



USAID
FROM THE AMERICAN PEOPLE



GOVERNING MANGROVES

UNIQUE CHALLENGES FOR MANAGING INDONESIA'S COASTAL FORESTS

JULY 2017

GOVERNING MANGROVES

UNIQUE CHALLENGES FOR MANAGING INDONESIA'S COASTAL FORESTS

Mani Ram Banjade

Center for International Forestry Research (CIFOR)

Nining Liswanti

Center for International Forestry Research (CIFOR)

Tuti Herawati

Center for International Forestry Research (CIFOR)
Forestry Research Development Agency (FORDA)

Esther Mwangi

Center for International Forestry Research (CIFOR)

JULY 2017

This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of its authors and do not necessarily reflect the views of USAID or the United States government.

This publication was produced for review by the United States Agency for International Development by Tetra Tech, through a Task Order under the Strengthening Tenure and Resource Rights Indefinite Delivery, Indefinite Quantity (USAID Contract No. AID-OAA-TO-13-00016).

Suggested Citation: 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.

This report is available at: [https://www.land-links.org/
www.cifor.org/library](https://www.land-links.org/www.cifor.org/library)

Prepared by: CIFOR for Tetra Tech

Tetra Tech
159 Bank Street, Suite 300
Burlington, VT 05401

CIFOR
Jl. CIFOR, Situ Gede
Bogor Barat 16115
Indonesia

Principal Contacts: Stephen Brooks
Land Tenure and Resource Governance Advisor
USAID Office of Land and Urban
Bureau for Economic Growth, Education, and Environment
sbrooks@usaid.gov

Matt Sommerville, Chief of Party
Matt.Sommerville@tetrattech.com

Cristina Alvarez, Project Manager
Cristina.Alvarez@tetrattech.com

Megan Huth, Deputy Project Manager
Megan.Huth@tetrattech.com

Cover photo by Rio Ahmad/Blue Forests. Coastal Field School participants from Kurri Cadi, Maros, South Sulawesi discuss the results of a trend analysis in preparation for mangrove restoration activities.

CONTENTS

ACRONYMS & ABBREVIATIONS	V
ACKNOWLEDGMENTS	VI
EXECUTIVE SUMMARY	VII
I INTRODUCTION	I
2 METHODOLOGY	5
3 MANGROVE GOVERNANCE AND TENURE: NATIONAL POLICY AND LEGAL FRAMEWORK	8
3.1 Government Agencies and Authorities Responsible for Mangrove Management	9
3.2 Legal and Policy Architecture for Mangrove Conservation and Management	9
4 MANGROVE GOVERNANCE AND TENURE IN PRACTICE IN LAMPUNG PROVINCE	14
4.1 Status of Mangroves in Lampung Province	15
4.2 Government Sectoral Responsibilities over Mangroves	16
4.3 Village Site Selection	19
4.4 History and Motivation for Community-based Mangrove Management	19
4.5 Village-level Tenure and Property Regimes in Mangroves	19
4.6 Village-level Mangrove Management Institutions	22
4.7 Gender and Mangrove Governance	25
4.8 Collaborative Mangrove Management	27
4.9 Community Efforts at Mangrove Rehabilitation	27
5 OPPORTUNITIES AND CHALLENGES FOR THE GOVERNANCE OF COASTAL MANGROVE FORESTS	29
5.1 Overlapping Governmental Jurisdictions and Regulations	30
5.2 Rights Distribution and Tenure Security	30
5.3 Benefits Capture and Distribution	31
5.4 Coordination among Key Stakeholders for Mangrove Governance	32
5.5 Outcomes of Mangrove Rehabilitation Efforts in Study Sites	32
5.6 Gender Equality	33
5.7 Conflict Resolution	34
5.8 Monitoring, Review, and Learning	34

6	RECOMMENDATIONS FOR POLICY, PRACTICE, AND RESEARCH	35
6.1	Strengthen National-level Coordination on Mangrove Governance	36
6.2	Devolve Mangrove Governance and Tenure to Communities	36
6.3	Consider Gendered Dimensions of Mangrove Management	37
6.4	Systemize Tenure Arrangements and Mangrove Rehabilitation	37
6.5	Support Regulating Large-scale Investments in Mangrove Areas	37
6.6	Pursue Income Generation Opportunities	38
6.7	Recommendations for Future Research	38
	REFERENCES	39
	APPENDIXES	41
A	Data Collection Instruments	41
B	List of Legislation affecting Mangrove Management and Governance	57

LIST OF FIGURES, TABLES, BOXES

FIGURE	
1	Distribution of mangrove forests in Indonesia 3
2	Research sites in Lampung Province 6
3	Organizational structure of BPDPM in Pahawang village 22

TABLES	
1	Number of people involved in focus group discussion in each research site. 7
2	Responsible agencies, their roles, and authority in mangrove resource governance 10
3	Matrix showing different pieces of legislation and the aspects of governance they address 13
4	Summary of implementing agencies for mangrove resource management in Lampung Province. 17
5	Population and mangrove forest area in selected sites 20
6	Key features of the selected sites 20
7	Rationale behind perception of tenure security in different territories in Pahawang village 21
8	Rationale behind perception of tenure security in different categories of land in Purworejo village 21
9	Local rules and practices in Pahawang village 23

BOXES	
1	Global status of mangroves 2
2	On changing authority from District Forestry Agency to Marine and Fisheries Department 31

ACRONYMS & ABBREVIATIONS

APL	<i>areal penggunaan lain</i> (Area for Other Land Uses)
BAPPENAS	<i>Badan Pembangunan Nasional</i> (National Development Planning Agency)
BPDPMP	<i>Badan Pengelola Daerah Perlindungan Mangrove</i> (Community Institution for Mangrove Protection and Management)
BPHM	<i>Balai Pengelolaan Hutan Mangrove</i> (Mangrove Forest Management Center)
CIFOR	Center for International Forestry Research
CO ₂	Carbon Dioxide
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
KII	Key Informant Interview
KKMN	<i>Kelompok Kerja Mangrove Nasional</i> (National Mangrove Working Group)
LMC	Lampung Mangrove Center
MMAF	Ministry of Marine Affairs and Fisheries
MOEF	Ministry of Environment and Forestry
NGO	Nongovernmental Organization
PES	Payments for Ecosystem Services
REDD+	Reducing emissions from deforestation and forest degradation in developing countries
SWAMP	Sustainable Wetlands Adaptation and Mitigation Program
UNEP	United Nations Environment Program
UNILA	<i>Universitas Lampung</i> (University of Lampung)
USAID	United States Agency for International Development
WATALA	Friends for Nature and Environment

ACKNOWLEDGMENTS

We would like to acknowledge the contribution of various people and institutions for their inputs and support during the entire assessment process. First, we wish to thank the U.S. Agency for International Development (USAID) for their funding support. We wish to offer special thanks to Dr. Steven Lawry, Director of Forests and Governance Research, Center for International Forestry Research (CIFOR), for his intellectual contribution in research design and inputs to the final report. We are grateful to Stephen Brooks, Land Tenure and Resource Governance Advisor at USAID as well as Nayna Jhaveri with Tetra Tech (on USAID's Tenure and Global Climate Change Program) for their support and overall guidance in the assessment's design and implementation. Many thanks to Daniel Murdiyarso, Principal Scientist at CIFOR headquarters in Bogor, Indonesia, for his inputs on identifying sites and for providing resources related to mangrove ecosystem and actor engagement.

We would also like to acknowledge the support and contribution provided by various individuals and agencies in Lampung Province in Indonesia, and sites we visited in Pasawaran and East Lampung districts. We are indebted to the kind support offered by Dr. Indra Gumay Febryano, Senior Lecturer at the University of Lampung, in accessing documents, linking with relevant individuals and agencies, and connecting us with the research sites. Similarly, we wish to thank Pak Sony, then Head of the District Forestry Agency in East Lampung District, for his support in selecting sites, providing information, and linking us with communities. We also wish to thank Eko Sulistianoro, of the nongovernmental organization WATALA (Friends for Nature and Environment) for his assistance in data collection in Margasari village.

We also wish to acknowledge the help of the people who supported our data collection activities in the villages. In particular, we wish to thank Pak Yani from Margasari village, Pak Isnaen from Pahawang village, and Pak Samsudin from Purworejo village for their warm welcome and support during data collection in their respective villages. Most of all, we would like to extend our special thanks to all the respondents and participants of this research from village, district, province, and national levels who offered their views and shared information.

EXECUTIVE SUMMARY



Fishing among mangroves: Two young boys throw their cast nets amongst the world's most productive mangrove system in Mimika, Papua, Indonesia. Credit: Robert Hewatt/USAID IFACS

This report provides an analysis of the governance and tenure dimensions of managing coastal mangrove forests in Indonesia. It is part of a broader study that includes a global review and a national-level study of mangrove governance and tenure in Tanzania focusing on the Rufiji delta. The report analyzes national-level legal and institutional frameworks to provide an indication of how different sectoral regulations address mangrove governance and tenure and how varied government

authorities implement them. In addition, the report analyzes mangrove management in practice, especially governance and institutional arrangements at the local level, to better understand how these arrangements function and ultimately how they influence mangrove resources. We highlight the experiences of three villages in Lampung province, which gives us rich insight into the local-level dynamics of mangrove management within different types of tenure arrangements over mangrove forests.

Indonesia possesses the largest cover of mangrove forests in the world, accounting for 20-22 percent of the world's mangrove area and up to half of Asia's mangroves (FAO, 2007; Giri et al., 2011). Mangrove areas support fish and shrimp production, with shrimp production (valued at US \$1.5 billion) accounting for over 45 percent of Indonesia's annual fish exports. Despite their importance, mangrove forests in Indonesia continue to face enormous threats from economic activities like aquaculture development and timber logging. Between 1970 and 2001, close to half of Indonesia's mangrove forests were destroyed through these pathways. Mangrove deforestation in Indonesia results in a loss of 190 million metric tons of carbon dioxide (CO₂) annually, representing about 20 percent of land use emissions (Murdiyarso et al., 2015). Currently only about 30 percent of mangrove forests are considered in good condition; both the Ministry of Marine Affairs and Fisheries (MMAF) and the Ministry of Environment and Forestry (MOEF) accept that over 70 percent of mangrove forests in Indonesia are in critical condition (Antara News, 2010; RLPS-MOF, 2007 in Kusmana, 2014).

Over the past two decades, the Government of Indonesia has introduced interventions aimed at controlling mangrove deforestation. These have included the declaration of coastal zones as protection areas, with mangrove timber extraction forbidden; the creation of mandatory greenbelts along the coastline; and the provision of mangrove seedlings for restoration and rehabilitation programs. Investments in mangrove rehabilitation gained momentum following the devastating tsunami that hit West Sumatra in 2004, which brought the role mangroves play in protecting against coastal erosion and storm surges into sharper focus. The resultant push for mangrove conservation and management by the Government of Indonesia, however, has focused on understanding the biophysical aspects of mangroves to improve success in rehabilitation and restoration. Even though the overall approach to mangrove restoration and rehabilitation has changed following the tsunami, involving greater community engagement, there has been little examination of the dynamics behind these efforts and their achievements. While pre-tsunami mangrove rehabilitation programs were challenged by contested claims over resources and limited engagement of local communities, post-tsunami rehabilitation schemes have increasingly adopted community participation as a central approach (Brown, Fadillah, Nurdin, Soulsby & Ahmad, 2014; Wibisono & Suryadiputra, 2006). Substantial involvement of nongovernmental organizations (NGOs) also characterizes these efforts. Lessons indicating the importance of integrating existing traditional institutions

with jurisdiction over coastal and marine resources into external NGO-driven mangrove conservation projects are now emerging (Iwasaki & Rahman, 2017).

The current government administration, which came into power in 2014, has strongly emphasized mangrove tree planting, with up to 4.9 million trees planted to date (personal communication, head of Coastal Restoration, Ministry of Marine Affairs and Fisheries). It established a National Mangrove Working Group [*Kelompok Kerja Mangrove Nasional [KKMN]*]. This built upon earlier interventions such as the National Strategy on Mangrove Ecosystem Management (*Strategi Nasional Pengelolaan Ekosistem Mangrove*), authorized in 2012 to strengthen cross-sectoral coordination. Although coordination is important, there has been little change in the current legal and policy framework for mangrove management in Indonesia that strongly supports government-managed mangrove protection as the primary policy approach. As a result, the laws give much less flexibility for the application of other devolved governance arrangements, such as co-management or community management. Such approaches are increasingly used with terrestrial forests over much of Indonesia, but the experiences within mangroves remain undocumented. Additionally, it is generally unclear how various stakeholders with mandates or interests in mangroves interpret and translate these protectionist policies and laws into action. There is a need for a better understanding of whether and how to engage local communities, especially those that live in and around mangroves, in support of conservation and rehabilitation. Establishing an evidence base of how governance and institutions influence mangrove use and management will provide a sounder basis for developing guiding policies and practices.

This assessment report draws from multiple sources, including a review of relevant published literature; a review of up to 21 national policies and regulations; focus group discussions (FGDs) with communities; and interviews with government officials and NGO representatives at national, provincial, and district levels working on mangrove governance. Field data was collected in three communities in Lampung Province. Lampung has a relatively large coverage of mangrove forests, diverse mangrove tenure and management regimes, recent mangrove rehabilitation initiatives, and established CIFOR project sites, which include research sites of the mangrove-focused Sustainable Wetlands Adaptation and Mitigation Program (SWAMP). Mangrove forests in Lampung fall under at least five different tenure and management regimes, including strict national park, *de facto* community-governed territory, state forest zones under the central government's ownership, areas

under local government management, and large-scale concessions. Three of these tenure regimes offer considerable rights and management responsibilities to local communities, and were selected as field study sites. They include Pahawang Island in Pesawaran District, which is community-governed; Purworejo village in East Lampung District, which is a state forest zone; and Margasari village in East Lampung District, which falls under “areas for other land uses” (*areal penggunaan lain* [APL]), which is under local government control, but managed by the University of Lampung (UNILA).

OPPORTUNITIES AND CHALLENGES FOR THE GOVERNANCE OF COASTAL MANGROVE FORESTS

Fragmented Sectoral Authority. Fragmented authority characterizes the legal and institutional framework for the governance of mangroves in Indonesia. Because mangroves are located at the confluence of land and sea, their management falls under five different government authorities: trees, for example, are under the jurisdiction of MOEF, while water is under MMAF. No single ministry has authority for mangrove management, so fragmented authority and overlapping jurisdictions characterize the legal and institutional framework. This poses major coordination challenges across line ministries. To improve coordination across sectoral regulatory and institutional frameworks, a National Strategy on Mangrove Ecosystem Management was authorized, but has not yet been fully implemented. However, the confusing multiplicity of laws and authorities across jurisdictions has no obvious negative impacts on local mangrove governance. At the local level, mangrove-specific regulations temper or substitute the array of national regulations.

Devolved Mangrove Governance. Despite the plethora of rules that apply to mangroves at the local, national, and sub-national levels, village-level regulations have been developed by local communities to specifically address mangrove protection and conservation. Communities in Lampung have negotiated management and exclusion rights with the relevant authorities, ensuring that they have the rights to manage and to exclude outsiders from “their” mangroves. They also have management responsibilities such as monitoring usage, sanctioning violators, and rehabilitating degraded mangroves.

Moreover, they are integrated into broader resource management rules at village and district levels. This

bottom-up approach, nested in higher-level regulations and authorities and extensively coordinated with higher-level authorities and actors, mitigates the potential confusion about mangrove management that may be conferred by the multiple authorities and jurisdictions. Mangrove-specific regulations at the village level aptly substitute for the lack of a mangrove-specific law or policy at the national level. Despite the protectionist character of the Presidential Decree no. 32 of 1990 that declares all mangroves as protection forest zones, there is space for a management regime that gives communities a considerable degree of statutory management authority in practice.

Local Leadership and Mangrove Management. Local community leaders play a central role in mangrove protection and rehabilitation. Active, committed, and trusted leadership often spearheads successful community initiatives. Such leaders can establish and maintain links with external agencies, securing funding and other support for mangrove management, protection, and rehabilitation.

However, because external support has mostly been obtained through the personal networks of individual leaders rather than through regular and systematic commitments from government or other agencies, mangrove protection and rehabilitation activities can be vulnerable to discontinuity or stoppages. Group efforts in Pahawang village, for instance, are dampened by the inadequate and often ad hoc nature of external engagement. Thus, while strong leadership is important for mobilizing local effort and creating important links to external actors, these links need to be regularized or institutionalized as they are necessary for sustaining local effort over the longer term.

Mangroves and Tenure Security. It is because of strong local leaders and their ability to foster reliable, external linkages that communities feel secure despite not holding the full bundle of rights to mangrove forests. Communities largely feel that their rights to mangrove forests are secure because village regulations were developed jointly and are recognized at higher levels; and because they undertake monitoring and enforcement activities, and there are clear structures and individuals tasked with that monitoring and enforcement. In addition, local leaders in each village cultivated and expanded their relationship with external actors over time, including government institutions, NGOs, researchers, and international organizations. Because of these relationships, leaders do not feel anxious despite concerns raised about the shifting authority over mangroves between MOEF and MMAF.

Perceptions of tenure security are highest among communities living adjacent to mangrove areas that they control relative to communities living adjacent to mangroves controlled by state forestry agency or the local government. However, all communities, regardless of tenure regime, perceive that their tenure security has improved with the adoption of mangrove management initiatives as compared to the prior situation. Communities in the three sites in Lampung indicated that their rights to use and manage (even exclude outsiders) mangrove forests are secure for a range of reasons. First, village regulations for mangrove use and management were defined jointly, rather than imposed from outside and are well known to community members. Furthermore, these regulations have been recognized and supported by higher-level government authorities such as the village head and the district government, which suggest that any challenge to their rights will be defended by those authorities. Second, communities conduct monitoring and enforcement and there are clear and visible structures (i.e., watchtowers) as well as responsible entities (i.e., guards, committees) tasked with monitoring and ensuring violators are sanctioned. Sanctions are well known and their severity increases with the magnitude and/or frequency of the violation.

When comparing security of tenure rights under the different tenure regimes, community-controlled areas are perceived as the most secure. Here, communities have full control over mangrove territory, they have also designated zones including a utilization area where they can harvest timber, and they can collaborate with any external agency without approval from government agencies. The village and district governments endorse their regulations for mangrove use and management, making them legally strong in excluding outsiders. Communities managing mangroves under state forests are the least secure because their area is under the authority of the District Forestry Agency. Here, the agreement between the District Forestry Agency and community groups does not specify the duration of rights.

However, the basis for community rights rests on recognition of village regulations by higher-level authorities rather than on direct signing of an agreement with the management authority (District Forestry Agency). Thus, the bundle of rights for communities as well as tenure security is technically much lower in comparison to community forestry models practiced in terrestrial forests, where communities have a stronger set of formally recognized rights for a longer period (about 35 years).

The communities claimed that equal rights (between men and women, young and old, local population and migrants) persist as supported by the regulations. However, it is evident that these village regulations are silent in terms of acknowledging gender and broader social differentiation. Without such acknowledgement and active inclusion, it is unclear how groups that have been systematically excluded can then participate in and benefit from overall mangrove governance.

Benefits Capture and Distribution. Communities appear to value environmental services or non-consumptive use (e.g., ecotourism) more than the direct economic returns from mangrove products. Mangroves provide a protective cover which reduces the pace and extent of coastal erosion and protects farmlands and fishponds, thus helping to assure critical livelihood activities. Protection against the negative impacts of coastal erosion is a major motive for community involvement in mangrove protection and rehabilitation activities.

As the economic returns from mangrove forests are marginal—largely because of the restrictions on timber harvesting—communities expect support from external agencies in producing seedlings, paying labor costs for planting, and providing funds for protection and development activities to incentivize local people's continuous participation in mangrove management and rehabilitation. Areas that fall under the state forest zone appear to have regular access to government resources for mangrove conservation and management. Communities in other categories of forests, such as community-controlled forests, have much less access to external agencies, usually on an ad hoc basis. Local leaders distinctly recognize the challenges in retaining the support of community members if there is no external support available to complement internal, voluntary efforts.

The limited benefits to local communities from mangrove resources are also linked with limited market access. Women's groups in all three villages shared the same concern of not having a market outlet for their products. They have limited resources and capacity to undertake engagement with markets and the scale of production is too small to cover the transaction costs.

In the absence of rights for extraction of resources from the mangrove ecosystem, communities have turned to ecotourism, which has generated limited returns to date. Overall, communities are shouldering the burdens and responsibilities of protecting, conserving, and rehabilitating mangroves that are clearly owned by

different categories of government—at the local and national levels—and their management agencies. It is unclear how much longer community institutions and initiatives will last without clear, substantive returns.

Coordination among Key Stakeholders for Mangrove Governance. A major explanation for the effectiveness of community institutions is their strong and clear coordination with district-level actors such as forest agencies, NGOs, and the Watershed Management Agency. The endorsement and acknowledgement of village-level mangrove regulations by village leadership, district-level leadership (*bupati*), and district-level forest agencies is one example of effective coordination. In one community, village regulations align with sub-national and national legislation. Such endorsements and alignment help to ensure village regulations are consistent and not in conflict with broader regulations that apply. Moreover, they allow for further coordination in practice. One example is the system of forest guards that work jointly with local communities to monitor, apprehend violators, and protect mangroves. Village leaders and forest guards also coordinate conflict resolution efforts—while sanctions for violations are issued from the village level, repeat violations are reported to and handled by public law enforcement mechanisms (e.g., the joint team [*purworejo*] or the police [*margasari and pahawang*]).

There is a modest level of coordination among district-level actors. As mentioned elsewhere, this is evident in how village regulations are recognized at the district level by the district and provincial heads. Some private companies appear to channel support for community mangrove rehabilitation through local NGOs who are in direct contact with communities. However, private companies involved in shrimp farming and other forms of aquaculture development (who would have a strong incentive to support mangroves as they protect the development/investments from destruction by strong waves) were not interviewed in this study, which remains a major knowledge gap.

No single national authority and policy on mangrove forest management operates in practice. Since the 1980s, multiple government authorities have been involved in mangrove governance (Kusmana, 2014). However, the sectoral ministries have their own upwardly accountable structures and budget disbursement mechanisms, creating no incentive for cross-sectoral coordination. Recognizing the role of different government agencies and non-state actors, the recent National Strategy for Mangrove Ecosystem Management (Presidential Regulation 73/2012) established a national multi-sectoral coordination team

with a separate steering committee and implementing team. Six different ministries coordinate the steering committee. The implementing team is led by MOEF and consists of 19 additional members from MMAF and other ministries. A similar cross-sectoral body has been envisioned for the provincial and district levels to coordinate and streamline mangrove management activities. In practice, however, these bodies either do not exist or are non-functional. Nonetheless, promotion of such bodies with the required budget, authorities, and linking mechanisms across sectors and levels of government could resolve the existing gap in coordination and joint initiatives that are critical for effective mangrove management.

Outcomes of Mangrove Rehabilitation Efforts in Study Sites.

