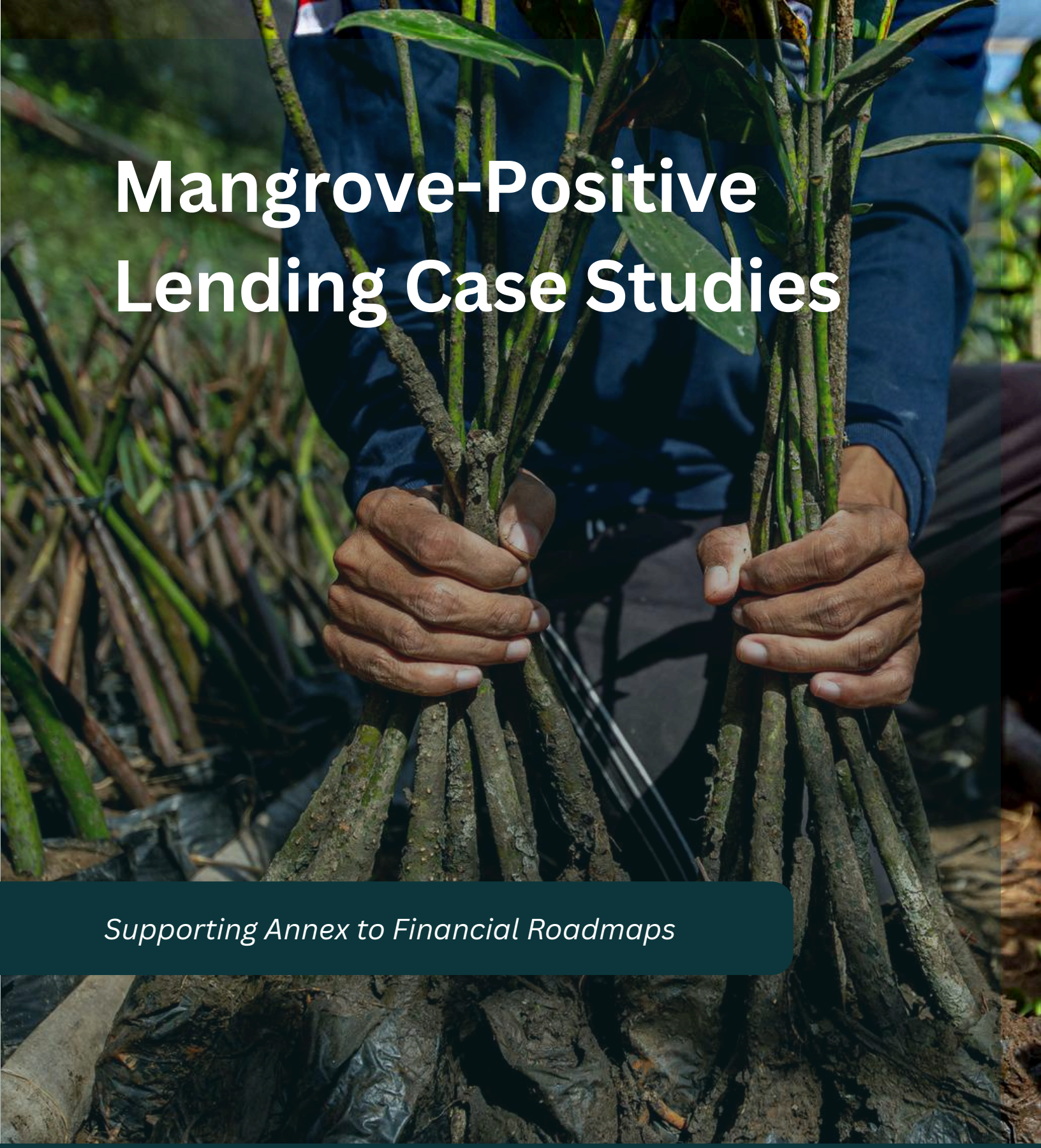

Mangrove-Positive Lending Case Studies

Supporting Annex to Financial Roadmaps

Prepared for:

MANGROVE BREAKTHROUGH

By:

MAGNITUDE GLOBAL FINANCE

About the Mangrove Breakthrough

The Mangrove Breakthrough, co-designed with the Global Mangrove Alliance, is a global movement and guiding force for systemic change – redefining how mangroves are valued, financed, and embedded into climate and economic agendas. It brings together governments, investors, civil society, and local communities with the mission of mobilizing $4 billion to secure the future of over 15 million hectares of mangroves by 2030. The Breakthrough was launched at COP27 and advances sector-specific goals:

1. **Halt loss:** reduce net human-driven mangrove loss to zero
2. **Double protection:** ensure long term protection for 80% of remaining mangroves
3. **Restore half:** restore mangroves to cover at least half of all recent loss
4. **Drive sustainable finance** to existing mangrove extent

About This Report

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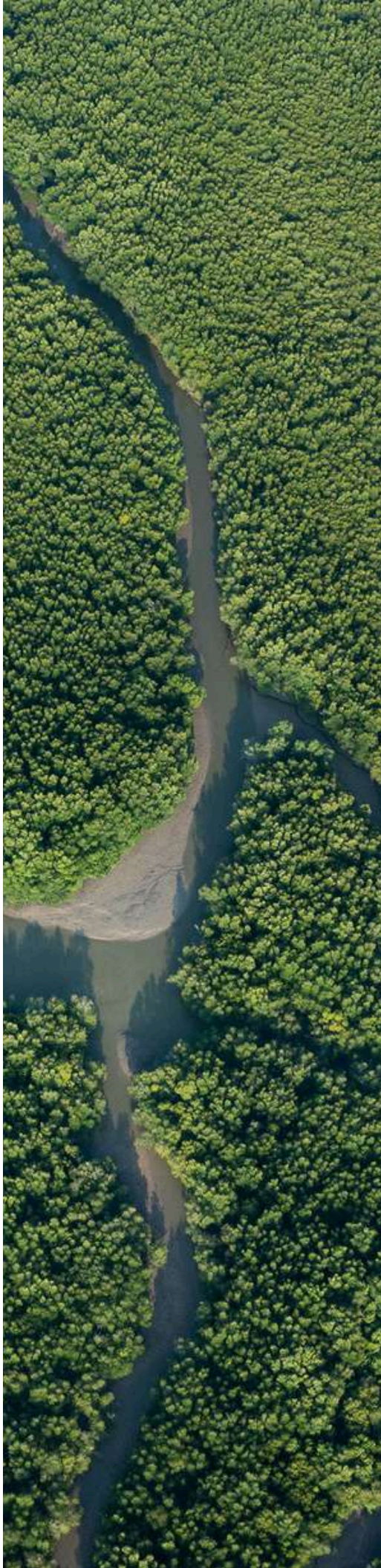

Mangrove-Positive Landscape in Colombia

Colombia is among the world's top ten mangrove-rich countries, with roughly 280,000 hectares spread across the Pacific (77%) and Caribbean (23%) coasts.[1] Colombian mangroves are central to the food security, culture, and livelihoods of Afro-Colombian and Indigenous communities, most of whom have customary or collective tenure rights over coastal territories. Despite this, Colombia has lost nearly 57% of its mangroves since 1960, primarily due to sea level rise, land-use conversion, resource extraction, natural pressures, and pollution.[2] Nearly 30 different factors have been identified as drivers of degradation and loss of mangrove forests in Colombia.[3]

In the Caribbean, where population density is highest, the main drivers of current mangrove loss are climate-related, including sea-level rise, storms, and coastal erosion. Anthropogenic drivers include coastal infrastructure development (notably tourism facilities and major highways that disrupt natural hydrology); untreated residential and industrial sewage and solid waste (especially plastic waste); land conversion for smallholder cattle ranching and agriculture (primarily rice cultivation), and illegal logging for local fuelwood and construction. Historically, shrimp farming, large-scale road projects, and river diversions for hydroelectric plants were significant drivers of mangrove loss (acknowledging that some diversions also produced mangrove gains elsewhere), but these are less prevalent today.[4, 5]

In contrast, Colombia's Pacific coast is effectively walled off from the rest of the country by the Western Andes (Cordillera Occidental) and the Chocó biogeographic rainforest, one of the most dense and humid tropical forests on Earth, with annual rainfall reaching 10–16 meters in some areas.[6] While these conditions make the region home to some of the tallest, most carbon-rich mangroves in the world, with canopies reaching up to 60 meters,[7] they also result in isolation from national markets, extreme poverty, few economic options, and significant security issues stemming from decades-long conflict among leftist guerrillas, paramilitaries, and drug-trafficking groups. The main drivers of mangrove loss on the Pacific Coast are sea-level rise, land conversion for housing displaced populations and for agriculture (notably coconut plantations), contamination from oil-pipeline spills, untreated residential and industrial sewage and solid waste (especially plastic waste), illegal gold mining, logging for fuelwood, construction materials, and timber (domestic and international). Finally, river deviations that alter hydrology also cause mangrove cover losses in some areas and gains in others.

