicating a trend towards higher but more uniform rainfall during

Figure 12: Growth of social forestry in Indonesia, 2010–2019 (hectares)



Source: RECOFTC, 2017; Data provided by Country Focal Points to the ASFCC.

five-day rains has decreased, indicating a trend towards higher but more uniform rainfall during the rainy season. The wet season has tended to start later than normal in some regions. For parts of Sumatra and Java, delays of 20 days were reported for 1991 to 2003, compared with 1960 to 1990. The dry season starts 10 to 60 days earlier. There is a trend towards an increase in extreme events. While droughts occurred once every four years before 1960, they are now reported to occur every three years (various sources quoted in MFAN, 2018).

Mean annual temperatures are projected to continue rising by 0.2°–0.3°C per decade, with a total increase estimated at 0.9°–2.2°C by the 2060s. Projected warming is more rapid for larger islands than for ocean areas and smaller islands. Hot days and hot nights are expected to occur on 48–95 percent of days and 63–99 percent of nights by the 2090s, while cold nights are expected to cease by the 2060s (MFAN, 2018).

Across the country as a whole, annual rainfall is projected to increase slightly. Models project changes ranging from a negative 1 percent to 5 percent by 2100. Large variations between seasons are expected (Climate Service Center, 2015). Delays in the start of the rainy season are more likely, and rainfall during the peak of the dry season is expected to be less. Significant regional differences are expected. Rainfall increases of up to 15 percent by the 2090s are projected in the easternmost islands. By 2100, rainfall decreases by 5–15 percent, especially in the dry season, are projected for the southern islands of Java, Bali and Nusa Tenggara (MFAN, 2018). Due to rainfall changes, extreme weather events such as droughts and floods will increase in the southern regions. The frequency of tropical cyclones is projected to decrease with climate change, but their intensity could increase (Met Office, 2013).

Rising sea levels are likely to have significant impacts on Indonesia's coasts, with estimates for the region varying between rises of 0.4 metres and 1.75 metres by 2100. A 1-metre sea-level rise could flood 405,000 hectares of coastal land and indirectly affect an additional 1 million hectares, particularly in northern Java, eastern Sumatra and southern Sulawesi (MFAN, 2018).

Climate change mitigation and adaptation strategies

Indonesia is the world's fourth-largest producer of total greenhouse gas emissions, behind China, the United States and India. It is the world's largest emitter of emissions from land-use change and forestry (CAIT Climate Data Explorer, 2019). In 2014, greenhouse gas emissions from the land-use and forestry sector were estimated at 68 percent, 1,682 megatonnes of carbon dioxide, of the country's total emissions (CAIT Climate Data Explorer, 2019). Indonesia's NDCs cited the estimated total greenhouse gas emissions volume at 1,800 megatonnes of carbon dioxide in 2005. Of this, 63 percent was considered the result of land-use change and forest and peat fires (GOI, 2015).

According to Indonesia's Forest Reference Level reports and based on data for 1990–2012, average annual emissions from above-ground biomass were 293 megatonnes of carbon

Box 10: Recognition of adat forests

Prior to 2013, hutan adat had been classified as state forest land. In May 2013, the Indonesia Constitutional Court issued a landmark ruling declaring that forest lands occupied by indigenous communities should no longer be classified as state forest land. It should be classified as hutan hak, or forests subject to rights.

Hutan adat is one of several categories of social forestry prioritized by President Joko Widodo. It is defined as forests located within territories where customary communities hold traditional rights (adat). Its aim is to improve the welfare of indigenous communities living in and around these forest areas. To bring the nation's forest regulations in line with the 2013 decision by the Constitutional Court, the Ministry of Environment and Forestry issued a regulation on forest rights in 2015. President Joko Widodo also recognized nine new adat forests, covering a total area of more than 13,000 hectares in December 2016. As of June 2018, there were 26 recognized adat forests across Indonesia, in Jambi, Central Sulawesi, South Sulawesi, West Kalimantan, Banten, West Java and East Kalimantan provinces (MOEF, 2018).

dioxide per year from deforestation and 58 megatonnes of carbon dioxide per year from forest degradation. In addition, there was an estimated 217 megatonnes of carbon dioxide per year from associated peat decomposition. In total, there was 568 megatonnes of carbon dioxide per year (MOEF, 2015). Projected emissions from deforestation, forest degradation and associated peat decomposition for 2013 were 0.57 gigatonnes of carbon dioxide.

Responding to climate change is a top priority for Indonesia, with adaptation measures focusing on sea-level rise, extreme weather and threats to ecosystems and biodiversity. In 2009, the government committed to reducing its carbon emissions by 26 percent by 2020 under its own efforts and by up to 41 percent with international assistance. Nearly 90 percent of this goal is to be achieved by reducing emissions from deforestation and peatland conversion.

The national policy framework on climate change includes the 2011 National Action Plan for Reducing Greenhouse Gas Emissions and the 2013 National Action Plan on Climate Change Adaptation. These commitments made Indonesia one of the few non-industrialized members of the Organisation for Economic Co-operation and Development that have enacted significant and comprehensive regulations for greenhouse gas emissions reduction (Tänzler and Maulidia, 2013).

Between 2013 and 2017, emissions fell by 358 megatonnes of carbon dioxide as a result of reductions in deforestation and degradation. Measured against 1990–2012 baseline emissions, it represented a 20.4 percent reduction. The largest contribution was from avoiding deforestation activity, which accounted for 85 percent of total emission reductions. Reductions from degradation accounted for 15 percent (MOEF, 2018).

Forests and social forestry in climate change mitigation and adaptation

The National Action Plan for Reducing Greenhouse Gas Emissions contained 13 action plans in the forestry sector for 2010–2014. These included increasing the area under social forestry (*hutan kemasyarakatan* and *hutan desa*) to 2.5 million hectares across 25 provinces by 2014. They included reducing forest fires, improving the management of essential ecosystems and conserving protected forests. They also included promoting forest plantation businesses and setting up business partnerships in 250,000 hectares of hutan rakyat, also known as people's forest. It is not clear how these measures are monitored and how many of the targets associated with the action plans were reached.

Indonesia's NDCs specifically mentions social forestry as a component of sustainable forest management that will help achieve the 2020 emissions reduction target. It is also a means to support the resilience of ecosystem services and landscapes. The business-as-usual emissions for the forestry sector in 2030 are expected to be 714 megatonnes of carbon dioxide. Unconditional mitigation emissions are set at 217 megatonnes of carbon dioxide and conditional mitigation emissions at 64 megatonnes of carbon dioxide (GOI, 2015).

Reducing deforestation and forest degradation is included as a mechanism to increase the resilience of Indonesia's food and water systems. The NDCs indicate tenure security as one of the foundations

Table 15: Greenhouse gas emission inventory from the forestry sector of Indonesia and its Nationally Determined Contributions, 2010–2015

Emission	Unit	Target 2030	2010	2011	2012	2013	2014	2015
Inventory land use, land-use change and forestry	megatonnes carbon dioxide		383	427	488	402	480	742
Inventory peat fire	megatonnes carbon dioxide		51	189	207	205	499	803
Inventory total	megatonnes carbon dioxide		434.79	616.34	694.98	607.33	979.42	1545.07
Business as usual	megatonnes carbon dioxide		646.55	769.25	770.84	767.69	766.42	765.09
Reduction from business as usual	megatonnes carbon dioxide	497	211.76	152.92	75.86	160.36	-213.01	-779.98
Progress towards 2030	%	17.2	7.33	5.29	2.63	5.55	-7.37	-26.99

Source: MOEF, 2018.

for a climate-resilient society. It includes plans to build social resilience by developing the capacity of communities so they can participate in local planning processes and have access to natural resources (GOI, 2015).

In 2011, the government issued a moratorium on new permits and concessions in natural forests in an effort to reduce deforestation. The moratorium was renewed in 2013 and 2015. It covers approximately 68 million hectares of forest, including 28 million hectares of primary forest, 15 million hectares of peatland and 15 million hectares of secondary forest (Austin, Sheppard and Stolle, 2012). There is likely some overlap between the peatland and forest (Murdiyarso et al., 2011). The moratorium has protected an estimated 25.3 gigatonnes of carbon (Austin, Sheppard and Stolle, 2012). It may have lowered Indonesia's greenhouse gas emissions from deforestation by around 1–2.5 percent over the past four years (Busch et al., 2014).

Indonesia is a partner country in the UN-REDD Programme, the Forest Carbon Partnership Facility and the Forest Investment Programme. It has established bilateral forest partnerships with Australia, Germany, Norway and the Republic of Korea. It has been working on its REDD+ readiness process since 2007. The National REDD+ Strategy was launched in 2012 and remains relevant. The National REDD+ Action Plan was completed to guide the implementation of the strategy at the national level. A national forest reference emissions level benchmark to evaluate reduction achievements was submitted to the UNFCCC Secretariat in 2015. It successfully passed a technical assessment by UNFCCC experts in 2016.

A national forest monitoring system, which is an enhancement of the National Forest Inventory Programme, has been in place since 1986. A safeguards information system was developed in 2013 and operates through an interactive web-based system (MOEF, 2018).

Table 16: Indonesia's progress towards the implementation of REDD+

Components of the REDD+ framework mandated by the Cancun Agreement of 2010	Indonesia's progress
National REDD+ Strategy	■ A National REDD+ Strategy was finalized in 2012. ■ A total of 11 provinces have formulated REDD+ strategies and action plans.
Forest reference emissions level	■ Indonesia submitted its forest reference emissions level to the UNFCCC in 2015, with a technical evaluation conducted in 2016. ■ The level for a number of provinces has been included in the provincial strategies and action plans. ■ Subnational forest reference emissions levels are being prepared in a number of provinces (Aceh, South Sumatra, West Kalimantan, East Kalimantan, Central Kalimantan and West Papua).
National forest monitoring system	■ The system was developed and is operational. ■ A number of regulations related to evaluation, reporting and verification of reductions in carbon emission levels have been promulgated. ■ A national registry system has been launched and is operational. ■ A National Inventory System for Greenhouse Gas Emissions (Sistem Inventarisasi Gas Rumah Kaca Nasional) was developed and is operational.
Safeguards information system	■ The Safeguards Information System REDD+ was submitted in 2015. ■ It is operational in three provinces (East Kalimantan, Jambi and West Kalimantan).
Funding mechanisms for REDD+	■ A government Regulation Concerning Economic Instruments for the Environment has been issued, with an associated funding system still under consideration by the Ministry for Finance.

Institutional arrangements for REDD+	▪ A task force for the institutional arrangements for REDD+ was established in September 2010 and remained in force until June 2011. ▪ A task force was re-established in September 2011 and remained in force through December 2012 and was later extended through June 2013. ▪ REDD+ working groups have been established in a number of provinces since 2011. ▪ The National Reducing Emissions from Deforestation and Forest Degradation Agency (BP REDD+) was established in August 2013 and ran until January 2015, at which point it was integrated into the Ministry of Environment and Forestry. In January 2015, Jokowi signed Presidential Decree No. 16/2015 on the structure of the Environment and Forestry Ministry on Jan. 21, 2015, disbanding the BP REDD+ and merged it with the Ministry of Environment and Forestry ▪ The Directorate General of Climate Change was established in January 2015.

Source: MOEF, 2018.

Indonesia was one of the first countries to start negotiating a voluntary partnership agreement with the European Union within its FLEGT initiative. It was the first Asian country to sign a voluntary partnership agreement (VPA), which came into force on 1 May 2014. Since 2016, Indonesia has issued FLEGT licenses for verified legal timber products that it exports to the European Union.

Indonesia has ambitious plans to restore peatlands following damage from large-scale fires in 2015. The Peatland Restoration Agency was established in 2016. It has been tasked with facilitating the restoration of 2.4 million hectares of degraded and burned peatlands in seven provinces: Riau, South Sumatra, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan and Papua. While much of this is in concession land, some is owned by communities or the State. Community-based projects are part of the restoration plans (Hergoualc'h et al., 2018).

Lao People's Democratic Republic

Total population	6,492,228 in 2015	
Rural population	4,349,793 in 2015	67% of total population in 2015
Total country area	23,680,000 hectares	
Total land area (excluding inland water bodies)	23,310,367 hectares	
Forest land	16,317,257 hectares in 2015	69% land area
Forest cover[12]	13,732,282 hectares in 2015	58% of land area
		84% of forest land
Production forest	3,147,000 hectares in 2015	19% of forest land
Protected forest (soil and water conservation)	7,988,000 hectares in 2015	49% of forest land
Protected forests (biodiversity conservation)	4,847,000 hectares in 2015	30% of forest land
Forest cover change	14,252 033,hectares (60.2%) in 2005 – 13,732,282 hectares (58%) in 2015	
Forest carbon stocks	Data not yet available, only reference emission level	
Community-managed forests (with community forestry agreement)	1,110 villages in 2019 Area of community forestry data not available.	
Social forestry policies and programs	■ Forestry Law, 2007 ■ Forestry Strategy, 2020 ■ Department of Forestry Guidelines No. 1476 Village Forest Management Plan, 2016 ■ Department of Forestry Guidelines No. 1477 Village Forest Management Planning, 2016 ■ Forest Law, 2019	
Climate change mitigation and adaptation targets, policies and programs	■ Strategy on Climate Change of Lao PDR, 2010 ■ Climate Change Action Plan of Lao PDR, 2013–2020	

Sources: Lao PDR Department of Forestry

National forest definition and classification

According to the 2003 Land Law and the 2007 Forestry Law, forest and forest resources in Lao PDR are in lands designated by the government as forest lands and in areas outside forest lands. This includes both stocked and temporarily unstocked forests.

Article 3 of the Forestry Law defines forest land as "all land plots with or without forest cover, which are determined by the State as forest lands." Forest is defined as "both natural and planted forests that has a canopy density of 20 percent or more and an area greater than 0.5 hectares, with trees with a diameter of at least 10 centimetres".[13] The official translation of the Forestry Law of 2019 was not available at the time of writing. However, it is expected that the government will continue to regard the forest as a precious resource of the nation. Its specific ecology consists of biodiversity, water sources and land with various tree species growing naturally or planted in an area of more than 0.5 hectares, with crown cover of more than 20 percent.

Lao PDR has three main forest classifications:

Production forest areas are managed primarily for production of wood, fibre, fuel and non-timber forest products. There are a total of 51 national production forest areas (105 Forest Management Areas in 17 provinces), which equals more than 3.1 million hectares. 2.2 million hectares (70.8 percent), are forested. Forty of the 51 production forest areas have been formally delineated.

Protection forest areas are managed primarily for soil, water and natural disaster protection, such as strategic reservoirs. A total 8 million hectares of national, provincial and district protected forest areas, of which 4.8 million hectares, or 59.8 percent, are forested. Most have not been formally delineated.

Conservation forest areas, also known generally as protected areas, are managed primarily for biodiversity conservation in two national parks, 22 national protected areas, 66 provincial and 143 district protected areas or conservation forest areas. The total area is 4.8 million hectares, of which 3.5 million hectares, or 73.4 percent, are forested. Many have not been formally delineated (World Bank, 2019b).

Forests outside these three forest categories total approximately 3.2 million hectares. They are managed or used by families and communities under customary rights to meet subsistence needs, such as housing, fuel, food and medicines. This land use overlaps with designated village forest.

Analysis of forest data: Changes and trends

Forest Land in 2015 was reported to be approximately 16 million hectares. It consists of about 7.9 million hectares of protected forests, 4.8 million hectares of forests for the conservation of soil and water, and 3.1 million hectares of production forests. This represents an increase of almost 3 million hectares between 2010 and 2015, mainly in the areas of protection and conservation forest.

Assessing forest cover in Lao PDR has been challenging due to the lack of an official, internationally recognized definition of forest. As a result, different estimates of forest cover exist, depending on the definitions and methodologies applied. For the purpose of this study, forest cover was reported to be slightly more than 13.7 million hectares in 2015, or 58 percent of total land area (Table 17 and Figure 13).