Community mangrove rehabilitation initiatives in the three Lampung sites have a modest history, with the earliest established about 20 years ago and the others 5 to 10 years later. The effectiveness of these efforts is variable, although all appear to be motivated by the protective function of mangroves. The initiatives directly connected to central or local government through land ownership and funding arrangements appear to be more effective. They rehabilitate larger areas, offer payment for labor, and have a broader range of activities in their rehabilitation programs. Across the initiatives, seedling survival rates vary from 60 to 90 percent and seem related to the strength of tidal waves, the prevalence of shellfish that suppress root growth, and whether or not planting is done on newly reclaimed land.

Altogether, positive outcomes in terms of improved status of mangrove forests were reported in all three villages, both in terms of increased area and improved forest cover, including the spatial area over which successful rehabilitation efforts have been completed. A number of factors contributed to these improvements: solid motivation, secure rights, participation and institutions for collective action, strong and committed leadership, knowledge and technology, availability of resources, external support, and coordination across sectors. Due to strong leadership as well as regular technical and funding support from the District Forestry Agency, communities have reclaimed land (*tanah timbul*) and planted mangroves. Motivated by a need to protect themselves, their property, and their agricultural land, communities can successfully protect and rehabilitate mangroves. Community rehabilitation efforts in Lampung have their origins in efforts by individual community leaders who were determined to avert the negative effects of coastal erosion on community lives and livelihoods.



Education and awareness of mangrove rehabilitation for elementary students in Situbondo, East Java by engaging them in mangrove planting activities. Credit: P3M UNATG/Mangroves for the Future Indonesia

Rule compliance, in terms of abiding by harvesting restrictions and contributing time and effort to mangrove protection and management activities—was generally high in each village. This compliance is largely attributed to dynamic and charismatic local leaders, joint determination of tenure rules, agreement with and knowledge of the rules, and effective enforcement of the rules. It is clear that the role of local leaders is a key factor in the success of rehabilitation efforts. However, strong leadership may come at the expense of deepening and broadening participation. Groups did not change leadership over long periods of time, which may indicate the benefits of continuity, or conversely, the perils of elite capture. Collaboration with external actors who lower the transactions costs of organizing by providing capacity building/training and planting materials is an additional factor that seems to affect the performance of mangrove governance in terms of actual forest condition. At the village level, rules are targeted and specific to the mangrove resource, but their application is sufficiently coordinated with higher-level actors.

Rewards and recognition for effort and achievements are important in sustaining motivation in protecting and maintaining mangrove ecosystems in these villages. Environmental awards, visits by representatives of external agencies to see and learn from their efforts,

and highlights of their activities in the public sphere have been additional incentives for local communities to continue their support for mangrove management despite the restrictions they face from harvesting products from the mangrove ecosystem.

Gender Equality. All the national policies and regulations relevant to mangrove use and management are silent in terms of women's rights over land and forest resources. Similarly, local village regulations are gender-blind—gender equality is assumed rather than actively sought. Community-level practices are rooted in local social norms, which are based on gender roles and the activities that men and women can appropriately perform in line with broader social expectations. NGOs have provided training to women on alternative products for market sales obtainable from mangrove leaves, barks, and fruits using processing techniques. However, because no further capacities have been developed to orient production toward markets, these products and processes have remained at a subsistence level. Women are trapped in low-skilled activities such as polybag filling and seedling planting, and are completely left out of decision-making processes. Because women are excluded from decision-making processes and structures, they are less aware than men of existing rules and programs related to mangrove ecosystem management. Young women are probably the least knowledgeable group in the community.

Conflict Resolution. All villages have hierarchical institutional arrangements for conflict resolution. The main mechanism used across the communities for conflict resolution is the committee that oversees mangrove development activities. When the committee fails to resolve a conflict, the village- and sub-district-level authorities become involved. District authorities rarely become involved in conflict resolution. When community members do not comply with the rules, they are normally warned or mildly punished, but penalties increase significantly for repeat violators. In general, if the violator is a member of the community or neighboring village, the conflict over mangrove resources is normally solved at the village level. The case would only come to higher-level authorities when local authorities could not maintain compliance or the violator is from outside the sub-district. This system of graduated sanctions is effective in ensuring compliance with rules.

Monitoring, Review, and Learning. Recent policies related to coastal management and initiatives since the deadly tsunami of 2004 have called for streamlining mangrove rehabilitation efforts. The Law on Coastal Areas and Small Islands Management and Presidential Regulation 121/2012 gives the mandate to central and local governments to monitor mangrove rehabilitation activities every six months. However, villages reported that they did not know whether local and central governments conducted any monitoring and evaluation in their villages. Villages have their own committees to monitor rehabilitation activities. When there is support from an external agency, community leaders and representatives from the respective agency carry out monitoring and evaluation.

RECOMMENDATIONS FOR POLICY, PRACTICE AND RESEARCH

The potential to increase mangrove coverage is, as yet, underutilized. The lessons from the governance and tenure initiatives developed by local communities provide important stepping-stones toward establishing a nationally coherent mangrove governance structure that is attentive to the substantial diversity of social and ecological conditions across Indonesia's mangroves.

Strengthen National-level Coordination on Mangrove Governance. Recent policy developments around mangrove management in Indonesia emphasize multi-stakeholder processes. The first step toward developing an institutional mechanism to establish multi-sectoral coordination for mangrove governance and management

was the creation of the National Strategy for Mangrove Management. However, after four years, implementation is still slow due to a limited budget for implementing the strategy as well as sectoral silos and mandates. This strategy was followed up in 2014 by the creation of a Mangrove Restoration Agency, whose effectiveness remains unclear.

As such, the government's positive efforts toward building a national-level mangrove management system so far are largely ineffective. An implementation plan is needed that identifies priorities for coordination building, budget support, and specific mechanisms for coordination by the Mangrove Restoration Agency. A detailed assessment of the constraints to its implementation as well as emerging opportunities for strengthening cross-sectoral collaboration in mangrove conservation management can bolster the agency's capacity to fulfil its mandate. In particular, the strategy can help to identify good practices that meet the unique needs of mangrove management, as opposed to terrestrial forests. In this way, specific regulations within laws under the responsibility of MOEF and MMAF can be tailored to the realities of mangrove management needs.

Devolve Mangrove Governance and Tenure to Communities. While there may be a need to harmonize and better coordinate national and sub-national laws and policies, and reduce the fragmentation, an even stronger case can be made for further strengthening local-level institutions and increasing their capacities to interact, collaborate, and coordinate with national and sub-national agencies. Similar initiatives that strengthen the capacity of sub-national and national actors to support local-level initiatives and reinforce community incentives for protection, management, and rehabilitation are necessary. Further research and experimentation (including piloting programs) can generate specific insights on how best to design institutions in support of local-level conservation management.

The Lampung situation indicates that strong local leaders are crucial for the success of mangrove rehabilitation efforts. Their relationship with community members are based on trust and confidence; the cooperation and links they forge with external actors are important for ensuring local people's support in rehabilitation efforts and channeling necessary technical and financial support. Support from external stakeholders has a positive influence on various aspects of local-level mangrove management and protection, including community mangrove rehabilitation efforts, tenure security, technical capacity, and access to financial resources. However, communities are receiving support on an ad hoc basis, based on their leaders' personal contacts, which is not secure. There is a need for a mechanism that offers budgetary and other forms of support (i.e., knowledge, technological, rehabilitation ecology) that communities

require. The establishment of a formal and functioning coordination mechanism between communities and other mangrove stakeholders is also critical for joint learning, sustainability of community-based mangrove management initiatives, and scaling up of tested approaches and initiatives.

Local communities are aware of the environmental services offered by mangrove forests and are putting considerable time and effort into their conservation, management, and rehabilitation. However, in the absence of direct economic returns and clear incentives, these efforts may not be sustainable. Avenues for strengthening incentives and reducing uncertainty over the future viability of current efforts include expanding the range of rights that communities hold to mangrove resources. In particular, efforts to expand their income generation possibilities; and take advantage of existing laws and mechanisms that require the provision of special incentives to encourage and sustain environmental conservation, such as PES and REDD+ should be considered.

Consider Gendered Dimensions of Mangrove Management. Most of the national policies and laws as well as the local rules and institutional arrangements related to mangrove forest governance are gender-blind. However, substantial differences exist between men and women in participation levels of decision making, knowledge, and information as well as in operational management.

A major focus of mangrove-related activities for women has been imparting forest product processing skills. Little has been done to expand their political space in mangrove forest governance. Specific legal and institutional provisions as well as incentives are required to assure women's participation in mangrove forest governance and decision making. Concrete proposals for institutional arrangements that enhance women's inclusion in decision making and overall mangrove governance should be generated through careful piloting.

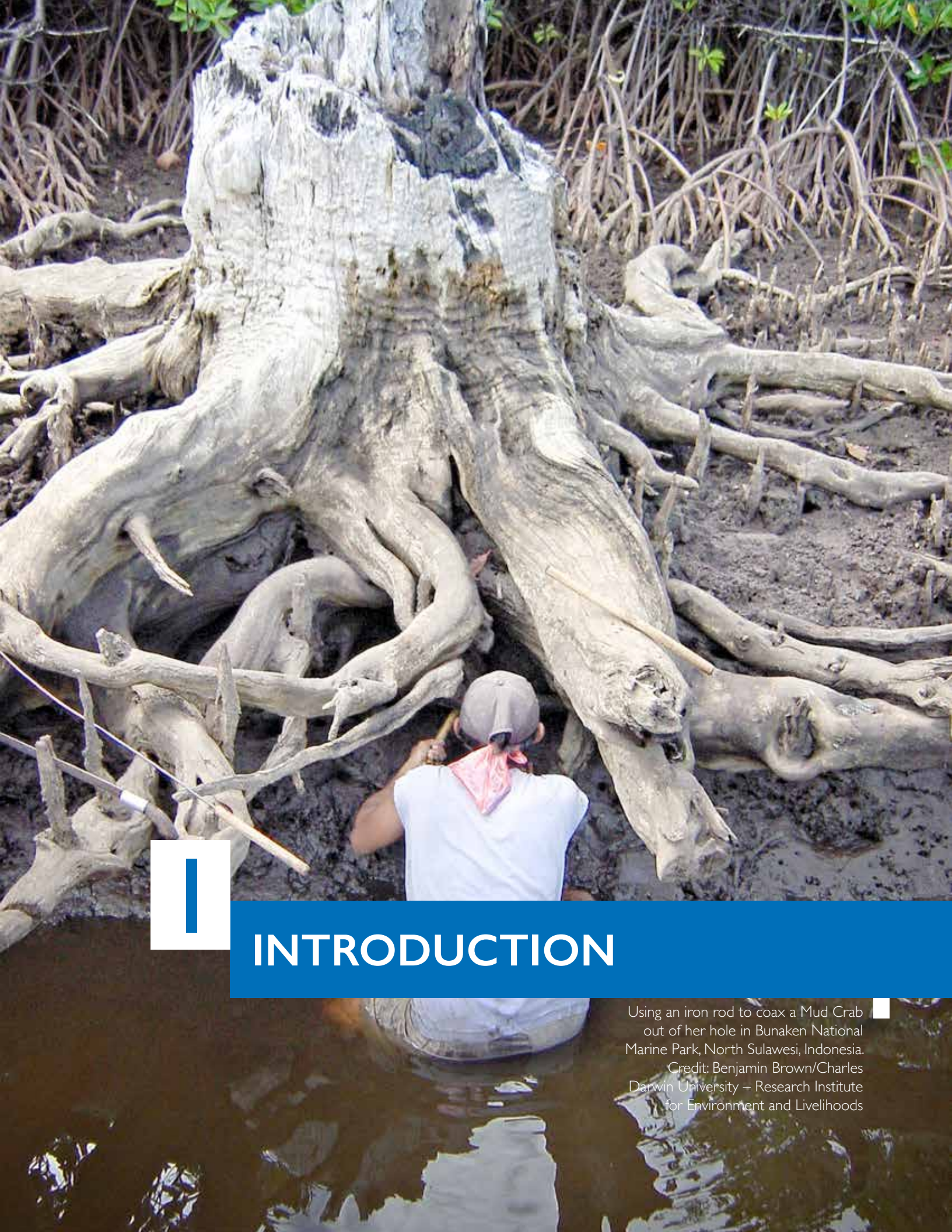
Systemize Tenure Arrangements and Mangrove Rehabilitation. Community-based rehabilitation efforts have shown great promise for conserving mangrove forests in Lampung Province. The overall area of mangrove forests has increased significantly in all three communities after they launched activities such as planting, restricting access and use in certain areas, and constructing wave barriers. Clearly, there is value to granting local people management and exclusion rights. These rights should be more formally granted in law rather than through the discretion of line agencies

or local governments. Furthermore, while broad tenure categories (i.e., state forest-owned vs. local government vs. de facto customary) are generally useful, the rights bundles held under each of these broad categories need to be clearer and systematically established.

Support Regulating Large-scale Investments in Mangrove Areas. Other avenues for strengthening incentives for and reducing uncertainty over the future viability of current efforts should be considered. One important area for intervention is to address the main threats to resource rights identified by communities and to strengthen their ability to exclude large-scale investments, which they perceive as the most serious threat.

Pursue Income Generation Opportunities. There is little work to date on income-generating opportunities from mangrove forests. The identification of new enterprises that can expand income-generating possibilities within existing laws and initiatives would be welcome. They can involve supporting the provision of special incentives to encourage and sustain environmental conservation such as PES or REDD+.

Recommendations for Future Research. Numerous thematic areas need more research to create a coordinated and effective mangrove governance approach. Starting with the government approach to mangrove management, there is a need for a stronger understanding of how specific needs of mangrove conservation, rehabilitation, and management are addressed within the MOEF as well as the District Forest Agency. At the local level, it is clear that community-level leadership has played a pivotal role in mobilizing local commitment and engagement for mangrove management. In light of this, further research on the conditions that foster the emergence and flourishing of enthusiastic and committed leaders can be useful not only for mangrove management, but also for broader community-based natural resource management. Additionally, to address an important gap in devolved mangrove governance and tenure on the gender-differentiated dimensions of mangrove management, there is considerable room for piloting and careful analysis of different modalities that incentivize women's participation. Research that identifies the most appropriate ways to enhance women's participation and role in mangrove management will ensure that pilots start on a strong footing. In particular, there is an urgent need to reform the mechanisms that give rise to and perpetuate gender blindness in local-level institutions and structures through the design of gender-transformative incentive mechanisms. Finally, looking to the future, research will involve improving the current, limited contribution of mangroves to local economies. This requires attention to issues of market access for mangrove products as well as processing and storage technologies.



INTRODUCTION

Using an iron rod to coax a Mud Crab out of her hole in Bunaken National Marine Park, North Sulawesi, Indonesia.

Credit: Benjamin Brown/Charles Darwin University – Research Institute for Environment and Livelihoods

Indonesia possesses the largest cover of mangrove forests in the world, accounting for 20-22 percent of the world's mangrove area and up to half of Asia's mangroves (FAO, 2007; Giri et al., 2011). Because Indonesia's mangroves play a critical role in the global status of mangroves (Box 1), it is vital to understand the country's approach to mangrove management across the archipelago. The objective of this report is to identify the types of governance approaches promoted by the government and other key stakeholders such as universities, nongovernmental organizations (NGOs), and local communities—in particular focusing on tenure arrangements that provide the enabling framework for planting, protecting, and managing these unique wetland forests. What have been the key lessons for improving governance and tenure rights over time? How can these lessons inform future interventions and initiatives?

Mangroves are distributed across the major islands of Indonesia (Figure 1) with estimates of the exact coverage varying between 2.8 million hectares (ha) (as reported by Indonesia's Ministry of Forestry)¹ and 3.2 million ha (as reported by Indonesia's Geospatial Information Agency). It is generally agreed that these forests face enormous threats from aquaculture development, rampant logging, industrial development, as well as allocation of concessions to private companies (FAO, 2007; Kusmana, 2014). Almost half of Indonesia's mangrove forest area was destroyed between 1970 and 2001,² and currently only about 30 percent of mangrove forests are in good condition. Both Ministry of Marine Affairs and Fisheries (MMAF) and the Ministry of Forestry accept that over 70 percent of mangrove forests in Indonesia are in critical condition (Antara News, 2010; RLPS-MOF, 2007 in Kusmana, 2014).

Box 1. Global status of mangroves

Fifteen countries hold about 75 percent of the world's mangrove forests, with only 6.7 percent designated part of the global protected areas network. Forty-two percent of the total global area of mangrove forests is in Asia, with another 20 percent in Africa (Giri et al., 2011). Mangroves provide a wide range of economic and ecological goods and services that are important for the food security and livelihoods of local populations. They are not only rich in biodiversity, but also protect coastal landscapes against erosion, and play an important role in climate change mitigation because they store and sequester significant quantities of carbon (Alongi, 2008; UNEP, 2014). Mangrove deforestation in Indonesia results in a loss of 190 million metric tons of CO₂ annually—about 20 percent of land use emissions (Murdiyarso et al., 2015). The 2004 tsunami in the Indian Ocean reinforced the recognition of mangroves as protectors of coastal communities from the impacts of severe storms and cyclones, and preventers of seawater intrusion. Mangrove forests are also valued for their recreational, spiritual, and cultural values (UNEP, 2014).

Despite their importance, mangrove forests are under threat and in rapid decline (Lewis, 2009). At least 35 percent of the total global area of mangrove forests was lost during from 1980 to 2000 (Valiela, Bowen & York, 2001). The rate of mangrove forest area loss declined to 1.7 percent from 2000 to 2012, but deforestation is still ongoing (Richards & Friess, 2016). Drivers of mangrove deforestation and degradation, especially in Southeast Asia and eastern Africa, include conversion to mariculture, agriculture, aquaculture, and coastal and urban development; natural disasters; overharvesting; and conflict (Fortes, 1988; Marshall, 1994; Richards & Friess, 2016; Saenger, Hegerl & Davie, 1983). Specifically, they are often cleared for shrimp production, an important industry in Indonesia, worth US \$1.5 billion annually and accounting for over 45 percent of total fish exports (MMAF, 2014 in Ilman, Dargusch, Dart & Onrizal, 2016). The shrimp industry employs over one million people.

Mangroves continue to play an important role in the lives and livelihoods of millions of people living in coastal areas (UNEP, 2014). They provide products such as timber, poles, fuelwood, fruit, and medicine. Leaves, fruits, and roots are used to make crackers, juice, and other food items. Mangroves provide habitats for aquatic fauna including prawn, eel, clam, crab, sea snail, and a variety of fish species (Armitage, 2002).

1 Ministry of Forestry and Ministry of Environment merged and became Ministry of Environment and Forestry in late 2014.

2 Earth observatory: <http://earthobservatory.nasa.gov/IOTD/view.php?id=47427>, accessed on 6 April 2016.



Figure 1. Distribution of mangrove forests in Indonesia

Source: Giri et al. (2011)

Since the 1990s, the Government of Indonesia has introduced various initiatives aimed at controlling mangrove deforestation. These include the declaration of coastal zones as protection areas, thus forbidding mangrove timber extraction; the mandatory creation of greenbelts along the coastline; and the provision of mangrove seedlings for restoration and rehabilitation. Investments in mangrove rehabilitation gained momentum following the devastating tsunami that hit West Sumatra in 2004, which brought into sharper focus the protective function of mangroves against coastal erosion and storm surges. Overall, pre-tsunami mangrove rehabilitation programs were challenged by site suitability problems, contested claims over resources, and limited engagement of local communities. Post-tsunami rehabilitation schemes attempted to correct these failures and increasingly adopted community participation as a central approach (Brown, Fadillah, Nurdin, Soulsby & Ahmad, 2014; Wibisono & Suryadiputra, 2006). NGO support has characterized these efforts. Even so, in the case of Aceh post-tsunami recovery, local traditional institutions such as *Panglima Laots* (with jurisdiction over coastal and marine areas especially on fisheries issues) were only mobilized as unskilled labor for mangrove planting projects in outsider-driven mangrove conservation projects rather than integrated into the planning and management processes (Iwasaki & Rahman 2017). Over time, the government recognized the importance of revitalizing

institutions such as *Panglima Laots* to sustain the success of mangrove restoration projects. The role of tenure rights in supporting community-based rehabilitation and afforestation of mangrove areas is crucial. This is illustrated in the case of Tongke Tongke village of the Sinjai District of South Sulawesi where the unwillingness of the local government to recognize the tenure authority of the local community members over those lands successfully planted with mangroves led to conflict (Amri, 2005).

It is clear that mangrove management is rising higher in the national agenda. In 2012, creation of the National Strategy for Mangrove Ecosystem Management (Presidential Regulation 73/2012) enabled coordination among the different government sectors. The current government administration, which came into power in 2014, established a National Mangrove Working Group [*Kelompok Kerja Mangrove Nasional [KKMN]*] to support implementation of the mangrove restoration program. It has strongly emphasized tree planting, with up to 4.9 million trees planted to date.

Across Indonesia's coastal landscapes, mangroves are managed under diverse tenure regimes that range across the spectrum from strict protected areas, to joint management, to communal and customary arrangements. While devolved governance and tenure arrangements are widely recognized in Indonesia as

important incentives for sustainable forest use and management by local communities, most of this debate has focused on terrestrial forests, largely bypassing the needs of coastal mangrove forests. There has been little examination of how different types of tenure regimes affect mangrove management and conservation. One recent study, however, has explored how different types of management regimes contribute to a range of ecosystem services (Oudenhoven et al., 2015). By categorizing mangrove management regimes in Java into five main categories and examining how they contribute to seven types of ecosystem services, the research led to a recommendation that the multifunctionality of mangrove forests be explicitly considered in developing a vision for sustainable coastal management.

As in the rest of the world, research on mangroves in Indonesia has mostly focused on biophysical dimensions that affect planting and rehabilitation rather than on mangrove governance dimensions. More recently, mangrove research in Indonesia has turned its attention toward the critical role mangroves play in carbon sequestration (Murdiyarso et al., 2015). This strong focus on the biophysical aspects of mangroves continues to be manifested within the most recent push for mangrove conservation and management by the Government of Indonesia.

Closer examination of the relevance of governance and tenure issues on effective mangrove restoration, protection, and rehabilitation is necessary. In addition, attention to the issue of scale, services, and benefits is crucial for designing mangrove management approaches, which carefully attend to the different scales in which ecosystem services are provided and the benefits realized (Máñez, Krause, Ring, & Glaser, 2014). While the current legal and policy framework for mangrove management in Indonesia strongly supports state-led protection of mangrove forests, it is unclear how various stakeholders with mandates or interests in mangroves interpret and translate these policies into action on the ground. There is also a need for more knowledge around whether and how local communities, especially those who live in and around mangrove areas, can best be engaged in meeting

and sustaining recent conservation and rehabilitation targets set by KKMN. Establishing an evidence base of how governance approaches and institutions influence the use and management of mangroves will provide a much sounder basis for developing guiding policy and practice across Indonesia's varied coastal landscapes.