Financing mangrove-positive businesses in Colombia is a persistent challenge, but also an emerging opportunity. On the constraint side, many community enterprises in coastal areas operate informally, lacking incorporation, collateral, and credit histories, which keeps them outside the scope of conventional bank lending. Seasonal cycles in fisheries and tourism create volatile cash flows that complicate repayment schedules, while the remoteness of many mangrove ecosystems adds high logistical costs. At the same time, Colombia has developed a strong policy framework anchored in national biodiversity policies, regional environmental authorities, and an emerging Green Taxonomy, which helps to foster a supportive environment for financing mangrove-positive businesses.

STAKEHOLDER LANDSCAPE

A diverse set of stakeholders shapes the enabling environment for mangrove-positive businesses in Colombia. Government institutions provide the policy and regulatory framework, non-governmental organizations (NGOs) contribute technical expertise and community partnerships, and the finance sector, including commercial banks and microfinance institutions, offers emerging pathways to channel capital into coastal economies.

Government Institutions. Colombia's government plays a central role in shaping the policy and regulatory environment for mangrove-positive businesses. Mangroves in Colombia are protected under multiple national instruments, including the 1974 Forest Code, Law 99 of 1993, and the National Biodiversity Policy (2000). Colombia's National Development Plans (PND) and climate adaptation frameworks increasingly highlight the importance of coastal ecosystem conservation. The Ministry of Environment and Sustainable Development (MADS) oversees mangrove policy and environmental licensing, while operational responsibilities are delegated to the 33 regional environmental authorities for permitting, monitoring, and enforcement in coastal areas. Mangroves are protected ecosystems under Decree 2811 of 1974 and Decree 1076 of 2015.

Spotlight on land tenure: Colombia's Regional Autonomous Corporations (CAR) are critical entities for mangroves. They govern the use of mangroves across the country, making private land ownership in mangroves extremely rare. Mangrove-positive projects that have been able to proceed in Colombia have had to secure the buy-in of the relevant CAR (for example the Conservation International blue carbon project Vida Manglar). This arrangement has historically complicated mangrove investments in Colombia, however recent developments may signal a shift away from unilateral mangrove control by CARs, as the Nariño CAR voluntarily recognized the rights of the Afro-Colombian Community Council Esfuerzo Pescador as the authority over mangroves in their collective territory.

Civil Society. Colombia's civil society stakeholders are highly active in advancing mangrove-positive projects and finance, often serving as technical partners, community facilitators, and intermediaries for donor funding. Global organizations such as World Wildlife Fund (WWF), Wildlife Conservation Society (WCS), Conservation International (CI), and MarViva play central roles in conservation, governance strengthening, and piloting new approaches. National organizations such as Fondo Acción and Fundación Omacha manage donor-financed restoration and blue carbon projects, frequently linking international finance with Afro-Colombian community councils on the Pacific and Caribbean coasts. These organizations have been critical in building capacity for monitoring, reporting, and verification, supporting land tenure security, and brokering agreements between communities, government, and financial actors.

Financial Institutions. Colombia's finance sector is relatively advanced when it comes to nature-finance initiatives and services. Asobancaria estimates that Colombia's green credit portfolio reached 7.5 million USD in 2024 (4.1% of total domestic credit portfolio), with a projected increase to 11% of the total bank portfolio by 2030 to meet national climate and environmental finance commitments.[8] However the sector is still evolving when it comes to meeting the needs of mangrove-positive businesses and community enterprises. While several large commercial banks in Colombia (Davivienda, Banco de Bogotá, BBVA, and Bancolombia) have issued or secured discounted biodiversity/blue/green funding with multilaterals (e.g., IFC Blue Bond; CAF biodiversity/sustainable bonds), financing from these bonds is not being directed towards coastal or mangrove areas. Microfinance institutions (MFIs), while present in Colombia, account for only 2.9% of Colombia's total loan portfolio, compared to approximately 20% in the Philippines.[9]

