

# WHERE LAND MEETS THE SEA

## A GLOBAL REVIEW OF THE GOVERNANCE AND TENURE DIMENSIONS OF COASTAL MANGROVE FORESTS

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Mangroves along Vietnam's coast – the first line of defence for houses and shrimp ponds. Credit: Klaus Schmitt/GIZ

### KEY POINTS<sup>1</sup>

This review provides an overview of the status of mangrove governance and its tenure dimensions globally. In particular;

<sup>1</sup> This brief is an adapted summary of the publication Rotich, B., Mwangi, E. & Lawry, S. (2016). *Where land meets the sea: a global review of the governance and tenure dimensions of coastal mangrove forests*. Bogor, Indonesia: CIFOR; Washington, DC: USAID Tenure and Global Climate Change Program. The report benefitted from significant contributions by Stephen Brooks of USAID's Office of Land and Urbanization and Nayna Jhaveri with Tetra Tech (on USAID's Tenure and Global Climate Change Program).

it assesses how effectively the diversity of legal and policy frameworks as well as institutional structures—formal and informal—enable mangrove governance across different settings. The review also examines the institutions and patterns of local management and use, including tenure rights and gender differentiation and how these local institutions might influence mangrove management and rehabilitation efforts. It is part of a larger study funded by the USAID Tenure and Global Climate Change Program that includes national-level assessments in Indonesia and Tanzania.



Clam collection in sandbank beyond mangroves. Credit: Nguyen Tan Phong/GIZ

## Key points of the assessment

There is a dearth of research on how mangrove forests are governed and what the role of enabling conditions such as tenure arrangements is for supporting mangrove management to meet multiple goals in the context of climate change.

1. Authority over mangrove forest management is overwhelmingly vested in state institutions, and state-led mangrove protection is a central objective. Government-led mangrove protection efforts, permitting no or minimal substantive use of its natural resources by local communities, face major challenges; mainly that enforcement is constrained by inadequate personnel, capacities, and budgets.
2. Given the ambiguous position of mangroves situated between the land and sea, the configuration of state authority for mangrove management is quite complex. Most commonly, this authority falls on a single line agency, namely the forest sector. The forest sector applies the framework used for terrestrial forests, which is often not appropriate to the distinctive ecological characteristics of mangrove systems. In some countries, there is fragmentation of responsibilities across two or more agencies such as forests, fisheries, environment, and wildlife. This contributes to a high level of segmentation and jurisdictional ambiguity.
3. Mangroves are regulated under legal frameworks intended for forests, environment, water, land, marine, or fisheries sectors. Generally speaking, laws and policies have not been crafted for the specific management requirements of mangroves.
4. Frameworks and mechanisms for coordinating mangrove governance across agencies and governance levels are uncommon, and where they exist, are difficult to put into practice.
5. Local tenure rights to mangrove resources vary. Customary rights as well as patterns of use and management are often unrecognized by statutory systems, especially in Africa. Local indigenous rights are often recognized by the state in Latin America, where full ownership, including title, is issued to communities. In Asia, long duration leases are granted to households and communities; these leases often offer a broad range of rights in the bundle, sometimes including transfer rights. In these cases, multiple uses, including collection of firewood, charcoal production, and fishing, are allowed.
6. There is a mangrove tenure transition underway in a few countries toward increased community participation in mangrove management and governance through devolved tenure arrangements. Experimentation with community-based approaches is increasing, motivated primarily by continued mangrove degradation and loss under strict protection regimes.
7. Outcomes of community-based approaches for mangrove management should be researched. While national governments continue to be central actors in mangrove conservation, international organizations and NGOs are exerting influence and shaping agendas and approaches to mangrove management. In particular, they are increasingly experimenting with inclusive models of community-based management. Community concessions and extractive reserves that accord full ownership or longer-term rights appear to be more effective in mangrove conservation. Programs involving communities jointly with nongovernmental organizations (NGOs), research organizations, and those that provide other incentives appear to generate better mangrove rehabilitation outcomes. Where customary rights are not respected or recognized and are actively undermined, or community institutions are subject to government interference, mangroves tend to deteriorate.
8. Gender equality has been a missing element in mangrove conservation and management, despite gender differentiation in the type of products harvested, the economic value of products harvested, and harvesting locations. As a result, their interests and potential contributions to better management outcomes are often diminished and disregarded. However, community-based rehabilitation programs are increasingly integrating gender and some are even focusing solely on empowering women.

