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Overview of Mangrove Governance and Lessons Learned in Cambodia, Thailand and Indonesia

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Executive Summary

In Southeast Asia (SE Asia), Mangroves have been known for their ecological support to climate action, livelihood assets and coastal protection. With 33 percent of the global mangroves located in SE Asia and one fifth in Indonesia, with SE Asia experiencing the greatest loss of mangroves. This problem mainly points to systematic problems in mangrove governance that need to be addressed in the region.

This report reviews existing studies to identify major challenges of mangrove governance that drive mangrove tenure conflicts and mangrove loss in Cambodia, Thailand and Indonesia to draw on lessons learned for other countries for sustainable mangrove conservation in the region.

The findings of this report showed that the commonalities of governance challenges shared by the three countries that drive mangrove loss and conflicts are unclear mangrove tenure and mangrove use planning to support mangrove conservation, weak law enforcement, ineffective cross-sectoral coordination, and limited community participation. A number of lessons learned could be drawn from the three case countries for effective conservation of mangroves in Southeast Asia.

1. Introduction

Mangroves have been increasingly known as valuable natural assets to support ecosystems and human society. It was estimated that the world had about 14.73 million ha of mangroves in 2020 located across 113 countries. The most extensive mangroves are located in Southeast Asia (33%), in which Indonesia has the largest coverage at one fifth of the global total [1]. 30% of the fish catch and almost 100% of the shrimp catch in SE Asia were contributed by mangrove forests [2]. Mangroves could absorb about 350 million megagrams of carbon worldwide [1]. They could also prevent over USD 65 billion in property damage caused by climate change and reduce flood risks to 15 million people every year [3].

With the highest number of mangrove forests however, SE Asia also experiences the greatest loss of mangroves [1]. The drivers of mangrove loss in SE Asia have been linked to both human and natural factors, with human factors remaining the main driver that can lead to mangrove tenure conflicts, violence and depletion of mangrove ecosystems on the ground [1]. Human factors such as mangrove clearance for agriculture, aquaculture and infrastructure development point to systematic problems in mangrove governance in SE Asia that need to be addressed [4].

This report reviews existing studies to identify major challenges of mangrove governance that drive mangrove tenure conflicts and mangrove loss in Cambodia, Thailand and Indonesia. It also seeks to draw lessons learned for effective and equitable governance of mangrove forests.

2. Research methods

This study used existing secondary data that includes datasets, reports, journal articles, legal frameworks and policy documents of the government of Cambodia, Thailand and Indonesia, NGOs and IOs to address the research questions. We also relied on the Global Mangrove Watch (2020)'s database, the FAO (2007)'s dataset, the analysis of Veettil and Quang (2019), the data of Pumijumnong (2014) and analysis of Arifanti et al., (2022) to synthesize the information on the trend of mangrove forest loss in the three countries.

3. Geography

Southeast Asia (SEA) has extensive mangrove coverage with approximately 33 percent of the total global mangroves. According to the Global Mangrove Watch dataset in 2020, Indonesia is the leading country, while Thailand and Cambodia rank respectively at 5th and 7th in the region as the countries with the highest amount of mangrove forests [1,5]. This massive dominance of mangrove coverage might be related to the favourable geographical location of the SEA countries. Indonesia's mangrove forests—home to one fifth of the global mangrove forest—are distributed along the elongated coastline of 95,181 km within the five main islands namely Jawa, Sumatra, Kalimantan, Sulawesi and Papua out of more than 17,504 islands [6, 7]. In Cambodia's, mangrove forests stretch over the 434 km-long coastline of the four main coastal provinces namely, Koh Kong, Sihanoukville, Kampot and Kep on the northeastern shore of the gulf of Thailand [8]. Approximately 80 percent of Thailand's mangroves are situated along the 937 km-

long Andaman coast in the Indian Ocean, while the rest are sited along the gulf of Thailand's with a length of 1,878 km [9,10].



Figure 1: Geographical distribution of mangrove forests in Cambodia, Thailand and Indonesia [5,11]

4. Trend of mangrove forest and its drivers of loss

4.1 Trend of mangrove forest

The diverse species of mangroves were found common among these three countries. Cambodia, Thailand and Indonesia were initially composed of 29, 35 and 47 species respectively. the IUCN found two types and five types of endangered mangroves in Thailand and in Indonesia [5].

The extent of mangrove forests in Cambodia, Thailand and Indonesia have been estimated differently by different studies. However, according to 2022 global mangrove watch (GMW), the estimated mangrove forest areas located within Cambodia, Thailand and Indonesia were 62,691 ha, 252,798 ha and 2.9 million ha, of which 65%, 6.29% and 25% were respectively located in the protected areas [5].

Table 1: Coverage of mangrove areas from different sources [5, 12,13, 14,15]

	References	Year	Area (ha)
CAMBODIA	FAO (2007)	2005	69,200
	Veettit and Quang (2019)	2016	51,603
	MoE (2020)	2018	57,053
	GMW (2022)	2020	62,691
THAILAND	FAO (2007)	2005	229,619
	Pumijumnong (2014)	2007	229,619
	GMW (2022)	2020	252,799
INDONESIA	FAO (2007)	2005	2,900,000
	GMW (2022)	2020	2,953,398

In the past, mangroves in the three countries had suffered significant destruction, but there was a substantial slowdown of mangrove loss during certain periods of time.

For example, according to Veettit and Quang (2019), Cambodia lost 36,810 ha between 1989 and 2016/2017. A large loss of mangrove forests in Cambodia occurred between 1989-1994 with an average loss rate of 1,994 ha per year. This rate had then slowed down somewhat between 1994-2009, with the average loss rate of 1,301 ha per year. The loss rate continued to drop significantly between 2009-2017, with an average loss rate of only 916 ha per year [14].