Table 17: Changes in forest land classifications and forest cover in the Lao PDR, 2002–2015

	2002–2010		2015	
	Hectares	% of total land	Hectares	% of total land
Forest land	13,500,000	58 %	16,317,257	69%
Production	3,100,000	23%	3,147,000	19%
Protection	6,900,000	51%	7,988,000	49%
Conservation	3,600,000	26%	4,847,000	30%
Forest cover	9,555,000	41%	13,732,282	58%

The Department of Forestry carried out forest cover assessments in 1989, 2002, 2010 and 2015 based on the national definition of forest cover. These assessments used mainly satellite imagery. They indicated that forest cover had declined from 70 percent in the 1960s to 50 percent in 1982 and to 41 percent in 2010. It was approximately 40 percent in 2015 (MRLG, 2019; RECOFTC, 2017 and 2014b).

However, according to the Ministry of Agriculture and Forests' Forest Cover Assessment, published in 2015, forest cover stood at 46.7 percent of total land area. This corresponds to an area of approximately 11.1 million hectares of forest[14] (MAF, 2015, cited in Koch, 2017). The increase in forest cover of 1.5 million hectares between 2010 and 2015 is explained by the regeneration of fallow land into forest (Koch, 2017).

The government has a target of increasing forest cover to 70 percent by 2020. It will be achieved through afforestation, reforestation, stabilization of shifting cultivation and the natural regeneration of 6 million hectares of unstocked forests. This plan is laid out in the Forest Sector Strategy to 2020, the 2016–2020 National Socio-Economic Development Plan, and the 2019–2030 National Green Growth Strategy.

Although the physical area of forests may have expanded, forest quality appears to be deteriorating. The area of dense forest with a canopy cover greater than 70 percent decreased by 29 percent to 8 percent of the total forest area. Open forest with a canopy cover of less than 40 percent increased from 16 percent to 29 percent (World Bank, 2019b; Koch, 2017).

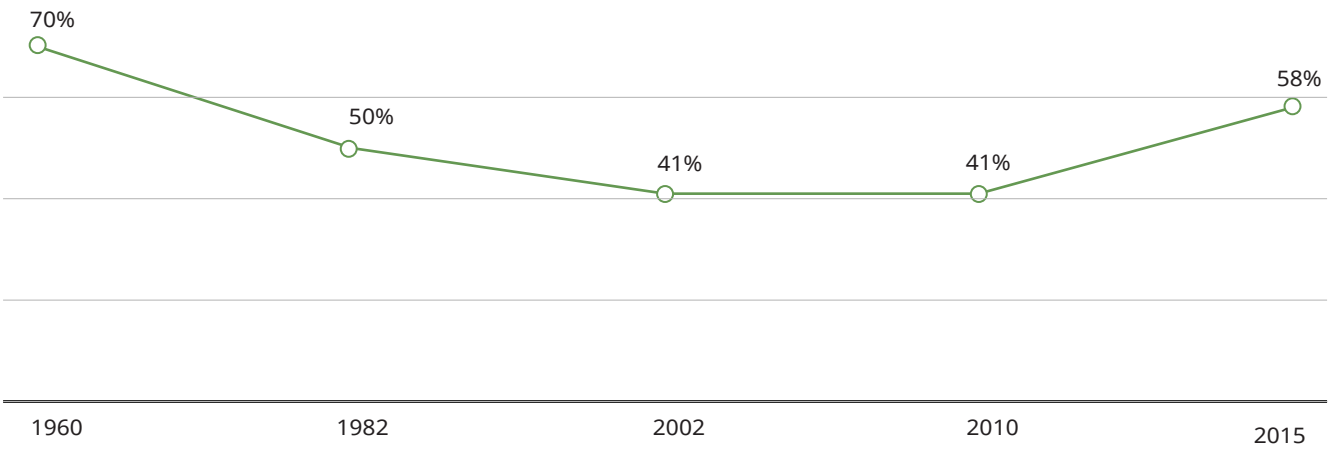
Forest fragmentation has also increased. Small forest parcels fewer than 10 hectares increased from 0.9 percent to 6.7 percent of the total forest area between 1992 and 2005. Large forest parcels greater than 1,000 hectares decreased from 88 percent in 1992 to 54 percent in 2015. An estimated 60–80 percent of intact forests were already degraded by 2015 (World Bank, 2019b).

The main drivers of this deforestation are land conversion for infrastructure and agricultural development, including hydropower dams, mining, agribusiness and illegal logging. Pressure on the country's forests comes from global demand for natural resources coupled with weak governance, contradictory legislation, limited capacity and high levels of poverty (RECOFTC, 2018). The causes of forest degradation include a lack of effective forest management, unsustainable harvesting of wood and non-timber forest products and shifting cultivation (World Bank, 2019b).

Social forestry policies and programs

The model of social forestry in Lao PDR is village forestry. It was introduced and developed in the 1990s by projects like the Lao-Swedish Forestry Programme's Joint Forest Management Project and the Forest Management and Conservation Programme. It is defined in the National Village Forestry Strategy paper as "the partnership between the State and organized villagers for the management of designated forests in order to sustain the flow of benefits, which are fairly shared by the villagers and the rest of the national community" (DOF, 1997, cited in Makarabhirom and Raintree, 1999). The model allows organized villages to manage the forest on behalf of the State, with assistance from government agencies. Any category of forest can be put under village forestry for any forest management objective. The aims of village forestry include sustainable use of forest resources, land allocation, engaging local people

Figure 13: Forest cover in Lao PDR, 1960–2015



Source: RECOFTC, 2017; Data provided by Country Focal Point to the ASFCC.

in forest management based on their needs and promoting income generation and rural development (Sophathilath, 1998).

A Village Forestry Working Group was established in 2014. Its role is to coordinate between ministries, departments and other public and private sector stakeholders. This includes donors, development agencies and civil society organizations at the central and local levels. It supports developing the capacity of organizations working on village forestry.

Prior to approval of the Forestry Law of 2019, social forestry in Lao PDR lacked a strong legal standing (RECOFTC, 2014a). Village forests were poorly recognized under the previous law. They were part of the village management area, designated according to land-use planning and allocation processes. This covered allocation of lands and forest lands to the village authority to manage, preserve, develop and use. It did not cover allocation to individuals or households (RRDPA, 2019; RECOFTC, 2014a; WRI, 2013).

A revised regulatory framework for village forestry was put in place in June 2019 with the passing of the Forest Law, particularly Article 65, and the Land Law. The Forest Law indicates that, for the first time, harvesting timber for commercial purposes is being considered (World Bank, 2019b). This reflects the growing recognition of the role of local people in the production, conservation and protection of village forests. The Decree on Promotion of Tree Planting for Commercialization No. 247/Go was approved in August 2019. It promotes investment in commercial tree plantations to ensure the supply of raw materials for processing, income generation and market demands. It aims to increase forest cover as a contribution to national socioeconomic development, in line with the green policy and sustainability.

Status of social forestry

The process of officially designating village forests is at an early stage and accurate records do not exist. The Department of Forestry aims to support 1,500 villages to prepare village forestry management plans through participatory processes. As of November 2019, approximately 1,110 village forests had been officially registered.[15]

Challenges facing social forestry

The process to establish a village forest is complex. It requires the government to define the forestry area and boundaries and prepare a detailed village forest map and basic forest inventory. It then requires preparing a five-year management plan and annual operational plan. As a result, considerable training and capacity building is required for both local government agencies and villagers (GIZ, 2016). With the passage of the Forest Law, it is now essential for development agencies and the government to educate villagers about the legal changes and to increase their capacity to develop and implement the forest management plans (RECOFTC, 2020).

Impacts of climate change

Although Lao PDR is not a major contributor to climate change, it will be affected by its impacts. It ranked the 89th most-affected country in the world from extreme weather events occurring between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019). The national economy depends heavily on agriculture, which produces 30 percent of the gross domestic product. More than 70 percent of the population depends on agriculture and natural resources for their livelihood and food security (GOL, 2015). Climate change is already causing economic losses and affecting health and livelihoods, food security and water supply. Increasing climate resilience in agriculture, food security and water resource management are priorities for the country.

Lao PDR is highly vulnerable to climate hazards, particularly floods and droughts. Fourteen of the country's 17 provinces as well as the capital, Vientiane, have experienced flooding since 1995. Severe droughts occurred in 1996, 1998, 2003, 2015 and 2016. A more variable annual rainfall, along with rising temperature, is likely to have significant impact on water resources, ecosystems and agricultural production (Government Office of Lao PDR, 2015).

Under a global high-emissions scenario, mean annual temperature is projected to rise by an average 4.5°C between 1990 and 2100. Extreme weather events are projected to increase, with the number of days with heavy rainfall of 20 millimetres or more rising by 7 percent, leading to greater flooding. The periods of dry spells are projected to increase by 10 days on average (WHO, 2015c).

Climate change mitigation and adaptation strategies

An estimated 61 percent (18 megatonnes of carbon dioxide) of the country's total greenhouse gas emissions were derived from land-use change and forestry in 2014. The forestry sector is one of the country's priority areas for mitigating and adapting to climate change. The country's NDCs notes that if the Forestry Strategy to 2020 target of 70 percent forest cover is reached, the country's forests would mitigate an estimated 60,000–69,000 kilotonnes of carbon dioxide (GOLPDR, 2015).

Lao PDR submitted its National Adaptation Programme of Action to Climate Change to the UNFCCC in 2009. Forests are a focus area,

along with agriculture, water, transport, urban development and public health. The country proposed 45 projects, including measures to strengthen the capacity of village foresters in forest management and reduce slash-and-burn agriculture. As of May 2013, 12 priority projects had been selected (UNFCCC, 2014) and four were being implemented under the Least Developed Country Fund.

Forests and social forestry in climate change mitigation and adaptation

The National Adaptation Programme of Action includes project proposals to increase the resilience of forest production and forest ecosystems. It also proposes projects to strengthen technical capacity for managing forests for climate change adaptation. An objective for the forest sector is to increase the capacity of village forest volunteers to manage and use community forests in response to climate change impacts.

Lao PDR has been implementing REDD+ pilot activities since 2009. In 2010, it became a pilot country under the Forest Investment Programme, a fund administered by the World Bank that supports developing countries' REDD efforts. In 2015, the UN-REDD Programme approved support for forestry sector planning. It also supports capacity-building of national and provincial government authorities for forest and resource governance and participatory forest management (UN-REDD Programme, 2018a).

The country has been engaging with the Forest Law Enforcement Governance and Trade Initiative since October 2013, with the aim of reducing deforestation. The country's Village Forestry Strategy is embedded in the National Forest Law Enforcement Governance and Trade Voluntary Partnership Agreement and its ongoing REDD+ strategy.

Malaysia

Total population	32,023,000 in 2017	
Rural population	7,927,000 in 2017	25% of total population
Total country area	33,062,139 hectares	
Total land area (excluding inland water bodies)	33,062,139 hectares	
Forest land	18,123,501 hectares in 2017	54.82% land area
Forest cover	18,123,501 hectares in 2017	54.82% of land area
Production forest	11,099,664 hectares in 2017	61.24% of forest land
Protected forest	3,280,885 hectares in 2017	18.1% of forest land
Forest cover change	-0.0034 hectares per year (-0.34% between 2013 and 2017)	
Forest carbon stocks	Carbon in above-ground biomass: 208.59 tonnes per hectare in 2017 Carbon in below-ground biomass: 50.06 tonnes per hectare in 2017	
Community-managed forests **(with community forestry agreement)**	Data not available	
Social forestry policies and programs	■ Peninsular Malaysia: recreation and greening of urban areas. ■ Sabah: participation of local people in sustainable forestry management in forest management units. ■ Sarawak: rural development, alternative livelihoods and agroforestry projects.	
Climate change mitigation and adaptation targets, policies and programs	■ National Climate Change Policy, 2010 ■ National REDD+ Strategy ■ Sabah REDD+ Strategy ■ European Union-REDD+: Tackling Climate Change through Sustainable Forest Management and Community Development Project ■ Project on Conservation and Sustainable Use of Tropical Peat Swamp Forests and Associated Wetlands Ecosystem	

Note: Malaysia does not include rubber plantations as a forest. However, for forest resource assessment reporting, rubber plantation is included as forest for international consistency. The total forest area is obtained from the gazettement notification, with state land forests that comply with the criteria as forest, based upon forest definition and geospatial maps. The geospatial maps are used to determine the boundaries of forest area, followed by ground verification and the issuance of gazettement notification.

Sources: Ministry of Water, Land and Natural Resources, Forest Resource Assessment 2020, forthcoming.

National forest definition and classification

In Malaysia, forest is defined as "land spanning more than 0.5 hectares, with trees higher than 5 metres and a canopy cover of more than 30 percent or trees able to reach these thresholds in situ." It does not include land that is predominantly under agricultural use, including rubber plantations on agricultural land and oil palm plantations, or urban land use.

The National Forestry Act of 1984 and the National Forestry Policy of 1978, plus all subsequent amendments, are the two primary laws related to forestry activities. Forest resources are managed by the State Forest Departments of Peninsular Malaysia, Sabah and Sarawak. In Sabah, the State Forest Policy of 1954 and the Forest Enactment Policy of 1968 are the main legal instruments. In Sarawak, the main legal instruments are the 1954 Forest Policy and the 1954 Forests Ordinance (Chapter 126, Parts II (Forest Reserves) and Part III (Protected Forests)).

Malaysia's forests are categorized as permanent reserved forests, state land forests for non-forestry uses and totally protected areas, such as national parks, wildlife and bird sanctuaries, virgin jungle reserves and protection forests.

Based on data published by the State Forest Departments, Table 19 shows forest classification and function in Malaysia.

In Peninsular Malaysia, there are approximately 5.7 million hectares of forest land, or about 44 percent of the country's total land area. The permanent forest reserve is approximately 4.8 million hectares, of which almost 3 million hectares is production forest and 1.8 million hectares is for forest protection.

In Sarawak, the permanent forest estate consists of 6 million hectares of forest for sustainable forest management. Nearly 1 million hectares are designated as protected areas such as national parks, wildlife sanctuaries and nature reserves.

In Sabah, approximately 59 percent of the land mass remains forested. The Forest Policy of 2018 aims to maintain at least 50 percent of Sabah's land mass as designated and protected forest for sustainable forest management, environmental protection, biodiversity conservation and socioeconomic well-being. The state government has pledged to designate at least 30 percent of Sabah's land area (2.2 million hectares) as protected by 2025.

Table 18: Forest classification and area in Malaysia

	Area (Hectares)	Forested area (Hectares)	Permanent forest estate and state land forest (Hectares)	Permanent reserved forest (Hectares)	Production (Hectares)	Totally protected areas (Hectares)
Peninsular Malaysia	13,210,000	5 770 000	260 000	4 810 000	2 990 000	1 820 000
Sarawak	12 400 000	No data*	5 684 870	4 321 996		809 900
Sabah	7 400 000	4 366 000	4 227 282	3 540 750	1 640 750	1 900 000
Malaysia (total)	33 010 000	10 136 000	10 172 152	12 672 746	10 630 750	4 529 900

Note: *= Based on data from various sources, we estimate Sarawak's forested area at nearly 8 million hectares.

Sources: See www.forestry.gov.my/en/2016-06-07-02-53-46/2016-06-07-03-12-29; https://forestry.sarawak.gov.my/modules/web/pages.php?mod=download&id=56&menu_id=0&sub_id=132; and http://forest.sabah.gov.my/publications/sabah-forest-policy-2018.html (accessed 25 October 2019).

Analysis of forest data: Changes and trends

At the national level, Malaysia's forest area was reported at slightly more than 18.1 million hectares, or 55 percent of the total land area in 2017. The forest area has reduced significantly since 2014, when it was reported to be around 20.2 million hectares, or 61 percent of total land area. This represents an average reduction of 678,942 hectares per year.[16]

Malaysia's forests also suffer from high levels of degradation. One assessment found that of the remaining forest cover in Malaysian Borneo, only 38 percent was relatively intact in 2009. Of the remainder, 39 percent was degraded and 23 percent was severely degraded (Bryan et al., 2013).

Social forestry policies and programs

The model of social forestry in Malaysia involves local communities in forestry operations undertaken by the state or private forest managers on state land. Forests are not allocated to local communities or households to manage, as in other ASEAN countries. Because the forests in each state are managed independently by the State Forest Department, social forestry takes a different form in each region:

In Peninsular Malaysia, the involvement of local people in forestry is mainly for recreation, education and the greening of urban areas.