DAVIVIENDA - FINANCING PATHWAYS FOR MANGROVE-POSITIVE BUSINESSES

Banco Davivienda, Colombia's second largest commercial bank, has steadily embedded sustainability into its business model and operations across Latin America. With a commitment to ensure that at least 30 percent of its loan portfolio qualifies as sustainable by 2030, the bank has scaled its sustainable finance efforts rapidly. As of mid-2024, Davivienda's consolidated sustainable loan portfolio reached a balance of Colombian Pesos (COP) 18.8 trillion, accounting for 13.4 percent of total loans and growing at an annual rate of 25 percent.[10]

A central pillar of this effort is Davivienda's Biodiversity Financing Framework, which aligns with Colombia's Green Taxonomy and the International Capital Market Association's Green Bond Principles. This framework sets out clear categories, eligibility criteria, and risk management processes to mobilize finance for biodiversity conservation and restoration.

At the 2024 United Nations Conference on Biodiversity (COP16) in Cali, Colombia, Banco Davivienda with support from the International Finance Corporation (IFC), signed an agreement to issue a $50 million biodiversity bond - the second of its kind in the world. The bond proceeds will be used to issue loans to projects and businesses that protect, conserve, and restore the country's biodiversity, with 10 percent specifically earmarked for mangrove conservation and restoration in the Pacific coast. The structuring process involved a second opinion from Standard & Poor's and guidance from IFC to refine categories, eligibility standards, and biodiversity impact indicators. IFC's participation is also anticipated to help attract global investors who value IFC's performance standards and expertise in sustainable finance.[11]

Since issuing the bond, Davivienda has prioritized building a pipeline of mangrove-positive businesses through the development of a mangrove-positive financing window in coordination with the Ministry of Environment's BioManglar program. The goal is to move from ad-hoc green lending and grants toward a tiered blended-finance facility that can originate, de-risk, and scale credit to coastal micro, small, and medium enterprises (MSMEs) and producer groups linked to mangroves (fisheries, piangua, community tourism, sustainable forestry and the broader coastal bioeconomy).The bank has worked closely with Colombia's Ministry of Environment, Afrodescendant Community Councils, and environmental NGOs that have been working in these communities for decades and have a deep understanding of the financing needs, risks, and opportunities of mangrove-related businesses and projects in these communities.

While Davivienda is still in the process of developing a pipeline of mangrove-positive businesses, Davivienda's loan officers have established a structured loan screening and evaluation process that can be used to assess potential mangrove-positive investments. Davivienda's Biodiversity Financing Framework establishes clear use-of-proceeds categories against which investments can be screened. Eligible categories relevant to mangrove-positive businesses include sustainable fisheries, nature-based tourism, sustainable forestry, circular economy and waste management, and territorial development infrastructure.[12] Projects must also clear Davivienda's exclusion list, which rules out activities tied to coal, deforestation, or operations in highly sensitive ecosystems.[13]

Once investments clear this initial screening, loan officers conduct a risk screening. Since 2011, Davivienda's Environmental and Social Risk Management System (SARAS) has been central to assessing environmental and social risks in credit applications for corporate and SME projects requiring environmental licenses.

While the biodiversity bond demonstrates Davivienda's leadership in mobilizing resources for nature and for mangrove-positive businesses specifically, the experience also highlights a key challenge: identifying and establishing a robust pipeline of investable mangrove-positive businesses. Likely, a blended finance mechanism including concessional finance such as grants, public guarantees and technical assistance will be required to de-risk and finance these types of enterprises.

MIBANCO: FINANCING SUSTAINABLE TOURISM IN MANGROVE ECOSYSTEMS

MiBanco is a microfinance institution with distinctive capabilities for serving coastal communities adjacent to mangrove ecosystems. The institution combines rapid credit approval (approximately 48 hours) with a geo-enabled Environmental and Social Management System that identifies and monitors risks to protected areas, including mangroves. This technological infrastructure, paired with intercultural service practices tailored to coastal livelihoods, positions MiBanco as a rare model for mangrove-positive finance in the microfinance sector.