Thailand lost 142,737 ha between 1961 and 2007. The major loss of mangrove forest occurred over the period 1961-1986 with an average loss rate of 7,037 ha per year. During that period, the main loss of mangrove was found on the west coast of the southern region, the eastern region, the east coast of the southern region and

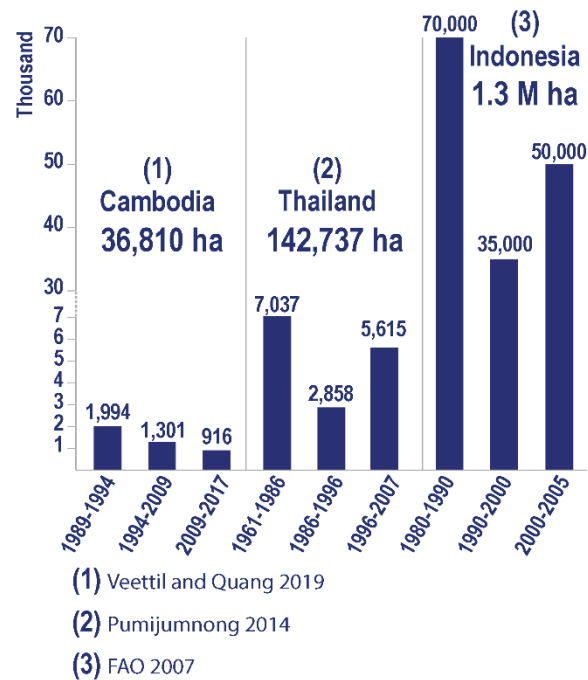


Figure 2: Average mangrove loss rate per year in Cambodia, Thailand and Indonesia [13,14,15]

the central region. The rate of average mangrove loss then slowed to 2,858 ha per year over the period 1986-1996, before it increased to 5,615 ha per year in 1996-2007 [15].

The total loss of mangroves in Indonesia was 1.3 million ha between 1980 and 2005. While the average loss rate of mangrove in Indonesia was high at 70,000 ha per year between 1980-1990, it then dropped to 35,000 ha per year between 1990-2000 but rose slightly to 50,000 ha per year between 2000-2005 [13].

The latest data from GMW (2022) showed a positive trend of mangrove gains in Cambodia, Thailand and Indonesia in the mid 2010s. Starting from 2008-2009, the annual rate of mangrove loss of the three countries had gradually dropped and by the mid 2010s, the annual rate of mangrove loss became minus, indicating the countries had gained back some mangroves. For example, the gain of mangroves in Cambodia began in 2016-2017, in Thailand in 2009-2010, and in Indonesia in 2017-2018 (see Figure 3). The positive trends might be the result of the conservation and rehabilitation efforts in those respective countries [5,16].

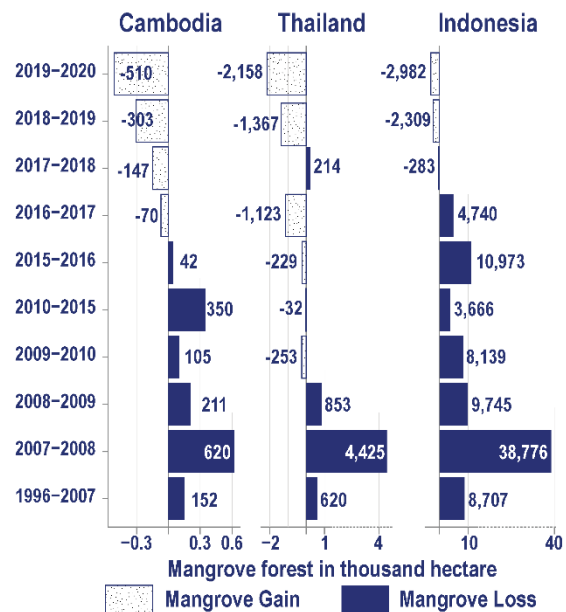


Figure 3: Annual mangrove loss rate in Cambodia, Thailand and Indonesia from 1996-2020 [5]

4.2 Drivers of mangrove loss

Cambodia, Thailand and Indonesia share similarities in terms of drivers of mangrove loss which can be grouped into six factors: i) aquaculture (shrimp farming), ii) agriculture (salt farming, rice cultivation and oil palm plantation), iii) urbanization (urban expansion and human settlements), iv) infrastructure development (piers, roads, ports and tourism-related infrastructure), v) other human activities (charcoal production, unregulated coastal development, timber production, non-productive conversion, poverty), and vi) natural factors (climate change, extreme weather events and erosion) [14,15,17,18,19, 20,21,22,23,24,25].

These six factors were the common contributors to mangrove loss in the three countries across different time periods. However, in the case of Indonesia, some studies found cutting mangroves for timber production was the main driver of mangrove loss in the past between 1960s-1990s [23] while in Thailand according to IUCN, 56 percent of mangroves was cleared by shrimp aquaculture and salt farms between 1961-1996 [17].