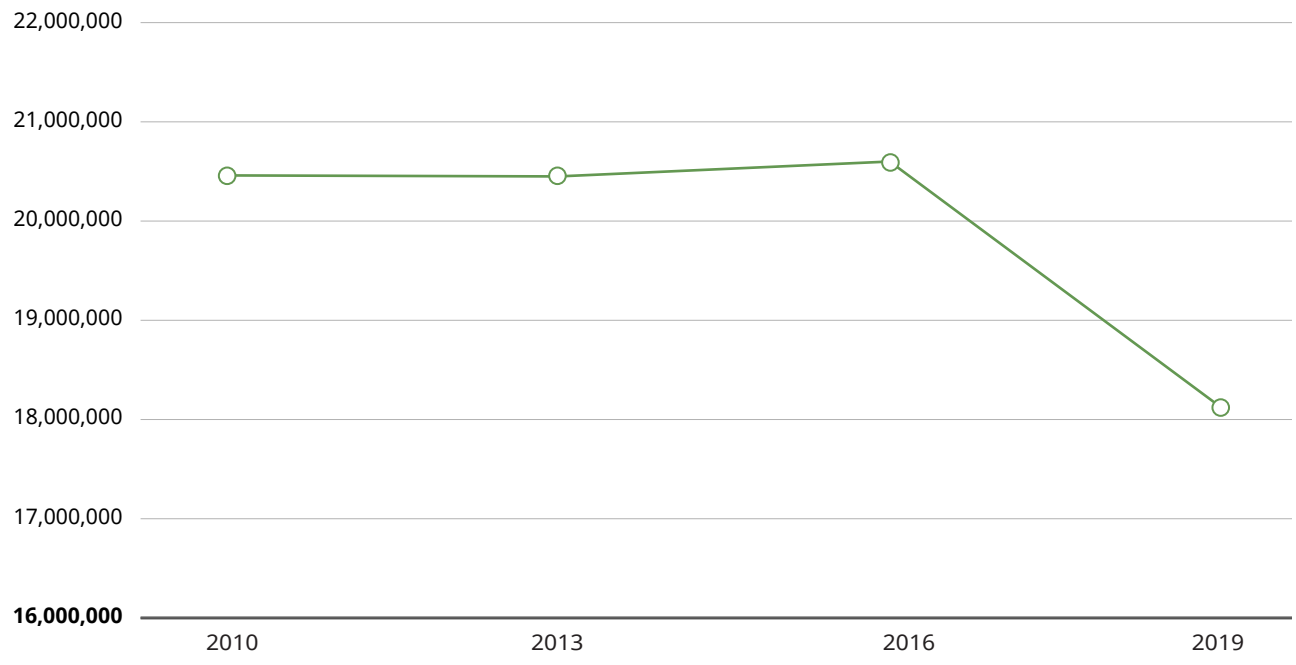
In Sarawak, a communal forest can be established where a settled community wants to set aside an area of woodland to provide forest produce for domestic needs. The forest remains under the control of the Forest Administration, in consultation with the Forest Department (Sarawak Forest Department website, accessed 9 November 2019). In protected forests, Forests Ordinance Cap. 126 permits people to collect forest produce for domestic use and to hunt, fish and pasture cattle. In 2011, the Forest Department established a community service initiative to strengthen cooperation and understanding between the government, the logging and plantation industries and local people in forest areas. The unit promotes community development with the aim of reducing rural poverty and local people's dependence on forest resources.

In Sabah, social forestry promotes community development and strengthens the participation of local communities in forest management activities. It also improves consultation and dialogue and adopts a people-centric approach in forest management planning and decision-making processes.

Status of social forestry

In Malaysia, all natural forests belong to the state government. Social forestry practices focus on involving local people in state-managed or private forestry operations on state forest land. Due to a lack of published data on these projects or programs, it is not possible to estimate the area of land or number of communities involved.

Figure 14: Changes in forest area in Malaysia, 2010–2019 (hectares)



Source: RECOFTC, 2017; Data provided by Country Focal Point to the ASFCCC.

Impacts of climate change

Malaysia has experienced changes in temperature and rainfall intensity. Surface mean temperature has increased 0.25°C per decade for Peninsular Malaysia, 0.2°C for Sabah and 0.14°C for Sarawak (MNRE, 2015). The surface maximum temperature increase is around 0.17°–0.22°C per decade, and the surface minimum temperature increase is around 0.2°–0.32°C per decade. Rainfall intensity has increased, leading to more severe monsoonal floods. Significant flood events occurred in Sarawak, Johor, Malacca and parts of Negeri Sembilan in March 2016, in Penang in November 2017, and in the states of Johor, Terengganu, Pahang and Sabah in January 2018 (Tang, 2018). Urban areas are also becoming more prone to flash flooding due to the higher rainfall intensity (GOM, 2016).

Average sea level in Malaysia has been rising at 3.67 ± 0.15 millimetres per year, based on the analysis of tidal data from 1984 to 2013 (Kamaruddin et al., 2016). This is higher than the projected global sea-level rise of 1.7–3.1 millimetres per year due to local climate and topographical conditions.

Malaysia ranked the 116th most affected country in the world by extreme weather events occurring between 1998 and 2017. It ranked 44th for the events that took place in 2017 (Eckstein, Hutfils and Winges, 2019).

Future climate simulations for Malaysia have pointed to a projected temperature rise of nearly 4°C by 2100. Although there is no definite trend for rainfall patterns, there will be increasing rainfall towards the end of the twenty-first century (Tang, 2018). Ercan, Fauzi and Kavvas (2013) projected the sea level on the coast of Peninsular Malaysia and the coasts of Sabah and Sarawak to rise by 0.51 metres and 1.06 metres, respectively, by 2100.

Climate change mitigation and adaptation strategies

According to FAO data, Malaysian forests contained a total of 2,834 megatonnes of carbon dioxide in 2015 (FAO, 2015). Malaysia's NDCs states that the country's total greenhouse gas emissions in 2005 were 288,663 gigatonnes of carbon dioxide. Emissions from land use, land-use change and forestry were 25,667 gigatonnes of carbon dioxide, or approximately 9 percent. Malaysia's contribution to global emissions was estimated to be about 0.6 percent in 2011 (GOM, 2016).

According to Malaysia's submission on reference levels for the REDD+ results-based payment system under the UNFCCC, the Second National Communication to the UNFCCC indicated that the land use, land-use change and forestry sector was a net sink for 2000, 2005 and 2007. There was total removal at around 240 megatonnes of carbon dioxide and emissions at around 26 megatonnes of carbon dioxide (MNRE, 2014).

Malaysia intends to reduce its greenhouse gas emissions intensity by 35 percent by 2030 compared to 2005 levels, or up to 45 percent with international assistance. The sectors to achieve this target are energy, industrial processes, waste, agriculture and land use, land-use change and forestry (GOM, 2016).

In 2010, Malaysia launched a National Policy on Climate Change. The policy aims to mainstream climate change into national policy, build institutional capacity and provide a framework for the country's activities on climate change. It contains 10 strategic policy goals and 43 actions, with a focus on mitigation, adaptation and capacity-building. One of its five core principles is environmental conservation and sustainable use of natural resources, including forests. However, the policy document does not provide detailed descriptions or timelines for how these goals are to be realized.

Recent national development plans incorporated strategies on sustainable growth, mitigation, conserving natural resources and strengthening resilience against climate change and natural disasters. In the forestry sector, two major initiatives have been launched. The Central Forest Spine and the Heart of Borneo initiatives both promote sustainable forest management and use of natural resources.

Between 2011 and 2015 under the 10th Malaysia Plan, the government spent 51 billion Malaysian Ringgit, or approximately 12 billion USD, to improve resilience against climate change. This included addressing flood risks and enhancing food and water security, coastal protection and health. A national adaptation plan will be developed to provide greater coordinated implementation (GOM, 2016).

Forests and social forestry in climate change mitigation and adaptation

Malaysia's NDCs states that forest degradation resulting from previous management efforts and the draining of peat swamps are core issues in the land-use change and forestry sector. At this stage, the document does not outline measures to address these challenges.

Myanmar

Total population (2014 population census)	51,100,000 in 2014	
Rural population	35,401,957 in 2014	70% of total population
Total country area	67,658,000 hectares	
Total land area (excluding inland water bodies)	65,755,000 hectares	
Forest land	17,123,400 hectares in 2015	25% of land area
Forest cover	29,041,000 hectares	44% of land area
		100% of forest land
Production forest	9,958,193 hectares	58% of forest land
Protected forest (soil and water conservation)	4,008,128 hectares	23% of forest land
Protected forests (biodiversity conservation)	3,941,676 hectares	23% of forest land
Forest cover change	31,773,000 hectares in 2010 to 29,041,000 hectares in 2015 (46.96%–42.92%)	
Forest carbon stocks	Not available	
Community-managed forests (with community forestry agreement)	5,426 community forests covering 289,168 hectares in 2019	
Social forestry policies and programs	▪ Forest Policy, 1995 ▪ Forest Law, 2018 ▪ Draft Forest Rules, 2019 ▪ Community Forestry Instructions, 1995, 2016, 2019 ▪ Community Forestry Strategy and Action Plan, 2018–2020 ▪ Community Forestry Guidelines (drafted by RECOFTC) ▪ Community Forestry (Standard Operation Procedures), 2019	
Climate change mitigation and adaptation targets, policies and programs	▪ Environmental Policy, 1994 ▪ National Sustainable Development Strategy, 2009 ▪ Environmental Conservation Law, 2012 ▪ Environmental Conservation Rules, 2014 ▪ Environmental Impact Assessment Procedures and Environmental Standard Guidelines, 2015 ▪ National Sustainable Development Strategy, 2015 ▪ National Environmental Policy, 2017 ▪ National Climate Change Policy, 2017 ▪ Climate Change Strategy and Action Plan, 2016–2030 ▪ Nationally Determined Contributions for Climate Change Mitigation	

Sources: No source, information provided by Country Focal Point to the ASFCCC.

National forest definition and classification

In Myanmar, large areas of forested land have been gazetted to form the permanent forest estate, which is subdivided into:

- Reserved forests as priority areas for timber production
- Public protected forests mainly for local use
- Protected areas, such as national parks, wildlife sanctuaries and nature conservation areas established for the purpose of biodiversity conservation

There are areas of unclassified forests, which are forested areas outside the permanent forest estate. There are also large areas of dipterocarp forest that form part of the rotational agricultural system (Treue et al., 2016).

Of the country's total forested area of 29 million hectares, only 41 percent, or 11.8 million hectares, actually lie within the permanent forest estate. Most of the forest outside the permanent forest estate lies on land designated as vacant, fallow or virgin. Only 60 percent of the permanent forest estate has forest cover remaining (Myanmar REDD+ Strategy, quoted in Ling and Fodor, 2019).

The size of the permanent forest estate has increased by 800,000 hectares since 2015, mainly due to an increase in the area of the public protected forests (RECOFTC, 2014).

Analysis of forest data: Changes and trends

Myanmar's forest cover was reported to be 29 million hectares in 2015. Forest cover declined from 48 percent of the total land area in 2010 to 44 percent of the land area in 2015. This represents a loss of 2.7 million hectares in five years.

Research was conducted for EcoDev and Advancing Life and Regenerating Motherland (ALARM), based on analysis of satellite imagery from 2014 (Bhagwat et al., 2016). It found that between 2002 and 2014, Myanmar lost nearly 2.1 million hectares, or 11.3 percent of its intact forest. Losses occurred both inside the forest reserves and in unreserved forests, mainly through conversion of forest to non-forest plantation development and forest degradation (Treue et al., 2016).

The high levels of deforestation in Myanmar are the result of a range of complex factors within and outside the forest sector. Internal drivers of deforestation include:

- Overexploitation of timber reserves
- Illegal logging
- Inadequate law enforcement
- Low levels of institutional capacity and inter-departmental coordination
- Lack of transparency and accountability in the sector
- High demand for the timber due to logging bans in other countries
- Forest fires
- Increase in new areas of shifting cultivation
- Overharvesting of wood biomass as a source of energy

Drivers of deforestation originating outside the forest sector include:

- Expansion of subsistence and large-scale commercial plantations and agricultural land
- Land grabbing
- Weak law enforcement and land-use planning
- Development of mining and hydropower projects
- Urbanization and infrastructure development
- Weak forest tenure encouraging conversion of forest into farmland
- Lack of alternative livelihoods and poverty

(Treue et al., 2016; MOECF, undated).

Table 19: Status of Myanmar's permanent forest estate, 2018

Category	2018 area (Hectares)	% land area 2018	Target area
Reserved forest	12,041,601	17.8%	
Public protected forest	5,041,364	7.45%	30%
Protected areas	3,510,685	5.85%	10%
Total	**20,593,659**	**31.1%**	**40%**

Source: Semi-annual progress report for Myanmar Reforestation and Rehabilitation Programme April–October 2018, cited in Ling and Fodor, 2019.

Table 20: Changes in Myanmar's forest cover, 2010–2019

	Hectares (hectares)	% of total land area
Baseline 2010	31,773,000	48%
Situational analysis 2013	31,773,000	48%
Situational analysis 2016	30,472,505	46%
Situational analysis 2019	29,041,000	44%

Note: The situation analyses were conducted in 2013 and 2016 and the data were published in 2014 and 2017, respectively.

Social forestry policies and programs

Since 2016, the objectives of community forestry in Myanmar has expanded. What was once a narrow focus on forest protection and meeting local people's basic subsistence needs now includes an emphasis on livelihoods and enterprise development. This is the result of an increasing understanding that forests will be better protected if local communities receive tangible benefits from the sustainable management of forest resources (Ling and Fodor, 2019; World Bank, 2019a).

The country's community forestry policy framework has undergone a number of revisions:

- The revised Forest Law of 2018 outlines nine objectives for long-term forest management and sustainable development, including strengthened measures to prevent illegal logging. The law provides legal authority to the Forest Department to support the development and commercialization of community forestry.
- In 2019, the Ministry of Natural Resources and Environmental Conservation (MONREC) conducted public consultations on the Forest Rules at the national and regional levels. The Forest Rules will elaborate how the Forest Law will be implemented.
- The original Community Forestry Instructions from 1995 were revised in 2016 and 2019. The Instructions of 2016 allowed for designation of forest "traditionally managed by the local community" as a community forest, at the discretion of local forestry officials. It introduced the concept of community forest enterprises for commercial production of value-added products. In this way, the Community Forestry Instructions revisions reflect a change in focus from meeting basic subsistence to livelihoods and enterprise development.
- The 2018–2020 Community Forestry Strategy aims to increase the impact of community forestry in Myanmar by allowing for commercialization. It also supports the development of small-scale community forestry enterprises.
- Community Forestry Guidelines are being drafted with support from RECOFTC.
- A community forestry database was initiated in 2019 with on-going support from RECOFTC and the World Bank.
- A governmental Community Forestry Unit and multistakeholder Community Forestry Working Groups were set up at the national, regional and township levels in 2013.
- The 2018 Biodiversity Conservation and Protected Areas Law introduced a new category of protected area: local community protected areas. Local community protected areas are created by the Director General of the Forest Department with the approval of MONREC. However, the draft rules supporting this law are relatively weak because they require the local community protected area to be supervised by a representative of the Forest Department. In addition, the process for securing free, prior and informed consent from affected communities is potentially subject to manipulation (UN-REDD Programme, 2018b).
- A Roadmap for Agroforestry Development, 2019 was adopted.

There have also been several studies and projects conducted related to community forestry development, including:

- Assessment of Non-Timber Forest Products for Community Forestry Development in Mountainous Regions of Myanmar towards Community Forestry Development (SEARCA, 2019)
- Assessment of the Benefit Sharing System of Community Forestry: Case Studies in Three Agro-ecological Zones (CIFOR and the Forest Department)
- Myanmar Country Environmental Analysis (Sustainability, Peace and Prosperity): Assessing the Opportunities for Scaling Up Community Forestry and Community Forestry Enterprises in Myanmar (RECOFTC and the World Bank, 2019)
- Strengthening Community Forestry National Working Group for Promoting Innovative Approaches to Advance Community Forestry and Improving Livelihoods of Forest and Farm Producers (FFF and FAO)

Status of social forestry

Since 2013, there has been a steady increase in the area of forest under community management. As of December 2019, the area of community forests had reached 289,168 hectares and 5,426 community forests had been established (Forest Research Institute, 2019). Therefore, 31 percent of the national target to establish 919,000 hectares of community forests by 2030 had been achieved as of May 2019 (Figure 15).