This assessment addresses the knowledge gap that exists regarding the governance of mangroves, particularly tenure dimensions related to use, management, and rehabilitation of mangrove resources in Indonesia. It analyzes national-level legal and institutional frameworks to provide an indication of how different sectoral regulations address mangrove governance and tenure and how respective government authorities and nongovernmental actors implement them at national and sub-national levels. The report also analyzes the practice of mangrove management, especially governance and institutional arrangements at the local level, to better understand how they function and influence the condition of mangrove resources. Empirical evidence is drawn from three locations in Lampung Province, where tenure regimes and mangrove management arrangements vary from community/customary management, to joint community-state management, to local government management in collaboration with a local university. Gender, a missing element in many mangrove studies (Bosold, 2012), is also considered in this assessment in terms of both rights as well as participation in decision making. The report concludes by providing recommendations for policy and practice based on the assessment's key findings.

Chapter 2 of this report describes the methodology used in this study. Chapter 3 presents an analysis of the policy and legal frameworks relevant to mangrove conservation. Within this overall context, Chapter 4 sets out the status of mangroves, and government responsibilities over mangroves in Lampung Province, before delving into the varied mangrove governance and tenure arrangements being developed by communities in their coastal environments. Chapter 5 presents the key sets of findings and Chapter 6 puts forward the major recommendations emerging from the study.



2

METHODOLOGY

Kamoro coastal communities share in a feed of Terebellidae “worms” from a naturally fallen old-growth mangrove. Molluscs gathered in the mangrove comprise more than 10% of the Kamoro diet. Credit: Rio Ahmad/Blue Forests

The assessment used a mixed-method approach to gather information at multiple levels of governance, from national to local. The main aim was to collect data that would provide insights into national legal and policy frameworks for mangrove management and their on-the-ground implementation, systems of local governance, tenure arrangements for mangrove conservation and management, and local perceptions of tenure security as well as the organization of local mangrove rehabilitation efforts.

Given the short timeframe of the study and the limited resources, Lampung Province was selected because of its diversity of tenure regimes, approaches to mangrove management, recent mangrove rehabilitation initiatives, and the existence of Center for International Forestry Research (CIFOR)-led projects such as the USAID-funded Sustainable Wetlands Adaptation and Mitigation Program (SWAMP), which focuses on the role of mangroves in addressing climate change. This study does not represent the full range of social-ecological conditions in which Indonesia's mangroves are embedded. Instead, it represents a setting characterized by high pressures on mangroves and other resources in

recent times due to large and rapid influx of migrants in its recent history and large-scale resource exploitation by corporations. It thus offers an interesting study case for a subset of issues and responses in the governance and tenure arrangements over mangroves in Indonesia at community and sub-national levels. However, this study's analysis of legal and institutional frameworks underpinning mangrove use and management speaks to broader Indonesia settings. Mangrove forests in Lampung fall under at least five different tenure and management regimes. These include strict national park, de facto community-governed territory, state forest zones under the central government's ownership, local government management, and large-scale concessions. Following an initial survey in Lampung Province in December 2015, the following tenure/management regimes were selected for in-depth study:

- Communal management (on Pahawang Island, Pesawaran District),
- Joint community-local government management (Purworejo village, East Lampung District), and
- Multistakeholder management led by the University of Lampung on local government land (Margasari village, East Lampung District).

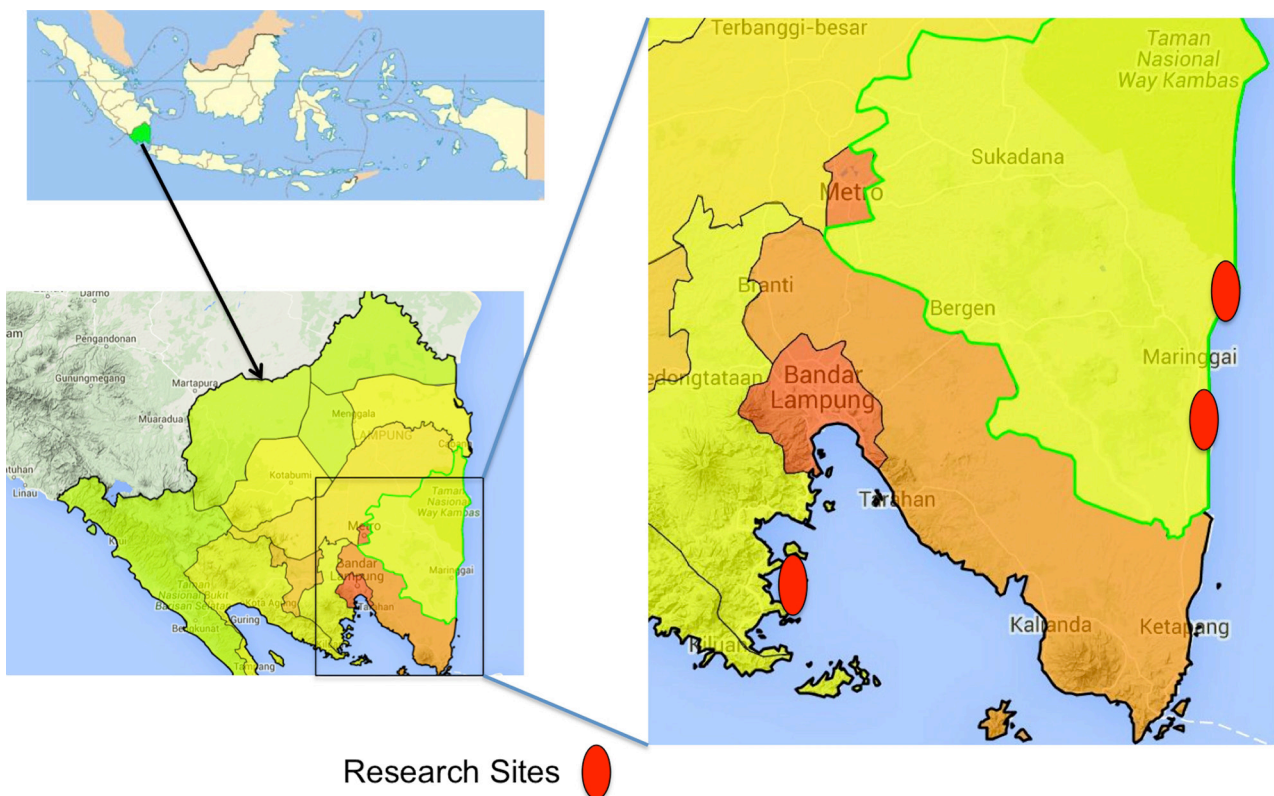


Figure 2. Research sites in Lampung Province

There are two other tenure regimes, one controlled by the government (Way Kambas National Park) and another by a private company (Dipasena shrimp industry), which were also intended to be assessed but the team had difficulties gaining access to the relevant managers. The selected research sites are illustrated in Figure 2.

At the national level, the assessment's main aim was to understand the policies and laws regulating mangrove use and management, key stakeholders and their involvement, coordination across sectors and levels of government, and the adequacy of regulatory provisions and implementation challenges. Through literature review, legal analysis, and interviews with relevant government agencies and NGOs, it was possible to develop a cohesive understanding of developments in the national sphere. Prior to conducting interviews at the national level, a CIFOR scientist, working mainly on the biophysical aspects of mangrove and carbon assessment, was interviewed to obtain a general understanding of the status of mangroves across Indonesia and to identify relevant stakeholders. SWAMP was also a useful resource in understanding the significance of mangroves in general and in identifying sites for this study. The assessment team conducted interviews at the national level with government ministries, NGOs, and academic institutions; and in-depth interviews with key individuals responsible for mangrove forest management within MOEF and MMAF.

Nine interviews were conducted at the sub-national level, including with a staff member at the University of Lampung who has been conducting mangrove governance research for over a decade, representatives of provincial and district government agencies, and NGOs working in the province. These interviews gathered information

on mangrove management, the roles of key actors in management and rehabilitation, and community tenure and management efforts, as well as links and interactions between communities and key actors.

Data was gathered at the community level primarily through key informant interviews (KIs) and focus group discussions (FGDs), complemented by the observation of sites and activities, meeting minutes, and published and unpublished documents of the respective communities such as village rules and management plans. The team conducted nine KIs at the community level with village heads, office bearers, and other leaders who possessed extensive amount of information on mangrove protection and rehabilitation. In particular, KIs were used to collect data on the history of the villages; demographic dynamics, history of mangrove exploitation and its consequences, use of mangroves, emergence and rationale behind mangrove protection and rehabilitation activities, rights and obligations of local communities over mangrove forest territories, local power dynamics, benefits distribution, outcome of mangrove management initiatives, and the relationship of the community with the external agencies.

In addition, FGDs were used to gather community-level data. Twelve focus groups (four in each site) were conducted, involving 78 people (37 women, 41 men) (Table 1). Focus groups of men and women, divided by age, yielded gender-disaggregated perceptions of mangrove governance, including tenure rights and benefit distribution. Reviews of relevant secondary data available for each site and district, and for Indonesia as a whole, supplemented these primary sources of data collection.

Table 1. Number of people involved in focus group discussion in each research site.

Village name	Men		Women		Total
	Older	Younger	Older	Younger	
Pahawang	9	5	5	5	24
Margasari	6	7	5	5	23
Purworejo	9	5	12	5	31
Total	24	17	22	15	78




3

MANGROVE GOVERNANCE AND TENURE

NATIONAL POLICY AND LEGAL FRAMEWORK

This Coastal Field School group is measuring the height of *Sonneratia alba* propagules, as a way to track sea level rise in their community. Credit: Rio Ahmad/Blue Forests



This chapter presents an analysis of the policy and legal framework for mangrove governance in Indonesia, beginning with an overview of the government actors responsible for implementing mangrove-related laws and policies. It aims to assess the extent to which current policies, laws, and strategies in the natural resources sector provide an enabling environment for the conservation and management of coastal mangroves. This section also provides an evaluation of the extent to which national laws and policies in relevant sectors address forest and land governance, especially tenure rights, with regard to mangrove forests. Twenty-one pieces of legislation, ranging from the constitution to sectoral regulations, were identified as relevant to mangrove forest governance (see Appendix B for the list of regulations reviewed).

3.1 GOVERNMENT AGENCIES AND AUTHORITIES RESPONSIBLE FOR MANGROVE MANAGEMENT

A number of jurisdictions play a role in managing mangrove forest due to their unique placement within the interface between land and sea. Up to four different government agencies are involved in mangrove management, including MOEF, MMAF, the Ministry of Agrarian and Spatial Planning Affairs/National Land Agency, and the National Development Planning Agency (BAPPENAS). MOEF holds the primary authority for mangrove protection in general and for mangrove management when situated in classified forest areas. MMAF is responsible for mangrove management in coastal and small island areas. The Ministry of Agrarian and Spatial Planning Affairs/National Land Agency is responsible for enforcing tenure rights and conducting spatial planning in mangrove zones. Lastly, BAPPENAS prepared the National Strategy for Mangrove Ecosystem Management. At lower levels, mangrove management is also regulated by provincial, district, and village governments.³

3 Indonesia's decentralization policy distributes authority and responsibility among national-, provincial-, district- and village-level government authorities. When the territory is classified as APL, land ownership and management responsibility rests with the local government. When it falls under *kawasan hutan* (state forest zone), the land ownership remains with the central government but management responsibility is with the district forestry agency. However, Law 23/2014 moved the management responsibility of forest and other natural resources from the district to the provincial level. In 2015, mangrove territory was shifted from the forestry agency to the fisheries agency.

More broadly, the mode of decentralization pursued within the government administrative structure in Indonesia has changed. The Law on Regional Autonomy 23/2014 shifted the authority for coastal areas management by the department of fisheries from the district to the provincial level in non-state zones. Similarly, the management responsibility for mangrove forests under the state forest zone shifted from the district forestry agency to the provincial forestry agency. This shift in authority from the lower to a higher level is rationalized by the need to control rampant corruption, nepotism, and inefficiency by regency-level government agencies (sub-provincial administrative units) during decentralization. However, the transfer of this power from the district to the provincial level has created confusion on the ground and led to the impression that there is no one with effective responsibility for protecting mangrove forests.

Overlapping authority and regulation is one of the greatest problems of mangrove management in Indonesia. For example, although mangrove forests are often located in coastal areas or on small islands, an area that is under MMAF jurisdiction through Law 27/2007 on the Management of Coastal Areas and Small Islands, many are classified within the state forest zone managed by MOEF. In addition, forestry planning and coastal management planning are largely not harmonized with regional spatial plans. The involvement of multiple government agencies at different levels in mangrove management is a decades-old practice; in the late 1980s, at least five government ministries (now four ministries) were recognized as responsible authorities for mangrove governance (Soemodihardjo & Soerianegara, 1989 in Kusmana, 2014).

The role and legal basis of each of these authorities is summarized in Table 2.

3.2 LEGAL AND POLICY ARCHITECTURE FOR MANGROVE CONSERVATION AND MANAGEMENT

Prior to 1938, when the mangrove silviculture regulation was issued, there was no single policy and institutional framework governing mangrove management (Ilman, Dargusch, Dart & Onrizal, 2016). This regulation was not implemented, however, due to World War II and the ousting of the Dutch colonial administration from Indonesia. The central policy, regulation, and institutional arrangements that shaped mangrove governance began with the New Order era (1966–1998), which promoted

Table 2. Responsible agencies, their roles, and authority in mangrove resource governance

Agency	Authority and legal basis
Ministry of Marine Affairs and Fisheries (MMAF)	Law 27/2007 on the Management of Coastal Areas and Small Islands
Ministry of Environment and Forestry (MOEF)	<p>Environmental Protection and Management Law Number 32/2009, Law 41/1999 on Forestry and Law 5/1990 on Natural Resources Conservation</p> <ul style="list-style-type: none"> • The environmental law provides general principles on mangrove management, instruments for preventing environmental destruction, planning, and law enforcement. • Once a mangrove area is designated as forest areas (mangrove forest), it falls under the jurisdiction of the forestry law. The law can apply three functions: as production forest, protection, and conservation (mangrove) forest. • In the case of conservation mangrove forest, the conservation law will be applicable. This law is under government review now.
Ministry of Agrarian and Spatial Planning Affairs/National Land Agency	<p>Basic Agrarian Law and Law on Spatial Planning</p> <ul style="list-style-type: none"> • 1960 Basic Agrarian Law (Law 5/1960) regulates any land rights including land for indigenous peoples. • The Spatial Planning Law (Law 26/2007) regulates the function of mangrove either as protected or cultivated areas.
National Development Planning Agency (BAPPENAS)	Mangrove utilization planning is part of the national development plan, prepared by BAPPENAS.
Local government	<p>Law 23/2014 on Regional Government places the authority for community-based coastal management with provincial government. If mangrove land is used for commercial purpose, district governments grant permits. Law 23/2014 grants that authority to district governments including the authority to handle informal land claims.</p> <p>Law 6/2014 on Villages also grants village governments the authority to manage natural riches in their jurisdiction.</p>

extensive forest exploitation to spur economic growth. The Basic Forestry Law 5/1967 and subsequent regulations such as Government Regulation 21/1970 regarding Forest Concessions, and Forest Regulation 33/1970 on Forest Planning had the greatest impacts on deforestation, including of mangrove forests.

Currently, two pieces of legislation specifically target mangrove management and conservation: Presidential Regulation 73/2012, concerning the National Strategy of Mangrove Ecosystem Management; and Minister of Environment Regulation Number 201/2004, regarding the criteria and standards for determining mangrove destruction. The National Strategy for Mangrove Ecosystem Management (Presidential Regulation 73/2012) established enhanced coordination, integration, synchronization, and synergy across relevant sectors, agencies, and institutions responsible for mangrove management. Government and other actors realized that it was difficult to coordinate mangrove management across different sectors that were operating through their own sectoral legal frameworks, as well as those ratifying international conventions such as biological

diversity and climate change. In addition, the strategy is an important acknowledgement of the centrality of mangrove ecosystem management within the overall approach to managing coastal landscapes, which was often overlooked while designing mangrove rehabilitation projects on the ground.

Substantively, the strategy requires the use of mangrove forests to be balanced against conservation and rehabilitation priorities. The strategy also underlines stakeholder coordination and collaboration, including the need for stakeholder support of mangrove management. It draws particular attention to community-based management and highlights the responsibility and authority of local governments in mangrove management. Finally, it emphasizes the importance of research, science, and technology for sustainable management. To ensure effective cross-sectoral coordination, the strategy establishes a national coordination team for mangrove management and a national working group to help the coordination team implement the national strategy. At the local level, provincial and district governments form their own strategies and working groups.



■ A mangrove nursery in Pulau Dua Nature Reserve. The area is vulnerable to aquaculture and industrial development. Credit: Aulia Erlangga/CIFOR

In terms of defining or constraining rights of local communities over mangrove forests, Presidential Decree 32/1990, Forest Law 41/1999, and subsequent regulations and local governance-related regulations are critical. For mangroves located in state forest zones, Forestry Law 41/1999 takes precedence. This law divides forest areas into three functional zones with different rights of utilization: production, protection, and conservation. Mangrove areas can be found across all three forest zones. If a mangrove forest is located in a production forest zone, timber logging is allowed. In protection forests, logging is prohibited. Only non-wood forest products and environmental services can be harvested from those zones. The most restricted utilization of mangrove occurs if they are located in conservation forest. In those zones, only environmental services, research, and education can be conducted.

Presidential Decree No. 32, 1990 declared all mangrove forests as protection forest zones, irrespective of whether the mangrove forest falls under areas classified as forest zone (i.e., on state forest land) or *areal penggunaan lain* (APL). The same presidential decree mandates the maintenance of a mangrove greenbelt in any coastal area, with a required width of 130 meters multiplied by “the annual average of the difference between the

highest and lowest tides” (Kusmana, 2014, p. 38). By placing mangroves under state forest zones, the decree vests authority and control over them in the central government, although management responsibility rests with the district forestry agency. When mangroves fall under APL, authority is vested in the local government.

In addition to the sectoral laws, thematic laws also have a bearing on the protection and management of mangroves. For example, Law 23/2014 on Regional Government specifies the authority of central, provincial, and district governments. Similarly, Village Law 6/2014 defines the authority of village governments. Both laws regulate the division of governmental authority, which applies to mangrove forests. In terms of protection, conservation, and rehabilitation of mangroves, as well as mangrove zoning as part of spatial planning, the central government holds the authority for cross-province areas; the provincial governments for cross-district areas; and the district governments for their district. Law 23/2014 states that the provincial government holds most authority over forestry, except for mangroves that are situated in a forest park (*taman hutan raya*). The latter forest is under the authority of the district government. With the Village Law 6/2014, village governments have authority to set up village development plans and to

develop economic activities in their territories. Villages with mangrove forests can use this law for mangrove management purposes. For the distribution of the benefits of mangrove use, villages can establish a special village economic organization called *badan usaha milik desa* (village-owned company).

Other regulations also have implications for mangrove management, especially local community rights and protection, rehabilitation, and use. Environmental Protection and Management Law 32/2009 defines the processes and standards for community participation, environmental safeguards, and incentives for environmental conservation. Provisions of this law support community participation; customary rights; financing, and/or incentives for conservation and sustainable use/management; maintained or increased mangrove forest cover in the landscape; and delivery of multiple benefits from mangroves (or other forests) in terms of ecological integrity, human well-being, and biodiversity conservation. Environment Law 32/2009 provides for alternative forms of conflict and dispute settlement, including the use of out-of-court settlements. It also introduces financing mechanisms to incentivize sustainable management, none of which has been implemented due to the absence of implementing regulations. However, this law provides a strong legal basis for the rehabilitation and/or restoration of mangroves, including the protection and preservation of biodiversity, because it requires that agents polluting and causing environmental destruction must conduct rehabilitation and restoration.

Like the Environmental Law, the Conservation Law (Law 5/1990) and the Biodiversity Law (Law 5/1994) encourage biodiversity conservation in coastal areas. Any mangrove forest inside the protection forest zone can be designated as a conservation forest area, thus severely limiting the rights of people over the resources. In addition, the Minister of Marine and Fisheries Regulation for Conservation (Regulation 17/2008) determines the types of conservation areas that can be delineated, the enactment of those areas, the division of governmental authority, and procedures for managing those areas.

The Spatial Planning Law 26/2007 and Law 27/2007 on Coastal Areas and Small Islands Management are important for mangrove governance as they set the basis for zoning, strategic and management planning, and the coordination of different government agencies and across levels of governments. The spatial plan is the main reference for any land and resource utilization and all other sectoral plans must be appropriately integrated. The various plans under Law 27/2007 specify activities

that can be conducted or prohibited, outline the procedures and responsibilities of the various institutions/agencies regarding resource use or development activities in specified zones, and provide a comprehensive conflict resolution with in- and out-of-court settlements.

The regulations related to management of coastal areas and small islands are largely supportive of community participation and customary rights in this area, and define the authorities and responsibilities between central and local governments. All these regulations have a common objective to protect, conserve, rehabilitate, utilize, and enrich natural resources and their ecosystems in coastal areas and on small islands. Hence they emphasize that “rehabilitation of mangrove in coastal areas and small islands must consider the balance of ecosystem and biodiversity.”⁴ Enriching biodiversity, improving natural habitats, and protecting species can achieve rehabilitation. Central and local governments as well as those who get direct or indirect benefits from coastal areas and small islands carry out rehabilitation.⁵ Presidential Regulation 121/2012 on Rehabilitation of Coastal Areas and Small Islands states that the rehabilitation should be implemented in mangrove areas as well.⁶ The regulation mandates the development of a rehabilitation plan that includes tenure rights, harmonization of the rehabilitation plan and zoning and spatial plans, and biophysical and socioeconomic conditions.⁷ It also mandates that central and local governments should conduct monitoring and evaluation of mangrove rehabilitation initiatives every six months.⁸

Community participation and empowerment is well regulated in Law 27/2007 on Coastal Areas and Small Islands Management. Chapter XI of the law consists of provisions regarding rights, obligations, and participation of communities, including complaints, objections, and compensation.

Public participation in planning is detailed in Ministerial Regulation 34/2014. Public consultation is mandatory in all planning processes. To enhance knowledge and capacity as well as multiple benefits from mangrove management, Ministerial Regulation 40/2014 emphasizes six areas of intervention: (i) capacity building, (ii) access to technology and information, (iii) capital, (iv) infrastructure, (v) markets, and (vi) access to other productive assets. The regulation allows various types of permits for the

4 Law 27/2007, Art. 32.

5 Law 27/2007, Art. 33.

6 Presidential Regulation 121/2012, Art. 2 (3).

7 Presidential Regulation 121/2012, Art. 9 (1).

8 Presidential Regulation 121/2012, Art. 14.

utilization of coastal areas and small islands. Legal entities, individuals, and local communities are eligible to be license holders. However, the law does not regulate the conditions of license application, duration, and procedure.

Table 3 shows the mangrove governance dimensions provided for among the laws described above. It is evident that the Coastal Areas and Small Islands Law, Environmental Protection and Management Law, and Regional Government Law cover the most ground in relation to governance. The Forest Law covers fewer aspects, but includes critical issues such as tenure and its security, as well as legitimizing mangrove forests as an important land use. However, the Forest Law's coverage of tenure and land use is restrictive—it is protectionist, severely limits the range of rights of local communities, and views protection as the only feasible mechanism for mangrove conservation. Due to a Presidential declaration that mangrove forests are protection forests, this law holds the greatest sway in mangrove management.