5. Types of mangrove tenure conflicts and violations

In Cambodia, mangrove tenure conflicts mainly occurred on state public land, protected areas and community fisheries land. Koh Kong and Kampot are the provinces that have frequent

conflicts and violations, followed by Kep and Sihanoukville. Similar to Cambodia, in Thailand, mangrove conflicts often happened within state public land, protected areas, reserved forest and community land and those conflicts mostly occurred in Phuket. On the other hand, in Indonesia mangrove tenure conflicts all occurred in state protected areas and state public land. Noticeably, conflicts over mangrove in these three countries commonly took place in the form of [14,15,17,18,19, 20,21,22,23,24,25]:

1. Clearance or encroachment on mangroves in protected areas or state public forest areas
2. Illegal title issuance on mangroves within protected areas or reserved forests areas
3. Overlapping claims on mangrove tenure between licensed investors and communities.

6. Mangrove governance

6.1 Legal frameworks and policies

Cambodia, Thailand and Indonesia share similar approaches in governing mangroves but prioritize their objectives differently. Cambodia with a small mangrove coverage plans to conserve mangroves in pursuit of a sustainable coastal ecosystem [26]. Thailand conserves mangroves to protect coastal resources but prioritizes natural disaster prevention and coastal erosion [27]. Indonesia, that has the largest area of mangroves in the region and in the world committed to mangrove conservation to achieve carbon sinks¹ by 2030 as set out in the global climate change agenda [28].

As mangroves are considered as a cross-sectoral issue situated between land and sea, governance of mangrove involves several laws and policies. Besides, fishery and forestry laws, other laws such as natural resource management, protected areas and national parks, marine and coastal resources management and land tenure are other relevant laws for mangrove governance (see Table 2).

In Cambodia, mangroves are part of fishery resources, so the Law on Fisheries adopted in 2006 provides frameworks to govern mangroves. In Thailand, mangroves are classified as forest, therefore forestry laws such as the Forest Act B.E. 2484 adopted in 1941, the National Park Act 2504 B.E. in 1961 and the Marine and Coastal Resources Management Act, B.E. 2558 adopted in 2015 could be applied to mangroves [29]. In Indonesia, governance of mangroves involves two sectors, forestry and fishery and the marine/coastal sector. Therefore, the regulations that serve as the basis for mangrove conservation were the 1960 basic agrarian law, law No. 5 of 1990 on the conservation of biological natural resources and their ecosystems, the regulation of presidential decree No. 32 of 1990 on the management of protection areas and law No. 41 on forestry adopted in 1999 [24, 30].

¹ Carbon sinks refer to natural or artificial carbon sequestration process that removes a greenhouse gas from the atmosphere.

In Cambodia, in the last seven years, there were efforts of the government to amend the Land Law 2001, Forestry Law 2002, Fisheries Law 2006 and Natural Protected Area Law 2008 to improve natural resource management, in particular the mangrove forest and tenure. Box 1 describes the legislative reforms to date relevant to mangroves in Cambodia.

Box 1. Legislative reform process to date relevant to mangroves in Cambodia

The Royal Government of Cambodia has conducted legislative reforms in the last seven years related to natural resources, in particular on mangrove forests. According to the Notification on the Outcome of the Plenary Session of the Council of Ministers on November 6, 2015, by Letter No. 1303 sor chor nor sor ror, the National Committee for Sub-National Democratic Development (NCDDs) is leading the preparation of the draft amendment to the Fisheries Law, Forestry Law, and Natural Protected Area Law. The three final revised laws are guided by principles such as sustainable development, good governance, transparency and participation, precautionary approach, and regional and international cooperation. These principles reflect the regional and international commitments to sustainable management and conservation of natural resources.

In November 2017, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) amended the Fisheries Law by changing Articles 6, 41, 42, 43, and 95. The amendments brought three significant changes that impacted the fisheries sector. Firstly, Fisheries Cantonments will now be integrated into the Provincial Departments of Agriculture, Forestry, and Fisheries under a new legal article. Secondly, the classification of gears for commercial fishing activity, specifically medium and large-scale operations, will be revised. Thirdly, a new scheme for offenses and penalties (including mangrove forests) will be introduced. The three draft laws have been thoroughly reviewed by the legal team, consisting of the Ministry of Justice, Ministry of Interior, Ministry of Agriculture, Forestry and Fisheries, Ministry of Environment and the National Committee for Sub-National Democratic Development, who have proposed a revised version that will be submitted to the Office of the Council of Ministers and the National Assembly in 2024. The specific role of the Sub-National Administrations in managing natural resources, such as forests, mangrove forests, fisheries, and protected areas within their jurisdiction, will be defined by the sub-decrees based on these three laws. Furthermore, the three laws ensure proper management, conservation, and development of such resources by delegating specific tasks to the Sub-National Administrators.

Besides the three draft laws, the Royal Government of Cambodia is also working on the new draft land law. To date, the draft Land Law is in the process of having public consultations to consolidate inputs from different NGO networks to be submitted to the Ministry of Land Management, Urban Planning and Construction (MLMUPC) for consideration by early 2024.

Another piece of legislation relevant to mangroves was the Environment and Natural Resource Code. In June 2023, the Ministry of Environment (MoE) also successfully introduced the Environment and Natural Resource Code that consists of 12 books and 865 articles. The management of mangroves is stated under Book 4 on sustainable management of natural resources.