Challenges facing social forestry

Myanmar's legal framework for community forestry has been strengthened and the area of community forests is increasing. However, the development and effectiveness of community forestry is often limited by various issues at the landscape or community levels (World Bank, 2019b). These include limited physical assets, such as paved roads and access to electricity that restrict market opportunities. The also include limited access to information and lack of capacity and awareness of rights and regulations

among local community representatives, local Forest Department staff and civil society staff. Limited access to finance reduces the ability of communities to invest in their forests and value-adding options for forest products.

Forests allocated for community forestry are often degraded forests that provide limited short-term benefits from timber or other valuable forest products. This lack of short-term benefits leads to reduced motivation and commitment on the part of the community forest user groups. The current understanding of the effectiveness of the user groups, their capacity to implement the Community Forestry Management Plan, and the operational challenges and constraints faced by the user groups remains limited (Ling and Fodor, 2019).

According to estimates based on government data, approximately 20 million hectares, or 30 percent of Myanmar's land area are classified as vacant, fallow or virgin. Approximately three-quarters of this land is thought to be occupied by the country's ethnic minority peoples (Goldberg, 2019). In September 2018, the Vacant, Fallow and Virgin Lands Management Law (2012) was amended to require existing vacant, fallow and virgin land users to give up their long-term customary land rights and apply for a 30-year land-use permit to continue using the land (Chau and Daudier, 2019).

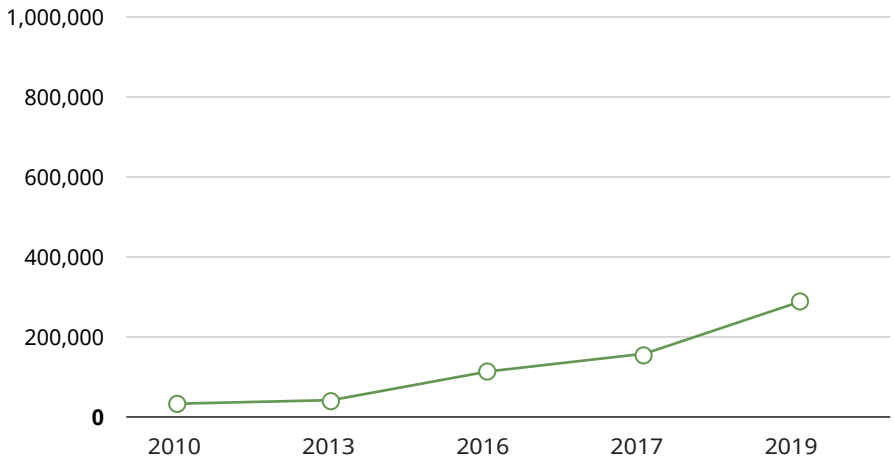
The process to convert vacant, fallow or virgin land to community forest is extremely challenging. The permits typically need to be renewed every 30 years and cannot be sold or transferred, even to family members, without government permission. While the concept of customary land use is recognized for the first time in the amended Vacant, Fallow and Virgin Lands Management Law, the processes for recognizing and registering customary land are not explained. Customary land-use systems are specifically exempt from the law. In practice this provides little security because customary land tenure in Myanmar lacks any legal definition or protection.

Customary land tenure systems vary substantially among the many ethnic communities, particularly in how they determine individual rights versus communal rights (Dunam, 2018). The amendments to the law have been strongly criticized by civil society organizations and land-rights activists. These groups say the amendments potentially criminalize and dispossess millions of people from their ancestral lands. The amendments also facilitate land grabs, weaken customary land tenure rights, increase the risk of conflict and impede the peace process (Gelbort, 2018).

Impacts of climate change

Myanmar is one of the world's most vulnerable countries to climate change. It ranked third in the 2019 Global Climate Risk Index in terms of the severity of impacts occurring between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019). The largest city, Yangon, is particularly vulnerable (WHO, 2015d).

Figure 15: Growth of area of community forestry in Myanmar, 2010–2019 (hectares)



Source: RECOFTC, 2017; Data provided by Country Focal Point to the ASFCC.

Data from weather stations maintained by the government's Department of Meteorology show that between 1981 and 2010, average daily temperatures increased by about 0.25°C per decade. Daily maximum temperatures increased by 0.4°C per decade between 1981 and 2010. The pace of warming appears to have been faster in inland areas than in coastal areas. The rise in daily maximum temperatures has been greater than the daily average. Total annual precipitation rose slightly between 1981 and 2010, with a greater rate of increase in coastal areas than in inland ones. In coastal areas, the precipitation increases occurred throughout the year. In inland areas, the increases occurred mainly during the monsoon season (Horton et al., 2017).

From 1960 to 2009, the monsoon season reduced in both duration and intensity (MOECF, 2012). Droughts, extreme temperatures, heavy rainfall, flooding and cyclones are becoming more frequent and severe (MONREC, 2016; MOECF, 2012). In August 2019, tens of thousands of people were displaced in Ayeyarwady Region and Mon and Kayin states due to flooding. Bago Region and Kayin and Mon states were similarly affected in July 2018.[17] In 2016, the impacts of El Niño resulted in extreme temperatures, unusual rainfall patterns, dry soil, high risk of fires and acute water shortages (OCHA, 2016).

In 2008, Cyclone Nargis caused extensive physical damage, with estimated economic losses of more than 4 billion US dollars and some 2.4 million people affected (MONREC, 2016). The damage was exacerbated by the removal or degradation of the protective fringe of mangrove forests in the delta region over many decades. This occurred from shrimp farming, rice farming, charcoal production and the fuelwood collection (UNEP, 2009).

In every region in Myanmar, temperatures are expected to increase by the middle of the century. Temperatures are projected to rise by 1.3°–2.7°C above historical levels. Warming varies by both season and region. The November–February cool season and the March–May hot season will see the most warming.

Regional differences in mean warming manifest after 2040, as inland areas are projected to warm more than coastal ones. The eastern and northern hilly regions are likely to experience the most dramatic warming, with hot season average temperatures rising by up to 3°C. From 1981 to 2010, one day of extreme heat per month was observed. By mid-twenty-first century, the projections show that Myanmar could experience anywhere from four to 17 days of extreme heat each month (Horton et al., 2017). Heat-related deaths among people aged 65 and older are projected to increase to about 38 deaths per 100,000 persons per year by 2080, compared with the 1961–1990 baseline of fewer than six deaths per 100,000 (WHO, 2015d).

Changes in rainfall patterns are projected to vary by region and season. The projections show that precipitation gains are most likely to occur during the monsoon season. It is unclear whether precipitation will increase or decrease during the cool and hot seasons (Horton et al., 2017).

Sea-level rise projections for the Myanmar coastline range from 20 to 41 centimetres by mid-century, depending on global greenhouse gas emission scenarios. Projected changes in cyclone severity and frequency remain uncertain. Coastal flooding during and independent of cyclones will worsen as sea levels rise (Horton et al., 2017). Sea-level rise under a high emissions scenario is estimated to put 18 million people a year at risk of flooding between 2070 and 2100 (WHOd, 2015).

Climate change mitigation and adaptation strategies

The government of Myanmar considers climate change to be a major challenge to its socioeconomic development. It is committed to mitigating climate change and adapting to its effects. Myanmar possesses the largest remaining forest area in mainland Southeast Asia. However, the country is going through a rapid process of industrialization and urbanization, which is increasing emission levels. In the four years between 2010 and 2014, emissions from energy production increased by 75 percent, according to the CAIT Climate Data Explorer (2019). Myanmar aims to sustainably develop its economy by balancing the demands of growth, poverty reduction and climate change, and limiting the growth of future emissions.

Myanmar's Initial National Communication was submitted to the UNFCCC in 2012. Its National Adaptation Programme of Action was adopted in the same year. The NDCs, submitted in August 2015, outlines mitigation actions in the forest and energy sectors and priorities for adaptation. The National Land Use Policy was published in 2016 and the National Environmental Policy in 2017. The 2017–2030 Myanmar Climate Change Strategy and Action Plan was prepared with the Myanmar Climate Change Alliance and launched in 2018. It encompasses six sector-based action plans, one of which focuses on the sustainable management of natural resources, including forests. In 2019, the government published an updated Climate Change Policy. It highlights the role of forestry in maintaining ecosystem resilience to climate change and the importance of reducing greenhouse gas emissions from deforestation.

Forests and social forestry in climate change mitigation and adaptation

An estimated 49.5 percent of the country's emissions were derived from land-use change and forestry in 2014 (CAIT Climate Data Explorer, 2019). Myanmar's NDCs includes the 2001–2030 National Forest Master Plan to increase the area of reserved forest, protected public forest and protected areas to 40 percent of the total land area. Myanmar plans to reduce deforestation to maintain sequestration benefits and preserve natural forest areas to protect biodiversity and ecosystem services. It also plans to increase capacity for sustainable forest management, conserve mangrove forests, and build the resilience of coastal communities (MOECF, 2015).

Climate change issues were not considered during the early implementation of community forestry in Myanmar. However, many actors now view community forestry as an effective and practical way to mitigate and adapt to climate change. A number of government departments, international organizations and non-government organizations are using community forestry to address climate change, particularly in areas most vulnerable to its impacts (APFNet, 2011).

Community forestry has received particular attention in Shan State and the central dry zone. These areas face a range of environmental issues, such as soil erosion, poor soil fertility, drought and deforestation (RECOFTC, 2016a). Community forestry is also being used in the delta region to restore mangrove forests, protect coastal communities and provide sustainable alternative livelihoods (WIF, 2015; APFNet, 2011).

The government has taken steps to make it easier for local communities to establish community forestry. The 2018 Forest Law gives community forestry legal status in higher-level laws. The 2017–2020 Community Forestry Strategy Action Plan issued by the Forest Department provides a coherent framework for developing community forestry. Community forest user groups and community forestry management committees are now being recognized within the national forest estate. This provides one of the few options local communities have to obtain formal legal recognition of rights to the land. In March 2019, there were 4,707 community forest user groups recognized in Myanmar, covering 119,355 households on 248,711 hectares of land (Lin et al., 2019).

The second implementation project of the National Adaptation Programme of Action is entitled Adapting Community Forestry Landscapes and Associated Community Livelihoods to a Changing Climate, in Particular an Increase in the Frequency and Intensity of Extreme Weather Events. It is implemented by MONREC, the Department of Meteorology and Hydrology, and the Ministry of Transport.

Philippines

Total population	100,981,437 (2015)	
Rural population	53,841,283	53.32% of total populationc
Total country area	30,000,000 hectares	
Total land area (excluding inland water bodies)a	29,817,000 hectares	
Total forest land	15,805,825 hectares (2017)	53% total land area
Forest cover	7,014,154 hectares (2015)	23.5% of total land area
		44.4% of total forest land
Production forestb	7,329,858 hectares	46.4% of total forest land
Protected forest (soil, water and biodiversity)b	7,254,660 hectares	45.9% of total forest land
Forest cover change	3% increase in forest cover between 2010 and 2015	
Forest carbon stocks	37 megatonnes of carbon dioxide (2010 net biomass carbon stock)	
Community managed forests(with community forestry agreement)	■ Community-based forest management: 1 615 598 hectares ■ Ancestral domain areas: 2 648 859 hectares ■ Certificate of Ancestral Land Title: 74 781 hectares ■ Certificate of Stewardship Contracts (outside of community-based management): 565 682 hectares ■ (there may be overlapping tenure areas)	
Social forestry policies and programs	■ Executive Order No. 263 Community-Based Forest Management Strategy, 1995 ■ Community-based forest management – Comprehensive Agrarian Reform Program ■ Indigenous People's Rights Act, 1997 (No. 3871) ■ Executive Order No. 318 Promoting Sustainable Forest Management, 2004	
Climate change mitigation and adaptation targets, policies and programs	■ Climate Change Act, 2009 ■ Philippine National REDD Plus Strategy, 2010 ■ National Framework Strategy on Climate Change, 2010 ■ National Disaster Risk Reduction and Management Law, 2010 ■ Philippine Strategy on Climate Change Adaptation, 2010–2022 ■ People's Survival Fund Act, 2012 (No. 10174) ■ Integrating Climate Change and Disaster Risk Reduction in Land Use Plans of Local Government, 2013 ■ Philippine Development Plan, 2017–2022 ■ National Greening Program (Executive Orders No. 26 and No. 193) ■ Executive Order No. 881 on REDD+ Planning and Development ■ National Climate Change Action Plan, 2011–2028 ■ Priorities: ■ Food security ■ Water sufficiency ■ Ecosystem and environmental stability ■ Human security ■ Climate-smart industries and services ■ Sustainable energy ■ 7. Knowledge and capacity development	

Source: Data provided by the Country Focal Point to the ASFCC; Philippine Land Statistics World Atlas; FMB, 2010; World Bank, 2017.18

National forest definition and classification

The Forest Management Bureau of the Department of Environment and Natural Resources defines forest as "land with an area of more than 0.5 hectare and tree crown cover (or equivalent stocking level) of more than 10 percent. The trees should be able to reach a minimum height of 5 metres at maturity in situ (original position or location)."

Based on the 2006 land classification data, the Philippines has a total land area of 30 million hectares. Of that, 52.7 percent is classified as forest land and 47.3 percent as alienable and disposable land.

Analysis of forest data changes and trends

In 1934, forest cover was 17 million hectares, or 57 percent of the country's land area. Since 1998, forest cover has remained at approximately 6.5 million to 7 million hectares. In 2015, forest cover was estimated to stand at around 7 million hectares.

Social forestry policies and programs

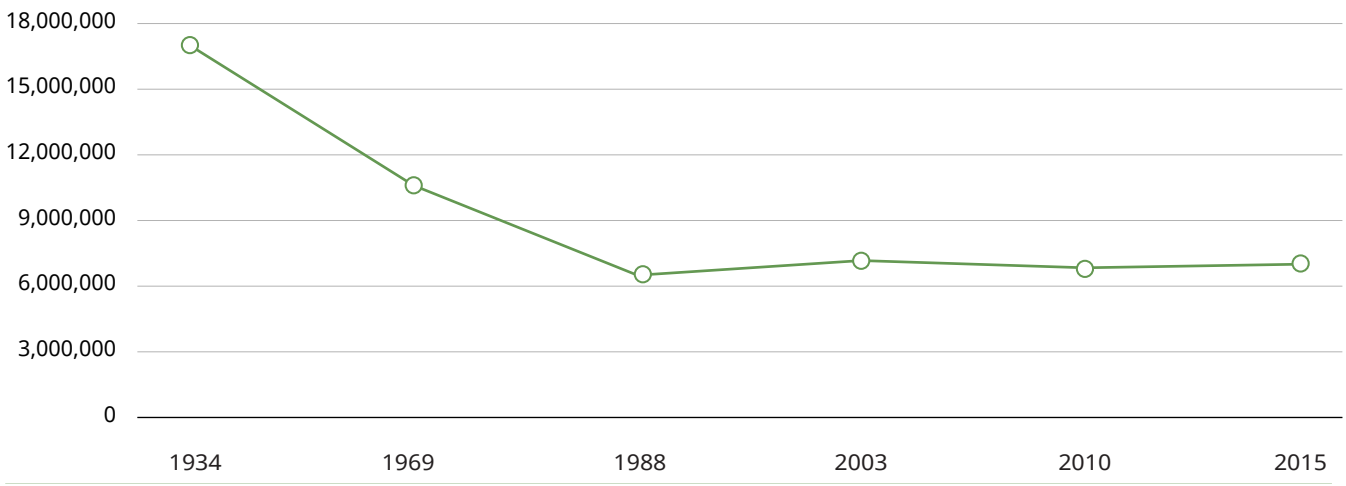
There are several forest policies relevant to social forestry in the Philippines:

- Executive Order No. 318 promotes sustainable forest management and has community-based forest management as one of the six guiding principles.
- Executive Order No. 23 allows the harvesting of planted trees in tenured community-based forest management areas.
- Executive Order No. 263 adopts community-based forestry management as the strategy for forest development.
- Community-based Forest Management Social Forestry adopts agroforestry and provides short-, medium- and long-term social, economic and environmental benefits to forest farmers and nearby communities.