Credit Product Terms. The client's relationship with MiBanco began in September 2016 through personal referral, starting with a 3 million COP (approx. $1,000) credit for business expansion. Over nine years, the client successfully completed six operations with MiBanco, ranging from 20 million COP (approx. $6,100) to 64 million COP (approx. $19,500). The largest facility, a 64 million COP microcredit with a 36-month term, financed the purchase of a van essential for tourist transport. The 32.34% nominal annual rate reflects MiBanco's risk assessment of small-ticket, thin-file borrowers in coastal areas.

Environmental and Social Impact. The financing directly advanced mangrove conservation. The client's motorless tour model, which requires minimal ecosystem disturbance, represents an alternative to extractive or damaging tourism models. By enabling the purchase of appropriate boats, MiBanco's credit supported the scaling of low-impact ecotourism while generating local employment and environmental education opportunities. Visitors learn about representative fauna and flora, helping to foster a constituency for mangrove protection.

Managing Seasonality and Risk. A critical challenge was seasonal volatility in tourism revenue. MiBanco supported adaptation through financial education and personalized advisory services. The client diversified income through online artisanal crafts sales to customers in Bogotá and Medellín, while pre-selling tourism packages to smooth cash flows. This adaptive capacity, combined with excellent payment discipline, demonstrates that mangrove-positive microfinance can succeed with appropriate support systems.

Institutional Learning and Replication Potential. MiBanco's experience confirms several lessons for mangrove-positive lending. First, sustainable coastal enterprises can benefit from close advisory relationships and tailored financial products. Second, blending tourism revenue with complementary income sources reduces vulnerability to seasonality. Third, environmental certification and visible ecosystem benefits strengthen both client loyalty and institutional credibility.

MiBanco’s MFI model shows high replication potential across Colombia's Caribbean and Pacific mangrove regions. Scaling requires partnerships with training institutions, tourism promotion authorities, and environmental organizations, aligning skills development, market access, and conservation objectives. The institution materially benefits from the relationship with the borrower, and also values the addition of a strong business in its green banking portfolio.

Mangrove-Positive Landscape in the Philippines

The Philippines sustains one of Southeast Asia's most extensive mangrove forests, covering approximately 311,400 hectares as of 2024.[14] These ecosystems are central to the livelihoods of millions of coastal residents, providing breeding and nursery grounds for fish and crustaceans, fuelwood, and construction materials, while serving as natural barriers against typhoons, storm surges, and coastal erosion.[15] They also represent globally significant carbon sinks.[16] Spread across 66 of the country's 82 provinces, mangroves remain vital to small-scale fisheries and household aquaculture that form the backbone of subsistence and local income for coastal communities. From an economic standpoint, mangroves provide both direct and indirect contributions to national income and stability. Site-based valuations in Banacon, Bohol, and Kamuning, Palawan estimate annual Total Economic Value (TEV) at $686–$1,039 per hectare, based on fisheries, timber, nipa, recreation, and biodiversity benefits.[17] This suggests that mangroves in the Philippines generate roughly $970 million - $1.5 billion annually in ecosystem goods and services.

Despite mangroves' ecological and economic importance, the Philippines has experienced historic declines in mangrove cover, driven by timber extraction and policies during the mid-20th century that incentivized large-scale conversion to fishponds. During this period, extensive tracts of mangrove forests were cleared for milkfish and shrimp ponds, supported by government-backed credit and licensing programs.[18] While national reforestation and community-based coastal management initiatives launched in the 1980s, including the declaration of Mangrove Swamp Forest Reserves, slowed losses and enabled localized recovery, mangroves remain under pressure from weak enforcement, insecure tenure, competing land uses, and limited financing for ecosystem restoration. Conversion for aquaculture and settlement, illegal cutting, and untreated waste continue to degrade key sites. Many abandoned or underutilized fishponds represent both a challenge and an opportunity: tenure ambiguities limit restoration, but new policies and projects are exploring how these lands could be reforested and reintegrated into sustainable livelihood systems.

At the same time, momentum is growing to unlock the economic and biodiversity value of mangroves through innovative business models around ecotourism, sustainable aquaculture, and blue carbon. Community-run businesses are turning to business models that could be described as

mangrove-positive to expand local revenue streams. Fisherfolk groups and local associations manage paddleboat tours, bamboo boardwalks, and nature education sites that attract domestic tourists seeking mangrove experiences. Notable examples include the Del Carmen Mangrove Paddleboat Tours (Siargao), Sabang Paddleboat Tours (Palawan), and Banacon Island's community-managed boardwalk and crab farming cluster (Bohol).[19] At the national level, the launch of the Philippines' National Blue Carbon Action Partnership (NBCAP) in 2025 signals strong interest in leveraging the carbon storage capacity of mangroves and seagrasses to meet climate commitments and support coastal resilience.