Table 2: Existing laws and policies that define mangrove governance in Cambodia, Thailand and Indonesia

Thailand	Cambodia	Indonesia
<ul style="list-style-type: none"> ▪ Forest Act 1941 ▪ Amended Land Code 1954 ▪ National Park Act 1961 ▪ National Reserved Forest act 1964 ▪ His Royal Highness King Rama 9 Declaration 1991 ▪ Wildlife Reservation and Protection Act 1992 ▪ Commercial Forest Plantation Act 1992 ▪ Decentralization Act 1999 ▪ Marine and coastal resources management act 2015 ▪ Promotion and Conservation of National Environmental Quality Act 1992/2018 ▪ Community Forest Act 2019 	<p>Ministry of Agriculture, Forestry and Fisheries:</p> <ul style="list-style-type: none"> ▪ Fisheries Law 2006 and new draft Law ▪ Forestry Law 2002 and new draft Law ▪ Sub-decree No. 79 on Community Forestry Management 2003 ▪ Sub-decree No. 25 on Community Fisheries Management 2007 <hr/> <p>Ministry of Economic and Finance:</p> <ul style="list-style-type: none"> ▪ Sub-decree No. 146 on Economic Land Concessions 2005 ▪ Sub-decree No.148 on the Establishment and Management of the Special Economic Zone 2005 <hr/> <p>Ministry of Environment</p> <ul style="list-style-type: none"> ▪ Environment and Natural Resources Code 2023 ▪ Law on Environmental Protection and Natural Resource Management 1996 ▪ Law on Natural Protected Areas 2008 and new draft Law ▪ Sub-decree on Water Pollution Control 1999 ▪ Sub-Decree on Solid Waste Management 1999 ▪ Sub-Decree on Environmental Impact Assessment 1999 ▪ Cambodia’s Shoreline Management Strategy (2006) ▪ Zoning guidelines for the protected areas in Cambodia 	<ul style="list-style-type: none"> ▪ Basic agrarian law 1960 ▪ Law on conservation of biological natural resources and their ecosystems 1990 ▪ No. 41 on Forestry 1999 ▪ Law on environmental protection and management 2009 ▪ Law on management of coastal zone and small islands 2007/2014 ▪ Law on regional government 2014
<ul style="list-style-type: none"> ▪ Policy on zoning for mangrove 1987 ▪ Mangrove rehabilitation policy 1991 ▪ Government resolution 1999 ▪ National economic and social development plan 2017-2021 	<p>Ministry of Land Management, Urban Planning and Construction</p> <ul style="list-style-type: none"> ▪ Land Law 2001 and new draft Law ▪ Law on the Amendment to the Law on Investment of the Kingdom of Cambodia 2003 <hr/> <p>Ministry of Interior</p> <ul style="list-style-type: none"> ▪ Sub-decree No. 182 on the Functions and Structure of Municipal Administration ▪ Sub-decree No. 184 on the Functions and Structure of District Administrations <hr/> <p>Ministry of Water Resources and Meteorology</p> <ul style="list-style-type: none"> ▪ Law on Water Resources Management 2007 <hr/> <p>National Committee on Coastal Area Management and Development</p> <ul style="list-style-type: none"> ▪ Royal Decree promulgating the Establishment of the National Committee on Coastal Area Management and Development 2012 	<ul style="list-style-type: none"> ▪ Presidential decree No.32 on the management of Protection Areas 1990 ▪ Presidential decree on forest protection 2004 ▪ Presidential decree on the national strategy for mangrove ecosystem management 2012 ▪ Presidential decree on

<ul style="list-style-type: none"> ▪ Sub-decree No. 171 on Organization and Functioning of General Secretariat of National Committee on Coastal Area Management and Development 2012 	Strategic Coordinating Team for Wetland Management 2020
Royal Government of Cambodia	
<ul style="list-style-type: none"> ▪ Circular No. 001 on Development of Cambodia Coastal Areas 2012 ▪ Circular No. 05 on Necessary Measures to Strengthen Natural Resource Management 2016 ▪ Cabinet Decision No. 45 on Regulations on Creation, Conservation and Supervision of Marine Resources 2013 ▪ Cabinet Decision No. 127 on the Establishment of the National Committee for the Prevention and Suppression of Natural Resource Crimes 2016 	

In total, Cambodia has at least 7 laws (4 of which are in the process of amendment), one code, 1 Royal-decree and 10 sub-decrees; Thailand 10 laws and 1 Royal Declaration; and Indonesia at least 6 laws and 4 presidential decrees that concern mangrove governance (see Table 3).

It is common across the three countries that mangroves are also managed by multiple ministries due to their overlapping boundary complexity. In Cambodia, mangroves can be found in six sectoral jurisdictions such as i) Natural Protected Area (NPA), ii) Community Protected Area (CPA), iii) Community Fisheries (CF), (iv) Economic Land Concession (ELC), v) Special Economic Zone (SEZ) and vi) Private Land Title (PLT). Therefore, at least seven ministries are involved in managing mangroves in Cambodia while in Indonesia, four ministries engage in mangrove governance. In Thailand, on the other hand, most of mangroves are managed by the Ministry of Natural Resources and Environment although by two different departments. Only for mangrove within naval bases, the responsibility is assigned to the Royal Thai Navy.

Even so, it is still similar among Cambodia, Thailand and Indonesia that inter-ministerial bodies are established to help coordinate mangrove management [31, 32, 33]. The roles and responsibilities of these inter-ministerial bodies can be found in the Annex.