Projects and programs related to social forestry include:

- Community-based Forest Management-Comprehensive Agrarian Reform Program, which is a poverty-and hunger-reduction program focusing on agroforestry and forest-based livelihoods and enterprises.
- Forestland Management Project, which is a 10-year project (2012–2022) implemented by the Department of Environment and Natural Resources and Japan International Cooperation Agency. It strengthens forest land management in three critical river basins through community-based forest management.
- Integrated Natural Resources and Environmental Management Project, which is a seven-year sustainable watershed management project (2013–2020) in four priority river basins. It focuses on indigenous peoples and resource-poor communities. It aims to reduce and reverse degradation of watersheds and associated environmental services caused by forest denudation and unsustainable farming practices.
- National Greening Program, which was initiated in 2011 to reduce poverty, promote food security, environmental stability and biodiversity conservation, and enhance climate change mitigation and adaptation. The program set out to plant 1.5 billion trees on 1.5 million hectares of forest lands between 2011 and 2016. As of December 2017, 1.6 million hectares of forest land had been rehabilitated. The program, now renamed the Enhanced National Greening Program, has been extended until 2028 to cover all remaining unproductive, denuded and degraded forestlands.

Figure 16: Forest cover in the Philippines, 1934–2015 (hectares)



Source: RECOFTC, 2017; Data provided by the Country Focal Point to the ASFCC.

Status of social forestry

The area of forest managed by local people under the various instruments increased by about 885,968 hectares from 2013 to 2018, or 22 percent. The increase has taken place predominantly in ancestral domain and ancestral land areas (Table 21). The area of forest managed under Community-Based Forest Management and Certificate of Stewardship Contracts has stagnated or been reduced.

According to the report presented to the 13th Meeting of the ASEAN Working Group on Social Forestry in July 2019, the area of forest managed by communities with land tenure is approximately 1.7 million hectares.

Challenges facing social forestry

As in other ASEAN countries, challenges facing social forestry mechanisms in the Philippines include lack of capacity, institutional support and access to finance. In some cases, market access for community-based, forestry-managed forest products is limited. These products would benefit from primary processing, value addition and the development of market information systems to improve the bargaining power of communities (Austria, 2017).

Impacts of climate change

The Philippines is among the world's most severely affected countries by climate change. It ranked fifth in the 2019 Global Climate Risk Index in terms of the severity of impacts occurring between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019). The country is particularly exposed to tropical storms. An average of 20 typhoons cross the country each year, causing physical and economic devastation (OPP, 2010).

The Philippines' southern islands of Mindanao were once considered typhoon-free but are now more frequently visited by typhoons. Sendong and Pablo, two of the deadliest typhoons that hit the country in the 2010s, devastated the region.

Observed departures from the 1971–2000 normal values between 1951 and 2010 indicate an increase of 0.65°C, or an average of 0.01°C per year. Maximum and minimum temperatures are seen to have increased by 0.36°C and 1°C respectively during the past 60 years. There appears to be a trend towards wetter conditions during the dry season.

The frequency of heavy storms during this period has increased. This dynamic is most notable during La Niña periods. The number of rainy days in the Philippines has increased since the 1990s, as has the inter-annual variability of the onset of rainfall. Sea-surface temperatures in the Pacific have increased between 0.6°C and 1°C since 1910, with the most significant warming occurring after the 1970s (PAGASA, 2011).

In the future, climate change is likely to exacerbate tropical cyclone intensity, drier seasons and extreme rainfall. These conditions are already threatening farms and fisheries and eroding development gains in vulnerable regions, such as Mindanao and the Visayas (FAO and UNDP, 2018).

Climate change scenarios were developed by the government for the Philippines using the Providing Regional Climates for Impact Studies regional climate model (PAGASA, 2011). They make the following projections:

- All areas of the Philippines are likely to become warmer, more so in the relatively warmer summer months. Mean temperatures in all

Table 21: Forest managed by local people under various instruments in the Philippines, 2016 and 2019

	Situational analysis 2016 (2013 data)		Situational analysis 2019 (2018 data)	
Mechanism	**area (Hectares)**	**% of total**	**area (Hectares)**	**% of total**
Community- Based Forest Management Area	1,615,600	40%	1,615,598	33%
Certificate of Stewardship Contracts	723,503	18%	565,682	12%
Ancestral domain (Certificate of Ancestral Domain Title)	1,635,972	41%	2,648,859	54%
Ancestral land (Certificate of Ancestral Land Title)	5,628	0%	74,781	2%
Protected area community-based forest management	38,249	1%	No data	No data
Total area managed by local people	**4,018,952**	**100%**	**4,904,920**	**100%**

Source: RECOFTC, 2017; Data provided by the ASEAN Working Group on Social Forestry focal point in the Philippines.

areas are expected to rise by 0.9°–1.1°C in 2020 and by 1.8°–2.2°C in 2050. The largest temperature increases are projected to occur during the March–May dry season.

- There is likely to be a reduction in rainfall in most parts of the country during the March–May dry season. A rainfall increase is likely during the June–August southwest monsoon season until the September–November transition season in most areas of Luzon and Visayas and during the December–February northeast monsoon season. The projections clearly indicate the likely increase in performance of the southwest and northeast monsoons in provinces exposed to these climate controls.
- Hot temperatures are likely to continue to be more frequent in the future. The number of days with maximum temperature exceeding 35°C are expected to increase by 2020 and again by 2050.
- Heavy daily rainfall is expected to continue to become more frequent. Extreme daily rainfall exceeding 300 millimetres is projected to increase in Luzon and Visayas only. The number of dry days with less than 2.5 millimetres of rainfall is expected to increase in all parts of the country in 2020 and again in 2050.

The risk of flooding from typhoons will be exacerbated by an anticipated rise in sea levels of 0.48–0.65 metres by 2100 (USAID, 2017b).

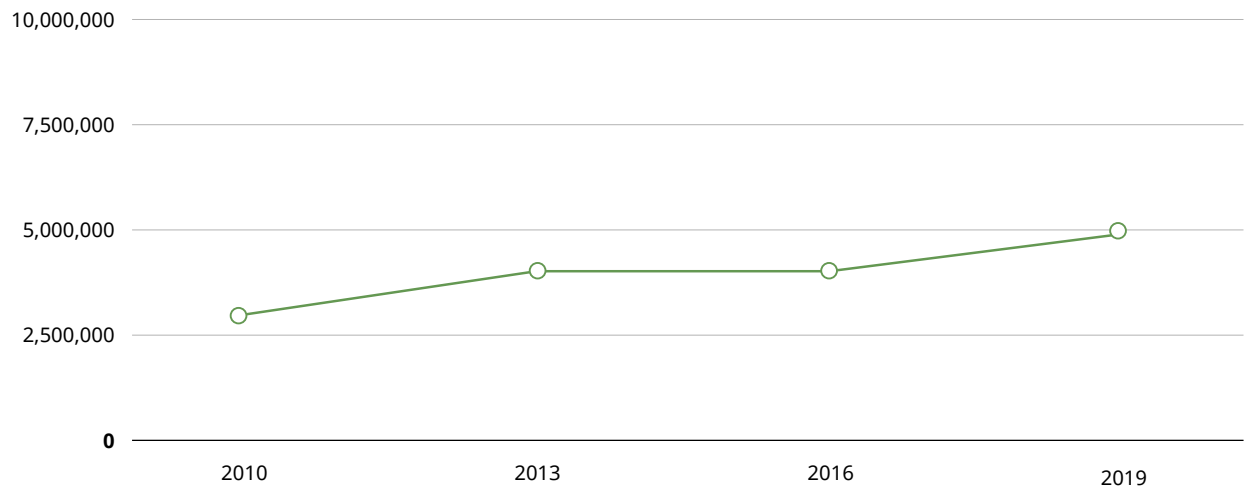
Some of the impacts of these changes on the forestry sector are explored in the Results-based Monitoring and Evaluation System that accompanies the National Climate Change Action Plan (CCC, 2016). These include the displacement of native species and invasion from weeds, pests and diseases. The rising temperatures also impact agricultural cultivation in high elevation forestlands.

Climate change mitigation and adaptation strategies

The main climate change policies in the Philippines are:

- The 2009 Climate Change Act, amended in 2012 created the Climate Change Commission to lead and coordinate policy development.
- The 2010 National Disaster Risk Reduction and Management Law guides the efforts to increase resilience to natural disasters and mitigate their impacts.
- The 2011–2028 National Climate Change Action Plan supports mainstreaming of climate change issues into national and local development processes. It also supports the implementation of short-, medium- and long-term actions in food and water security, ecological stability, human security, climate-smart industry and sustainable energy.
- The 2010–2022 National Framework Strategy on Climate Change set out the road map to address climate change and strengthen adaptation of natural ecosystems and human communities. It outlines a clean development path for the country.
- The 2010–2022 Philippines Strategy for Climate Change Adaptation supports the translation of adaptation strategies into national and local policies. It also supports increasing the adaptive capacity of communities and the resilience of natural ecosystems. It covers biodiversity, forestry, coastal and marine resources, fisheries, land, agriculture, water sector, minerals, energy, public health and infrastructure.

Figure 17: Forest area managed by local people, 2010–2019 (hectares)



Source: RECOFTC, 2017; Data provided by the Country Focal Point to the ASFCC.

The country's climate change response is coordinated by the Climate Change Commission. It is updating the 2011–2028 National Climate Change Action Plan to reflect new priorities identified from the Paris Agreement as well as the 2017–2022 Philippines Development Plan. The National Climate Change Action Plan outlines adaptation and mitigation strategies based on seven thematic areas. Action in the forestry section is covered principally in the ecological and environmental stability theme (CCC, 2011).

In addition, provincial and local governments are empowered to combat localized effects of climate change. Local Government Units, which include provinces, municipalities and villages, are mandated by law to formulate their own Local Climate Change Adaptation Plans. To date, more than 300 such plans have been approved by the local legislative bodies (FAO and UNDP, 2018).

The Philippines intends to reduce its greenhouse gas emissions by about 70 percent by 2030, relative to its business-as-usual scenario of 2000–2030. This is conditional on external finance and technical assistance. Emissions reductions will come from the energy, transport, waste, forestry and industry sectors (GOP, 2015). The NDCs includes priority measures to develop climate- and disaster-resilient ecosystems, but forests are not mentioned specifically.

Forests and social forestry in climate change mitigation and adaptation

Analysis of the forestry sector's potential contribution to future greenhouse gas emissions is included in the Building Low Emission Alternatives to Develop Economic Resilience and Sustainability Project. The project is funded by the United States Agency for International Development. The 2018 update report covers the forestry sector during 2015–2030. It shows that in 2015, the forestry sector provided a net carbon sink, with a net stock of 34.8 megatonnes of carbon dioxide in that year. However, under the baseline business as usual scenario, the sector would become a net greenhouse gas emitter by 2030, with net emissions of 52.8 megatonnes of carbon dioxide in 2050 (CCC and USAID, 2018).

The report sets out two potential mitigation options. The first option is forest protection. It reduces the loss of closed forest and open forest by reducing emissions of greenhouse gases from timber harvesting, fuelwood gathering, forest disturbance and deforestation. The second option is forest restoration and reforestation. It includes restoring degraded forests and establishing tree plantations, resulting in increased carbon sequestration. Forested land would increase from 35.43 percent of land area in 2010 to 37.9 percent in 2050 under the first option. It would increase by 44 percent in 2050 under the second option. The second option provides the greatest benefit, with 517 megatonnes of carbon dioxide by 2030. This has an allocated value of US$ 2.20 per tonne of mitigation. The first option provides 377 megatonnes of carbon dioxide by 2030, a value of US$ 3.50 per tonne (CCC and USAID, 2018).

The 2011 National Greening Program is the Philippine's major reforestation program. It promotes the country's self-sufficiency in wood

Table 22: REDD+ projects in the Philippines

Project	Location	Period
Climate-Relevant Modernization of Forest Policy and Piloting of REDD in the Philippines	Southern Leyte	2010–2013
Advancing Development of Victoria-Anepahan Communities and Ecosystem through REDD (ADVANCE REDD)	Southern Palawan	2010–2013
Community Carbon Pools Program (C2P2)	Southern Sierra Madre Mountain Range	2010–2014
Quirino Forest Carbon Project	Quirino Province	2009–2029
Philippine Peñablanca Sustainable Reforestation Project	Peñablanca Province	30 years
Preparation of a National REDD+ Mechanism for Greenhouse Gas Reduction and Conservation of Biodiversity in the Philippines	Albay Davao Oriental Eastern Samar	2012–2017

Source: DENR, 2017.

and wood products, poverty alleviation, food and economic security, and environmental stability. The original target was to reforest approximately 1.5 million hectares of unproductive, denuded and degraded forest land by 2016. In 2015, the program's implementation period was extended from 2016 to 2028 so that it could cover the estimated 7.1 million hectares of remaining unproductive, denuded and degraded forest land. From 2011 to 2018, the program greened nearly 2 million hectares of unproductive, denuded and degraded forestland nationwide using about 1.7 billion seedlings. In 2019, program's budget was 2.6 billion Philippine pesos, approximately 119 million USD. This covered the cost of planting 985,000 seedlings on 900 hectares and of maintaining and protecting 353,886 hectares of planted areas (PNA, 2019).

The Philippine National REDD+ Strategy was adopted by the Department of Environment in 2010, with a 10-year time frame to 2020. Projects have produced studies on the drivers of deforestation and forest degradation. They have also produced a review and analysis of forest policy, carbon rights, and frameworks and guidelines on benefit sharing and safeguards (Table 22).

In the Philippines Master Plan for Climate Resilient Forest Development, social forestry or community-based forest management is a cross-cutting strategy in all forest management systems. Localization of the 2017–2028 Strategic Management Framework towards Climate Resilient Community-based Forest Management is in line with the Master Plan.

Thailand

Total population[a]	69,290,640 in 2019	
Rural population[a]	32,117,653 in 2019	46% of total population
Total country area[b]	51,764,592 hectares	
Total land area (excluding inland water bodies)[a]	51,089,000 hectares	
Total forest land	Data not available	Data not available
Forest cover[b]	16,398,128 hectares in 2018	31.68% of total land area
Production forestc	3,801,000 hectares in 2008	Data not available
Protected forestc (soil and water)	16,428,000 hectares in 2018	Data not available
Protected forestsc (biodiversity conservation)	16,428,000 hectares in 2018	Data not available
Forest cover change[b]	0.32% between 2017 and 2018	
Forest carbon stocks[d]	1.16 billion tonnes of carbon (2018)	
Community-managed forests (with community forestry agreement)	15,236 villages covering 1,180,513 hectares (May 2019)	
Social forestry policies and programs	■ National Strategic Plan, 2018–2037 ■ National Economic and Social Development Plan No. 12, 2017–2021 ■ Community Forestry Bill came into force in May 2019 ■ National Park Act, 2019	
Climate change mitigation and adaptation targets, policies and programse	■ Climate Change Master Plan, 2015–2050 aims for Thailand to become a climate change-resilient and low-carbon society following a sustainable development pathway consisting of three core approaches (adaptation, mitigation and capacity-building) ■ Climate change adaptation includes six measures: flood, drought and water management, agriculture and food security, tourism, public health, natural resource management and human settlement and security	

Source:
[a]= See www.worldometres.info/world-population/thailand-population/;
[b]=See www.forest.go.th/land/(in Thai);
[c]=Calculated on a basis of FRA, 2020 (www.fao.org/forest-resources-assessment/en/) where soil and water and biodiversity conservation in protected forest in Thailand are not categorized);
[d]=A value of above ground C = 11.31 tonnes of carbon per rai or 70.69 tonnes of carbon per hectare referred to Ladawan et al., 2011. Reference Emission Level Development for REDD+ in Thailand (in Thai); and e=See www.degp.go.th/media/36631.pdf (in Thai).

National forest definition and classification

Thailand's 1941 Forest Act defines forest as land that has not been taken up or acquired by any other means in relation to land laws (Ongprasert, 2010). The forest area includes all types of forest, such as evergreen, pine, mixed deciduous, dry dipterocarp, scrub, mangrove, swamp and beech forest. These can occur in national forest reserves, national parks, wildlife sanctuaries and forest parks. Forests are defined as an area greater than 0.5 hectares, with trees taller than 5 metres and a canopy covering more than 10 percent of the ground area (FAO, 2015).

The country's natural forests are owned by the State. Responsibility for forest management is shared between two departments. The Royal Forest Department is mandated to conserve, protect and manage forest land and promote community forest management. The Department of National Parks, Wildlife and Plant Conservation manages the country's protected areas.