## INTRODUCTION<sup>2</sup>

Many countries have started to develop new policies and regulatory frameworks specifically targeted to the unique needs of mangrove forest conservation, protection, and development in the context of climate change. Global attention on mangroves has been considerably elevated in recent years. Although there have been many small and large initiatives at the national and local levels to rehabilitate and restore mangrove areas, particularly after the 2004 tsunami in the Indian Ocean, these have largely revolved around developing a strong knowledge base about the biophysical or ecological dimensions of mangrove planting and protection to achieve better success rates.

In doing so, the central issue of how governance and tenure arrangements provide the enabling framework for achieving an integrated approach to mangrove management has largely been left on the margins. While there is a small but steadily growing literature on community-based management of mangroves, a substantial gap in mangrove governance work is clearly evident. Given that mangrove forests play a critical role in multiple ways within coastal

landscapes, support for effective governance institutions that establish clear tenure rights to access, use, and manage mangroves can ensure that institutions of mangrove management meet a wide range of goals.

These goals include rehabilitating and afforesting mangroves, reducing the drivers of deforestation and degradation, developing appropriate silvicultural and resource use practices, and establishing landscape-level spatial planning. Designing such governance institutions will need to consider the appropriate scale of governance, and who should be the primary set of stakeholders involved in decision making and implementation (including gender and social inclusion considerations) to obtain effective results within coastal areas or wetlands with mangroves.

This assessment provides a synoptic analysis of the legal, policy, and institutional frameworks that relate to the governance and tenure dimensions of mangrove forests in key mangrove countries across Africa, Asia, and Latin America. It highlights the spectrum of achievements to date, as well as challenges typically encountered in the governance and tenure dimensions of mangrove forest management. This assessment forms part of a broader study that includes national-level assessments in Indonesia and Tanzania.

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<sup>2</sup> The main publication contains the full set of references that support the analysis presented in this Brief.



## TRANSFORMING DRIVERS OF MANGROVE DEFORESTATION AND DEGRADATION

Mangroves are found across the tropics and sub-tropics. According to the *World Atlas of Mangroves*, the five countries with the largest mangrove areas are Indonesia, with 21 percent of the global total; Brazil, with nine percent; Australia, with seven percent; and, Mexico and Nigeria, with five percent each. Forty-two percent of mangroves are found in Asia, followed by Africa (20 percent), North and Central America (15 percent), Oceania (12 percent), and South America (11 percent). About 75 percent of all mangrove forests are found in just 15 countries. Given the significant variation in mangrove structure and species diversity in different geographical localities, governing mangroves requires careful attention not only to its ecological context but also the socioeconomic context within which management takes place.

It is evident that global thinking toward mangroves has gradually evolved from perceptions of swampy wetlands to fertile nurseries, natural breakwaters, and forests with high capacity to sequester “blue” carbon. They not only offer a level of resilience in the face of constant environmental changes, but recent studies of carbon sequestration levels within mangrove forests indicate they possess an incredible capacity

to store carbon, about 10 times greater than upland tropical forests. Given the magnitude of their importance, research is being carried out to specify more precisely how climate change is affecting particular types of mangroves on a region-by-region basis.

Mangroves, throughout the 1980s and 1990s, however, were largely seen as unproductive and unhealthy. This led to a range of anthropogenic drivers behind rapid deforestation and degradation of mangroves during this period. Mangrove losses have been primarily associated with economic development, especially conversion to aquaculture in Asia and Latin America. From 1980 to 2000, nearly 20 percent of mangrove forests were lost. The annual rate of forest loss between 2000 and 2005 was slightly reduced at 0.66 percent.

Within Southeast Asia, where the majority of the world's mangroves are found, new studies indicate that from 2000 to 2010, mangrove forests were lost at an average annual rate of 0.18 percent, indicating a lower level of deforestation than earlier estimates. Some 30 percent of 100,000 hectares lost were from conversion to aquaculture; other major drivers included rapid expansion of rice production in Burma, and sustained conversion to oil palm plantations in Indonesia and Malaysia.