Table 3: Number of laws, regulations and policies, inter-ministerial bodies and ministries involved in mangrove governance across Cambodia, Thailand and Indonesia

	Laws/regulation/policies	Inter-ministerial bodies	Ministry support
Cambodia	<ul style="list-style-type: none"> ▪ 7 laws (4 in the process of amendment) ▪ 1 code ▪ 1 Royal-decree ▪ 10 Sub-decrees ▪ 4 circular/cabinet decision/regulations ▪ Other policies 	<ul style="list-style-type: none"> ▪ National Committee on Coastal Area Management and Development 2012 ▪ National Committee for the Prevention and Suppression of Natural Resource Crimes 2016 	<ul style="list-style-type: none"> ▪ Ministry of Agriculture, Forestry and Fisheries ▪ Ministry of Environment ▪ Ministry of Land Management, Urban Planning and Construction ▪ Ministry of Economic and Finance ▪ Ministry of Interior ▪ Ministry of Water Resources and Meteorology ▪ Ministry of Tourism
Thailand	<ul style="list-style-type: none"> ▪ 10 laws ▪ 1 Royal declaration ▪ Other policies 	<ul style="list-style-type: none"> ▪ National Committee on Marine and Coastal Resource Management Policy and Planning 	<ul style="list-style-type: none"> ▪ Ministry of Natural Resources and Environment ▪ Royal Thai Navy ▪ Ministry of Interior
Indonesia	<ul style="list-style-type: none"> ▪ 6 laws ▪ 4 presidential decrees ▪ Other policies 	<ul style="list-style-type: none"> ▪ Strategic Coordinating Team for Wetland Management 	<ul style="list-style-type: none"> ▪ Ministry of Environment and Forestry (MOEF) ▪ Ministry of Marine Affairs and Fisheries (MMAF) ▪ Ministry of Agrarian and Spatial Planning Affairs/National Land Agency (MASPPA-NLA) ▪ Ministry of National Development Planning (MNDP)

In terms of tenure, mangroves are considered as state public properties in the three countries. Therefore, human settlement and mangrove utilization for private use in the state owned mangrove areas including protected areas are prohibited. However, there were exceptions when “state public properties lose their public use, they can be listed as private property of the state” based on the Cambodian Land Law 2001 [34]; or when there is a licence or permission is given by the Ministry of Natural Resources and Environment based on the National Reserved Forest Act 1964 of Thailand [29]; or when location licenses or management licenses are issued based on

the Amendment to Law Number 27 of 2007 on Management of Coastal Zone and Small Islands 2014 of Indonesia [35].

For community’s rights to mangroves, the existing laws in the three countries have recognised these rights (see Table 4). However, the degree of devolvement of mangroves to communities still varied by country. Thailand seemed to show high commitment to community tenure rights through its efforts to adopt the Community Forest Act B.E. 2562 in 2019. Cambodia and Indonesia, though not having a separate law on community tenure rights, have embedded community rights into their existing legal frameworks, such as the Fishery Law 2006, the sub-decree on the Community Forestry Management 2003, the sub-degree on the Community Fishery Management 2007, the Land Law 2001 and the Law on Natural Protected Areas 2008 for Cambodia, and for Indonesia, it is Law no.1/2014 on the Management of Coastal Zone and Small Islands, Law No. 32 on environmental protection and management 2009 and the Presidential Decree No. 73 2012. Further legal analysis to explain to what extent the community rights have been protected by these laws in the three countries is needed.

In Cambodia, due to the recent amendments to the existing laws by the Royal Government of Cambodia (e.g. Land Law, Fisheries Law, Forestry Law and Natural Protected Area Law), how community’s rights to mangroves are affected by these amendments will be discussed in a separate legal analysis paper.

Table 4: Existing laws related to community rights to mangroves in Cambodia, Thailand and Indonesia

Cambodia	Thailand	Indonesia
<ul style="list-style-type: none"> ▪ Law on Fisheries in 2006 ▪ Sub-decree No. 79 on Community Forestry Management 2003 ▪ Sub-decree No. 25 on Community Fishery Management in 2007 ▪ Land Law 2001 ▪ Law on Natural Protected Areas 2008 	<ul style="list-style-type: none"> ▪ Community Forest Act B.E. 2562 	<ul style="list-style-type: none"> ▪ Law No. 32 on Environmental Protection and Management in 2009 ▪ Law No.1 on Management of Coastal Zone and Small Islands 2014 ▪ Presidential decree No. 73 on the National Strategy for Mangrove Ecosystem Management 2012

6.2 Governance challenges

Like the rest of the world, the configuration of mangrove governance in Cambodia, Thailand and Indonesia remains complex. This is due to the ambiguous position of mangroves situated between the land and sea, that to some extent has to involve various intersectoral bodies that

include forestry, fishery, land, coastal, marine resources and protected areas, that have different priorities and interests [30,31].

Although some efforts have been made by Thailand to put mangroves mostly under the jurisdiction of the Ministry of Natural Resources and Environment, the complexity of mangrove governance and management remain due to the potential for mangrove areas being developed for economic development (e.g. commercial ports, shrimp aquaculture, agriculture, real estate, resorts and so forth), that to some extent involves the jurisdictions of various sectors. To restore mangroves, these underlying economic development priorities need to be thoroughly studied in comparison to ecological and socioeconomic values of mangroves [36].

In Cambodia, Thailand and Indonesia, we also see the efforts of the government to address this issue by establishing multi-sectoral bodies to coordinate the work between sectors. However, in practice, the implementation of these bodies is still constrained due to low budget and lack of linking mechanisms across sectors and levels of government [30,37,38].

Effective governance of mangroves also requires fair and effective laws and enforcement. This means that the laws and policies should be clearly defined, are consistent with human rights consider the situation of indigenous people, local communities, women and all vulnerable, marginalized and/or minority groups, and incorporate the principles of environmental sustainability [39].

Unclear tenure for mangroves was another driver of mangrove conflicts and evictions in the three countries. Despite having tenure regulations, it was still found that mangrove conflicts in the three countries revolved around having various claims of ownership by actors to own the same mangrove areas, leading to tensions which points to the issue of unclear mangrove tenure in the three countries. To address this issue, there is a need for strengthening mangrove tenure and tenure rights through revisiting and redefining the relevant existing laws and regulations to realign them to support mangrove conservation [40].