Analysis of forest data: Changes and trends

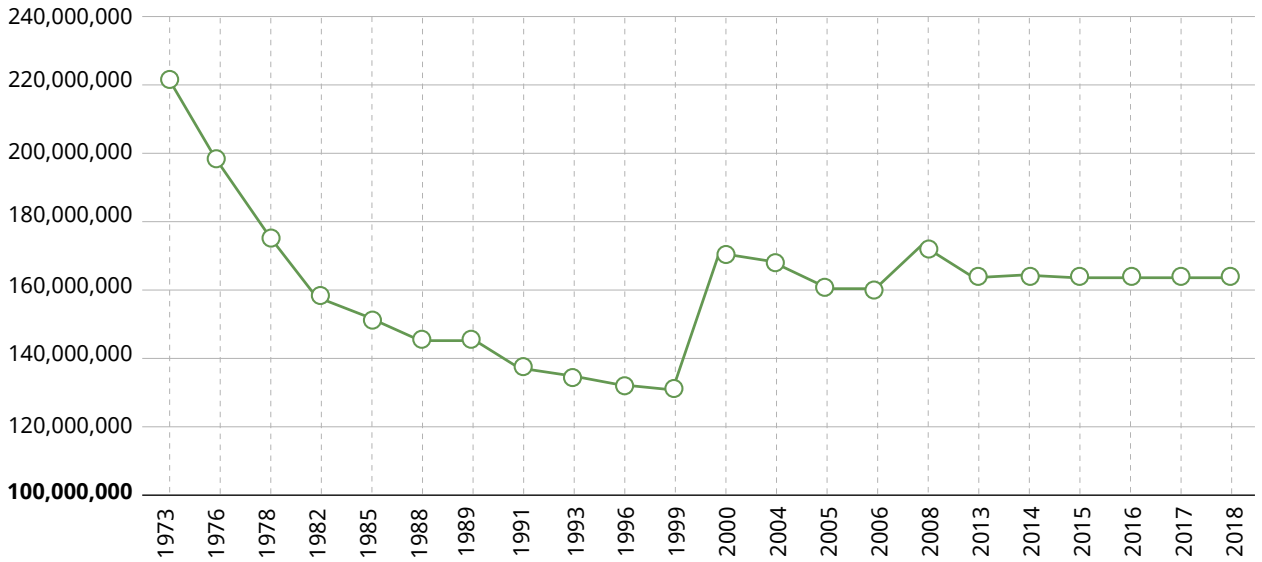
In 2018, Thailand had approximately 16.4 million hectares of forest cover (RFD, 2019). Over the past 50 years, Thailand's forest cover declined from 43 percent to just 25 percent in 1999. By 2018 it had increased to almost 32 percent (RFD, 2019). This is supported by recent analysis by the World Resources Institute, which found that Thailand's forest cover increased by almost half a million hectares between 2010 and 2017 (WRI, 2019).

Social forestry policies and programs

After a process spanning almost 30 years, a draft Community Forestry Bill was approved in May 2018. It was passed in the National Legislative Assembly in February 2019. It came into effect on 29 May 2019 with its official publication in the Royal Gazette.

The bill provides legal recognition of the rights and responsibilities of local communities to manage their forests. It provides greater clarity about which activities are and are not permitted. However, community forests can only be registered in national forest reserved areas. The new law does not apply to conservation areas and protected areas, such as national parks.[19] Therefore, it does not provide any additional benefits to forest-dependent communities in these areas. In late 2019, Thailand began developing the bylaws, decrees and guidelines to accompany the bill. It includes information on how to register as a community forest and how to create a management plan (RECOFTC, 2019).

Figure 18: Changes in forest area in Thailand, 1973–2018 (hectares)



Source: Royal Forest Department, 2019.

Status of social forestry

The area of community forests has steadily increased since 2010 (Figure 18). According to the Community Forestry Management office at the 13th Meeting of the ASEAN Working Group on Social Forestry, hosted in July 2019, there were nearly 1.2 million hectares of forests registered as community forests by May 2019. Thailand has so far achieved 74 percent of its national target and appears to be on track to establish 1.6 million hectares of community forest by 2025.

Impacts of climate change

Thailand is among the world's most severely affected countries. It ranked 13th in the 2019 Global Climate Risk Index in terms of the severity of impacts between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019). Like other countries in mainland Southeast Asia, Thailand has experienced significant rises in average temperatures and increasing intensity of rainfall events. From 1955 to 2005, Thailand experienced a mean temperature increase of 0.95°C, a maximum temperature increase of 0.86°C and a minimum temperature increase of 1.45°C (ONEP, 2015). In 2016, the country had its longest heatwave in five decades. A record high temperature of 44.6°C was recorded in Mae Hong Son in April of that year.

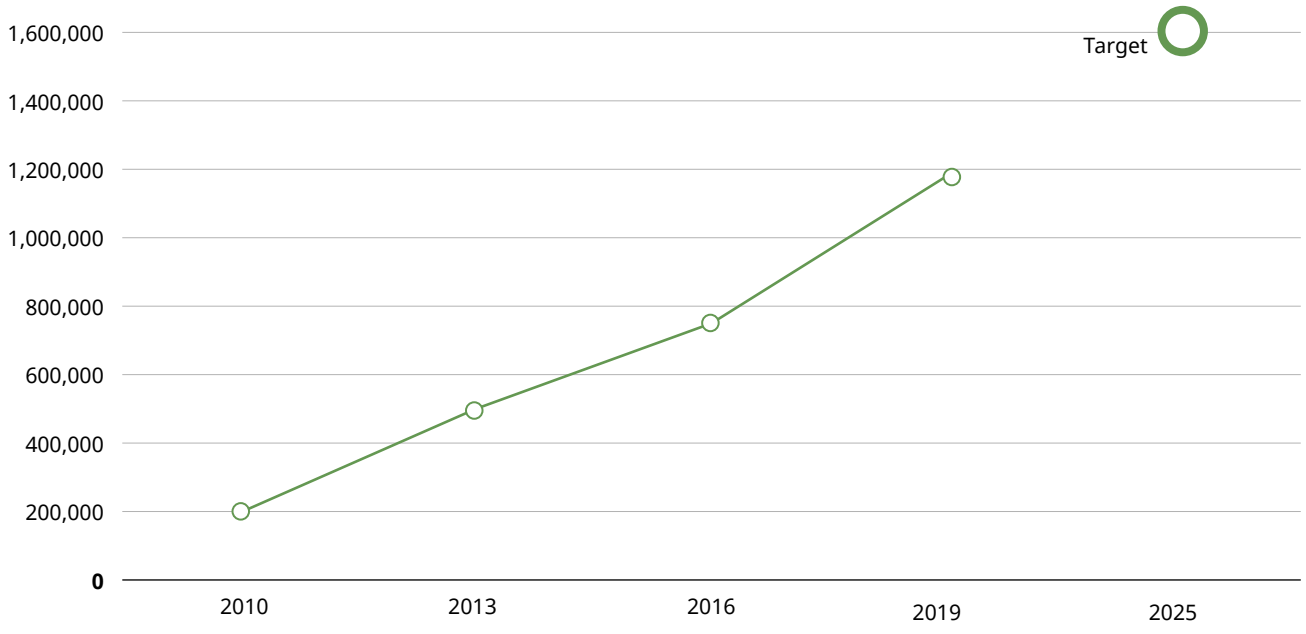
From 1955 to 2014, the number of rainy days decreased and rainfall intensity increased (ONEP, 2015). The amount of total rainfall is becoming more erratic. According to data from the Thai Meteorological Department, average rainfall during 1971–2000 was 1,573 millimetres per year. In 2011, annual rainfall was much higher than average, at 1,950 millimetres, and in 2015 it fell to just 1,400 millimetres.

Rising sea levels are exacerbated by land subsidence at the mouth of the Mekong River. This has already caused saltwater intrusion in the Upper Gulf of Thailand, threatening the viability of mangrove forests, fisheries and rice harvests (Sojisuporn, Sangmanee and Wattayakorn, 2013).

Under a high emissions scenario, mean annual temperatures are projected to rise by about 4.3°C on average from 1990 to 2100. Under this scenario and without investments in adaptation, approximately 2.4 million people a year could be affected by flooding due to sea-level rise between 2070 and 2100. Heat-related deaths in persons aged 65 and older are projected to increase to about 58 deaths per 100,000 by 2080. The estimated baseline is about three deaths per 100,000 population annually between 1961 and 1990 (WHO, 2015f).

The capital city, Bangkok, is particularly vulnerable to climate impacts, including flooding. Under a scenario of a 4°C temperature rise and no adaptation measures, 40 percent of the city would be inundated by extreme rainfall events and sea-level rise by 2030. This would increase to 70 percent inundation in the 2080s (World Bank, 2013).

Figure 19: Area of official community forest in Thailand, 2010–2019 (Hectares)



Source: RECOFTC, 2017; Data provided by Country Focal Points to the ASFCC.

Climate change mitigation and adaptation strategies

Thailand's 2018–2037 National Strategy provides the country's overall strategic direction. It includes a plan for eco-friendly development and sustainable climate-friendly growth.

Thailand's climate change governance structure is underpinned by the 2015–2050 Climate Change Master Plan. It is overseen by the National Committee on Climate Change Policy and chaired by the prime minister. The Master Plan specifies a set of short-, medium- and long-term mitigation, adaptation and capacity-building targets for 2016, 2020 and 2050 respectively. The medium-term targets include increasing the forest area to 40 percent of the country's land area; supplying at least 25 percent of energy consumed from renewable energy sources; and increasing green space within municipalities to more than 10 square metres of green space per capita. The long-term targets include reducing energy intensity by at least 25 per cent, compared with the business-as-usual scenario by 2030; increasing investment in low-carbon and environment-friendly industries; reducing open burning in agriculture areas; and reducing the carbon intensity of the economy.

The National Committee on Climate Change approved the National Adaptation Plan in late 2018. The Plan includes developing sector-specific components for natural resources management and forestry. The first implementation phase of the Plan takes place in 2018–2021. It will outline processes for building stakeholder capacity, developing database systems, and monitoring and collaborating across national agencies and international initiatives (MONRE, 2018).

In 2014, Thailand pledged to reduce its emissions by 7–20 percent by 2020. Preliminary analysis suggests a 4 percent reduction has been achieved. The 7 percent target should be reached by 2020 (ONEP, 2015). By 2030, Thailand intends to reduce its greenhouse gas emissions by 20 percent from the projected business as usual level, or by 25 percent with enhanced support, technology and financial resources (ONEP, 2015). Mitigation strategies include promoting energy conservation and alternative and green energy, and introducing projects to reduce emissions in the forestry sector, such as REDD+.

Forests and social forestry in climate change mitigation and adaptation

The country's NDCs was submitted to the UNFCCC in 2015. It includes the intention to use community forests to promote the national policy of a self-sufficient economy and safeguarding food security at the community level (ONEP, 2015). It commits to increasing national forest cover to 40 percent through local community participation to enhance adaptive capacities of related ecosystems.

The National Adaptation Plan has a workplan centred around protecting and restoring forest areas and promoting and developing eco-villages (MONRE, 2018). The Climate Change Master Plan includes forestry as a priority sector for mitigation. As part of its mitigation efforts, Thailand plans to increase forest cover to 20 percent by 2020. This is the halfway point to achieving its NDCs commitment of 40 percent. It will also accelerate watershed forest restoration efforts to reduce flood risk. The area of mangrove forests will also be increased, at a minimum rate of 800 hectares per year as part of adaptation measures (ONEP, 2014).

Community forestry projects have been adopting adaptation and mitigation priorities. The projects are supported by various non-government organizations, government departments and other agencies. For example, RECOFTC implemented the Adaptive Management in Forest Landscapes and Sustainable Livelihoods for Climate Change Mitigation and Adaptation Project from 2010 to 2013. The project developed community-level tools and techniques for participatory forest assessment and carbon accounting. It also strengthened local capacity to manage forests for climate change mitigation and adaptation benefits.

The Royal Forest Department is beginning to promote adaptation activities in community forests under its jurisdiction. These projects are working to rehabilitate forest and mangrove ecosystems, support local livelihoods and increase resilience to climate change (RECOFTC, 2014b). The Department of National Parks, Wildlife and Plants Conservation initiated REDD+ in Thailand in November 2018. This will involve developing the Forest Reference Level so that the government can set a benchmark to measure the emissions reduced from the national REDD+ program. In addition, Thailand's National Forest Monitoring System will be improved and updated. It is a practical tool for national forest policy and planning.

A carbon assessment in 61 community forests between 2013 and 2017 was supported financially by the RATCH Group Public Company Ltd. It found an average of 39 tonnes of carbon per hectare stored in community forests. According to a presentation by the Community Forest Management Office at the 13th Meeting of the ASEAN Working Group on Social Forestry in July 2019, 1.2 million hectares of community forest stores approximately 46.5 megatonnes of carbon dioxide.

Viet Nam

Total population	97,283,887 in 2019*	
Rural population	62,339,514 in 2019*	64.08% of total population*
Total country area	34,793,026 hectares	
Total land area (excluding inland water bodies)	33,123,000 hectares	
Forest land	14,491,295 hectares in 2018	41.65% land area
Production forest	7,748,058 hectares in 2018	53.47% of forest land
Protected forest (soil and water conservation)	4,588,059 hectares in 2018	31.66% of forest land
Protected forests (biodiversity conservation)	2,155,179 hectares in 2018	14.87% of forest land
Forest cover change	0.32% per year between 2006 and 2016	
Community-managed forests (with community forestry agreement)	As of December 2018, there was a total of 4 111 848 hectares under the direct ownership of local people: 12 095 community forests covering 1 156 714 hectares and 2 955 134 hectares owned by individuals and households	
Social forestry policies and programs	■ Community Forest Management ■ Law on Forestry 2017 (effective January 2019)	
Climate change mitigation and adaptation targets, policies and programs	■ National Target Programme on Climate Change, 2008 and 2012 ■ National Climate Change Strategy, 2011 National Socio-Economic Development Strategy, 2011–2020 ■ National Green Growth Strategy, 2012 ■ Law on Natural Disaster Prevention and Control, 2013 ■ Law on Environment, 2014 ■ National Strategy on Disaster Prevention, Response and Mitigation to 2020 ■ Action Plan Framework for Adaptation and Mitigation for Climate Change in Agriculture and Rural Development, 2008–2020 ■ REDD+ ■ Programme 886	

Source: *= https://danso.org/viet-nam/.

National forest definition and classification

The national definition of forest is an area of at least 0.5 hectares, with trees higher than 3 metres and a canopy cover of 0.3 hectares or growing stock that exceeds 30 cubic metres per hectare (FAO, 2010b). Forest cover assessments include natural forests of timber, bamboo, mangrove, mixed and rocky mountain forest, and plantations of timber, bamboo, mangrove and other specialty species (VNFOREST, 2015).

Analysis of forest data: Changes and trends

According to data presented at the 13th annual meeting of the ASEAN Working Group on Social Forestry in June 2019, Viet Nam's total forest area was nearly 14.5 million hectares, or 41.65 percent of the total land area in 2018. Of the total amount, 10.3 million hectares, or 71 percent was natural forest and 4.2 million hectares, or 29 percent was plantation forest.

Forest cover in Viet Nam has been slowly increasing over the past decade, from less than 12 million hectares in 2002 to almost 14.5 million hectares in 2018. This is an average increase of 170,000 hectares a year.