It is clear that the laws and policies that touch on mangroves are many and diverse, from sectoral laws (i.e., Forestry, Marine, and Fisheries), to thematic/ crosscutting laws (i.e., Environmental Management, Regional Government), to a mangrove strategy. Apart from Presidential Decree No. 32, 1990, which declared mangroves as protection forests and mandated the reservation of a mangrove greenbelt along the coast, there is no mangrove-specific law. However, as demonstrated here, many laws contain pieces that can be applicable in mangrove forest settings. While there is a logic to this level of fragmentation given the somewhat ambiguous location of mangroves, a single, integrated piece of mangrove legislation could result in more efficient administration and effective governance. Most of all, its stipulations can be tailored to address the specific and unique needs of mangroves as wetland forests existing between the land and sea.

Table 3. Matrix showing different pieces of legislation and the aspects of governance they address


	Gender equality	Community participation	Benefits distribution	Tenure rights	Tenure security	Coordination across levels of government	Conflict resolution	Community/ customary systems	Financing and/or incentives	Knowledge and capacity	Cross-sectoral coordination	Mangrove forest cover	Biodiversity conservation	Multiple benefits from mangrove	Mangrove forests as legitimate land use	Monitoring and review
Forest Law				✓	✓											✓
Environmental Protection and Management Law		✓				✓	✓	✓	✓		✓	✓	✓	✓		
Basic Agrarian Law	✓		✓	✓	✓	✓		✓				✓				
Coastal Areas and Small Islands Management		✓		✓	✓	✓	✓	✓		✓		✓	✓	✓		✓
Spatial Planning Law		✓				✓	✓				✓					✓
Conservation Law and Biodiversity Law												✓	✓			
Fisheries Law										✓						
Regional and Village Government Laws		✓	✓	✓	✓	✓	✓				✓					
National Strategy on Mangrove Ecosystem Management						✓	✓			✓	✓					✓

A woman with short dark hair, wearing a pink and white patterned t-shirt and a colorful patterned skirt, is holding a large mud crab. She is looking down at the crab with a focused expression. The crab is dark brown with large claws and is being held by a yellow string. The background shows a wooden structure and some greenery.

4

MANGROVE GOVERNANCE AND TENURE IN PRACTICE IN LAMPUNG PROVINCE

A Kamoro woman displays her catch of Mud Crab (*Scylla serratus*), which are caught daily in the bountiful forests of the Lorentz Lowlands in Indonesian Papua. Credit: Robert Hewatt/USAID IFACS



This section offers an assessment of the evolution of legal and institutional arrangements and actual practices of mangrove governance and tenure in Lampung Province. Through the selected three case studies in Lampung, the assessment can delve deeper into the implications of varied governance regimes at multiple institutional scales on mangrove management and conservation. Lampung Province is located in the southeast of Sumatra Island, with an area of 35,376 km². Until the mid-twentieth century, the current Lampung territory was sparsely populated (Kusworo, 2014). During the colonial period, Lampung was known as Indonesia's "pepper basket," playing a key role in the global lucrative pepper trade (Kusworo, 2014). Later, coffee production and export of forest products added to its trading base. In the 1990s, Lampung regularly ranked among the poorest provinces of Indonesia. In 1999, one out of two families were categorized as poor. Lampung experiences one of the highest incidences of land conflict in Indonesia given that many transmigrants became squatters on forested lands. While the population has grown substantially, from 104,200 in 1845 to about eight million in 2015, much of this expansion was primarily driven by the government's transmigration⁹ program that started in 1951, transferring impoverished migrants from overpopulated Java to other areas.

Around 85 percent of the current population in Lampung Province comprises immigrants from neighboring provinces. With the increased population, pressure for additional land led to rapid deforestation in Lampung. In the 1990s, conversion of mangroves in eastern Lampung for rice production and shrimp production was the last phase of opening up the lowlands (Kusworo, 2014). The rapid loss of mangroves, having led to increased damage to coastal landscapes from intense storm surges and intrusion of saline water inland, has resulted in communities mobilizing to protect their lands and livelihoods. In doing so, community leadership has taken up the charge of creatively utilizing existing laws, regulations, and policies to forge appropriate partnerships for improving mangrove conservation and rehabilitation.

After setting out the status of mangrove forests in Lampung and the prevailing government approach to mangrove management in Lampung, the focus of this chapter examines the range of initiatives taken by communities in partnership with the government, universities, and NGOs to address their concerns about mangrove loss and its impacts on their security and livelihoods. Governance arrangements for mangrove management among the three selected villages is studied, which represent community-owned, MOEF-owned,

⁹ The Dutch colonial government began the transmigration program, and the Indonesian government continued it to transfer landless people from densely populated parts of Java to less populous areas. The program reached its peak from 1979 to 1984. It has been controversial, because of the fear of Javanization and Islamization it propagated. As funds ran dry, the scope of the program significantly reduced.

and local government-owned mangrove territories. Next, the chapter explores the history of mangrove management and the emergence and functioning of local-level institutions and structures, which highlights local tenure rights to mangrove resources and considers the gender dimensions of rights and participation in governance. Finally, the chapter sets out the local-level efforts at mangrove rehabilitation and their linkages to external actors and resources to identify the key factors that influence rehabilitation and conservation efforts.

4.1 STATUS OF MANGROVES IN LAMPUNG PROVINCE

Government data indicates that 30.43 percent of Lampung's land area is forested, although the specific portion occupied by mangroves remains unclear. From the 1970s, particularly from 1990s, mangrove forests were logged for charcoal production and converted to brackish ponds for fish farming (*tambak*), agriculture, and settlements (Ilman et al., 2016; Kusworo, 2014). During this period, Indonesia's main exports were shrimp and fish, which resulted in widespread exploitation of mangrove forests throughout the country. The government welcomed external investors and encouraged private companies to take advantage of the country's vast array of natural resources to spur economic growth. In East Lampung District, about 62,500 ha of mangrove territory was granted for shrimp farming to Dipasena, a private Indonesian company; it started its operation in 1988 by clearing the mangrove forest and continued to expand its shrimp production territory up to 2000.

The continued practice of government-issued logging concessions in mangrove forests led to intense coastal erosion due to powerful tides and storm surges. This also negatively impacted agriculture and fisheries, as many of the fishponds established along the coastline were swept away by strong tides and winds. Therefore, in 1975, the Fisheries Department instructed local governments to maintain a 400-meter wide greenbelt in coastal areas; this was followed by a similar regulation from the Forestry Department in 1978 (Ilman et al., 2016). By 1978, about 45,000 ha of mangrove territory had been given to 13 companies for logging, mostly in Sumatra and Kalimantan (Ilman et al., 2016). By the end of the 1980s, however, the government either revoked the earlier permits or stopped issuing new permits. Even as mangroves were being cleared, the central government initiated measures to control mangrove deforestation such as declaring coastal mangrove forests as protection forest zones, mandating greenbelts along the coastlines, funding mangrove planting activities, and supporting local communities in mangrove forest management.

Gradually, exploitation of mangroves for timber slowed from 2000 onward as the government took measures to



curb deforestation, encourage rehabilitation, and introduce silvicultural guidelines. The main triggers for the government initiatives were coastal erosion, which negatively affected local people's livelihoods, and the deadly tsunami of 2004 in the Indian Ocean, which had even greater negative impacts along deforested coastlines. Fast-growing mangrove species were used to recover part of the previously cleared mangrove territory in the region. However, at the same time, fishponds continued to expand in Sumatra (Ilman et al., 2016).

4.2 GOVERNMENT SECTORAL RESPONSIBILITIES OVER MANGROVES

In Lampung Province, mangrove forests are located in the state forest zones, de facto communal land, and the APL territory. Within each of these categories, there are a complex set of stakeholders, some working in a coordinated fashion, and some with overlapping mandates. Local communities have played a key role in pushing the mangrove conservation agenda and practice forward. In the state forest zone, the Watershed Management Agency, the District Forestry Agency, and NGOs are involved in mangrove management. Similarly, in the de facto communal land area, NGOs and village authorities are the primary actors while communities also draw support from external donors based on the personal connections of village leaders. In APL territory within Margasari village, the local government owns the mangrove land territory, whereas the main management responsibility has been given to the Lampung Mangrove Center (LMC), and other stakeholders such as the District Fishery Agency, Marine Agency, NGOs, and communities are involved in mangrove management.

Currently, the following governmental and nongovernmental agencies are working on protection and rehabilitation of

mangrove forests in Lampung Province: the Fishery and Marine Agency at the national and district levels, the NGO *Mitra Bentala*, LMC, the Watershed Management Agency under MOEF, and Way Kambas National Park. Table 4 provides a summary of the implementing agencies, including the governance level (district, provincial, or national) at which they are positioned, the legal basis of their operation, and their key objectives. With the exception of the national park, all the agencies are working with local communities in mangrove management and community empowerment activities. Most of these organizations overlap in supporting local communities. For example, while the Watershed Management Agency provides mangrove seedlings to communities in state forest zones, NGOs offer social mobilization and institutional development support to the same communities. However, there are no reported partnerships between the Watershed Management Agency and Fisheries and Marine Agency, as they are operating in exclusive territorial jurisdictions in relation to mangrove forests. Nonetheless, the Fisheries and Marine Agency offers support to communities located beyond mangrove territories outside of the state forest zone. In rare cases do they work in the same communities where the Forestry or Watershed Management Agencies have been supporting communities in state forest zones. In Purworejo village, for example, local communities have secured the support of both the Fisheries Agency and the Forestry Agency.

Sustained support from government agencies to local communities for mangrove management in a de facto community ownership area is a substantial challenge. In Pahawang village, for example, *Mitra Bentala's* attempts at securing technical and funding support from the Forestry Agency have been unsuccessful mainly because their village falls outside the state forest zone. The local government is also unwilling to offer support as they consider the community mangrove area outside of their jurisdiction.

Table 4. Summary of implementing agencies for mangrove resource management in Lampung Province.

	Fishery and Marine Agency	Fishery and Marine Agency	Mitra Bentala	Lampung Mangrove Center (LMC)	Lampung Forestry Office	District Forestry and Plantation Office	Watershed Management Agency	Way Kambas National Park
Level	National	Pesawaran District, East Lampung Province	Lampung Province	Lampung Province	Lampung Province	Districts of Lampung Province (our sites in East Lampung and Pasawaran districts)	Lampung Province	Lampung Province
Type of Agency	Government	Government	NGO	University of Lampung	Government	Government	Government	Government
Law and policies	<ul style="list-style-type: none"> • Law No 27/2007 on Management of Coastal Areas and Small Islands • Presidential Decree on National Strategy for Mangrove Ecosystem Management 	<ul style="list-style-type: none"> • District regulation on the establishment, organization, and working procedures of technical implementing unit of Pesawaran district 	<ul style="list-style-type: none"> • Law No. 27/2007 on Management of Coastal Area and Small Islands • Indonesian Constitution 1945 	<ul style="list-style-type: none"> • East Lampung Regent Decree No. B. 303/22 / SK / 2005 on Determining a location for Lampung Mangrove Center 	<ul style="list-style-type: none"> • Lampung Governor Regulation No. 34/2010 on the Details, Duty, Function and Administration of the Office of the Provincial Government of Lampung • Law No 41/199 on Forestry 	<ul style="list-style-type: none"> • Regulations of the Head of Lampung Timur District Number 23 Year 2007 on the Establishment of Implementing Agency in East Lampung district • Regulation of the Head of East Lampung District No. 26/2007 on Description of the Tasks and Functions of the Implementing Agency in East Lampung district 	<ul style="list-style-type: none"> • Minister of Forestry Decree No. 26/Menhut-II/2010 on the Technical Guidelines for Rehabilitation • Forest and Land 	<ul style="list-style-type: none"> • Law No. 5/1990 on Conservation of Natural Resources and Ecosystem • Law No. 41/1999 on Forestry • Minister of Forestry Decree No. 670/Kpt-II/1998 on the Organization of the Way Kambas National Park

continued on next page

Table 4. Continued

	Fishery and Marine Agency	Fishery and Marine Agency	Mitra Bentala	Lampung Mangrove Center (LMC)	Lampung Forestry Office	District Forestry and Plantation Office	Watershed Management Agency	Way Kambas National Park
Main objective	<ul style="list-style-type: none"> • Improve local economy • Protect mangroves • Implement integrated rehabilitation program for tourism 	<ul style="list-style-type: none"> • Empower communities • Protect mangroves and control erosion 	<ul style="list-style-type: none"> • Empower communities • Protect mangroves and raise awareness 	<ul style="list-style-type: none"> • Educate • Conserve the environment • Empower communities 	<ul style="list-style-type: none"> • Develop policies, institutional arrangements for implementing policies • Plan forestry and forest management operations • Gazette forest zones; production forests, protected forests, and National Parks • Implement and monitor rehabilitation, reclamation, silvicultural systems, aquaculture and processing • Manage forest reserves, production forests and protected forests at provincial scale, and Forest Management Units • Support capacity building; educate, provide technical training, applied research and development 	<ul style="list-style-type: none"> • Manage plantations and forests • Provide technical support to social forestry schemes 	<ul style="list-style-type: none"> • Improve rehabilitation program by providing data and site information • Provide guidance and technical support • Provide seedlings • Facilitate 	<ul style="list-style-type: none"> • Secure coastal and forest area • Establish conservation groups • Protect endangered species; provide elephant care, conflict mechanism between humans and wildlife • Prevent, put out fires, and treat post-fire forest; monitor hot spots and prevent forest fires • Develop and utilize nature

4.3 VILLAGE SITE SELECTION

To understand the details of local-level governance and tenure dynamics within Lampung's mangroves, three sites were selected that highlighted the different types of tenure arrangements found in villages (Table 5). Pahawang village is located in Pesawaran District, and the remaining two villages are in East Lampung District. East Lampung District holds 2,730 ha of mangrove forest. Over 2,000 ha of these mangrove forests are found within kawasan hutan (state forest zone), including 1,000 ha in the Way Kambas National Park. About 1,000 ha are outside the national park, including 700 ha under the Mangrove Rehabilitation Center, managed by the University of Lampung (UNILA) in collaboration with the District Forestry Agency, local communities, and NGOs (Margasari village). About 300 ha are managed by the District Forestry Agency by mobilizing local communities (Purworejo village).

Since Lampung Province is largely inhabited by immigrants from other islands or from other parts of Sumatra Island, the population of two of the villages (Purworejo and Margasari) is comprised entirely of migrants; the third village comprises a majority of Lampung indigenes (Pahawang village). Purworejo was established in the 1950s while the other two were recognized as villages only in the 1980s. Similarly, Purworejo and Margasari villages were set up for aquaculture while Pahawang village has a strong agricultural component. The main features of the selected sites, including mangrove tenure, coverage, and demographics are presented in Table 6.

4.4 HISTORY AND MOTIVATION FOR COMMUNITY-BASED MANGROVE MANAGEMENT

A major motivation for mangrove management and rehabilitation by the communities was the coastal erosion effects of mangrove loss and degradation. Mangrove loss was driven by timber extraction and logging, as well as fishpond construction (*tambak*) in the 1970s, 1980s, and 1990s, primarily by migrants from East Java. Charcoal production and the harvesting of mangrove bark for dye production were additional causes of deforestation and degradation. Negative impacts of coastal erosion included washing away of fishponds, houses, and agricultural land by seawater, as well as outbreaks of malaria and dengue fever. Mangrove loss also destroyed fish breeding grounds that necessitated fishers going further out to sea to fish. By the early 2000s, the erosion had substantially affected

local economies and livelihoods. It sharpened focus on the importance of mangrove forests and the urgent need for sustainable management and protection. In Purworejo Island for example, between 1998 and 2009, community incomes from fishponds declined by a drastic 40 percent while in Margasari a total of 500-meter stretch of coastal land was lost to the ocean.

Most importantly, village leaders spearheaded rehabilitation and conservation management activities. In Purworejo for example, since 2005, Mr. Samsudin planted mangrove seeds within state forest areas to protect the village's land and assets. He began receiving state support for this initiative two years later. Similarly, Mr. Isnaen of Pahawang Island began rehabilitation activities in 2000 with the support of *Mitra Bentala*, a local NGO that focuses on environmental management and community empowerment. In Margasari village, Mr. Sukimin initiated erosion control by planting *Avicennia* spp. and installing bamboo poles to break the force of the seawater. This created new land upon which natural regeneration of mangrove occurred. This initiative received further support from UNILA, which provided technical advice and diversified mangrove planting to include *Rhizophora* mangrove species.

4.5 VILLAGE-LEVEL TENURE AND PROPERTY REGIMES IN MANGROVES

As noted above, these three villages fall under different land tenure regimes. The regimes differ quite markedly and include *de facto* community control (previously customary territory on Pahawang Island), state forest zone/*kawasan hutan* (in Purworejo), and local government forest managed jointly with UNILA in APL areas (Margasari).

In the customary territory on Pahawang Island, indigenous people traditionally held *de facto* ownership of the entire island collectively. At the time, mangrove forests were treated as open access and were accorded low value since communities had access to terrestrial land for agriculture and only caught fish, crabs, and prawns opportunistically. Over time, the land was parceled out to individual households and most of the territory is now under individual parcels. Only a small portion of the territory's 1,084 ha is community land, and about 140 ha of that is mangrove forest. The community land held and managed collectively is located in the coastal area, and has been assigned for mangrove forest development.

The mangrove forest in the state forest zone of Purworejo legally falls under the jurisdiction of MOEF with the District Forestry Agency bearing responsibility for its management and conservation. The District Forestry Agency of East Lampung

Table 5. Population and mangrove forest area in selected sites

Village	Sub-Villages	Total households	Population			Total village area (ha)	Mangrove forest area (ha)
			Male	Female	Total		
Pahawang	6	452	827	849	1,676	1,084	142
Purworejo	8	984	1,898	2,140	4,038	525	300
Margasari	12	1,859	3,741	3,830	7,571	7,002	700

Table 6. Key features of the selected sites

Features	Pahawang village	Purworejo village	Margasari village
Establishment	1980	1956	1981
Location	Sub-district Marga Punduh, Pesawaran District	Sub-district Kotagajah, East Lampung District	Sub-district Labuhan Maringgai, East Lampung District
Sub-village	6 hamlets	6 hamlets	12 hamlets
Ethnicity	West Java (Banten), Central and East Java Lampung, Bugis, and Padang	Lampung, Java, Bali, Palembang, Sunda, and Tiong hoa	Sumatra (Metro, Palembang), Serang, Cilacap, South Sulawesi, and Java
Main livelihood	Agriculture, fishery, labor, trading, teachers, and government service holders	Fishery, shrimp farming, agriculture, and labor	Fishery and agriculture (paddy field)
Public facility	Elementary school (1985), Secondary school (2000), High school (2012), Village health center (1995)	Kindergarten (1995/1996), village health center (2010), secondary health post (2001), mosque (2000s), village hall, village road (2013), highway of East Lampung district (1990s)	Alfa supermarket (2013), ice factory (1980s), bank BRI (2015), gas station (2015), fish auction (1980s), village health post (2010), village hall (1980s), mosque (1980s), Fisheries and Marine Office/General Works Office/Forestry Department Office (2015), LMC (2015) Trans Kuala/Translok (1988), village road (2009)
Tenure category	De facto community controlled territory	State forest zone	APL
Mangrove development activities	Ecotourism development	Ecotourism development	N/A
Population composition	Inhabited by predominantly customary community (over 90%)	Predominantly immigrants, non-customary people	Predominantly immigrants, non-customary people
Local leadership	NGO support local leader to lead mangrove development (Mr. Isnaen)	Self-initiatives of local leader in mangrove development (Mr. Samsudin)	Ex-village leaders taking initiative in mangrove development (Mr. Sukimin)
External support	NGO support for community institution building	Collaboration with a range of external actors, both governmental and nongovernmental	Translocated households from nearby national park
Legal basis	Village regulation and permit from bupati as legal basis for mangrove management	Conservation group has prepared rules of mangrove forest governance in line with the existing state forest regulation	The agreement between the community, UNILA, and East Lampung government gives the overall coordination role of mangrove management to UNILA through LMC

District officially declared the area as a protected zone in 1990 under the Presidential Decree 23/1990. Ten years later, the government surveyed and demarcated the mangrove forest area and reached an agreement with community members, allowing them to use fishponds they had previously constructed in the forest. In return, community members were required to plant mangrove trees in and around the fishponds.

The mangrove forest area in Margasari, managed collaboratively by local government and UNILA, is designated as *Kawasan Lindung* (protected zone) and faces severe restrictions in the use of mangrove

forest. Apart from the public/state-owned land, land in the area is held and titled individually, with no collective ownership.

Despite the differences in broad tenure categories (customary, state, local government), the bundle of rights available to communities are restricted since all three areas are protected—two by law and one through local community restrictions. More specifically, community members can collect aquatic fauna (e.g., fish, crabs, prawns, etc.) and other non-timber forest products (NTFPs), such as leaves, fruits, and seeds, from the mangrove area but cannot harvest mangrove trees.

Table 7. Rationale behind perception of tenure security in different territories in Pahawang village

Area	Tenure security status	Reason for tenure security/insecurity
Mangrove area (30 ha)	Secure	<ul style="list-style-type: none"> Area is under the management of <i>Badan Pengelola Daerah Perlindungan Mangrove</i> (BPDPM) Zoning created opportunities for conservation and use Local people comply by the rules
Mangrove area (about 110 ha)	Secure – inside BPDPM but threats posed by external pressures	<ul style="list-style-type: none"> Utility zone under BPDPM management is secured Demand for more mangrove area by external investors is posing threats to local tenure security
Private land (about 700 ha)	Secure – titled settlements	<ul style="list-style-type: none"> Land for housing is certified, land for public facilities and social facilities is owned commonly
	Insecure – gardens and farmland	<ul style="list-style-type: none"> Farmlands mostly do not have ownership titles

Table 8. Rationale behind perception of tenure security in different categories of land in Purworejo village

Area	Tenure security status	Reason for tenure security/insecurity
Mangrove forest (state land)	Insecure	<ul style="list-style-type: none"> Limited bundle of rights (only access rights and collection of dead and fallen products) Environmental security (protection from erosion) External people frequently use the area for fishing and timber extraction Agreement with local government with unlimited time frame
Fishponds in individual land located outside Register No. 15	Secure	<ul style="list-style-type: none"> Titled land Distance from fishponds to the sea is quite far, so less risk of erosion No overlapping claim or risk of limiting rights by other parties
Fishponds inside the individually parceled out land but located inside Register No. 15	Insecure	<ul style="list-style-type: none"> Located inside Register No. 15, so legally is state-owned land Do not have land certificates
Wet rice field (individual land)	Secure	<ul style="list-style-type: none"> Have land certificates
Settlement (individual land)	Secure	<ul style="list-style-type: none"> Ownership certificate Recognized by the village leader who issued the village land certificate
Settlement (individual land)	Insecure because of infrastructure development	<ul style="list-style-type: none"> Located on the west side of trans road The settlement may be affected by the new road construction Potential for landslide

The perceptions of tenure security vary with the tenure regime. Communities perceive their rights to mangrove forests on state land as insecure, due to the limited bundle of rights restricted mainly to access and collection of fallen or dead products. Outsiders also frequently use the area for fishing and illegal timber extraction. Communities in the community-managed area perceive their rights as secure mostly because the rules defining their rights and authorities of different actors are clear. Community members agree with the rules, which are also enforced. Local people are increasingly confident as they have cultivated good relationships and joint activities with external actors, which tends to lower threat levels. Similarly, the community in the area jointly managed by UNILA and the local government indicated that they felt secure against external threats because of the active presence of LMC and the District Forestry Agency. Across all three tenure regimes, external, private investments were identified as the biggest threat to local rights. Illegal timber harvesting and fishing by external fishermen is also perceived as a threat. Tables 7 and 8 summarize the key factors influencing perception of tenure security in Pahawang and Purworejo villages.