There is more recognition that government-led mangrove protection efforts alone are not effective enough due to inadequate personnel, limited capacities of responsible departments and budgets of the government [41]. Therefore, the trend to shape mangrove governance with the use of inclusive models of community-based management or co-management through devolved tenure arrangements to communities became popular across the three countries.

Embedding community tenure rights into the existing laws and regulations indicated the extent to which community rights have been recognized by the governments. However, access to justice and conflict resolution is important. Communities should be aware of their natural resource-related rights and the avenues available to them for resolving conflicts or seeking redress. They should be able to seek and obtain support for grievances and resolve their conflicts [39].

Findings from previous studies across the three countries showed that natural factors such as sea level rise and erosion are becoming important drivers of mangrove loss in the region. Strategies

could be developed in response to these factors to build mangrove resilience by identifying degraded areas for restoration and rehabilitation programs [42]. Indonesia and Thailand shared a long history of implementing restoration programs for mangroves, which can provide lessons learned to Cambodia.

Mangrove restoration could fail if it involves an inappropriate mangrove planting program, i.e., mono species plantation or lack of maintenance. Box 2 provides the good lessons learned of how Community-Based Ecological Mangrove Restoration (CBEMR) in Thailand could contribute to higher survival rates of mangroves.

Box 2. The Case of Community-Based Ecological Mangrove Restoration (CBEMR) in Thung Yor village, Krabi Province, Thailand

Community-Based Ecological Mangrove Restoration (CBEMR) has been implemented in Thung Yor village, Krabi province, Southern of Thailand since 2017 by the Mangrove Action Project (MAP). In the early 1990s, the mangroves in the village were cleared for shrimp farms. Through restoration efforts in 2017, the village gained back mangrove forests in just a few years thanks to CBEMR with the participation of a project team, community and stakeholders. It was found that 12 mangrove species including fish returned for the local people. The restoration required not a single hand to plant a propagule, but with water flow corrected. Different to the traditional practices, CBEMR applies natural processes, taking into account mangrove ecology and biology to restore degraded mangrove areas. CBEMR allows local communities to learn social and technical challenges affecting the restoration site, including site hydrology, soil elevation relative to sea level, pressures on the mangroves and why a site is not naturally regenerating. CBEMR was considered cost effective because it does not only ensure a higher survival and success rate of mangrove regeneration, but also avoids the cost and necessities of building a nursery and planting [43, 44].

Also, based on Thailand's experience, the fact that the restoration program depends on external funding agencies, which could affect the autonomy of internal institutions to decide how, where, and when mangrove rehabilitation should be implemented, therefore leading to low survival rate of mangroves [37]. The literature also suggested that an effective restoration program for mangroves still requires a clear mangrove tenure arrangement. From the experience of Indonesia, comparing different tenure regimes, community-controlled areas are considered as the most secure and effective, to help manage, protect and rehabilitate mangroves [30].

7. Conclusion and Lessons Learned

This paper confirms that natural factors have gradually emerged as a contributor to mangrove loss, but systematic problems in mangrove governance remain the key driver that must be addressed. Drawing from the experiences of Cambodia, Thailand and Indonesia, the

commonalities of governance issues shared by the three countries that drive mangrove loss and conflicts include unclear mangrove tenure and mangrove use planning to support mangrove conservation, weak law enforcement, ineffective cross-sectoral coordination, and limited community participation. A number of lessons learned could be drawn from this paper for effective conservation of mangroves in the region.

- In countries where mangrove coverage under protected areas remains small, incorporating more mangrove areas into protected areas is a necessary measure to support mangrove conservation;
- Incorporating mangroves into protected areas may not contribute to mangrove conservation if zoning of protected areas is not clear or there is a lack of law enforcement;
- Strengthening security of mangrove land tenure and land use planning is important as it allows people to invest in protecting and restoring mangrove ecosystems in their areas. However, granting mangrove tenure for large-scale investment projects that are identified as a threat to local communities should be avoided or the appropriate environmental impact assessment should be conducted;
- Effective mangrove conservation and restoration still depends on the models of community-based management and customary rights. Therefore, returning the control of mangroves to communities to manage and rehabilitate them could be considered. However, stakeholders need to provide support to communities through strengthening local leadership, providing support on technology and resources, promoting local participation and livelihoods and ensuring effective government coordination in support of communities;
- While countries may have already adopted laws and policies to govern mangrove tenure rights (i.e., forestry laws, fishery laws, protected area laws, coastal laws, natural resource management laws or land laws), overlapping regulations remain. Therefore, there is a need to revisit the existing laws to realign them and clarify government's authority across sectors;
- Due to the effects of climate change, building mangrove resilience through mangrove restoration programs is important. There is a need to focus on the appropriate selection of mangrove species for planting, the hydrological works to control tidal flows for mangroves, engagement of the community for mangrove maintenance, and sustainable funding and autonomy of internal institutions to decide how, where, and when mangrove rehabilitation should be implemented.