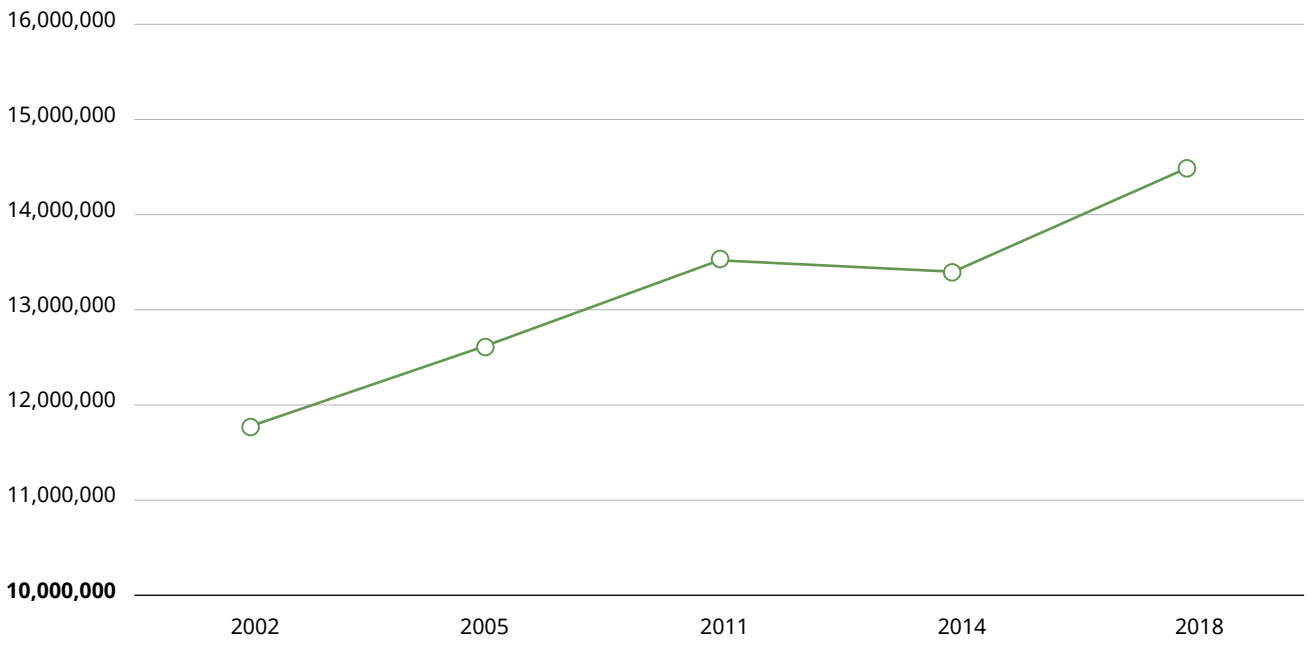
Forest land is classified in three categories or functions. Production forests, for production of timber and non-timber forest products, cover about 7.7 million hectares. Protection forests, for protection of soil and water resources, cover about 4.6 million hectares. Special-use forest, for nature conservation, tourism, cultural heritage and scientific research, cover about 2.2 million hectares.

The majority of the increase in forest cover has taken place in production forest, which has increased by 1 million hectares since 2014 (Table 23). Special-use forest and protection forests remain about the same. If the increase in forest cover consists of mainly commercial species in planted forests, it may help to support livelihoods and economic growth. However, it is unlikely to generate significant benefits for biodiversity conservation and eco-system services or support forest communities' resilience to climate change.

Table 23: Change in forest type in Viet Nam, 2017–2019

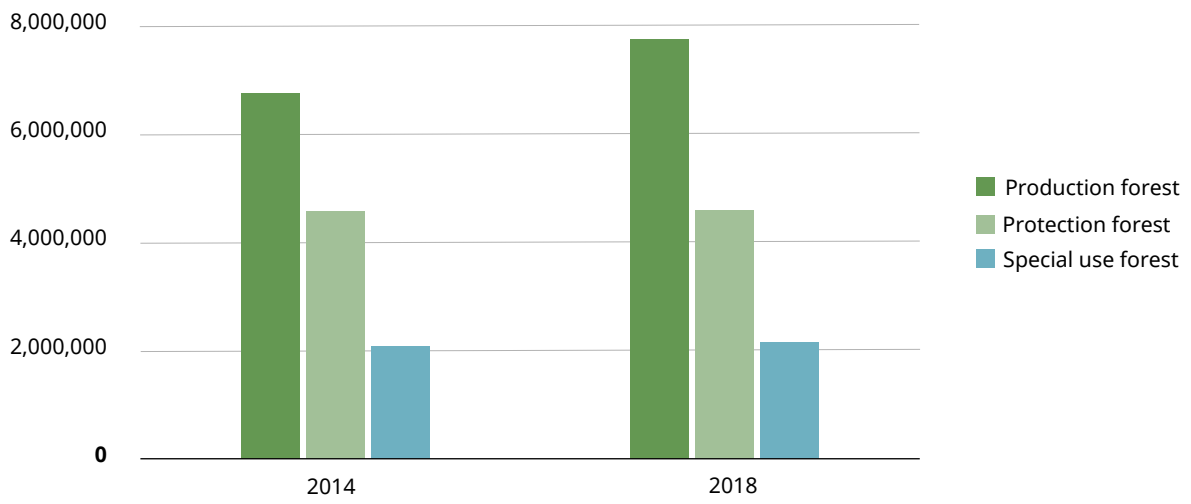
	Situational analysis 2017 (2014 data)		Situational analysis 2019 (2018 data)	
Forest type	Total area (Hectares)	% forest land	Total area (Hectares)	% forest land
Production forest	6,751,923	50%	7,748,058	53%
Protection forest	4,564,537	34%	4,588,059	32%
Special-use forest	2,085,132	16%	2,155,178	15%
Total forest land	**13,401,592**	**100%**	**14,491,295**	**100%**

Figure 20: Changes in forest cover in Viet Nam, 2002–2018 (Hectares)



Source: RECOFTC, 2017; Date provided by the Country Focal Point to the ASFCC.

Figure 21: Change in forest type in Viet Nam, 2014–2018 (Hectares)



Source: RECOFTC, 2017; Dinh, 2019; Data provided by the Country Focal Point to the ASFCC.

Figure 22: Map of forest cover in Viet Nam

Table 24: Forest ownership in Viet Nam, December 2018

Forest owner	Hectares
Special-Use Forest Management Boards	2,056,504
Protection Forest Management Boards	2,984,158
Economic organizations	1,711,594
Science and educational organizations	118,521
Foreign enterprises	66,159
Households and individuals	2,955,134
Communities	1,156,714
Army	198,825
Other organizations	148,793
Communes	3,094,893
Total	**14,491,295**

Source: Dinh, 2019.

Social forestry policies and programs

The 2004 Law on Forestry Protection and Development was revised and became the 2017 Law on Forestry, which went into effect in January 2019. The new law reflects changes in forest management to address increasing forest degradation and declining numbers of wild species of fauna and flora. The new law covers forest classification, management, protection, development, and forests and forest products for commercial purposes. The law strengthens the recognition of customary rights and practices of ethnic minority groups. It acknowledges the rights of households and communities as forest owners over their planted production forests (Dinh, 2019).

In June 2017, the prime minister approved the 2016–2020 Target Programme for Sustainable Forest Development. The program plans to increase forest cover to 14.4 million hectares, or 42 percent by 2020. It plans to restore 15 percent of the degraded forest area and increase the area of special-use forest by 100,000 hectares. It also plans to increase forestry production, plantation productivity and forest exports; maintain 25 million jobs; contribute to disaster risk reduction and climate change mitigation; and support livelihoods improvement, poverty reduction and food security for forest-dependent people (Dinh, 2019).

Status of social forestry

The total area of forest land managed by local people was approximately 4 million hectares at the end of 2018. Of this, households and individuals managed 3 million hectares, or 20 percent of the total area. Communities managed slightly more than 1 million hectares, or 8 percent.

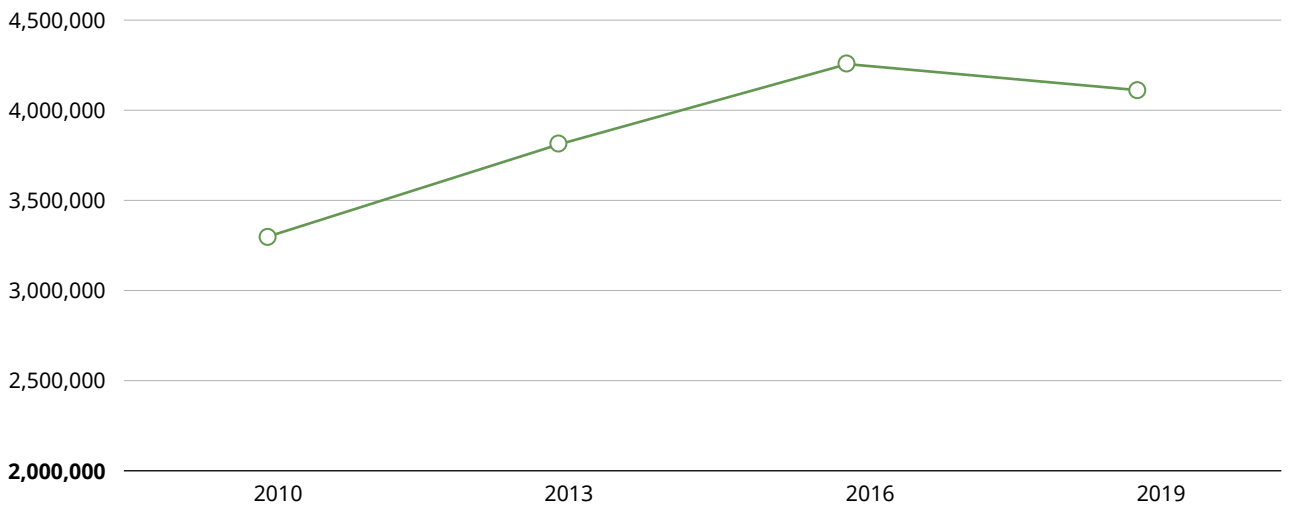
Table 25: Change in area of natural and planted forests managed by local communities and households in Viet Nam, 2015 and 2018 (Hectares)

	Forest area 2015		Forest area 2018		Change in forest area	
Forest type	**Households**	**Communities**	**Households**	**Communities**	**Households**	**Communities**
Natural forest	1,398,187	1,062,340	1,410,324	1,051,224	12,137	-11,116
Plantation forest	1,747,781	48,069	1,544,810	105,490	-202,971*	57,421
Total	3,145,968	1,110,409	2,955,134	1,156,714	-190,834	46,305

Note: The area plantation forest under the ownership of households and individuals has declined by around 200,000 hectares since 2015. This is likely a result of the redistribution of plantation forests to other forest owners.

Source: VNFOREST, 2015; RECOFTC, 2017; Data provided by the Country Focal Point to the ASFCC.

Figure 23: Area of forest managed by local people in Viet Nam, 2010–2019 (Hectares)



Source: RECOFTC, 2017; Data provided by the Country Focal Point to the ASFCC.

Challenges facing social forestry

The decentralization of forest governance in Viet Nam has been largely successful in allocating large amounts of forest land to local people. This has helped to reverse the trend of deforestation seen in the latter half of the twentieth century. While this is impressive, some challenges remain. Households and communities do not legally own the allocated forest. The roles and formal decision-making powers of local communities remain unclear. The State retains a large degree of control in how forests are managed (Bayrak, 2019).

Impacts of climate change

Viet Nam is among the world's most severely affected countries. It ranks ninth in the 2019 Global Climate Risk Index in terms of the severity of impacts between 1998 and 2017 (Eckstein, Hutfils and Winges, 2019). The country faces significant climate-related challenges that are compounded by a range of non-climate factors. Its extensive coastline and major river deltas with large populations are vulnerable to the impacts of tropical storms and sea-level rise. Highland areas have poor water-retention capacity and are susceptible to erosion and landslides.

Climate changes observed since 1960 include an increase in annual mean temperatures of 0.5°C, higher in the dry season and in the South. There were significant increases in the number of hot days and nights throughout the year. There was a reduction in annual rainfall totals in the North and an increase in the South (USAID, 2017c).

Sea levels are rising at around 2.8 millimetres a year (MONRE, 2015), for a total of around 20 centimetres over the past 50 years (MONRE, 2015; ISPONRE, 2009). The frequency and intensity of typhoons has increased by 0.43 events per decade. There was a southward shift in typhoon tracks coupled with changes in the peak timing of landfall (USAID, 2017c).

Viet Nam experienced a severe drought, along with other ASEAN countries, in 2015 and 2016. According to FAO, 52 of the country's 63 provinces were affected by the drought. Eighteen provinces were in a state of emergency. More than 2 million people experienced acute water shortages and required humanitarian assistance (FAO, 2016b).

A further rise in mean annual temperatures of 1° to 2°C and a 180 percent increase in the number of heat waves are projected to occur by 2050. Increases of two to seven percent in annual rainfall across all regions are projected by 2050, with greater variability between the dry and rainy seasons. By 2090, increases of 2–14 percent in the proportion of total rainfall falling during heavy events are likely, particularly in the northern regions. There will be an increased risk of landslides in mountain areas (USAID, 2017c).

Climate change mitigation and adaptation strategies

In 2008, the government issued the National Target Programme to Respond to Climate Change. Climate change was mainstreamed into the 2011–2020 National Socio-Economic Development Strategy. It includes policies on disaster risk reduction, coastal zone management and energy supply and use.

In 2011, the National Climate Change Strategy was adopted, outlining objectives for 2011 to 2015 and 2016 to 2050. The strategy states that responses to climate change must be associated with sustainable development and a transition towards a low-carbon economy. It also states that opportunities to increase competitiveness and strengthen the national position must be matched with adaptation and mitigation efforts (MONRE, 2015).

In 2012, the National Green Growth Strategy was approved. It includes mitigation targets, measures and regulations on linking with international carbon markets. In 2013, the Law on Natural Disaster Prevention and Control was enacted. It addresses diverse natural hazards that affect the country, which are primarily climate change related. The 2014 Law on Environment includes a chapter on climate change (MONRE, 2015).

The government submitted its NDCs to the UNFCCC in November 2015. It calls for a reduction of greenhouse gas emissions by 8 percent against the business-as-usual scenario by 2030 and up to 25 percent with international assistance. This will be achieved through initiatives in energy, agriculture, waste and land use, land-use change and forestry. This includes increasing forest cover to 45 percent by 2030, equal to approximately 15 million hectares of forest (MONRE, 2015). Improved management of greenhouse gas emissions will enhance sequestration and reduce emissions from land use, land-use change and forestry by 20 percent by 2020 from 2005 levels (Decision No. 1775/2012) (MONRE, 2015b).

Forests and social forestry in climate change mitigation and adaptation

To achieve the mitigation and adaptation targets outlined in its NDCs, Viet Nam plans to enhance sustainable forest management, afforestation, reforestation and carbon sequestration. It will protect environmental services, reduce deforestation and forest degradation, and conserve biodiversity. These efforts will be especially important in areas where they are linked to livelihood development and income

generation for local communities and forest-dependent people (MONRE, 2015).

The National Strategy for Natural Disaster Risk Prevention, Response and Mitigation and the Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector recognize the role of forests in climate change mitigation and adaptation. These plans include activities for reforestation and protecting upstream forests and establishing and managing increased areas of forest land and forest cover. Other activities explore the potential of using non-timber forest products in protection forests to provide benefits to local people, as well as planting trees to protect dyke systems (RECOFTC, 2014c). The National Climate Change Strategy also includes strategic tasks on increasing forest cover and developing community capacity on adaptation.

At the end of 2018, Viet Nam completed its REDD+ readiness phase. It became the first country in the Asia-Pacific region to complete the Warsaw Framework for REDD+ after fulfilling the UNFCCC safeguards requirements. As a result, Viet Nam is now eligible to receive REDD+ results-based payments. The country submitted modified forest reference emissions level to the UNFCCC in 2016. It adopted the National Forest Monitoring System and incorporated an online safeguards information system within the government's Forest Management Information System.

Since joining REDD+ in 2008, responsibility for administering it has moved from the Ministry of Agriculture and Rural Development to a State Steering Committee. The committee is headed by the deputy prime minister, which emphasizes the elevated importance given to the REDD+ agenda.

In 2017, the country's second National REDD+ Action Programme was approved by the prime minister. A FLEGT-VPA was signed with the European Union in 2018 to institutionalize sustainable forest management practices and legal, transparent trade in timber.

The current National REDD+ Action Programme, covering the period 2017 to 2020, includes measures to ensure the target of 16.2 million hectares of forest is met by 2020; to improve forest governance policies and practices and strengthen law enforcement; to embed enhanced forest production methods and business models; and to finalize the core REDD+ instruments in compliance with the UNFCCC provisions.

The World Bank's Forest Carbon Partnership Facility's Emission Reductions Programme will continue to develop in six provinces in the North Central Coast Region. It encompasses five internationally recognized conservation corridors, where just under 60 percent of the area is forested.

As part of the FLEGT-VPA, state-owned rubber companies will work with local non-government organizations to develop and implement voluntary standards for sustainable investments in forestry and land use. They will also ensure that mechanisms for leveraging finance from the private sector to forest-based initiatives are in place.