STAKEHOLDER LANDSCAPE

A diverse array of stakeholders shapes the enabling environment for mangrove-positive businesses in the Philippines. Government institutions provide the regulatory framework and oversee national programs, NGOs and civil society organizations deliver technical expertise and on-the-ground implementation, the finance sector and microfinance institutions offer emerging pathways to capital, and community-based organizations link conservation directly with livelihoods.

Government institutions. Mangrove management is anchored in a robust but fragmented regulatory framework. The Department of Environment and Natural Resources (DENR), through the Biodiversity Management Bureau (BMB) and Forest Management Bureau (FMB), oversees national mangrove conservation programs such as the Coastal and Marine Ecosystems Management Program (CMEMP) and the National Greening Program (NGP). The Bureau of Fisheries and Aquatic Resources (BFAR) regulates fisheries and manages livelihood support infrastructure like community fish landing centers that directly intersect with mangrove ecosystems. The Climate Change Commission (CCC) integrates mangroves into adaptation policies and links them to carbon finance opportunities under the country's NDC. Meanwhile, the Local Government Code devolves day-to-day enforcement to municipalities, which play a pivotal role in passing ordinances, collecting eco-fees, and managing community patrols. Despite overlapping mandates and limited resources, local governments in places such as Del Carmen and Sabang have shown innovation in aligning mangrove protection with ecotourism revenues.

Civil society. Philippine NGOs are deeply engaged in mangrove conservation, restoration, and livelihood development. Organizations such as Wetlands International, WWF Philippines, Conservation International, Haribon Foundation, Rare, and Tambuyog Development Center have led efforts ranging from blue carbon pilots to fisherfolk training and co-management planning. Regional organizations like the Philippine Reef & Rainforest Conservation Foundation and Oceanus Conservation are also advancing site-based

ecotourism and community monitoring initiatives. These groups are central to building technical capacity, piloting financing mechanisms, and brokering agreements among communities, local governments, and financiers.

Financial institutions. Access to formal finance for mangrove-linked livelihoods remains limited, but several banks and microfinance institutions have relevant programs. CARD Bank and ASA Philippines provide microloans to women entrepreneurs and rural households, indirectly supporting coastal livelihoods. Bangko Kabayan, LANDBANK, and the Development Bank of the Philippines (DBP) offer loans for SMEs, agriculture, and environmental projects, though few are tailored specifically to mangrove enterprises. While these institutions provide important entry points, barriers such as lack of collateral, high interest rates, insecure land tenure, and seasonal cash flows limit uptake by fisherfolk cooperatives and eco-enterprises.

MANGROVE-POSITIVE LENDING: MUNICIPALITY OF DEL CARMEN, SIARGO

The Municipality of Del Carmen in Siargao Island manages the Philippines' largest contiguous mangrove forest, covering 4,871 hectares, recognized as a Ramsar Wetland of International Importance and nominated under the ASEAN Heritage Park network.[20] The mangrove ecosystem serves as a natural barrier against typhoons, coastal erosion, and sea-level rise, protecting 20 coastal villages (barangay) and supporting a rich fisheries nursery that sustains local livelihoods.

Under the leadership of Mayor Alfredo M. Coro II, Del Carmen has become a national model for mangrove governance, integrating environment, social protection, health, and livelihood programs into a single local development agenda. The Local Government Unit's (LGU) Municipal Environment and Natural Resources Office (MENRO) manages mangrove protection and restoration; the Tourism Office oversees community-based ecotourism enterprises; and the Municipal Economic Enterprise and Development Management Office (MEEDMO) manages public assets and livelihood initiatives. In 2017 Del Carmen won the country's "Best Mangrove" award:

"The Best Mangrove Award is another recognition highlighting Del Carmen's story of change and love story with the Mangroves. Beyond protecting and preserving the mangroves to protect us from storm surges and improve marine life habitation for food, it's our culture and history that has bound with the Del Carmen Mangrove Forest," said Coro.[21]

However, sustaining mangrove protection at scale continues to pose challenges. The LGU faces financing constraints for infrastructure and restoration programs, overlapping mandates with national agencies, and limited technical capacity for accessing emerging market opportunities such as blue carbon, biodiversity,

and nature credits. Despite these constraints, Del Carmen has demonstrated that a strong governance model and local participation can mobilize financing for conservation-linked development.