4.6 VILLAGE-LEVEL MANGROVE MANAGEMENT INSTITUTIONS

Despite the differences in tenure regimes within these three villages, local-level institutions that govern mangrove management bear strong resemblance to each other with respect to the organizational structures designed to guide and

enforce management activities. They also have similar mechanisms for legitimizing them within the broader context of Indonesia's mangrove management system.

The institutions were formed about 2005 through joint efforts of community leaders and external actors. In the community-managed territory, a local NGO supported the community to develop a mangrove-focused organization called *Badan Pengelola Daerah Perlindungan Mangrove* (BPDPM), or community institution for mangrove protection and management. BPDPM is headed by a chairman and consists of four divisions (Figure 3).

The village head and village council nominate the committee. BPDPM conducts its activities based on an annual and a five-year program. Through the establishment of a joint task force comprising community leaders, youth leaders, and six hamlet heads, BPDPM has led the development of village-level regulations for mangrove protection, rehabilitation, and utilization, including rules for the harvesting of timber and other mangrove products such as fish, shrimp, and sea worms.

Similar initiatives were instituted in areas under state forest zones and in local government mangrove areas managed by LMC, although the pathways used to arrive at community organizations were slightly different. In the state forest zones, the District Forestry Agency organized a workshop with village leaders to create a critical mass of individuals who would champion mangrove protection and rehabilitation. An outcome of the workshop was the establishment of groups in at least five villages. Each group includes a group leader, a secretary, a treasurer, and 11 members. The number

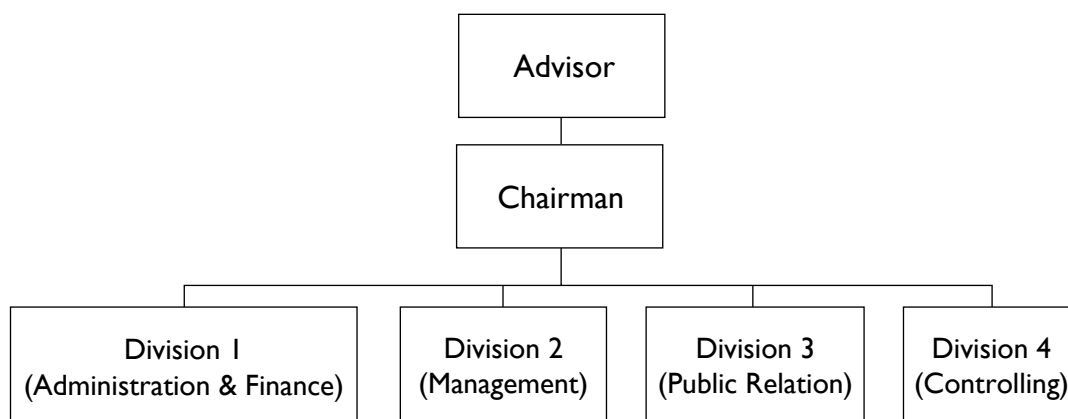


Figure 3. Organizational structure of BPDPM in Pahawang village

of groups expanded over time; one particular village, Purworejo, which began with one group in 2007, now has three groups after two more were formed in 2011.

In the local government mangrove forest, there is currently a formal, registered institution for mangrove management through the LMC, which was established through a Decree of East Lampung Regency in December 2005. However, prior to the establishment of the LMC, village leaders established four groups between 1993 and 2005 as a precondition for government support and funding for mangrove rehabilitation activities. Upon the enactment of the LMC, which has formal authority to manage local government mangroves jointly with communities and other relevant actors, these preexisting community mangrove groups entered into formal agreements with UNILA for mangrove management. This agreement is reviewed every five years. All the organizations are located at the village level and are autonomous, functioning independently of the village government structure.

Regulations for managing mangroves specify who has monitoring and sanctioning authority (such as BPDPM); who can harvest what products in what way (e.g., selective harvesting of branches, collection of fallen branches); and the equality of every village member in gaining benefits from mangroves. In addition, the regulations specify obligations, including planting mangroves around shrimp farms, and prohibitions, such as felling mangrove trees, clear-cutting mangroves for pond establishment, or using poison for shrimp fishing. Table 9 illustrates the local rules of Pahawang Island in the community-managed territory. Generally, outsiders are not allowed to extract resources without permission from group leaders and unsanctioned extraction leads to stiff penalties. Timber extraction is generally prohibited. Some groups require that anyone who cuts must plant at least 150 mangrove seedlings (usually supplied by the group). Repeat offenders are usually sent to the District Forestry Office for further legal action.

Table 9. Local rules and practices in Pahawang village

Aspects of mangrove governance	Is there any provision?	If yes, what exactly is mentioned	Practice (if different from the rules)
Bundle of rights and duration (access, use, manage, alienate, compensate)	Yes	Village officials and BPDPM are authorized to take appropriate measures to revert illegal activities within mangrove forests Rules of use and restrictions are included: access of people to core zone is prohibited, NTFPs collection is allowed in the buffer zone, and all forest products from utilization zones are permitted for its members only	Utilization is only permitted for Pahawang village. The area of mangrove protection zone in Pahawang is a public good (prohibiting sale of the land)
Tenure security (authority, protection of rights, assurance of rights)	Yes	The BPDPM is an autonomous institution and is empowered to make and revise rules	BPDPM is recognized by sub-district and district officials
Gender equality	No		Both men and women are involved in the protection activities Women's participation is largely confined to mangrove forest products processing and men are mainly involved in the decision-making process Women also participate in training in mangrove product processing at the provincial level
Community level governance: Representation and participation	No		The committee is comprised of Pahawang village members All members are encouraged to participate in every program, but level of participation depends on their interest

continued on next page

Table 9. Continued

Aspects of mangrove governance	Is there any provision?	If yes, what exactly is mentioned	Practice (if different from the rules)
Delivery of multiple benefits from mangroves	Yes	Major benefits recognized by local communities include mangrove products mainly from selective harvesting of branches, limited harvesting of timber, ecotourism, and research	People know the territory and rules, and abide by the rules
Benefits distribution	Yes	Every village member has an equal right to access, use, or harvest products from mangrove areas	As mentioned in rules and community decisions
Incentives for conservation and management	No	Rules do not specify the incentives of mangrove management but obliges groups to maintain a greenbelt	As a group they got financial support from Mangrove Center in Medan (BPHM) for rehabilitation program by providing mangrove seedlings
Community/customary systems and authorities	No		Recently, they are not tightly bound in the customary system, as they are now mixed with migrants and Lampung people
Coordination and collaboration with other agencies	Yes	Leaders are aware BPDPM is an autonomous institution and can establish a relationship with external agencies and seek funding A NGO, village authority, or research organization can monitor mangrove area in Pulau Pahawang	In addition to Mitra Bentala, they have also networked with agencies such as BPHM, UNILA, and LMC
Rehabilitation and restoration of mangrove	Yes	People who have carried out shrimp pond or fish cultivation should rehabilitate/replant mangrove areas on their land	
Biodiversity conservation and ecological integrity	Yes	Protection of mangrove forests is a joint effort to save small island ecosystems that are highly vulnerable. In this mangrove forest area, activities that disrupt and damage the function of mangrove forests are not permitted; disruption and destroying of mangrove is defined as felling of the mangrove trees, harvesting worms by cutting mangrove trees, catching small shrimp, using poison around mangrove and clear cutting mangrove areas for use as a fishpond.	
Conflict resolution	No		When there is conflict, BPDPM decides after consultation with conflicting parties
Monitoring and review	Yes	The village head and BPDPM are authorized to conduct monitoring The village head, village officials, and BPDPM must raise awareness of protection of mangrove forests, especially for people who conduct their activities around mangrove and coastal areas	

BPDP, who manages the community territory, does allow timber extraction. Here, the mangrove forest has been divided into three zones (core, buffer, and utilization). Use of mangrove forest or aquatic resources is prohibited in core and buffer zones. Collecting mangrove products for fuelwood or timber for house construction (Layos tree, *Rhizophora mucronata*), or establishing fishponds in the utilization zone requires permission from BPDP. Timber extraction is permitted in the utilization zone with the caveat that an equal number or more of seedlings must be planted for every tree extracted. BPDP provides the seedlings. The first time someone extracts trees without permission, he or she will be asked to plant 50 mangrove seedlings in a designated area. If the same person extracts mangroves again without permission, he or she faces a fine of IDR 50,000,000 (about US \$3,700). Third time offenders are reported to the police for further action.

It is clear that village-level regulations for mangroves, and the village organizations that implement them, enjoy strong recognition from village authorities, district authorities, and even the central government. Village leaders and district-level authorities (*bupati*) have formally approved and endorsed village regulations. In the customary territory, BPDP has even obtained a local government decree. Community institutions in the state zone forest aligned their local mangrove rules with national policies and regulations.

Generally, it is evident that these local-level institutions for mangrove management are successful in improving mangrove protection and conservation. The level of compliance with village-level regulations is high; mangrove-related conflicts are few and enforcement is effective. Both enforcement and conflict resolution are enhanced by the multi-level nature of the actors that cooperate with the mangrove management institutions. For example, in the local government forest managed by the LMC, monitoring and rule enforcement is conducted by a network of forest safety guards (*pamswakarsa*) comprising community group leaders and forest rangers, established through the district government. In the state forest zones, a similar structure exists and has been further developed to handle conflicts with outsiders: the *pamswakarsa*¹⁰ (voluntary security team) and *tim terpadu* (integrated team). *Pamswakarsa* is comprised of leaders of the conservation groups and forest guards, and is responsible for regular patrols and monitoring

of rule compliance. The integrated team consists of village authorities, police representatives, and the military commander of the territory at the sub-district level. Conflicts are primarily solved by the *pamswakarsa*; if they are unable to solve a conflict, then the integrated team is approached. The District Forestry Agency intervenes if both the *pamswakarsa* and *tim terpadu* fail to resolve a conflict.

The institutions and organizations for mangrove management described here are reasonably well designed and appear fit for purpose. They are similar with regard to their emergence, development, and structures adopted for resource management. All of them demonstrate the importance of focused leadership. All are linked to external actors who appear to endorse them, and offer complementary services and support critical to institutional functioning. Moreover, these organizations have reached out and supported development of similar mangrove management institutions and groups in other villages, thus scaling out mangrove protection and management and achieving some coordination with neighboring villages.

However, several weak points are evident. First, none of the organizations have changed their leadership since they were constituted (i.e., in at least 10 years). Moreover, the processes to acquire and maintain leadership positions are generally unclear. In the case of BPDP, the village head and village council nominate the committee, which contradicts the notion that BPDP is independent of the village government structure. Second, none of the organizations has women in their leadership and all the village-level mangrove regulations are gender-blind. These are serious flaws, which can potentially undermine the groups' functioning in the future.

4.7 GENDER AND MANGROVE GOVERNANCE

The rules for mangrove conservation management and protection are applied uniformly across all community members—men, women, and youth—although local social norms usually determine the distribution of rights, responsibilities, interactions, and knowledge in mangrove governance. As noted above, all village-level regulations are gender-blind; several mechanisms may be at work to produce and perpetuate this gender blindness. These mechanisms can include cultural tradition and custom, where women are expected to automatically follow and support men's decisions or to limit their activities in the public sphere, coupled with the traditional view of forestry as a male enterprise.

¹⁰ These are "forest guards" appointed by the District Forestry Agency for mangrove conservation; they patrol the designated territories and work as liaisons between the villages and District Forestry Agency.

The leadership of mangrove institutions claims to involve all community members (i.e., men, women, old, young, and migrants) but the participation of men and women in mangrove-related management and decision-making activities clearly differ. Only the men (older and younger) participate in planting activities. Women participate in seedling preparation and polybag filling and seldom attend planting or other training activities (e.g., developing food crackers, juice, or souvenirs mainly from mangrove leaves and fruits), and are not given the responsibility of patrolling. They are not represented on committees and executive bodies, and are not invited to meetings where issues such as seedling production, where to plant, and when and how to monitor are decided. They are solely dependent on their male family members to access any information related to decisions or plans. Men consider this exclusion of women as normal and rationalize it, "It is difficult to ask women to attend meetings because women are busy taking care of their houses" (participant in FGDs, older men category, Pahawang village).

Women agreed they would definitely attend meetings if they were invited. They claimed to know their rights and responsibilities in village mangrove forests largely through their interactions with their male family members. They lack knowledge of higher-level rules and regulations issued by the bupati (regent), by the governor, or at the national level. Young women had the least amount of knowledge of local rules and were mainly invited to participate in seedling planting activities. They reported that the rules of mangrove harvesting were stricter following the creation of the mangrove management institutions. For example, they are denied access to firewood from mangrove forests, or being restricted to certain areas of the mangrove territory (e.g. core mangrove area of Pahawang).

The limited involvement of women in management and decision making is related to their household role as the primary family caregiver, while men deal with external affairs. Older women thought that women were not sufficiently empowered to participate in public decision making and needed external support to strengthen their capacity and confidence. Some women reported that they were not interested in participating in mangrove management because they were busy, sometimes going out to sea to fish with their husbands. Others preferred to conduct their activities from home, such as preparing commercial products from mangroves or salting fish and peeling crabs for sale.

In Margasari village, the mangrove rehabilitation program explicitly addressed women's role in mangroves by

supporting education and income-generation projects. Three women's groups (30 people, 10 people in each group) have been established and are involved in running environmental education programs for children. These women also attend training programs run by UNILA on processing forest products. The Medan Mangrove Center in Bandar Lampung has also attempted to build women's capacity to diversify their use of mangrove products. Through these programs, women are now able to process mangrove products such as syrup, crackers, and sticky food from leaves and fruits. These products are mostly used for subsistence as the women have little information about how to market them, and with the lack of preservatives, the products cannot be stored for long, also limiting product marketability. UNILA has set up these groups to empower women through training and support for income-generating activities. Women are also active in managing a library that UNILA helped establish.

Young women take part in tourism-related activities, and unlike the older men, view private investment in tourism as a valuable opportunity. They believe that if external investors are permitted to come to the area, land value will appreciate significantly. Young men have more knowledge and experience in mangrove management than young women do. They are actively involved in community groups promoting ecotourism activities, including coral reef restoration. Young men worry that if individual landowners continue to make property-related decisions, the pressure to change land use will be much higher than the motivation to maintain the mangrove forest ecosystem. Young men indicated that, "Pahawang community as a group cannot prevent land selling in the village, as they relate to the interests of the landowner of the land itself. When a landowner sells it to the outside investor, then the mangrove would be threatened because external investors may not recognize the environmental values of mangrove forests to local communities. We hope all of the stakeholders will take care of mangrove protection efforts."

Overall, gender differentiation is clearly evident in mangrove management, but the rules crafted for mangrove management are gender-blind. As women do not have a seat at the decision-making table, they have to depend on male relatives to articulate their differentiated needs on their behalf. While practical needs linked to their gender roles might be met, their strategic needs and aspirations are stymied. The longer-term danger is that women's interest in, and incentives for, adopting sustainable mangrove management practices will be stifled.

4.8 COLLABORATIVE MANGROVE MANAGEMENT

Because the legal and institutional framework as well as the authority for mangrove management is fragmented among a range of actors, there is need to understand how local, village-level institutions navigate this complex landscape of actors, rules, and authorities. The establishment of formal and functional organizations and structures focused on mangrove conservation management, protection, and rehabilitation provides a good basis for collaboration since they provide a recognized structure and a reference point.

In addition, over the years, communities have sustained contact with the actors that contributed to and helped establish their mangrove institutions, such as *Mitra Bentala* (customary territory of Pahawang), the District Forestry Agency (state forest in Purworejo), and LMC (local government forest in Margasari village). These actors have served as an important bridge between communities and other actors who have supported the achievement of community goals such as rehabilitation initiatives, capacity building, funding, recognition, and endorsement by village and district authorities. Private companies do not work directly with communities but instead fund NGOs who work with communities.

Local community institutions reach out to and coordinate with a broad range of actors at multiple levels, many times through their intermediaries of choice. There does not appear to be a systematic mechanism for coordination between communities and other mangrove stakeholders, or a formal network that would support more focused and deliberate interaction. This is critical for sustaining and scaling up current initiatives, and ensuring that communities have the requisite technical, institutional, and budgetary support for their mangrove conservation management and rehabilitation efforts.

4.9 COMMUNITY EFFORTS AT MANGROVE REHABILITATION

Mangrove rehabilitation initiatives in Lampung province have a modest history, with the earliest established about 20 years ago in 1995 and the others 5 to 10 years later. The effectiveness of these efforts, however, is variable. For example, those that are directly connected to government (local or central) through land ownership and funding arrangements are more effective—planting more seedlings more consistently, rehabilitating larger areas, offering payment for labor invested, and engaging

in a broader range of activities in their rehabilitation programs. In all cases, rehabilitation programs are managed by the village-level organizations established for mangrove conservation management and protection (discussed above).

Three different approaches to rehabilitation programs are evident. The first is reliant on school programs and opportunistic integration of planting into ecotourism programs. The second is a hybrid program that relies on mandatory planting by primary beneficiaries of mangroves (fishers) as well as payment/compensation for the labor of those who plant seedlings. The third is an integrated, voluntary model that depends on paid labor, and includes awareness campaigns and training in the ecology and economics of mangroves. The last two models have achieved more in terms of rehabilitation but also required greater capital input.

In Pahawang Island, which receives NGO support, community institutions are heavily reliant on school programs and other programs that engage youth, such as ecotourism guides who integrate mangrove planting into visitors' programs. Targeted awareness-raising programs are conducted among primary and elementary schoolchildren. The main species planted by these groups are *pidada* (*Sonneratia caseolaris*).

In the second model (Purworejo), practiced in state-owned forests, a mandatory planting program is the main feature. Each time a person goes fishing, they are required to plant five trees. This mandatory planting applies to all people from the village, irrespective of their fishing location; they will still be given an area to plant even if they go fishing in the deep sea. In the areas where local communities have already built shrimp ponds inside the state forest zone, expansion is prohibited. Mandatory rehabilitation is also conducted within the shrimp ponds located inside the state forest zone. These programs pay for labor and share knowledge about mangrove forest management. Although the community in the state mangrove forest does not have a strong mangrove education program, they have established a mangrove arboretum, which is part of the awareness program. They have constructed a monitoring tower and infrastructure aimed at breaking the waves such as wave breaks, embankments, dikes/levees etc. They are the only community visited that had a tree nursery of its own.

The LMC-managed program on local government land (Margasari) has a central planting component that pays for labor. It includes a strong education dimension, which trains communities in the ecology and economics of mangroves, including ecotourism development. Alongside this are community and school awareness programs and infrastructure development (e.g., the construction of bridges, shelters, and watchtowers).

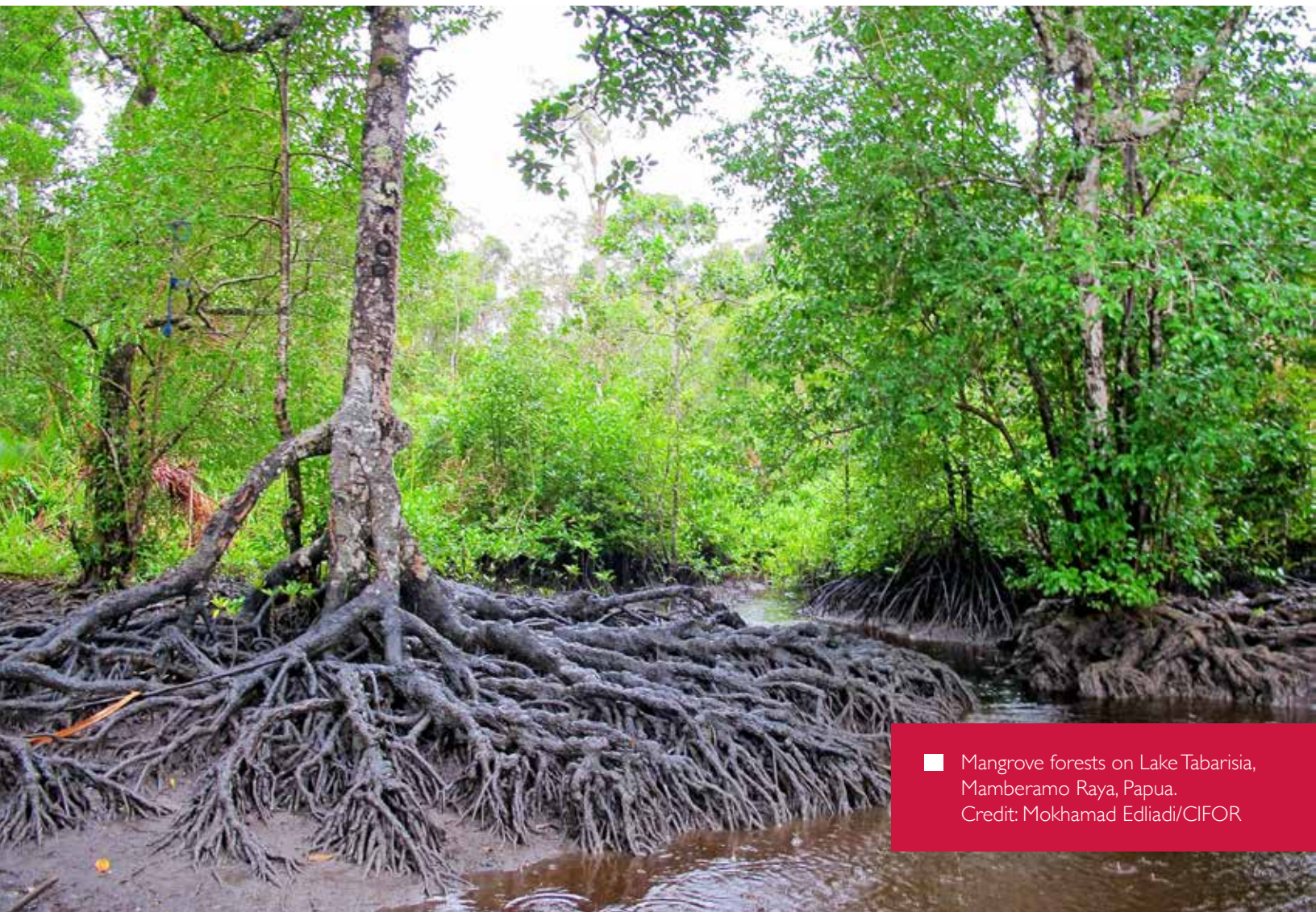
External support for these community rehabilitation efforts are skewed toward the program conducted in and around state forests, which explains the diversity of its rehabilitation interventions, including various forms of infrastructure aimed at controlling wave speed and force. This program receives support (e.g., seedlings) from various government agencies such as the Medan Mangrove Center, the Provincial Development Planning Board, the Forest and Land Rehabilitation Department at the provincial level, the Indonesian Army, and several state-owned enterprises. It has been able to reclaim up to 350 ha of new land from the sea on which the group started planting in 2011. So far, they have planted 328 ha, with a seedling survival rate of 90 percent.