Stack of mangrove firewood used for the preparation and smoking of fish on a small fishing island in Fresco, Cote d'Ivoire. Credit: David Aduama/USAID WA BiCC/Tetra Tech

## Governance and Mangrove Management

In attempting to remedy the significant loss of mangroves, the primary form of intervention has been to identify how mangroves can be planted and protected, as well as determine ways to convert specific types of land uses (from aquaculture, for example) back to mangroves. Much of the focus has been on understanding their biophysical or ecological dimensions, such as mangrove tree species differentiation and relative growth rates; factors influencing restoration and rehabilitation; and physical effects on coastal erosion and biodiversity. Increasingly, new ecological studies are now focusing on the role of mangroves in climate change mitigation and adaptation.

Given the unfolding scenario where many governments are interested in developing new policy and legal frameworks, the dearth of research is notable on how mangrove forests are governed and what the role of enabling conditions such as tenure arrangements can be for supporting mangrove management to meet a spectrum of needs in the context of climate change. This assessment explores how mangrove governance and tenure rules operate in a range of countries with diverse experiences. Countries with large mangrove areas were examined, as were countries with long coastlines relative to their total land mass such as Bangladesh, Indonesia, and Vietnam because they are particularly vulnerable to the effects of climate change.

In assessing how well mangrove governance and tenure arrangements are able to support healthy mangrove ecosystems, a number of key questions were explored. Which types of legal and policy approaches are best for managing mangroves that create shelterbelts along coastlines? Do tenure issues place an obstacle in the way of planting lands most appropriate for mangroves? Are

there specific types of local governance institutions that can support effective mangrove management to meet a wide range of needs? Strong local-level participatory institutions can potentially be well placed to become the modality for meeting a range of critical objectives: reducing the drivers behind mangrove deforestation and degradation, enhancing rehabilitation and afforestation, improving management practices, addressing climate change mitigation and adaptation, and engaging in long-term planning to support healthy mangrove ecosystems. The question is to understand how local institutions can be configured to meet these ambitious goals.

## LEGAL AND POLICY FRAMEWORKS FOR THE GOVERNANCE OF MANGROVES

This assessment shows that authority over mangrove forest management is overwhelmingly vested in state institutions and that state-led mangrove protection is a central objective. Given the ambiguous position of mangroves situated between the land and sea, the configuration of state authority for mangrove management is quite complex. Most commonly, we find that this authority falls on a single line agency. This is typically the forestry agency, but occasionally the environmental or wildlife agency. Within the forest sector, however, mangroves typically occupy a marginal role with few policies or regulations tailored to the unique needs of mangrove forests. In some countries, responsibilities are fragmented across two or more agencies such as forests, fisheries, environment, and wildlife. This contributes to a high level of segmentation and jurisdictional ambiguity.

For example, in Vietnam, mangroves fall under the jurisdiction of two ministries: the Ministry of Agriculture and Rural Development, and the Ministry of Natural Resources and Environment. The overlapping jurisdiction and weak collaboration between these two ministries has created confusion for stakeholders and uncertainty in mangrove management. In the Philippines, regulation of mangrove forest lands has historically come under the legal jurisdiction of both the Department of Environment and Natural Resources, whose mandate is to protect and sustainably manage these forests, and the Department of Agriculture, whose mandate is to promote brackish water aquaculture development in these same areas. The two departments have historically shown a lack of coordination when it comes to mangrove management. In Indonesia, four different government authorities have responsibility for mangrove management and the president has established a national strategy to ensure coordination. Coordinating committees established under this strategy have not been effective due to lack of budget and personnel, and fragmented sectoral mandates that do not reward collaboration.

In general, frameworks and mechanisms for enabling multi-sectoral coordination and multi-stakeholder consultation across agencies and governance levels are uncommon, and where they exist, are difficult to put into practice. Although

attempts at coordination and the development of a national mangrove plan have been made in a number of countries since the late 1970s, there has been no assessment of their effectiveness.