Revenue-generating activities and the mangrove economy. Del Carmen's mangroves anchor the municipality's ecotourism economy, generating roughly 30 million Philippine Pesos (PHP) (~$515,000) per year in direct tourism revenues from attractions such as Sugba Lagoon and a network of mangrove boardwalks.

Visitor fees are set at 50 PHP (local) and 100 PHP (foreign) per person. Each boat tour – averaging 2,150 PHP –distributes proceeds among the boat operator, assistant crew, and owner, while the LGU collects wharfage and user fees. Approximately 137 boats and 500 individuals are directly employed, and 27 trained tour guides participate in a structured revenue-sharing system.

The LGU has also legislated community savings groups ("paluwagan") across all barangays, allowing tourism workers and fishers to access micro-savings and credit. Several people's organizations (POs) such as *Kamamana* and *DelCafEa* manage mangrove planting grants and operate community-based tourism facilities.

The next phase of Del Carmen's mangrove economy involves expanding mangrove-adjacent tourism infrastructure – including new boardwalks, a boat-and-basket tour, and an eco-hotel – financed through a landmark local government loan made possible by the demonstration of revenue generating potential from sustainable mangrove management.

Loan details. In 2022, the Municipality of Del Carmen secured a 200 million PHP loan (~USD $3.5 million) from the Development Bank of the Philippines (DBP) to finance five priority infrastructure projects:

1. Eco-hotel (27 million PHP)
2. Del Carmen Arena
3. Public market
4. Sewage treatment plant
5. Cemetery facility

The projects were approved under DBP's local government infrastructure financing window, designed to strengthen economic resilience and environmental compliance of municipalities. The projects were financed through a repayable instrument, making the investment program one of the few LGU-led, debt-financed green infrastructure programs in the Philippines. Conceptualized by Mayor Coro and incorporated into the town's Comprehensive Land-Use Plan (CLUP), the flagship investment, the eco-hotel, will be a 40-room facility sheltered by mangroves from storm impacts and

showcasing eco-friendly operations including plastic-free policies, waste segregation, renewable-energy use, and integration of circular economy practices. The project also aligns with the EU-UNDP *Circular Economy Pilot Initiative* in Del Carmen.

While the LGU's engineering and finance teams handle the loan administration, the MENRO facilitated the environmental permitting and Protected Area Management Board (PAMB) endorsement. The Environmental Compliance Certificate (ECC) is currently being finalized; missing requirements are being addressed in coordination with the Environmental Management Bureau (EMB) Butuan as of October 2025. The loan package includes standard LGU financing terms, estimated 10- to 15-year tenor, with interest and repayment managed by the municipal finance cluster (accounting, budget, and treasury offices). Collateralization is typically backed by Internal Revenue Allotment (IRA) shares and local revenue streams such as tourism fees. A feasibility study and business plan were prepared internally under the Mayor's Office and reviewed by the Municipal Planning and Development Coordinator to ensure consistency with the CLUP and tourism master plan. The DBP also required an environmental and social safeguard review as part of the loan evaluation process.

Integrated value chain and the economies of protection. Del Carmen's mangrove economy functions as a closed-loop value chain where ecological integrity, social inclusion, and financial performance reinforce one another. Healthy mangroves sustain fisheries and create the scenic landscape that attracts visitors. Tourism revenues, in turn, fund community livelihoods and local enterprise, which generate savings and strengthen repayment capacity for LGU financing. The municipality ensures that each stage of this chain contributes back to conservation:

- Protection and Enforcement: MENRO and barangay monitors prevent illegal cutting and manage replanting programs across 20 coastal barangays.
- Community Livelihoods: People's organizations operate tourism boats and manage mangrove planting contracts, ensuring that income and stewardship are linked.
- Revenue Management: A clear sharing scheme allocates portions of user fees to LGU maintenance funds, PO savings, and conservation activities.
- Financing and Reinvestment: Predictable tourism revenue allowed the LGU to access the DBP loan, reinvesting in eco-infrastructure (boardwalks, eco-hotel, STP) that further supports sustainable tourism.
- Ecosystem Resilience: Continuous protection of mangroves safeguards fisheries productivity, buffers against storms, and sustains the very income streams that service the loan.