References

- [1] Leal, Maricé and Spalding, Mark D (editors) (2022). The State of the World's Mangroves 2022.
- [2] RECOFTC (2011). Mangroves more Carbon Rich and Important for Climate Change. Available at: <https://archive.recoftc.org/project/grassroots-capacity-building-redd/news-and-features/mangroves-more-carbon-rich-and-important-climate-change>
- [3] P. Menéndez, I.J. Losada, S. Torres-Ortega, S. Narayan, M.W. Beck (2020). The Global Flood Protection Benefits of Mangroves, Scientific Reports 10 (1).
- [4] World Bank (2003). Governance of natural resources in the Philippines: Lessons from the past, direction.
- [5] Bunting, P.; Rosenqvist, A.; Hilarides, L.; Lucas, R.M.; Thomas, T.; Tadono, T.; Worthington, T.A.; Spalding, M.; Murray, N.J.; Rebelo, L-M. (2022). Global Mangrove Extent Change 1996 – 2020: Global Mangrove Watch Version 3.0. Remote Sensing. <https://www.globalmangrovetwatch.org/>
- [6] Kusmana, C. and Sukristijono, S. (2016). Mangrove Resource Uses by Local Community in Indonesia. Journal of Natural Resources and Environmental Management, vol. 6 (2).
- [7] World Bank (2021). Indonesia's 'Green Belt' - Mangroves for local and global benefits. Available at: <https://blogs.worldbank.org/eastasiapacific/indonesias-green-belt-mangroves-local-and-global-benefits>
- [8] Nop, S., DasGupta, R., Shaw, R. (2017). Opportunities and challenges for participatory management of mangroves resource (PMMR) in Cambodia. In: DasGupta, R., Shaw, R. (Eds.), Participatory Mangrove Management in a Changing Climate, Disaster and Risk Reduction, pp. 187–202. https://doi.org/10.1007/978-4-431-56481-2_12.
- [9] Kaosa-ard, M. and Pednekar, S.S. (1998) Background report for the Thai Marine Rehabilitation Plan 1997–2001. Report submitted to the Joint Research Centre of the Commission of the European Community and the Department of Fisheries, Ministry of Agriculture and Cooperatives, Thailand Development Research Institute, Bangkok, Thailand.
- [10] Spalding, M., Kainuma, M. and Collins, L. 2010. World Atlas of Mangroves. Earthscan, London.
- [11] Miller M.A. and Tonoto, P. (2023). Leveraging plural valuations of mangroves for climate interventions in Indonesia. Sustainability science 18:1533-1547.
- [12] MoE (2020). Cambodia forest cover 2018. Phnom Penh: MoE.

- [13] FAO (2007). The world's mangroves 1980-2005. FAO forestry paper 153. Available at <https://www.fao.org/3/a1427e/a1427e00.htm>
- [14] Veettil, B.K and Quang, N.X. (2019). Mangrove forests of Cambodia: Recent changes and future threats. *Ocean and coastal management*, 181(104895).
- [15] Pumijumnong, N. (2014). Mangrove forests in Thailand. In Fraidah-Hanum, I., Latiff, A., Hakeem,
- [16] Ei Win, Hnin (2018). Mangrove forest conservation in Thailand. <https://ap.ffc.org.tw/article/1277>
- [17] IUCN (2020). Thailand celebrates its first National Mangrove Forest Day. Available at: <https://www.iucn.org/news/thailand/202005/thailand-celebrates-its-first-national-mangrove-forest-day>
- [18] Fauzi, A. Sakti, A., Yayusman, L., Harto, A., Prasetyo, L., Irawan, B., Kamal, M. & Wikantika, K. (2019). Contextualizing mangrove forest deforestation in Southeast Asia using environmental and socio-economic data products. *Forests*, 10, 952.
- [19] Richards, D.R. and Friess, D.A. (2016). Rates and drivers of mangrove deforestation in Southeast Asia, 2000–2012. *PNAS*: 113 (2) 344-349
- [20] Goldberg, L., Lagomasino, D., Thomas, N., and Fatoyinbo, T. (2020). Global declines in human-driven mangrove loss.
- [21] Su, J. (2021). Mapping mangrove in Cambodia: Evaluating mangrove forest land cover changes in Kampong Som Bay, Cambodia, using Landsat 8 OLI satellite data. <https://storymaps.arcgis.com/stories/7949763f7c804cc88100d4237badd777>
- [22] Ministry of Environment (Cambodia). 2019. National state of oceans and Coasts 2018: Blue Economy Growth of Cambodia. Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), Quezon City, Philippines. 169 p.
- [23] Ilman, M., Dargusch, P., Dart, P., and Onrizal. (2016). A historical analysis of the drivers of loss and degradation of Indonesia's mangroves. *Land Use Policy*. 54:448-459.
- [24] Arifanti, V.B.; Sidik, F.; Mulyanto, B.; Susilowati, A.; Wahyuni, T.; S.; Y.; Yuniarti, N.; Aminah, A.; Suita, E.; et al. (2022). Challenges and Strategies for Sustainable Mangrove Management in Indonesia: A Review. *Forests*, 13, 695. doi:<https://doi.org/10.3390/f13050695>
- [25] Bhowmilk, A.K., Padmanaban, R., Cabral, P., and Romeiras, M.M. (2022). Global Mangrove Deforestation and Its Interacting Social-Ecological Drivers: A Systematic Review and Synthesis. *Sustainability* 2022, 14(8), 4433
- [26] MAFF (2015). The strategic planning framework for fisheries update for 2015-2025. Phnom Penh: RGC