The group in the customary territory has only received sporadic and insufficient support from the District Forestry Agency, the Medan Mangrove Center, the Fisheries and Marine Center, and *Mitra Bentala*. This lower level of support is undermining local enthusiasm for mangrove rehabilitation efforts, and BPDPM is thought to be less effective today. One of the key informants from Pahawang village stated, “So far we are not satisfied

with the recent status of BPDPM, because BPDPM is currently not strong anymore. We need to examine both the actors and institution of BPDPM in order to revitalize mangrove rehabilitation initiatives.”

In the area on local government land, the LMC planted 325 ha of *Avicennia* spp., *Rhizophora* spp., and *Nypa fruticans* between 1995 and 2007. The survival rate was about 60 percent, even with enrichment planting, due to high tides and shellfish that suppressed root growth. Mangrove planting programs succeeded when seeds were planted in the newly reclaimed land (*tanah timbul*).

Overall, mangrove rehabilitation programs in Lampung District have received acclaim from researchers and other actors from the provincial and national levels for their work. In 2010, for example, community groups in Pahawang Island received a prestigious environmental award (*Kalpataru*), established by the then Ministry of Environment, for their self-organization and efforts in protecting the mangrove forest. LMC groups in Margasari, both at the national and district levels, have won similar recognition.



■ Mangrove forests on Lake Tabarisia, Mamberamo Raya, Papua.
Credit: Mokhamad Edliadi/CIFOR




5

OPPORTUNITIES AND CHALLENGES FOR THE GOVERNANCE OF COASTAL MANGROVE FORESTS

Using a Phantom III drone to measure the past success of mangrove restoration during a Mangrove Forest Landscape Restoration assessment in Pohuwato, Gorontalo, Indonesia.

Credit: Benjamin Brown/Charles Darwin University – Research Institute for Environment and Livelihoods



This chapter draws out some key findings from this assessment of national- and local-level governance of mangroves within Indonesia. It addresses key thematic issues such as tenure and rights, coordination, and gender and benefits distribution; and highlights lessons that can inform future programming and policy development relating to the governance and tenure dimensions of coastal mangroves. In particular, this chapter analyzes whether and to what extent national regulations and programs are able to permeate through diverse layers of actors and institutions before reaching the communities. As explored in Chapter 4, the rules of mangrove governance are being negotiated at the village level with or without awareness of the government's regulatory frameworks in place at higher levels. In this chapter, emphasis is given to critically analyzing national- and sub-national-level policies, regulations, institutional arrangements, and activities to understand why certain aspects of mangrove management get more attention than others, as well as its effects on the mangrove resource and the community's well-being.

5.1 OVERLAPPING GOVERNMENTAL JURISDICTIONS AND REGULATIONS

As the mangrove ecosystem comprises terrestrial and marine resources, various national-level policies and laws regulate its conservation and management. In the mangrove ecosystem, the trees are under the jurisdiction of MOEF while water is under MMAF. There is considerable confusion in defining mangroves as primarily terrestrial or marine, and different laws and regulations apply if the mangrove forest is in an area that is predominantly terrestrial versus in a marine ecosystem. Mangroves in different areas therefore fall under the authority of different government agencies; these sectoral laws and overlapping jurisdictions pose major coordination challenges across line ministries.

Despite the plethora of rules that apply to mangroves at the local, national, and sub-national levels, village regulations were developed to specifically address mangrove protection and conservation. Moreover, they are integrated into broader resource management rules at village and district levels. This bottom-up approach, nested in higher-level regulations and authorities and extensively coordinated with higher-level authorities and actors, mitigates the potential confusion about mangrove management that may be conferred by the multiple authorities and jurisdictions. Mangrove-specific regulations at the village level aptly substitute for the lack of a mangrove-specific law or policy at the national level.

Despite the protectionist character of the Presidential Decree of 1990, there is space for a management regime that gives communities a considerable degree of statutory management authority in practice.

5.2 RIGHTS DISTRIBUTION AND TENURE SECURITY

Since all coastal mangroves are legally classified as protection zones, severe restrictions on rights apply. In addition, when the mangrove forests fall within a state forest zone, Forest Law 41/1999 takes precedence. When mangroves fall under APL, Regional Autonomy Law 23/2014 is relevant and local governments have authority to make land use decisions. However, the Presidential Decree of 1990 keeps the coastal mangrove areas as protected zones, restricting land conversion and requiring the maintenance of a greenbelt along the seashore. Despite some specific laws providing avenues for expanding the rights of local communities and the range of uses of coastal mangroves, the operational laws are overwhelmingly protectionist, restricting local communities' rights and concentrating ownership and authority in government agencies.

Although mangroves are under the authority of government agencies and classified as protected zones, with restrictions against consumptive use, communities have been able to negotiate use, management, and exclusion rights in practice. In light of growing mangrove loss, communities began to initiate management approaches that served to ensure mangroves are protected as well as support livelihoods among local residents. It is because of strong local leaders and their ability to foster reliable, external linkages that communities feel secure despite not holding the full bundle of rights to mangrove forests. They have also established management responsibilities that include the monitoring of mangrove use, sanctioning of violators, and rehabilitation of degraded mangroves. Communities have drafted regulations for mangrove conservation and management, which have been incorporated into overall village regulations recognized and accepted by higher-level authorities. Certificates of endorsement have also been provided by the local government. In one instance, mangrove village regulations have been aligned with national and sub-national legislation, where local communities work closely with the District Forestry Agency and local government authorities. People involved from these agencies had better understanding of the

national and sub-national level legislations and hence could inform local communities about these legislations while preparing local rules of mangrove management. Monitoring and enforcement of village rules is conducted jointly with external agencies such as the District Forestry Agency, which also contributes to a system of forest guards.

Communities largely feel that their rights to mangrove forests are secure because village regulations were developed jointly and are recognized at higher levels; and because they undertake monitoring and enforcement activities, and there are clear structures and individuals tasked with that monitoring and enforcement. In addition, local leaders in each village cultivated and expanded their relationship with external actors over time, including government institutions, NGOs, researchers, and international organizations. Because of these relationships, leaders do not feel anxious despite concerns raised about the shifting authority over mangroves from MOEF and the Marine and Fisheries Departments (see Box 2).

When comparing security of tenure rights under the different tenure regimes, community-controlled areas are perceived as the most secure. Here, communities have full control over mangrove territory, they have also designated zones including a utilization area where they can harvest timber, and they can collaborate with any external agency without approval from government agencies. The village and district governments endorse their regulations for mangrove use and management, making them legally strong in excluding outsiders. Communities managing mangroves under state forests are the least secure because their area is under the authority of the District Forestry Agency. Here, the agreement between the District Forestry Agency and community groups does not specify the duration of rights.

Box 2. On changing authority from District Forestry Agency to Marine and Fisheries Department

“We don’t care who is the prime authority because we have been working with both the agencies and have already established very good relationships with them.”

Mr Samsudin, Head of the Motiara Hijau I group and coordinator of the four groups within Purworejo village in East Lampung District

However, the basis for community rights rests on recognition of village regulations by higher-level authorities rather than on direct signing of an agreement with the management authority (District Forestry Agency). Thus, the bundle of rights for communities as well as tenure security is technically much lower in comparison to community forestry models practiced in terrestrial forests, where communities have a stronger set of formally recognized rights for a longer period (about 35 years).

The communities claimed that equal rights (between men and women, young and old, local population and migrants) persist as supported by the regulations. However, it is evident that these village regulations are silent in terms of acknowledging gender and broader social differentiation. Without such acknowledgement and active inclusion, it is unclear how groups that have been systematically excluded can then participate in and benefit from overall mangrove governance.

5.3 BENEFITS CAPTURE AND DISTRIBUTION

Communities appear to value environmental services or non-consumptive use (e.g., ecotourism) more than the direct economic returns from mangrove products. Mangroves provide a protective cover which reduces the pace and extent of coastal erosion and protects farmlands and fishponds, thus helping to assure critical livelihood activities. Protection against the negative impacts of coastal erosion is a major motive for community involvement in mangrove protection and rehabilitation activities.

As the economic returns from mangrove forests are marginal—largely because of the restrictions on timber harvesting—communities expect support from external agencies in producing seedlings, paying labor costs for planting, and providing funds for protection and development activities to incentivize local people’s continuous participation in mangrove management and rehabilitation. Areas that fall under the state forest zone appear to have regular access to government resources for mangrove conservation and management. Communities in other categories of forests, such as community-controlled forests, have much less access to external agencies, usually on an ad hoc basis. Local leaders distinctly recognize the challenges in retaining the support of community members if there is no external support available to complement internal, voluntary efforts.

The limited benefits to local communities from mangrove resources are also linked with limited market access. Women's groups in all three villages shared the same concern of not having a market outlet for their products. They have limited resources and capacity to undertake engagement with markets and the scale of production is too small to cover the transaction costs.

In the absence of rights for extraction of resources from the mangrove ecosystem, communities have turned to ecotourism, which has generated limited returns to date. Overall, communities are shouldering the burdens and responsibilities of protecting, conserving, and rehabilitating mangroves that are clearly owned by different categories of government—at the local and national levels—and their management agencies. It is unclear how much longer community institutions and initiatives will last without clear, substantive returns.

5.4 COORDINATION AMONG KEY STAKEHOLDERS FOR MANGROVE GOVERNANCE

A major explanation for the effectiveness of community institutions is their strong and clear coordination with district-level actors such as forest agencies, NGOs, and the Watershed Management Agency. The endorsement and acknowledgement of village-level mangrove regulations by village leadership, district-level leadership (bupati), and district-level forest agencies is one example of effective coordination. In one community, village regulations align with sub-national and national legislation. Such endorsements and alignment help to ensure village regulations are consistent and not in conflict with broader regulations that apply. Moreover, they allow for further coordination in practice. One example is the system of forest guards that work jointly with local communities to monitor, apprehend violators, and protect mangroves. Village leaders and forest guards also coordinate conflict resolution efforts—while sanctions for violations are issued from the village level, repeat violations are reported to and handled by public law enforcement mechanisms (e.g., the joint team [purworejo] or the police [margasari and pahawang]).

There is a modest level of coordination among district-level actors. As mentioned elsewhere, this is evident in how village regulations are recognized at the district level by the district and provincial heads. Some private companies appear to channel support for community mangrove rehabilitation through local NGOs who are in direct contact with communities. However, private

companies involved in shrimp farming and other forms of aquaculture development (who would have a strong incentive to support mangroves as they protect the development/investments from destruction by strong waves) were not interviewed in this study, which remains a major knowledge gap.

No single national authority and policy on mangrove forest management operates in practice. Since the 1980s, multiple government authorities have been involved in mangrove governance (Kusmana, 2014). However, the sectoral ministries have their own upwardly accountable structures and budget disbursement mechanisms, creating no incentive for cross-sectoral coordination. Recognizing the role of different government agencies and non-state actors, the recent National Strategy for Mangrove Ecosystem Management (Presidential Regulation 73/2012) established a national multi-sectoral coordination team with a separate steering committee and implementing team. Six different ministries coordinate the steering committee. The implementing team is led by MOEF and consists of 19 additional members from MMAF and other ministries. A similar cross-sectoral body has been envisioned for the provincial and district levels to coordinate and streamline mangrove management activities. In practice, however, these bodies either do not exist or are non-functional. Nonetheless, promotion of such bodies with the required budget, authorities, and linking mechanisms across sectors and levels of government could resolve the existing gap in coordination and joint initiatives that are critical for effective mangrove management.

5.5 OUTCOMES OF MANGROVE REHABILITATION EFFORTS IN STUDY SITES

Positive outcomes in terms of improved status of mangrove forests were reported in all three villages, both in terms of increased area and improved forest cover, including the spatial area over which successful rehabilitation efforts have been completed. A number of factors contributed to these improvements: solid motivation, secure rights, participation and institutions for collective action, strong and committed leadership, knowledge and technology, availability of resources, external support, and coordination across sectors.

Due to strong leadership as well as regular technical and funding support from the District Forestry Agency, communities have reclaimed land (tanah timbul) and planted mangroves. Motivated by a need to protect

themselves, their property, and their agricultural land, communities can successfully protect and rehabilitate mangroves. Community rehabilitation efforts in Lampung have their origins in efforts by individual community leaders who were determined to avert the negative effects of coastal erosion on community lives and livelihoods.

Rule compliance, in terms of abiding by harvesting restrictions and contributing time and effort to mangrove protection and management activities—was generally high in each village. This compliance is largely attributed to dynamic and charismatic local leaders, joint determination of tenure rules, agreement with and knowledge of the rules, and effective enforcement of the rules. It is clear that the role of local leaders is a key factor in the success of rehabilitation efforts. However, strong leadership may come at the expense of deepening and broadening participation. Groups did not change leadership over long periods of time, which may indicate the benefits of continuity, or conversely, the perils of elite capture. Collaboration with external actors who lower the transactions costs of organizing by providing capacity building/training and planting materials is an additional factor that seems to affect the performance of mangrove governance in terms of actual forest condition. At the village level, rules are targeted and specific to the mangrove resource, but their application is sufficiently coordinated with higher-level actors.

Rewards and recognition for effort and achievements are important in sustaining motivation in protecting and maintaining mangrove ecosystems in these villages. Environmental awards, visits by representatives of external agencies to see and learn from their efforts, and highlights of their activities in the public sphere have been additional incentives for local communities to continue their support for mangrove management despite the restrictions they face from harvesting products from the mangrove ecosystem.

5.6 GENDER EQUALITY

All the national policies and regulations relevant to mangrove use and management are silent in terms of women's rights over land and forest resources. Similarly, local village regulations are gender-blind—gender equality is assumed rather than actively sought. Community-level practices are rooted in local social norms, which are based on gender roles and the activities that men and women can appropriately perform in line with broader social expectations. NGOs have provided training to women on alternative products for market sales obtainable from mangrove leaves, barks, and fruits using processing techniques. However, because no further capacities have been developed to orient production toward markets, these products and processes have



■ Women sorting leaves for mangrove tea production after receiving training on mangrove tea production in Kraksaan Sub-district, Probolinggo District, East Java Province. Credit: Mangroves for the Future Indonesia

remained at a subsistence level. As has been described in the context of the three villages above, women are trapped in low-skilled activities such as polybag filling and seedling planting, and are completely left out of decision-making processes. Because women are excluded from decision-making processes and structures, they are less aware than men of existing rules and programs related to mangrove ecosystem management. Young women are probably the least knowledgeable group in the community.

5.7 CONFLICT RESOLUTION

All villages have hierarchical institutional arrangements for conflict resolution. The main mechanism used across the communities for conflict resolution is the committee that oversees mangrove development activities. When the committee fails to resolve a conflict, the village- and sub-district-level authorities become involved. District authorities rarely become involved in conflict resolution.

When community members do not comply with the rules, they are normally warned or mildly punished, but penalties increase significantly for repeat violators. In general, if the violator is a member of the community

or neighboring village, the conflict over mangrove resources is normally solved at the village level. The case would only come to higher-level authorities when local authorities could not maintain compliance or the violator is from outside the sub-district. This system of graduated sanctions is effective in ensuring compliance with rules.

5.8 MONITORING, REVIEW, AND LEARNING

Recent policies related to coastal management and initiatives since the deadly tsunami of 2004 have called for streamlining mangrove rehabilitation efforts. As shown above, the Law on Coastal Areas and Small Islands Management and Presidential Regulation 121/2012 gives the mandate to central and local governments to monitor mangrove rehabilitation activities every six months.¹¹ However, villages reported that they did not know whether local and central governments conducted any monitoring and evaluation in their villages. Villages have their own committees to monitor rehabilitation activities. When there is support from an external agency, community leaders and representatives from the respective agency carry out monitoring and evaluation.

¹¹ Presidential Regulation 121/2012, Art. 14.

A man wearing a white t-shirt with 'Gorontalo' printed on it and a striped hat is standing in a mangrove forest. He is holding a measuring tape against the trunk of a mangrove tree. The background is filled with dense mangrove vegetation and sunlight filtering through the leaves.

6

RECOMMENDATIONS FOR POLICY, PRACTICE, AND RESEARCH

Pak Umar, a local mangrove expert from Torsiaje Jaya
measures the diameter of a restored mangrove in
Bangga Village, Gorontalo, Indonesia.
Credit: Benjamin Brown/Charles Darwin University –
Research Institute for Environment and Livelihoods

This chapter offers brief recommendations for policy, practice, and future research to address the challenges and gaps identified in this assessment of mangrove governance and tenure dimensions in Indonesia. Governing mangroves is a complex endeavor that includes developing appropriate national policies and laws, building strong coordination mechanisms across government sectors, developing regulations that specifically attend to the unique needs of mangrove forests (as opposed to terrestrial forests), and promoting the involvement of civil society. Most of all, the effective devolution of mangrove governance needs to be supported by engaging communities to develop tenure institutions able to establish inclusive, sustainable, and collaborative rules for mangrove use and management. All are critical issues that need close attention for a coherent system of mangrove governance to function within the large areas of mangroves that remain in Indonesia. The potential to increase mangrove coverage is, as yet, underutilized. The lessons from the governance and tenure initiatives developed by local communities provides important stepping-stones toward establishing a nationally coherent mangrove governance structure that is attentive to the substantial diversity of social and ecological conditions across Indonesia's mangroves.

6.1 STRENGTHEN NATIONAL-LEVEL COORDINATION ON MANGROVE GOVERNANCE

Recent policy developments around mangrove management in Indonesia emphasize multi-stakeholder processes. The first step toward developing an institutional mechanism to establish multi-sectoral coordination for mangrove governance and management was the creation of the National Strategy for Mangrove Management. However, after four years, implementation is still slow due to a limited budget for implementing the strategy as well as sectoral silos and mandates. This strategy was followed up in 2014 by the creation of a Mangrove Restoration Agency, whose effectiveness remains unclear.

As such, the government's positive efforts toward building a national-level mangrove management system so far are largely ineffective. An implementation plan is needed that identifies priorities for coordination building, budget support, and specific mechanisms for coordination by the Mangrove Restoration Agency. A detailed assessment of the constraints to its implementation as well as emerging opportunities for strengthening cross-sectoral collaboration in mangrove conservation management can bolster the agency's

capacity to fulfil its mandate. In particular, the strategy can help to identify good practices that meet the unique needs of mangrove management, as opposed to terrestrial forests. In this way, specific regulations within laws under the responsibility of MOEF and MMAF can be tailored to the realities of mangrove management needs.

6.2 DEVOLVE MANGROVE GOVERNANCE AND TENURE TO COMMUNITIES

While there may be a need to harmonize and better coordinate national and sub-national laws and policies, and reduce the fragmentation, an even stronger case can be made for further strengthening local-level institutions and increasing their capacities to interact, collaborate, and coordinate with national and sub-national agencies. Similar initiatives that strengthen the capacity of sub-national and national actors to support local-level initiatives and reinforce community incentives for protection, management, and rehabilitation are necessary. Further research and experimentation (including piloting programs) can generate specific insights on how best to design institutions in support of local-level conservation management.

The Lampung situation indicates that strong local leaders are crucial for the success of mangrove rehabilitation efforts. Their relationship with community members are based on trust and confidence; the cooperation and links they forge with external actors are important for ensuring local people's support in rehabilitation efforts and channeling necessary technical and financial support. Support from external stakeholders has a positive influence on various aspects of local-level mangrove management and protection, including community mangrove rehabilitation efforts, tenure security, technical capacity, and access to financial resources. However, communities are receiving support on an ad hoc basis, based on their leaders' personal contacts, which is not secure. There is a need for a mechanism that offers budgetary and other forms of support (i.e., knowledge, technological, rehabilitation ecology) that communities require. The establishment of a formal and functioning coordination mechanism between communities and other mangrove stakeholders is also critical for joint learning, sustainability of community-based mangrove management initiatives, and scaling up of tested approaches and initiatives.

Local communities are aware of the environmental services offered by mangrove forests and are putting considerable time and effort into their conservation, management, and rehabilitation. However, in the absence of direct economic returns and clear incentives, these efforts may not be sustainable. Avenues for strengthening incentives and



■ Members of the “Womangrove” mangrove forest management learning group from Tanakeke Island conduct transects on Panikiang Island to help visualize the end result of their mangrove restoration activities. Credit: Benjamin Brown/Charles Darwin University – Research Institute for Environment and Livelihoods

reducing uncertainty over the future viability of current efforts include expanding the range of rights that communities hold to mangrove resources. In particular, efforts to expand their income generation possibilities; and take advantage of existing laws and mechanisms that require the provision of special incentives to encourage and sustain environmental conservation, such as PES and REDD+ should be considered.

6.3 CONSIDER GENDERED DIMENSIONS OF MANGROVE MANAGEMENT

Most of the national policies and laws as well as the local rules and institutional arrangements related to mangrove forest governance are gender-blind. However, substantial differences exist between men and women in participation levels of decision making, knowledge, and information as well as in operational management.

A major focus of mangrove-related activities for women has been imparting forest product processing skills. Little has been done to expand their political space in mangrove forest governance. Specific legal and institutional provisions as well as incentives are required to assure women’s participation in mangrove forest governance and decision making. Concrete proposals for institutional arrangements that enhance women’s inclusion in decision making and overall mangrove governance should be generated through careful piloting.

6.4 SYSTEMIZE TENURE ARRANGEMENTS AND MANGROVE REHABILITATION

Community-based rehabilitation efforts have shown great promise for conserving mangrove forests in Lampung Province. The overall area of mangrove forests has increased significantly in all three communities after they launched activities such as planting, restricting access and use in certain areas, and constructing wave barriers. Clearly, there is value to granting local people management and exclusion rights. These rights should be more formally granted in law rather than through the discretion of line agencies or local governments. Furthermore, while broad tenure categories (i.e., state forest-owned vs. local government vs. de facto customary) are generally useful, the rights bundles held under each of these broad categories need to be clearer and systematically established.

6.5 SUPPORT REGULATING LARGE-SCALE INVESTMENTS IN MANGROVE AREAS

Other avenues for strengthening incentives for and reducing uncertainty over the future viability of current efforts should be considered. One important area for intervention is to address the main threats to resource rights identified by communities and to strengthen their ability to exclude large-scale investments, which they perceive as the most serious threat.

6.6 PURSUE INCOME GENERATION OPPORTUNITIES

There is little work to date on income-generating opportunities from mangrove forests. The identification of new enterprises that can expand income-generating possibilities within existing laws and initiatives would be welcome. They can involve supporting the provision of special incentives to encourage and sustain environmental conservation such as PES or REDD+.