Conclusions and recommendations

Progress and conclusions

The need for greater progress

Over the past 10 years, steady progress has been made to implement social forestry in the ASEAN region. The area of forest managed under social forestry doubled between 2010 and 2019, and now stands at 13.9 million hectares. Cambodia, Indonesia, Myanmar, the Philippines, Thailand and Viet Nam are making slow progress towards their targets to increase forest areas managed by local communities to more than 30 million hectares.

Despite this progress, forest cover in the region has declined by almost 7 million hectares, or 3.4 percent, since 2013. There are considerable reductions in Indonesia, Cambodia, Malaysia and Myanmar. All ASEAN countries are losing their primary forests at a dramatic rate.

The significance of the role of forests in the climate crisis in ASEAN is striking. The land-use change and forestry sector is responsible for the largest amount of emissions. They account for 43 percent of greenhouse gas emissions from all 10 Member States. The region accounts for 52 percent of global emissions from land use and forestry. The ASEAN forests are globally important, and how they are managed is of great importance for individual countries and the planet.

One notable change in the past 10 years, particularly since the last situational analysis was published in 2017, is the shift in consciousness globally about the climate crisis. There is now an urgency to address it and increasing demands from the public and development agencies for governments to take more decisive action, including increasing investments and participation from the public and private sector. As a result, the private sector is showing greater interest in increasing their involvement in mitigation and adaptation interventions.

Two IPCC special reports have helped to galvanize this view and highlight the important role of forests. One highlights the impacts of global warming of 1.5°C above pre-industrial levels (IPCC, 2018) and the other focuses on climate change and land (IPPC, 2019b). The increasingly evident impacts of climate change regionally and globally has heightened public awareness and concern over the past 10 years. Higher temperatures, erratic and unpredictable rainfall and extreme weather events are having a direct impact on agriculture, natural resources and rural people's health and livelihoods in the region.

The IPCC has set 2030 as the deadline to limit warming to 1.5°C, or well below 2°C above pre-industrial levels. However, the impact of climate change in the region continues to rise. This makes clear that the progress and targets are inadequate. There needs to be a significant increase in efforts to deliver social forestry that has a positive impact on climate change mitigation and adaptation.

Barriers to progress must be overcome

Social forestry has had an increasing role in the response to climate change in ASEAN over the past 10 years. Examples include national reforestation programs and community-based initiatives to reduce deforestation and forest degradation and increase landscape resilience. Cambodia, Myanmar, Thailand, the Philippines and Viet Nam are implementing large-scale national reforestation programs to reduce deforestation and land degradation.

Efforts to scale up and accelerate progress on social forestry seem hard won. The challenges of implementing social forestry in the region remain largely unchanged over the past 20 years. The outlook for social forestry is promising and progress is being made in some areas. However, insecure tenure, inadequate incentives, weak legislative frameworks, low institutional capacity, poor governance and limited funding all remain significant barriers to progress. Climate change and other challenges in the region are likely to exacerbate these obstacles. This is particularly true for tenure security. Migration and conflict over forested landscapes are increasing, with rights over forest lands becoming a particular flashpoint. This was documented in RECOFTC's 2019 report Tenure Arrangements in ASEAN: Achieving Secure Tenure to Successfully Deliver Social Forestry.

Some progress has been made to improve tenure security in the region. Indonesia and the Philippines are increasingly recognizing customary land tenure systems. They are allocating more forest to local people through customary mechanisms, such as ancestral

domain and ancestral land titles in the Philippines, and customary rights, called *hutan adat,* in Indonesia. Still, there is a long way to go. There are also occasional steps backwards that weaken customary land tenure and increase the potential for land conflicts. Myanmar's 2018 Vacant, Fallow and Virgin Lands Management Law is one such example. Most of the lands under this classification are in ethnic rural areas. The nearly 10 million people who live or rely on this land for their livelihood must now apply for 30 year concessions to use their own land. If they don't and another entity is awarded their land, they will lose their customary land. Most of these people do not know about the law.

These challenges will need to be resolved before social forestry can be scaled up and implemented effectively. Considerable effort is still needed across all Member States to remove these barriers. It is increasingly clear that business as usual will not produce the scale and effectiveness of social forestry outcomes required to tackle the climate crisis.

Of all the barriers to progress, achieving secure tenure and strengthening the rights of people who depend on forests has the potential to deliver the biggest gains. Secure tenure can help reduce deforestation and forest degradation, achieve zero hunger, reduce poverty and help communities increase their resilience and adapt to climate change.

Social forestry's wide-ranging potential

Social forestry has vast potential to support climate change mitigation and adaptation and to contribute to the delivery of all the 17 Sustainable Development Goals to varying degrees.

Social forestry focuses on community engagement, empowerment and the community's ability to benefit from healthy and sustainably managed forests. As the effects of climate change continue to grow stronger, social forestry's ability to deliver sustainable, resilient landscapes that protect communities, especially the most vulnerable, will become increasingly important. Other types of forestry will struggle to deliver these benefits, but a holistic landscape approach to social forestry needs to be taken.

The past 10 years have seen increased recognition of social forestry's potential to support climate change mitigation and adaptation. There are positive signs that a cross-sector approach to social forestry is gaining ground, including forest landscape restoration programs in Cambodia, Thailand and Myanmar.

Social forestry traditionally sat within the forestry sector. Given the broad range of benefits that it can deliver across the spectrum of landscape settings, an integrated, ecosystem-service driven, landscape-based approach is a logical progression. This will allow social forestry to fit into current policy agendas and help ensure that the full range of potential benefits are delivered.

The environmental, social and economic drivers of change in the ASEAN region present an opportunity for social forestry to provide benefits beyond forest landscapes. For example, it can support the development of green infrastructure in rapidly urbanizing and peri-urban landscapes, agroforestry in agrarian landscapes and mangrove rehabilitation in coastal landscapes. It provides solutions for the biodiversity, land degradation and food security crises that are gaining the attention of donors and decision-makers regionally and globally. Its emphasis on good governance enables it to contribute to broader agendas, including gender equality, social welfare, human rights and displaced persons, where institutional links between the sectors might be less well established.

Recommendations

The following recommendations are proposed to respond to these conclusions. They are crucial for taking social forestry in the ASEAN region forward into the next 10 years, a critical period for responding to the climate crisis.

Increase investment in social forestry

Social forestry has the potential to simultaneously advance the climate change mitigation and adaptation and sustainable development agendas. Therefore, increased recognition, prioritization and investment are urgently needed.

Social forestry needs to clearly demonstrate its positive impact on these various agendas. Governments should invest more in measuring, monitoring, collating anddisseminating information on social forestry throughout the region. This will help refine and evolve social forestry programs based on a deeper understanding of good practices. Governments should also highlight cases that demonstrate where social forestry has successfully delivered multiple benefits and had positive impacts. This will encourage future investment. A more detailed understanding of the positive impacts of social forestry can facilitate efforts to scale up.

Social forestry faces the same challenges as other spatially disparate, community-focused solutions. Governments perceive them to be harder to implement than a one-size-fits-all, top down approach. For this reason, social forestryneeds to be reframed as a large-scale regional solution rather than a small-scale approach relegated to the most degraded lands.

Social forestry must be given a fair chance to succeed. Governments should provide communities the opportunity to manage good-quality forests and not only degraded forests. They need adequate resources, incentives and rewards to balance out the effort, responsibility and investment they make.

Governments should also make efforts to demonstrate how social forestry can be scaled up, including the necessary components like human capacity and finances. The roles that governments, civil society and communities should play and the steps they need to take must be spelled out clearly.

With the right prioritization and investment, social forestry can make a significant contribution to the region's efforts to tackle climate change. To gain increased recognition of its potential, a clear unified message needs to be delivered to decision-makers. This report provides many of those messages.

The ASEAN-Swiss Partnership on Social Forestry and Climate Change has made inroads, taking a unified message into higher-level regional debates. However, there is potential to further increase the influence of social forestry in the ASEAN region and beyond in other international forums besides the forestry sector. The ASEAN Senior Officials on Forestry (ASOF) and other high-level ministries within ASEAN should make efforts to put social forestry on the agenda and demonstrate its potential and impact. This should translate into donor interest and convince national governments to prioritize social forestry programs and push forward reforms that support it.

A cross-sector and integrated approach to social forestry

A new approach to social forestry is needed to tackle barriers to progress and contribute to climate change mitigation and adaptation efforts. A cross-sector, integrated landscape-based approach will tap into current policy agendas and help ensure that the full range of potential benefits are delivered.

A crucial first step is for forest agencies to look beyond social forestry's traditional boundaries and identify links to relevant policy agendas outside the forestry sector. Linking social forestry with other sectors, such as urban planning, rural development, agriculture and coastal management, will require language and terminology that resonates with different disciplines. Clearly demonstrating and documenting the potential and success of social forestry will help other sectors understand its value for their sector, leading to broader support. It is important to highlight social forestry's contributions in different contexts while demonstrating an understanding of the barriers to implementation that policy-makers grapple with. This will enable proposals to be adapted, realistic, pragmatic and less easily dismissed at the first hurdle.

Common ground with sectors like water and agriculture may be more established and easy to develop. However, there are other areas where institutional links are currently weak but tremendous potential exists to achieve common goals. Examples include human rights, displaced persons and gender equality.

The Sustainable Development Goals provide a unifying blueprint for action and a common language for governments, donors, civil society and communities to determine shared goals and targets. The landscape approach to social forestry provides one option. It provides the scale, setting, approach and solutions needed to achieve these goals and targets. The potential of the landscape approach to achieve the Sustainable Development Goals needs to be communicated and demonstrated clearly. Existing cross-sector regional platforms, such as the Multi-sectoral Framework on Climate Change and Food Security, also provide an opportunity to develop this cross-sector approach.

Achieve strong and clear forest tenure

Achieving tenure security for communities and strengthening the rights of people who depend on forests is one of the most challenging barriers to successful social forestry in the ASEAN region. However, it has the potential to deliver the biggest gains. It is also likely to come under increased pressure as climate change intensifies.

In the short-term, development agencies need to work with Member States and communities to help them understand the essential components of good-enough tenure, which unlocks the necessary security to allow social forestry to flourish. This pragmatic solution provides focus on the components of tenure arrangements and tenure security that might be preventing progress, rather than attempting a comprehensive program of reform. More work is needed to develop and test this approach.

In the long-term, there also needs to be a comprehensive effort by development agencies, governments, the private sector and communities to develop a common language to discuss tenure. This will improve decision-makers' understanding of tenure arrangements, help tenure issues make their way onto the agenda and increase willingness to engage potential solutions. Governments, however, must embrace the plurality and complexity of tenure when developing solutions, ensuring that

these solutions are flexible and adaptable. The RECOFTC 2019 report Tenure Arrangements in ASEAN: Achieving Secure Tenure to Successfully Deliver Social Forestry discusses this more in-depth.

Endnotes

1 Each country has a different target date, ranging from 2019 to 2030.

2 At the time of publication, the country data had been validated by Myanmar and Thailand.

3 See https://www.statista.com/statistics/804503/urbanization-in-the-asean-countries/ (accessed 19 October 2019).

4 Water shortages are being exacerbated by overdemand and construction of dams for hydropower projects.

5 Cambodia, China (Yunnan Province and Guangxi Zhuang Autonomous Region), the Lao PDR, Myanmar, Thailand and Viet Nam.

6 This information comes from personal communication with the Department of Forestry, 2019.

7 See https://coastal.climatecentral.org.

8 See the CAIT Climate Data Explorer, http://cait.wri.org/, accessed 12 November 2019.

9 These results include pine, rubber and palm oil plantations and other perennial crops.

10 See Hans Nicholas Jong, 14 August 2019, https://news.mongabay.com/2019/08/indonesia-forest-clearing-ban-is-made-permanent-but-labeled-propaganda/.

11 See www.nst.com.my/world/world/2019/12/544042/indonesian-fires-burnt-16-million-hectares-land-year.

12 May include temporarily unstocked forests, as per the national forest definition.

13 A different definition is used for reporting to the FAO Forest Resources Assessment. In 2015, Lao PDR defined forest as: minimum height of trees of 5 metres, minimum forest canopy cover of 10 percent and minimum area of 0.5 hectares, resulting in a forest cover area of 18,761,410 hectares.

14 It is not clear why there is a difference in the 2015 forest cover figures cited by the Department of Forests and the Ministry of Forests. It is possible this may be due to the use of different forest definitions.

15 This information comes from personal communication with the Department of Forestry, 2019

16 It is not clear if this sharp rapid reduction in forest area is due to a change in the definition of forest, improved data collection techniques or actual changes on the ground.

17 See Floodlist.com.

18 This information was compiled using Climate Change Commission (2018). Climate Change and the Philippines Executive Brief. Issue No. 1; National Commission of Indigenous People; National Mapping and Resource Information Authority; Philippine Forest at a Glance 2018 Edition; Philippine Forestry Statistics of the Forest Management Bureau; Philippines Statistics Authority. 2017. Philippine Statistical Yearbook; United States Agency for International Development (USAID). 2010. Building Low Emission Alternatives to Develop Economic Resilience and Sustainability Project (B-Leaders): Philippines Mitigation Cost-Benefit Analysis 2018 Update Report- Forestry Chapter; Senate Economic Planning Office. (June 2015). Philippine Forests at a Glance; World Bank. 2018. Rural Population percent of total population, https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=PHWorld Atlas, undated. Geography Statistics of the Philippines, www.worldatlas.com/webimage/countrys/asia/philippines/phlandst.htm.

19 See www.bangkokpost.com/thailand/general/1632754/community-forest-bill-wont-benefit-all-campaigners-say.

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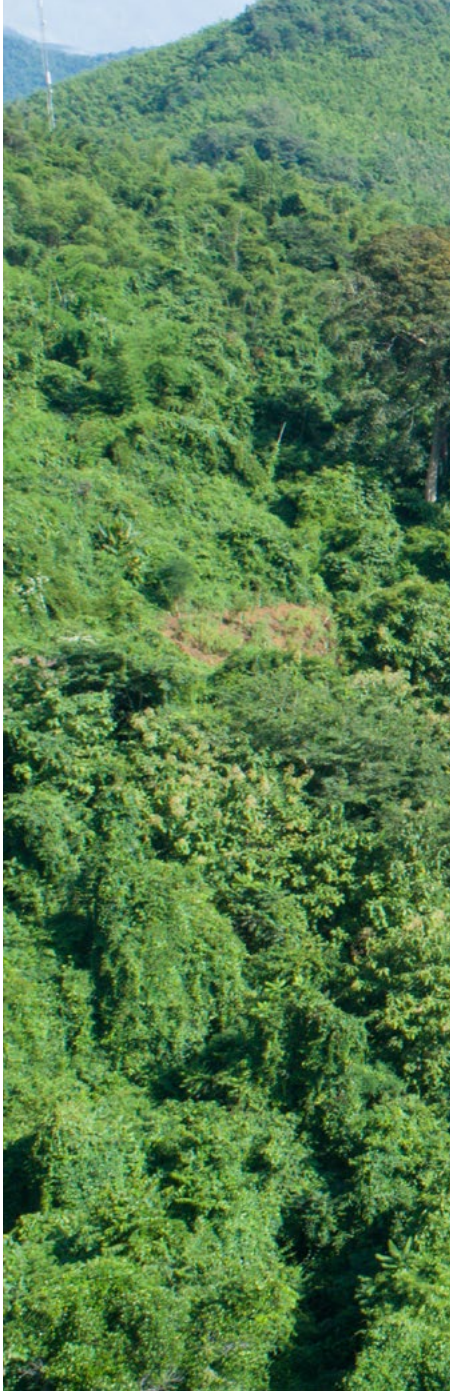

RECOFTC

At RECOFTC, we believe in a future where people live equitably and sustainably in and beside healthy, resilient forests. We take a long-term, landscape-based and inclusive approach to supporting local communities to secure their land and resource rights, stop deforestation, find alternative livelihoods and foster gender equity. We are the only non-profit organization of our kind in Asia and the Pacific. We have more than 30 years of experience working with people and forests, and have built trusting relationships with partners at all levels. Our influence and partnerships extend from multilateral institutions to governments, private sector and local communities. Our innovations, knowledge and initiatives enable countries to foster good forest governance, mitigate and adapt to climate change, and achieve the Sustainable Development Goals of the United Nations 2030 Agenda.

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