In general, laws and policies have not been crafted for the specific management requirements of mangroves. Despite the ecological uniqueness and socioeconomic importance of mangroves, only one country, Mexico, has passed laws specifically designed for the management of mangrove forests. Instead, mangroves are considered under the legal frameworks for forests, environment, wildlife, water, land, and fisheries. This results not only in fragmentation of authority and in ambiguities, but also in conflict and competition. Regulation and management in practice are even more complex than the legal and policy frameworks governing mangroves. State-led mangrove protection, which permits no substantive use of its natural resources by local communities, faces major challenges: enforcement is constrained by inadequate personnel, capacities, and budgets.

## MANGROVE GOVERNANCE AND TENURE IN PRACTICE

While mangrove forests largely remain under the jurisdictional authority of the government, there is increasing recognition that devolving tenure rights to the local communities (including indigenous peoples) who use and manage resources in mangrove forests offers important benefits for the government, local residents, and the forest ecology. A nascent mangrove tenure transition is taking place in a range of countries through which devolution to local governance bodies is either promoted by the government itself, or takes place in a de facto fashion by communities creatively forging their own regulations to manage their forests in collaboration with the local government and other stakeholders such as universities. Though more limited in scope than reforms in terrestrial forests, many devolved mangrove tenure arrangements have considerable promise and have led to positive mangrove management outcomes.

Overall, there is increasing experimentation with community-based approaches; mangrove forests around the world are held under a variety of devolved tenure regimes. Given the right regulatory context, local communities are often best placed to manage these local ecosystems because their close proximity permits them to develop rules that match the resource condition and social situation. Community concessions and extractive reserves that accord full ownership or longer-term rights appear to be more effective in mangrove conservation. For example, local stakeholders in Ecuador have clear, legal title to mangroves. Here, more than 40 mangrove concessions covering nearly 40,000 ha have proven effective in curbing deforestation, sustaining increased seafood yields, improving livelihoods,



Mangrove forests on Lake Tabarisa,  
Mamberamo Raya, Papua.  
Credit: Mokhammad Edliadi/CIFOR

and reducing conflict with the large-scale shrimp industry. In Brazil, the establishment of large extractive reserves in mangrove forests offers an alternative management approach to strict protected areas that exclude local inhabitants. In the extractive reserves, control and ownership of natural resources is conferred to local communities, who regulate access to and harvesting of timber and fishing resources, and establish local resource management rules. Many of these extractive reserves appear more effective at protecting the area and mangrove resources than the reserves managed by the Federal Government of Brazil.

After the 2004 tsunami in Asia, efforts were launched in the most affected countries to restore mangroves in the areas where they were destroyed. The Philippines, Thailand, and Indonesia have achieved successes with mangrove restoration. The Philippines has the most extensive experience with establishing and improving community-based mangrove management to rehabilitate degraded mangrove forests. From the 1980s to the present, mangrove restoration has been one of the key objectives of the Philippine central government; mangrove replanting has been popular in the country, mostly in collaboration with coastal communities. USAID supported the development of community-based forest management agreements in mangrove areas starting in the late 1990s.

Many coastal communities initiated community-based mangrove management programs voluntarily with technical assistance from NGOs, research organizations, and governments. For example, in Trang Province, in southern Thailand, two coastal communities have crafted and maintained well-defined institutions for forest management, resulting in a superior stand structure in the community-managed mangrove forests compared with that in a neighboring state forest, where there are no effective rules controlling access. Programs involving communities jointly with external institutions such as NGOs or research organizations that permit capacity building, utilization of new technologies, and collaborative knowledge generation appear to generate better outcomes in terms of mangrove rehabilitation and management. On the other hand, where community-based programs are top-down and initiated primarily by the central government, as in India, Pakistan, the Philippines, Vietnam, Tanzania, and South Africa, low-to-moderate levels of success have been achieved.

A tenure model situated between unrecognized customary institutions and fully titled community ownership is the granting of leases of various kinds to households, communities, and corporations. Under Vietnam's Decision 51, also known as the 7:3 Policy, individuals and households enter into long-term contracts with forest protection and management boards for forest use and protection. Under the agreement, landholders are required to maintain 70 percent of the contracted land under forest cover; while the remaining 30 percent of the land and surface water can be utilized for agriculture, aquaculture, and other income-generating activities.