6.7 RECOMMENDATIONS FOR FUTURE RESEARCH

Numerous thematic areas need more research to create a coordinated and effective mangrove governance approach. Starting with the government approach to mangrove management, there is a need for a stronger understanding of how specific needs of mangrove conservation, rehabilitation, and management are addressed within the MOEF as well as the District Forest Agency. At the local level, it is clear that community-level leadership has played a pivotal role in mobilizing

local commitment and engagement for mangrove management. In light of this, further research on the conditions that foster the emergence and flourishing of enthusiastic and committed leaders can be useful not only for mangrove management, but also for broader community-based natural resource management. Additionally, to address an important gap in devolved mangrove governance and tenure on the gender-differentiated dimensions of mangrove management, there is considerable room for piloting and careful analysis of different modalities that incentivize women's participation. Research that identifies the most appropriate ways to enhance women's participation and role in mangrove management will ensure that pilots start on a strong footing. In particular, there is an urgent need to reform the mechanisms that give rise to and perpetuate gender blindness in local-level institutions and structures through the design of gender-transformative incentive mechanisms. Finally, looking to the future, research will involve improving the current, limited contribution of mangroves to local economies. This requires attention to issues of market access for mangrove products as well as processing and storage technologies.



■ Chainsaw worker returns to the boat during low tide in Kubu Raya, West Kalimantan, Indonesia. Credit: Sigit Deni Sasmito/CIFOR

REFERENCES

- Alongi, D. (2008). Mangrove forests: resilience, protection from tsunamis, and responses to global climate change. *Estuarine, Coastal and Shelf Science*, 76(1), 1–13.
- Amri, A. (2005). Mangrove plantations and land property rights: A lesson from the coastal area of South Sulawesi, Indonesia. *Southeast Asian Studies*, 43(2), 141–160.
- Antara News (2010, 31 July). Minister: Indonesia's mangroves in critical condition. Retrieved from <http://www.antaraneews.com/en/news/1280584463/minister-indonesias-mangroves-in-critical-condition>
- Armitage, D. (2002). Socio-institutional dynamics and the political ecology of mangrove forest conservation in Central Sulawesi, Indonesia. *Global Environmental Change*, 12(3), 203–217.
- Bosold, A.L. (2012). Challenging the “man” in mangroves: The missing role of women in mangrove conservation. *Student Publications*. Retrieved from Paper 14. http://cupola.gettysburg.edu/student_scholarship/14
- Brown, B., Fadillah, R., Nurdin, Y., Soulsby, I. & Ahmad, R. (2014). Case study: Community based ecological mangrove rehabilitation (CBEMR) in Indonesia. *Surveys and Perspectives Integrating Environment and Society (SAPIENS)*, 7(2).
- Food and Agriculture Organization [FAO]. (2007). *The world's mangroves 1980–2005*. Rome: Food and Agriculture Organization of the United Nations.
- Fortes, M. (1988). Mangrove and seagrass beds of East Asia: Habitats under stress. *Ambio* 17, 207–213.
- Giri, C., Ochieng, E., Tieszen, L. L., Zhu, Z., Singh, A., Loveland, T., . . . Duke, N. (2011). Status and distribution of mangrove forests of the world using earth observation satellite data. *Global Ecology and Biogeography*, 20, 154–159.
- Ilman, M., Dargusch, P., Dart, P. & Onrizal. (2016). A historical analysis of the drivers of loss and degradation of Indonesia's mangroves. *Land Use Policy*, 54, 448–459. doi:<http://dx.doi.org/10.1016/j.landusepol.2016.03.010>
- Iwasaki, S. & Rahman, A. (2017). Roles of traditional coastal management institution for mangrove rehabilitation and restoration in Aceh province, Indonesia. In R. D. Gupta & R. Shaw (Eds.), *Participatory mangrove management in a changing climate: Perspectives from the Asia-Pacific*. (pp. 217–227). Tokyo: Springer Japan.
- Kusmana, C. (2014). Distribution and current status of mangrove forests in Indonesia. In I. Faridah-Hanum, A. Latiff, K. R. Hakeem, & M. Ozturk (Eds.), *Mangrove ecosystems of Asia* (pp. 37–60). New York: Springer.
- Kusworo, A. (2014). *Pursuing livelihoods, imagining development: Smallholders in highland Lampung, Indonesia*. Acton, Australia: ANU Press.
- Lewis, R.R. (2009). Methods and criteria for successful mangrove forest restoration. In G. M. E. Perillo, E. Wolanski, D. R. Cahoon, & M. M. Brinson (Eds.), *Coastal wetlands: An integrated ecosystem approach* (pp. 787–800). Amsterdam and Oxford: Elsevier.
- Máñez, K. S., Krause, G., Ring, I. & Glaser, M. (2014). The Gordian knot of mangrove conservation: Disentangling the role of scale, services and benefits. *Global Environmental Change*, 28, 120–128.
- Marshall, N. (1994). Mangrove conservation in relation to overall environmental consideration. *Hydrobiologia*, 285, 303–309.
- Murdiyarso, D., Purbopuspito, J., Kauffman, J. B., Warren, M. W., Sasmito, S. D., Donato, D. C. & Kurnianto, S. (2015). The potential of Indonesian mangrove forests for global climate change mitigation. *Nature Climate Change*. doi:10.1038/nclimate2734
- Oudenhoven, A. P. E. van, Siahainenia, A. J., Sualia, I., Tonneijck, F. H., Ploeg, S. van der, Groot, R. S. de., Alkemade, R. & Leemans, R. (2015). Effects of different management regimes on mangrove ecosystem services in Java, Indonesia. *Ocean and Coastal Management*, 116, 353–367.
- Richards, D. R. & Friess, D. A. (2016). Rates and drivers of mangrove deforestation in Southeast Asia, 2000–2012. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 113, 344–349.

- Saenger P, Hegerl E. J., & Davie J. D. S. (1983). *Global status of mangrove ecosystems*. Commission on Ecology papers. Gland: IUCN.
- United Nations Environment Program. (2014). *The importance of mangroves to people: A call to action*. Cambridge: United Nations Environment Program, World Conservation Monitoring Center.
- Valiela, I., Bowen, J. L. & York, J. K. (2001). Mangrove forests: One of the world's threatened major tropical environments. *BioScience*, 51(10), 807–815.
- Wibisono, I. T. C. & Suryadiputra, I. N. (2006). *Study of lessons learned from mangrove/coastal ecosystem restoration efforts in Aceh since the tsunami*. Bogor: Wetlands International Indonesia Program.

APPENDIXES

APPENDIX A. DATA COLLECTION INSTRUMENTS

Instrument I: Guidelines for Interviewing (I) NGO Professionals

Basic Information about the respondent

Date of interview	Location of interview	Duration of interview
Name (optional)	Sex	Age
Telephone number (optional)		
Name of organization		Distance to nearest forest from office
Official designation	Total length of time with the organization	Length of time at organization in the current position
Highest level of education attained	Subject studied with respect to highest educational attainment	

Background Information

- What is the primary purpose of your organization/office/entity? In particular, what are your aims, if any, concerning mangrove forests and related resources? Please describe.
- Please indicate the thematic areas in which the mangrove-related activities you implemented last year (e.g., community forestry; fisheries; illegal logging; rehabilitation/restoration, gender and women's empowerment, etc.).
- Who are your target beneficiaries and what supportive service/s do you provide to them? Please provide examples.
- In what locations does your organization/project operate? Under what kinds of tenure/management regimes do these areas fall? Please provide names of forests and relevant villages.
- Has mangrove forest cover in this province/district changed over the past xx years? In what direction, positive or negative? What are the key drivers of this change? If negative, what measures have you put in place to stem mangrove decline? If positive, what practices do you have in place to safeguard against the risk of reversal?

NGO Practices for Mangrove Management

- What projects have you implemented in the past that specifically target mangrove forests or have implications for the use and management of mangrove forests and related resources? Did you work with communities, village leaders and other government agencies? With whom in particular? How did you work with these different

actors? Please describe. Did the project adopt a gender perspective? Please describe some of the activities you conducted in order to have a gender perspective. How would you rate the participation of the different actors that you worked with? Overall, how would you analyze past experience (of mangrove projects) in terms of successes and failures? What were your greatest successes and what were your greatest failures and why?

- Does your organization do anything specific to encourage community participation in forest/environment/land management? Please provide examples. How about with regard to women?
- Which other organizations or state/regional entities do you work with, particularly those that work on natural resources or gender? What kinds of projects and programs do you collaborate in? What are the responsibilities of these other organizations relative to your own in these projects/programs? How do you evaluate these collaborations? What aspects of the collaborations need to be improved? How?
- What are some of the main mangrove management needs and problems facing communities where you work (may be local, sub-national, national). Please describe some of the ways, if any, that you/your office/your organization have addressed communities' needs and problems. In your opinion, have these needs and problems increased, decreased or stayed the same over the past ten years?
- Please describe the activities you have implemented with respect to tenure and rights of communities to mangrove forests. Overall, how effective have the activities you (or your organization) implemented been in promoting communities' participation in mangrove management? Did the activities give special consideration to women, low-income groups, migrants, indigenous groups? How? What are/have been some of the constraints/obstacles to implementing these activities?
- What are some of the measures you (or your office) have taken to ensure that the rights granted to communities to forest resources are safeguarded and/or even guaranteed? What challenges do you face in implementing measures for safeguarding community rights to forests?
- What type of information does your office provide to community members? In general, how frequently (often) do you/your office provide information to the communities? What are the most common ways in which community members express their needs and concerns about mangrove forests (or other related resources) to your organization or office? Do they do this frequently? What are some of the needs and concerns that communities bring to you? How do you address them?
- What are the main mangrove-related conflicts you are called on to manage and/or resolve? What are some of the ways in which you solve the conflicts? In your opinion, have these been effective? In what ways can conflict resolution be improved in order to make it effective? Please mention some key challenges you face in resolving conflicts.
- Are there currently conflicts (disagreements) between your office or organization's practices and what communities would like/expect in terms of mangrove management? Please explain. Which practices contradict with community expectations? In what ways?
- Do you work with traditional leaders/customary authorities in the management and administration of mangrove forests? Please describe. If you do not work together with traditional/customary authorities in any way, please indicate why not.

Social, Political, and Economic Context

- From your perspective, how do social factors – at either local or national levels – facilitate or hinder your individual or your organization's ability to implement support and/or advocate for mangrove management? Please consider religious practices or beliefs, gender norms, cultural practices, ethnic affiliations, or social status. Please indicate the effect i.e., if it is enabling or hindering. Also, describe the effect on your ability to support/advocate for management. If it is a hindrance, what do you do to minimize the effect?
- In your opinion, how do political factors – at either local or national levels – facilitate or hinder your individual or your organization's ability to implement support and/or advocate for mangrove management? Please take into consideration changes in government, decentralization, policy environment and international agreements (e.g., REDD, United Nations declarations e.g., on indigenous peoples, Millennium Development Goals). Please indicate the effect whether enabling or hindering. Also, describe the effect on the ability to advocate. If it is a hindrance, what do you do to minimize the effect?
- In your opinion, how do economic factors – at either local or national levels – facilitate or hinder your individual or your organization's ability to support and/or advocate for mangrove management? Please take into

consideration domestic economic issues, budgetary issues, as well as global priorities and mechanisms. Please indicate the effect whether enabling or hindering. Also, describe the effect on the ability to implement. If it is a hindrance, what do you do to minimize the effect?

- In your view, does the nature of the mangrove resource (i.e., at the interface of the landscape and seascape/terrestrial and marine systems) present any particular challenge or opportunity in its management? Please explain. If yes, is this a dimension that requires special practices or further legal/policy consideration?

Leadership Support for Mangrove Management

- In your understanding, what is the lead institution for mangrove management? Please explain. How effective is this institution's leadership in implementation? Please explain.
- Are there any opinion leaders and influential institutions from any sector that you directly interact with in your advocacy work? Please name the leaders or institutions supporting implementation. How do they support advocacy and how has this affected you/your organization? Please name the leaders or institutions opposing advocacy. How do they oppose and how has this affected you/your organization?

Stakeholder Involvement

- In your view, are there other State agencies that should be playing a more central role in the management of mangroves (note levels, e.g., at the national level and at the district level). Please explain why.
- To what extent are different sectors within the government currently involved in mangrove management?
- To what extent are other stakeholders outside government involved in mangrove management, including the intended beneficiaries? How? Please explain. Ask about different stakeholders, as appropriate: other NGOs, women's groups, the private or commercial sector, groups representing the poor and other vulnerable populations and others.
- Are there other civil society or community-based organizations/groups advocating for mangrove management? Please describe the effect of their advocacy efforts on your work.

Coordination with Other Agencies

- Is there any formal agreement/arrangements to coordinate among the various NGOs that are advocating for mangrove management? How effective is the coordination among the various organizations that are involved? Please explain.
- Why do you coordinate or collaborate with other organizations (other government agencies and NGOs)? What have been the challenges to your collaborative efforts? How can collaboration be improved?

Instrument 2: Guidelines for Interviewing Forestry Authorities and Other Government Agencies

Basic Information about the Respondent

Date of interview	Location of interview	Duration of interview
Name (optional)	Sex	Age
Telephone number (optional)		
Name of organization		Distance to nearest forest from office
Official designation	Total length of time with the organization	Length of time at organization in the current position
Highest level of education attained	Subject studied with respect to highest educational attainment	

Background Information

- What is the primary purpose of your organization/office/entity? In particular, what are your aims, if any, with regard to mangrove forests and related resources? Please describe.
- Please indicate the thematic areas in which the mangrove-related activities you implemented last year fell (e.g., community forestry; fisheries; illegal logging; rehabilitation/restoration, gender and women's empowerment etc.).
- What is the extent of mangroves in this area? Have there been any changes in mangrove forest cover in the past 20 years? What have been the main drivers of the changes? If the changes are negative, what kinds of interventions have you undertaken to alleviate the negative? If the changes are positive, what measures have you put in place to reduce the risk of negative change?

Policies and Laws Regulating Mangrove Use and Management

- Which is/are the main policy/law that you and your office are responsible for implementing with respect to mangrove forests? What are the main objectives of this law/policy? Have these objectives been translated into plans, strategies, or programs? Please explain.
- Please describe the four main activities that your organization undertakes in order to implement the law/policy.
- Are you/your office involved in any way in mangrove management? If yes, please provide examples of activities where you are involved. Where are these activities located?
- Are there any areas where you/your organization have direct, legally mandated control over and management responsibility for mangrove management? Are there any areas where you are involved in management but do not have direct legally mandated control over the resource?
- What has been the main policy/law that affects the rights of various actors to mangroves such as communities, customary/traditional leaders, men, women, private sector, District Forestry Agency, etc.? Note: Rights may include the right to use, to harvest NTFPs, to sell NTFPs, to harvest timber, to sell timber, to graze livestock, to collect fuelwood, to sell fuelwood, to collect water, to own the forest etc.
- What projects have you implemented in the past that specifically target mangrove forests or have implications for the use and management of mangrove forests and related resources? Did you work with communities, village leaders and other government agencies? With whom in particular? How did you work with these different actors? Please describe. Did the project adopt a gender perspective? Please describe some of the activities you conducted in order to have a gender perspective. How would you rate the participation of the different actors that you worked with? Overall, how would you analyze past experience (of mangrove projects) in terms of successes and failures? What were your greatest successes and why; what were your greatest failures and why?

- Does your organization do anything specific to encourage community participation in forest/environment/land management? Please provide examples. How about with regard to women?
- Please describe the activities you have implemented with respect to tenure and rights of communities to mangrove forests. Overall, how effective have the activities implemented by you (or your organization) been in promoting communities' participation in mangrove management? Did the activities give special consideration to women, low-income groups, migrants, indigenous groups? How? What are/have been some of the constraints/obstacles to implementing these activities?
- What are some of the measures you or your office has taken to ensure that the rights granted to communities to forest resources are safeguarded and/or even guaranteed? What challenges do you face in implementing measures for safeguarding community rights to forests?
- What are some of the main mangrove management needs and problems facing communities where you work (may be local, sub-national, national). Please describe some of the ways, if any, that you/your office/your organization have addressed communities' needs and problems. In your opinion, have these needs and problems increased, decreased or stayed the same over the past ten years?
- What type of information does your office provide to community members? In general, how frequently (often) do you/your office provide information to the communities? What are the most common ways by which community members express their needs and concerns about mangrove forests (or other related resources) to your organization or office? Do they do this frequently? What are some of the needs and concerns that communities bring to you? How do you address them?
- What are the main mangrove-related conflicts you are called on to manage and/or resolve? What are some of the ways in which you solve the conflicts? In your opinion, have these been effective? In what ways can conflict resolution be improved in order to make it effective? Please mention some key challenges you face in resolving conflicts.
- Are there currently conflicts (disagreements) between your office or organization's policies and what communities would like/expect in terms of mangrove management? Please explain. Which policies contradict with community expectations? In what ways?
- Do you work with traditional leaders/customary authorities in the management and administration of mangrove forests? Please describe. If you do not work together with traditional/customary authorities in any way, please indicate why not.

Social, Political, and Economic Context

- From your perspective, how do social factors – at either local or national levels – facilitate or hinder your individual or your organization's ability to implement mangrove-related laws and policies? Please consider religious practices or beliefs, gender norms, cultural practices, ethnic affiliations, or social status. Please indicate the effect, i.e., enabling or hindering. Also, describe the effect on your ability to implement. If it is a hindrance, what do you do to minimize the effect?
- In your opinion, how do political factors – at either local or national levels – facilitate or hinder your individual or your organization's ability to implement mangrove-related laws and policies? Please take into consideration changes in government, decentralization, policy environment and international agreements (e.g., REDD, United Nations declarations e.g., on indigenous peoples, Millennium Development Goals). Please indicate the effect whether enabling or hindering. Also, describe the effect on the ability to implement. If it is a hindrance, what do you do to minimize the effect?
- In your opinion, how do economic factors—at either local or national levels— facilitate or hinder your individual or your organization's ability to implement mangrove-related laws and policies? Please take into consideration domestic economic issues, budgetary issues, as well as global priorities and mechanisms. Please indicate the effect whether enabling or hindering. Also, describe the effect on the ability to implement. If it is a hindrance, what do you do to minimize the effect?
- In your view, does the nature of the mangrove resource (i.e., at the interface of the landscape and seascape/terrestrial and marine systems) present any particular challenge or opportunity in its management? Please explain. If yes, is this a dimension that requires further legal/policy consideration?

Leadership Support for Implementation of Mangrove-Related Policy and Law

- In your understanding, what is the lead institution for mangrove management? Please explain. How effective is this institution's leadership in implementation? Please explain.
- Are there any opinion leaders and influential institutions from any sector that you directly interact with in mangrove management? Please name the leaders or institutions supporting implementation. How do they support implementation and how has this affected you/your organization? Please name the leaders or institutions opposing implementation. How do they oppose implementation and how has this affected you/your organization?

Stakeholder Involvement

- In your view, are there other state agencies that should be playing a more central role in the management of mangroves (note levels e.g., at the national level and at the district level). Please explain why.
- To what extent are different sectors within the government currently involved in mangrove management?
- To what extent are other stakeholders outside government involved in mangrove management, including the intended beneficiaries? How? Please explain. Ask about different stakeholders, as appropriate: NGOs, women's groups, the private or commercial sector, groups representing the poor and other vulnerable populations and others.
- Are there civil society or community based organizations/groups advocating for mangrove management? Please describe the effect of their advocacy efforts on your work.

Coordination with Other Agencies

- Are there any formal agreement/arrangements to coordinate among the various organizations with responsibilities for mangrove management? How effective is the coordination among the various organizations that are involved? Please explain.
- Why do you coordinate or collaborate with other organizations (both other government agencies and NGOs)? What have been the challenges to your collaborative efforts? How can collaboration be improved?

Instrument 3: Guidelines for Conducting Focus Group Discussions (FGDs) at the Village Level

Province
District
Sub-District
Village
Group
Name of participants
Date/Time
Facilitator
Note taker

I. Timeline Exercise

Ask participants to name the most important moments in the history of the village. (Try to bring the focus mainly to the past 30 years). Prompt with questions, such as, depending on what is appropriate (use your knowledge of the village):

- When was the village/community established? When did the first residents arrive?
 - When was the school/health post built?
 - When was the highway built?
 - When did other migrants move to the village?
 - Have there been any changes in the extent of outmigration over time? What is the status of outmigration from the village?
- ⇒ Ask how livelihoods have changed over time. Use the events identified to establish time periods. What was the main source of income or livelihoods / main product harvested (etc.) in one period versus another?
- ⇒ Ask specifically about use of mangrove forest resources and changes over time.
- ⇒ Ask about mangrove condition and change over time.
- ⇒ Ask about changes in climate and climate-related events over time, for example droughts, dry and wet seasons, floods, beach erosion etc.
- ⇒ Ask about conflicts, especially with outsiders, companies, the government and neighbor communities. How have these changed over time?

Why did these changes occur? What were the drivers or causes of change? What were some of the effects of change on: (a) livelihoods; (b) mangrove forest condition; and, (c) resilience/adaptability. For any negative changes mentioned, it would be helpful to get a listing of what they did to try and overcome the negative aspects and their perception of success/or non-success.

2. Spatial Extent of Management and Use Rights and Changes Over Time

Present the map drawn during the KII (Map should already be available), showing all the areas that the community/ village uses, map should show areas of mangrove forests (identified whether there is more than one forest area), agriculture, water sources, pasture or grazing, housing, garden and hunting. Verify the areas as established through the

KII and their labels (a locally recognized name that people refer to). Contextualize the map if needed, indicating the name of neighboring communities/villages. You may use also an existing (official) map as a reference.

The purpose of this exercise is to understand, in all villages, the extent of management, use and rights and who makes which rules (local people, State agencies, NGO projects or private companies/corporations).

Note discrepancies among participants with regard to areas; boundary issues with neighboring communities; or conflicts with external actors.

Remember that the primary interest is on mangrove forests; so if there are too many areas to discuss, focus the time on the forest areas and the most important forest areas (note area affected in hectares: e.g., we need to know if we are talking about a very small area or a very large one).

3. Mangrove Forest Product Harvesting

Product	Household consumption (How much can be extracted? When can be harvested? Who decides this?)	Where* do they harvest (refer to the community map)? Who decides this?	Allowed to sell (How much are you allowed to sell? Who decides this?)	User group (differentiate whether within or outside the community)	Do you need to ask for permission for harvest? From whom?	Changes over time? (What caused this change?)
---------	---	--	---	--	---	---

*Later please refer to the ID Code identified in the map from KII.

Please remember to ask participants the extent to which mangroves contribute to their livelihoods. Are mangrove resources important in their livelihood portfolios?

Who is not permitted to harvest mangrove forest products?