- [27] RTG (2012). 11th National Economic and Social Development Plan (NESDP) (2012-2016). Bangkok: RTG.
- [28] World Bank (2021). Indonesia's 'Green Belt' - Mangroves for local and global benefits. Available at: <https://blogs.worldbank.org/eastasiapacific/indonesias-green-belt-mangroves-local-and-global-benefits>
- [29] FAO and IUCN (2016). Mangrove related policy and institutional frameworks in Pakistan, Thailand and Viet Nam.
- [30] Banjade, M.R., Liswanti, N., Herawati, T., & Mwangi, E. (2017). Governing mangroves: Unique challenges for managing Indonesia's coastal forests. Bogor, Indonesia: CIFOR; Washington, DC: USAID Tenure and Global Climate Change Program.
- [31] RGC (2012). Sub-degree on organization and Functioning of General Secretariat of National Committee On Coastal Area Management and Development. Phnom Penh, Cambodia
- [32] RTG (2017). 12th National Economic and Social Development Plan (NESDP) (2017-2021). Bangkok: RTG.
- [33] Mursyid, H. et al. (2021). Governance issues related to the management and conservation of mangrove ecosystems to support climate change mitigation actions in Indonesia. Forest Policy and Economics 133. Available at: <https://www.ykan.or.id/content/dam/tnc/nature/en/documents/ykan/buku-dan-jurnal/itp/1-s2.0-S1389934121002288-main.pdf>
- [34] RGC (2001). Land Law. Phnom Penh, Cambodia.
- [35] Republic of Indonesia (2018). Amendment to Law Number 27 of 2007 on management of coastal zone and small island. Available at: <https://faolex.fao.org/docs/pdf/ins139269.pdf>
- [36] Pham TT, Vu TP, Pham DC, Dao LHT, Nguyen VT, Hoang NVH, Hoang TL, Dao TLC and Nguyen DT. 2019. Opportunities and challenges for mangrove management in Vietnam: Lessons learned from Thai Binh, Quang Ninh and Thanh Hoa provinces. Occasional Paper 197. Bogor, Indonesia: CIFOR.
- [37] Memon, J.A and Chandio, A.A. (2011). Critical appreciation of restoration and conservation of degraded mangroves in Thailand. *International Journal of Environmental and Rural Development* 2-2.
- [38] Jong, H. N. (2022, Feb 01). Indonesia on track with peatland restoration, but bogged down with mangroves. (Mongabay News) Retrieved Jul 20, 2023, from [bogged-down-with-mangroves](#)
- [39] Springer, J., Campese, J. and Nakangu, B. (2021). *The Natural Resource Governance Framework – Improving governance for equitable and effective conservation*. Gland, Switzerland: IUCN.
- [40] Chigbu, U.E., Mabakeng, M.R. and Chilombo, A. 2021. Strengthening tenure and resource rights for land restoration. UNCCD Global Land Outlook Working Paper. Bonn.
- [41] Rotich, B., Mwangi, E. and Lawry, S. (2016). Where land meets the sea: A global review of the governance and tenure dimensions of coastal mangrove forests. Available at:

<https://www.climatelinks.org/sites/default/files/asset/document/2021-08/Where%20Land%20Meets%20the%20Sea%20Brief.pdf>

[42] McLeod, Elizabeth and Salm, Rodney V. (2006). Managing Mangroves for Resilience to Climate Change. IUCN, Gland, Switzerland. 64pp.

[43] MAP (2024). Thailand's mangrove reimagined Available at:
<https://photography.mangroveactionproject.org/stories-post/thailand-mangroves-reimagined>

[44] GMA (2024). Restoring the natural mangrove forest in Thailand. Available at:
<https://www.mangrovealliance.org/restoring-the-natural-mangrove-forest-in-thailand/#>

Annex

Table 1. Main institutions responsible for mangroves and their jurisdiction

	Responsible institutions	Jurisdiction
Cambodia	Fishery Administration under the Ministry of Agriculture, Forestry and Fisheries	Manage fishery resources including mangroves within flooded area attached to fishing areas
	Nature Protection and Conservation Administration under the Ministry of Environment	Implement the framework for the management, conservation and development of protected areas including fishery resources and mangroves Investigate, control, and crackdown on illegal activities harmful to the protected area and, if necessary, file a complaint to court
Thailand	Department of marine and coastal resources under the Ministry of Natural Resources and Environment	Govern mangrove forests outside national parks and naval areas including mangroves in conservation zones and those in reserved forests
	Department of national parks, wildlife and plant conservation under the Ministry of Natural Resources and Environment	Oversees mangrove forests inside the protected areas
	The royal Thai navy	Oversees mangrove forests within naval bases
Indonesia	Ministry of Environment and Forestry	Mangrove protection located in the state forest areas both in mainland and maritime
	Ministry of Marine Affairs and Fisheries	Mangrove protection outside the state forest areas (coastal and small island areas)
	Ministry of Agrarian and Spatial Planning Affairs	Tenure rights enforcement and spatial planning development in the mangrove zones
	Ministry of National Development Planning	Prepare the national strategy for mangrove ecosystem management
Cambodia	National Committee for the Prevention and Suppression of Natural Resource Crimes (NCPSNRC)	Prevent and suppress natural resource crimes which include coastal and fishery resources, such as deforestation, timber transportation, illegal timber exports, wildlife capture and illegal wildlife exports, encroachment on state land, and illegal mining throughout the country.
	National Committee on Coastal Area Management and Development	Manage and develop coastal areas in Cambodia in a sustainable and responsible manner
Thailand	National Committee on Marine and Coastal Resource Management Policy and Planning	Monitor, implement and approve the national mangrove conservation policy and implement plan regarding those mangrove resources outside national parks, wildlife sanctuaries, non-

hunting areas and privately owned mangrove land

Indonesia	National coordinating team for mangrove ecosystem management	Ensure it can achieve international sustainable development goals (SDGs), low carbon development and the country's nationally determined contribution report to the United Nations Framework Convention on Climate Change (UNFCCC)
	Strategic coordination team for wetlands management under MNDP	