Planters preparing to take seedlings out to coastal areas to plant in Do Son peninsula, Vietnam. Credit: Nayna Jhaveri/USAID Tenure and Global Climate Change Program/Tetra Tech

Most households that participate in the program expanded aquaculture and are now earning increased income from shrimp, blood shell culture, and fish farming. At the same time, forest cover has increased by 20 percent, according to the An Minh-An Bien Forest Protection Management Board. In another recent study carried out in Ca Mau Province, a survey of 40 households indicates the households have a substantial dependence on the income from shrimp and crab cultivation but do not have a share of any income from timber harvests due to lack of full ownership. Given that the study found a strong relationship between per pond area income and mangrove coverage, it concluded that the regulations in the form of universal mangrove-to-water ratios need to take into consideration the economic realities of local households.

In contrast, the widespread lack of government respect for, and recognition of, legitimate customary rights leads to the undermining of traditional forms of livelihoods that revolve around a sophisticated understanding of mangrove ecologies. This leads not only to conflict but also deterioration in mangrove condition. The lack of a formal framework or process established by the state to recognize customary or other legitimate forms of community-level governance in coastal landscapes is a source of tension between coastal communities and formal institutions. Much more research is needed to examine the impacts and effectiveness of different types of governance approaches associated with specific types of tenure arrangements.

## **GENDER-DIFFERENTIATED APPROACHES: A MISSING DIMENSION IN MANGROVE GOVERNANCE**

Within this devolution of tenure rights to local-level communities, gender equity remains a missing element in mangrove conservation and management. Gender is an important factor in mangrove conservation, as men and women use mangroves differently and have unique perspectives about the importance of mangroves and how they should be protected. Gender differentiation is evident along various dimensions, such as how women and men value mangrove products, their rights to mangrove forests and forest products, how they harvest those products, whether the products are used for market or for subsistence, and the extent to which they are involved in decision-making about mangroves. The factors driving gender differentiation are primarily cultural norms, which also influence gender roles and expectations. Community-based rehabilitation or income generation programs are increasingly integrating gender-based considerations and some are even focused solely on empowering women.

Because studies of gender and mangroves are scarce, there is little empirical data to draw a pattern of gender differentiation with regard to mangroves. The few available studies have shown that there is gender differentiation in the type of products harvested, in the economic value of products harvested, and locations where harvesting is conducted.

One study conducted in the Philippines showed that men and women differ in the value they perceived from mangrove products. Women place a higher value on the sea cucumbers, shells, and invertebrates supported by

mangroves in the intertidal zones, while men value fish living in offshore reefs. Men's preferences tend to be perceived as more important and women's fishing needs as secondary, leading to the marginalization of women and negatively affecting biodiversity conservation.

Product harvesting practices by men and women differ and affect the condition of mangrove forests. In southwest Cameroon, for example, women carry out seasonal, intensive harvesting of smaller mangrove trees over a larger working area closer to home, which contributes to mangrove ecosystem degradation. Men, on the other hand, carry out less frequent, small-scale, and selective harvesting of larger trees further away from home.

A gendered division of labor was observed in the Galle-Unawatuna mangroves of Sri Lanka, where men are involved mostly in fisheries-related activities and women in edible plant collection. Similar differentiation has been observed in charcoal value chains in the Mida Creek area in Kenya, where cutting trees for commercial firewood and charcoal burning is done by men, while the actual selling of charcoal in the creek area is done by women. Conversely, in the coastal regions of Tanzania, income generated from mangrove activities is under the control of men.

Overall, the review found that though there is evidence of gender differentiation in the use and management of mangrove resources, legal and local institutional frameworks both fail to fully anticipate and take that differentiation into account. The extent to which legal frameworks mandate attention to gender differentials or even how actual practices play out on the ground remain unclear given the shortage of gender analysis in mangrove studies.



Women planting mangrove seeds in Da Loc, Thanh Hoa province, Vietnam. Credit: Nguyen Viet Nghi/ USAID Vietnam Forests and Deltas Program/Winrock