4. Management and Exclusion Rights

Decision-making rules:

- i. Who makes decisions about mangrove management practices (harvesting—what, when, how much; sale of harvested products; tree planting, restoration, rehabilitation; conversion of mangroves to other land uses)
 - a. How do village authorities participate in the definition of decision-making rules?
 - b. How do village members participate in the definition of decision-making rules (e.g., via communal assemblies)?
 - c. How does the State participate in the definition of decision-making rules around village forests (are these decisions controlled by the State e.g., District Forestry Agency; define the level of autonomy of the village to define these type of rules – which rules are made locally and which are made by the State?)
 - d. How do other actors such as NGOs and private companies participate in the definition of decision-making rules around mangrove forests?
 - e. How do women participate in the definition of decision-making rules (e.g., in the communal assemblies, they have specific committees?). How do they feel about their participation? In particular, do they experience any constraints? What are they (if they do not mention, also ask whether lack of time to participate; inability to combine care work with forest management responsibilities; perceived effects of their participation on benefits shared etc. also the constraints)? In their view, how can these constraints be alleviated? Have they tried to address these constraints? Please provide specific examples. Also, please mention if they feel women's participation has been adequate and the conditions that have enabled women's meaningful participation (e.g., location and timing of meetings, sensitivity to women's needs and priorities by leaders,

NGO or state agency rules/facilitation etc.). *It is important to note whether women have already been mentioned in the discussion prior to prompting these questions.*

- f. How do original vs. people that have joined the community by marriage or settlement (or any other customarily approved means) participate in decision making about mangrove forests? If outmigration is an issue, to what extent out-migration has been affecting participation of men and women in decision-making processes?
- ii. Have any of these rules changed over time? (Focus on approx. the last 20 years) Explain changes. What caused the changes?
- iii. Have there been any conflicts over decision-making? Please describe them, including parties to conflict, causes of conflict and frequency. Were the conflicts resolved? By whom? Who is responsible for resolving decision-making conflicts? In your opinion, are they effective? Do they resolve conflicts fairly?

5. Monitoring and Compliance

- i. Who enforces rule compliance about extraction and forest use and management practices in the village? Note: Refer to specific situations: What happens if I break the rules? Say I take too much timber... is there a sanction? Who enforces it? When was the last time someone was sanctioned; what was the reason, explain. How many people were sanctioned in the last year?
 - a. In case rules are not complied with, what type of sanctions exist?
 - b. Overall, do you think these sanctions are fair? Are they effective? Are they enforced fairly?
- ii. Who has establishes sanctions for rule violations? Are the village regulations written (are there any bylaws)? Are village members aware of them?
- iii. Who monitors rule compliance about extraction/forest management practices in the village?
- iv. Can rights to forests (to extract products) be taken away? What kinds of circumstances prompt a reversal of rights?
- v. Has any external actor (e.g., government, private company, NGO) kept you from extracting products from mangrove forests? If yes, which external actor? For what products? What were the reasons for imposing these restrictions? What were your responses to these restrictions?
- vi. Have any of these rules or sanctions on extraction changed over time? (Focus on approx. the last 20 years) Explain changes. What caused the change?
- vii. Today, do you think community members follow the rules? (always, frequently, not often, never). Which ones would you say are the most commonly followed/violated? Why?
- viii. Have there been any conflicts over rule monitoring and enforcement? Please describe them, including parties to conflict, causes of conflict and frequency. Were the conflicts resolved? By whom? Who is responsible for resolving conflicts over monitoring and enforcement? In your opinion, are they effective? Do they resolve conflicts fairly?

Alienation: lease, collateral, sale, inheritance

- i. Are you allowed to lease mangrove forests areas to another member within the village/person outside the village?
- ii. Are you allowed to use mangrove forest lands as collateral for credit (any other way to put it)?
- iii. Are you allowed to sell forestlands to another member within the village/person outside the village?
- iv. Are rights to mangrove forests transferable within the family (inheritance of rights)? To whom? What about to women (daughters, wives)?
- v. Have any of these rights changed over time? (Focus on approx. the last 20 years) For whom have rights changed? Explain changes. What caused the change?
- vi. Have there been any conflicts over alienation rights? Please describe them, including parties to conflict, causes of conflict and frequency. Were the conflicts resolved? By whom? Who is responsible for resolving conflicts over rights transfer? In your opinion, are they effective? Do they resolve conflicts fairly?

Overall satisfaction with rights

- i. If somebody threatens your rights, what can you do about it? Are there any grievances (*keluhan*)? Have you ever had to use them? What was the result?
- ii. On a scale of 1 to 3, discuss and then vote individually your level of satisfaction with rights (voting should be kept secret). Refer to the following scale:

- 1 = as a village, that you are very dissatisfied with the rights to use forest resources that you have currently and would like to see major changes
- 2 = somewhat satisfied but you would like to make some changes
- 3 = you are very happy and would make no changes, where would you place this village?)
- iii. If you want to make changes, what are the 3 changes you would like to make?

6. Tenure Security Exercise

By tenure security we mean “your confidence that the members of this village will continue to be able to use, at least for the next 25 years, the land and forests you now use and benefit from in that particular area.”

- Going back to the map of the village/community ask participants to discuss for land-use areas identified in the map, rank whether they perceive their rights, as a village, to be secure or not? And why? What do you see as the threats (differentiate between external or internal) that prevent them from enjoying/exercising their right)?
- Make sure to note the area in question (hectares) and the owner of that area.

A. AREA (use name on map; note owner/ hectares)	B. SECURE/ INSECURE/ not sure or cannot agree (both)/Don't know	C. REASON FOR SECURITY AND INSECURITY ANSWER IN (B) – PROVIDE 3 ANSWERS

- Do you think that the way we define tenure security (Moderator should read this definition again) captures the experience of this community or are there other things you would consider more important than effectively protecting/guaranteeing rights into the foreseeable future?
- For example, if the number of years were shorter (say 5 years) would you have answered the question differently?
- Has the security of your village rights changed over time? (Focus on approx. the last 20 years) Explain changes. What caused the change?
- In villages where reform has taken place: how have reforms changed security?

7. Knowledge of Existing Laws that Relate to Mangrove Areas

- i. Are you aware of any current formal laws (i.e., laws passed by government) related to your use and management of mangroves? Please describe the laws, the year they were passed (or when you got to know about them) and how they have affected your use and management of mangroves. For example, did the law restrict/improve access to products; did the law require specific forms of organization among community members for management and decision making; did the law require that women, youth and marginalized groups are more involved; did the law require that benefits are distributed in a specific way?
- ii. How did you get to know about this/these laws i.e., who informed you about them and how (whether individually, in special meetings)?
- iii. Did you have an opportunity to provide your opinion and participate in shaping this/these laws? Please explain.

8. Investments in Mangrove Improvements

- i. Have you participated in any activities aimed at improving mangrove forests in any way? For example, improving/enriching tree species, extending mangrove forest cover, increasing/enriching other important animals that reside in the mangroves or others you may name? Please describe the activities. For each activity, mention who initiated it (whether community, state agencies, NGOs, etc.), when you started it, when it ended or whether it is ongoing.
- ii. In your view, did having tenure rights influence your decision to engage in the activity? If yes, please explain how. What other reasons did you have for engaging in the activity? Did you have any specific role or responsibility in the activity? Was there any specific focus on women's participation in the activity? Please describe.
- iii. In your opinion, was the activity successful (or not)? What were/are the key factors for success (or failure)? What challenges did you face and how did you (or how do you) overcome them?
- iv. Were your efforts supported by external actors? Which external actors? What kinds of support did they offer?
- v. How does the nature of mangroves (sometimes underwater, sometimes not) affect how you approach improvements (like the ones you stated previously)? How does it affect your overall management practices?

9. Effects of Climate Variability

This section explores the most important climatic stresses in the past 20 to 30 years and resource users' experiences with them. Based on the discussions, these may include the frequency and magnitude of extreme climate events such as droughts, floods, wave surges, strong winds and their impacts on mangrove forests and livelihoods. Resource users' responses to these stresses and how mangrove forests and related resources have helped or hindered coping with climate variability are to be discussed.

- i. What have been some of the most common climate-related events you have experienced in the past 20 to 30 years? These events can include drought, flooding, high waves, strong winds etc. Please draw a timeline to illustrate when each event happened. Have these events been increasing in frequency or not? Have they been increasing in severity or not? e.g., rainfall more erratic, droughts lasting longer...
- ii. What were the impacts of these events on the cover of mangrove forest, availability of forest products (e.g., fuelwood, poles, fish stocks)? What were the impacts on other resources?
- iii. What were the impacts of these events on your livelihoods (e.g., amount and type of food; overall income – both income related and subsistence)? Were these impacts the same for everyone or were some community members more affected? Who were the most affected?
- iv. Did the extreme events in any way affect your rights and access to mangrove forests and resources or in your approach to managing the resources? For example, was there greater cooperation to ensure that products are available for all or did conflicts increase? Please provide examples with your explanation.
- v. What did you do to cope with any economic hardships that the event may have resulted in? Please describe what you did individually and as a group to cope with any hardships the events may have caused to you. Did any of these coping actions involve mangrove forests and related resources in any way?
- vi. In your view, how important are mangrove forests in assisting you to overcome the effects of climate stress?
- vii. Did you receive support from external actors such as NGOs or state agencies? What kinds of supports did they provide?

Instrument 4: Guidelines for Conducting In-Depth Interviews with Key Informants at the Village Level

Province:
District:
Sub-district:
Village:
Name of Respondent/occupation/age:
Role in the community/village/clan (e.g., village leader):
Role in forests (e.g., member of forest management committee):

Date/Time:
Interviewer:
Length of interview (Start/Finish):

Information on Respondent: Ask questions to gather information on the Interviewee background (gender/age/occupation) as well as the leader's participation/ role in the community/village/clan (e.g., village leader) as well as around forests (e.g., member of forest management committee); role in tenure reform implementation (if applicable).

I. Background Information About the Village

Some of this information can be collected from review of literature (including census data) and KI at the regional/district level. In cases where information gaps exist specific questions may be asked to Key Informants. There is no need to repeat these questions to all of the KI, once information is obtained, except to the extent that responses might vary, such as about sources of inequality; in addition, some of this information could be obtained prior to arriving in the village):

- i. Distance/travel time to nearest market, health center, school etc.
- ii. Population of the village members, changes between the population now and 10 years ago; ethnicities represented – which is the most dominant i.e., which has largest proportion of population, which the least; (review census data available from official sources/health posts)
- iii. Proportion of village that is literate etc.
- iv. Main products most people take to sell to market (e.g., crops, timber, medicinal plants etc.)
- v. Main economic activities of the village, farming, forestry, fisheries etc. —estimated portion of families doing each.
- vi. Main threats to the community? Main threats affecting the village rights to land and mangrove forests?
- vii. Economic opportunities presented by activities such as (elicit whether these activities are viewed as an opportunity/threat): aquaculture, timber, oil and gas extraction etc.
- viii. Main drivers of deforestation; main drivers of forest degradation
- ix. Key cleavages/areas of internal differentiation in the village – migrants vs locals, wealth distribution, main source of livelihood, levels of forest dependence, education and literacy, gender etc.
- x. Are there differences in land ownership among villagers and are they small or large? Is inequality in land holdings increasing/decreasing/not changing?
- xi. In terms of wealth distribution would you say this village is very homogeneous (people have more or less the same level of wealth). On a scale of 1 (very homogenous) to 5 (very unequal)?
- xii. In terms of existing conflict in the community would you say this village is peaceful and harmonious: On a scale of 1 (very harmonious) to 5 (very conflictive)?

2. Current Mangrove Forest Resources and Users in the Village and How These Have Changed Over Time

- i. Ask about current mangrove forest resource.
- ii. Ask about changes over time and reasons for change. The changes include changes to the condition of mangrove forests and related resources as well as changes with regards to rights and access of communities, management practices, how communities organize themselves for management, the presence of external actors over time (e.g., which external actors, their objectives and activities etc.). Probe to find out whether there are links between mangrove resources, tenure rights, management rights, external actors etc.

3. Draw a map of the land and forest area used by the village (NOT the area to which it has formal rights, but ALL areas used). Then ask about each area:

The map only needs to be drawn once, then used in other interviews and in the FGD. Information will be collected to elaborate a map before it is used in FGDs. If a map is already available at the village level, you may use it during interview to validate the information and cross check for any variations.

- i. What is each area used for and by whom, note different land uses and proportions e.g., mangrove forests, agroforests, pastures, settlements (gather information on areas: harvesting timber and NTFPs, clearing for farming, pasture or grazing, recreational and spiritual uses, hunting, gardening, housing – add other relevant categories as needed). For future purposes use an ID code for each area identified in the map. Remember the main interests is mangrove forest management. With regard to mangrove forests:
 - a. Who uses the forest/forest resources/forested landscapes for what, when, how, why?
 - b. What external actors use these areas, how and why?
 - c. Gather information on the spatial distribution of these uses (areas identified in map). For instance do they use different forests for timber and NTFPs? Why? Yes or no? Gather information on the links between mangrove resources and other terrestrial resources.
 - d. Who is the formal owner of each area: (1) individual – some level of collective action around resources; (2) areas designated for the use of collectives; (3) areas that are the property of the State)
 - e. In each of the areas identified, how has use changed over time, when and why? Ask questions about changes in mangrove forest uses, what triggered these changes and when. Allow respondents to recall several episodes of such changes if they can remember but try to at least cover major changes during the past 10–30 years. Focus on the most significant changes that respondents can recall.
- ii. Which area on the map (in hectares and percent of total area used, percent of total area of village – if these are different) was affected by the change in use? What was the effect of the change in use on people's livelihoods and on the condition of mangrove forests and related resources?

4. How have men and women's rights to land and forest resources changed over time?

- i. What were the key reasons driving changes in rights to mangrove resources? Who granted (or removed or modified) the rights (e.g., land agency, court, forest institute or ministry, regional government, village leaders) after a long struggle by village, or by other organization, after conflict with neighbors, etc.? Explain.
- ii. How were local residents involved (or not) in rights changes?
- iii. Did the changes involve the creation of new village organizations/committees and arrangements or strengthening of existing ones? Please explain. What is the composition of these village committees/organizations, roles and responsibilities?
- iv. What are your overall perceptions of these changes? Have they improved how you use and manage mangroves? In what ways? Have they improved people's livelihoods? Have they improved the status and condition of mangroves?

5. How do women gain access to land and forest resources within the village?

- i. Do they have their own plots separate from men's?
- ii. In regards to the access to land and forest resources what happens to women if they marry or their husband dies (or he leaves her)? How about single women?
- iii. Are women involved in management and decision making? If yes, how? If not, why not?
- iv. Has there been any change in women's rights and access?
- v. If women are involved in decision-making, has this improved women's rights and access? Why or why not?
- vi. Are women's rights provided for in the forest or other related law? What are some of the main obstacles to enforcing women's rights at the local level? What, if any, is your role in ensuring that women's rights are protected? If none, please indicate whose responsibility it is to enforce women's right to land, forests and other natural resources

6. Based on Each Area Identified on the Map, What are the Rules for Forest Use Today?

- i. Who makes the rules for forest use? Are there any special rules that limit the activities carried out in the forests?
 - a. Maintenance/Rehabilitation (e.g., eradicate invasive species; enhance regeneration, build perimeter fences to prevent cattle wandering into the forests, etc.) If yes, explain. Who made these rules? (village leaders, village assembly, forest management committee, or local government?)
 - b. Harvesting of forest products (e.g., products to be harvested, harvest time, quantity/year?). If it exists, explain. Who made these rules? (Village leaders, village assembly, forest management committee or local government?)
 - c. Are there rules that restrict other activities? e.g., processing and sale of forest products? If yes, please explain. Who made the rules? Village or local government? Are the processed products for personal consumption or trade?
- ii. Who makes the rules regarding who is allowed to access which resources and for what purpose? (or to convert forest; also rules may differentiate between what can be accessed for home use versus sale)

7. Conflicts over Mangrove Forest Resources

- i. What were the main sources of mangrove-related conflicts between this village and outsiders/external actors?
 - a. How have these changed over time: type, source, degree and intensity.
 - b. How did you resolve the conflicts? What were the main challenges faced in resolving conflicts?
 - c. Did these conflicts affect how people use and manage mangroves?
 - d. Have these conflicts affected overall forest condition?
 - e. Are there legal guidelines for conflict resolution? How frequently are they applied in the event of conflict? For what kinds of conflicts are they usually applied? In your experience, are legal guidelines/statutory law the main way in which conflicts are resolved? If not, why not?
- ii. What are the main forest-related conflicts inside the village?
 - a. How have these changed over time: type, source and degree/ intensity.
 - b. What were the challenges you faced when trying to resolve the conflict?
 - c. Have these conflicts affected how people's rights to forests e.g., access, use, management?
 - d. Have these conflicts affected overall forest condition?
 - e. Are there legal guidelines for conflict resolution? How frequently are they applied in the event of conflict? For what kinds of conflicts are they usually applied? In your experience, are legal guidelines/statutory law the main way in which conflicts are resolved? If not, why not?
- iii. Over the last 5 years, what do you think of the level of conflict within the group (please explain)? Increased/ Unchanged/Decreased/Interfered with daily activities? Channeled in ways that do not interfere with daily activities

8. Tenure Security

- i. Do you think that villagers rights to forest resources are secure or insecure and why? By tenure security we mean "Your confidence that the members of this village will continue to be able to use, at least for the next 25 years, the land and forests you now use and benefit from in that particular area."
- ii. What makes tenure secure/insecure? List 3 main reasons.
- iii. For whom is tenure secure/insecure: women, men, migrants, members of ethnic groups, elites etc.?
- iv. How has tenure security changed over time?
- v. On a scale of 1 to 5 where 1 is very insecure and 5 is very secure, where would you put this village currently?

9. Knowledge of Existing Laws that Relate to Mangroves

- i. Are you aware of any current formal laws (i.e., laws passed by government) related to your use and management of mangroves? Please describe the laws, the year they were passed (or when you got to know about them) and how they have affected use and management of mangroves. For example:
 - a. Did the law restrict/improve access to products?
 - b. Did the law require specific conservation measures to be implemented by communities, groups or individuals?
 - c. Did the law require specific forms of organization among community members for management and decision-making?
 - d. Did the law require that women, youth and marginalized groups are more involved?
 - e. Did the law require that benefits are distributed in a specific way? [Probe further to get a sense of the distributional effects of the law]
- ii. How did you get to know about this/these laws i.e., who informed you about them and how (whether individually, in special meetings)?
- iii. Did you and/or others have an opportunity to provide your opinion and participate in shaping this/these laws? Please explain.

10. External Support for Mangrove Forests/Forestry

- i. Which are the most important actors (internal as well as external) to forest use/management/rights and access today in the village? How has this changed over time?
 - a. Do external actors provide financial support, how much, which activities are supported?
 - b. Do they provide technical support to forestry? Of what kind?
 - c. Do they provide support for women's groups? Of what kind?
 - d. How often have village organizations met with officials from the most important external organizations in the past year?
 - e. How many times in past year met with national forestry officials/district forestry officials; provincial level officials?
 - f. Have you requested an intervention related to forest tenure or forestry from district/provincial/national forestry? What was the intervention you requested for; whether it was granted; if happy/satisfied with it?
 - g. Are you satisfied with the range of services and effectiveness of services provided by external actors? Please explain. If appropriate, please indicate some of the things that can be done to improve interactions between external actors and your village
- ii. Was similar support available in prior times? Explain/compare.

11. Effects of Climate Variability

- i. What have been some of the most common climate-related events you have experienced in the past 20 to 30 years? These events can include drought, flooding, high waves, strong winds etc. Please draw a time-line to illustrate when each event happened. Have these events been increasing in frequency or not? Have they been increasing in severity or not? e.g., rainfall more erratic, droughts lasting longer...

- ii. What were the impacts of these events on the cover of mangrove forest, availability of forest products (e.g., fuelwood, poles, fish stocks)? What were the impacts on other resources?
- iii. What were the impacts of these events on villagers' livelihoods (e.g., amount and type of food; overall income – both income related and subsistence)? Were these impacts the same for everyone or were some community members more affected? Who were the most affected?
- iv. Did the extreme events in any way affect villagers' rights and access to mangrove forests and resources or the approach to managing the resources? For example, was there greater cooperation to ensure that products are available for all or did conflicts increase? Please provide examples with your explanation.
- v. What did the village do to cope with any economic hardships that the event may have resulted in? Please describe what was done individually and also as a group to cope with any hardships the events may have caused. Did any of these coping actions involve mangrove forests and related resources in any way?
- vi. Did the village receive support from external actors such as NGOs or State agencies? What kinds of supports did they provide? In your opinion was this support adequate? What were some challenges in coordinating external support when these climate events occurred?

12. Customary Authority and Mangrove Management

Questions for elders on customs and change. Refer to information described in I above as well as the information gathered during literature review for the existence of customary forest tenure systems - use this information in conducting this interview.

- i. In the absence of introduced forest institutions (such as before colonialism or before de facto penetration of the State forest apparatuses in the village) how did/do people regulate their relations with forests? Here probe on customary forest tenure systems and institutions such as informal rules, taboos, norms, myths, etc. (ask about rules pertaining to women specifically). How did people observe/respect/adhere to these traditional systems in the past? Are these systems still applicable currently? Why yes or no? Note if some elements of those pre-existing systems still exist and which have been abandoned and why? Note also how those customary systems overlap/interact/conflict with introduced more formal management systems and institutions (if any).
- ii. Ask questions about traditional/customary forest management arrangements that existed in the past or are still in use.

APPENDIX B. LIST OF LEGISLATION AFFECTING MANGROVE MANAGEMENT AND GOVERNANCE

Name of legislation	Content of legislation
1945 Constitution	General policy of mangrove management and protection
Law 32/2009 on Environmental Protection and Management	
Law 26/2007 on Spatial Planning	
Presidential Regulation 73/2012 on National Strategy on Mangrove Ecosystem Management	
Presidential Regulation 2/2015 on Mid-Term Development Plan	Mangrove management planning
Law 5/1990 on Natural Resources Conservation	Mangrove protection and conservation
Law 5/1994 on Biodiversity	
Presidential Regulation 32/1990 on Protected Areas	
Minister of Environment Regulation 201/2004 on Mangrove Degraded Criteria	
Law 5/1960 – Basic Agrarian Law	Land tenure in mangrove forests
Law 31/2004 on Fishery	Zoning, utilization, and monitoring of mangroves in coastal areas and small islands
Law 27/2007 on Coastal Areas and Small Island Management	
Presidential Regulation 121/2012 on Rehabilitation of Coastal Areas and Small Islands	
Minister of Marine and Fisheries Regulation 17/2008 on Conservation Areas in Coastal Areas and Small Islands	
Minister of Marine and Fisheries Regulation 12/PERMEN-KP/2013 on Controlling of Coastal Areas and Small Islands Management	
Minister of Marine and Fisheries Regulation 34/PERMEN-KP/2014 on Planning of Coastal Areas and Small Islands Management	
Minister of Marine and Fisheries Regulation 40/PERMEN-KP/2014 on People's Participation and Empowerment in Mangrove Utilization in Coastal Areas and Small Islands	
Law 41/1999 on Forestry	Utilization and protection of mangrove in forest areas
Government Regulation 45/2004 on Forest Protection	
Law 23/2014 on Regional Government	Division of governmental authority on mangrove governance



USAID
FROM THE AMERICAN PEOPLE