This integrated approach transforms mangrove protection from a cost center into an economic engine – a model where environmental health underpins fiscal health. By aligning livelihood generation, governance, and financing, Del Carmen demonstrates how local governments can leverage debt financing to structure an economy around the protection of natural capital.

Impact and a replicable LGU-led conservation finance model. The loan represents an innovative use of debt financing for local governments to finance mangrove-positive development. Rather than relying solely on donor grants, Del Carmen demonstrates how predictable local revenues – generated from tourism and enterprise fees – can service debt and expand conservation-linked infrastructure. Key impacts observed and anticipated include:

- Economic diversification: Tourism revenues support hundreds of households, while the Eco-Hotel is expected to attract conferences and ecotourism visitors, further broadening local income streams.
- Environmental safeguards: Integration of an STP and eco-friendly hotel design ensures that new tourism infrastructure minimizes pollution and disturbance to nearby mangroves.
- Community benefits: Employment and micro-enterprise opportunities extend to boat operators, guides, and suppliers, sustaining the social acceptance of mangrove protection.
- Institutional learning: The LGU's experience with DBP loan compliance, safeguard requirements, and feasibility preparation strengthens its capacity to access future green finance instruments.

The Eco-Hotel site lies adjacent to mangrove areas, reinforcing the LGU's responsibility to maintain ecological balance. The MENRO ensures continued monitoring and prohibits destructive activities within the buffer zone.

Although the ECC remains in process, the LGU has taken proactive measures to align operations with circular economy principles, including the reduction of single-use plastics and adoption of waste segregation protocols across tourism facilities.

Lessons and replication potential. Del Carmen's experience highlights how LGUs can leverage bank loans to scale conservation-aligned infrastructure when three enabling factors are present:

1. Strong revenue base and creditworthiness – predictable tourism income enables repayment and de-risks lending.
2. Institutional integration – coordination among LGU offices ensures compliance and sustainability.
3. Political leadership and vision – sustained commitment from the Mayor's Office anchors environmental objectives in economic planning.

For replication, other coastal municipalities can adopt Del Carmen's approach by:

- Bundling ecotourism and environmental projects within a single LGU loan portfolio.
- Using tourism fees or environmental service charges to augment repayment streams.
- Embedding environmental safeguards in loan conditions to maintain mangrove integrity.
- Commissioning an expert opinion on the risk reduction value of mangroves to planned infrastructure investments.

MANGROVE-POSITIVE BUSINESS EXAMPLE: NAY PALAD LUXURY ECO-HOTEL

Nay Palad Hideaway is a luxury eco-resort in Siargao, Philippines, recognized for its philosophy of "barefoot luxury" - an all-inclusive model that combines exclusivity with sustainability. The resort is surrounded by 104 hectares of ancient mangrove forest, home to 14 mangrove species, 29 bird species, and 265 species of flora. This unique setting makes mangroves both a defining feature of the guest experience and a critical element of the resort's long-term resilience.

In 2021 Typhoon Odette hit Nay Palad, causing significant damage to buildings that were not sheltered by mangroves. These were rebuilt with stronger and more climate-resilient infrastructure, and a renewed commitment to conservation resulting from the obvious benefit that the hotel received from nearby mangroves: the staff quarters, directly beside the mangrove, escaped the typhoon with only minimal damage. Nay Palad's experience and recovery illustrate how luxury hospitality can align commercial viability with ecosystem stewardship, positioning Nay Palad as a model for regenerative tourism in coastal environments.

Mangrove-positive business model. Mangroves are integral to Nay Palad's identity, operations, and guest experience:

- Brand identify and responsibility: Nay Palad is uniquely located "between ancient mangrove forests and the white sands of Siargao." Mangroves are not marketed as a gimmick, their presence is critical to the resort's brand. This creates a responsibility to protect the forest, educate guests, and ensure the mangrove endures for future generations. Mangroves are thus embedded in the promise that "barefoot luxury is sustainable luxury."
- Experiential value: Guests connect with mangroves through kayaking, paddleboarding, and guided "Nature Explorer" tours. These activities generate value from standing mangroves while highlighting their ecological and cultural importance (e.g., habitat for crabs and shrimps, anchoring boats, storm protection).

- Physical risk reduction: The mangroves act as a natural buffer against storm surges and erosion. During Typhoon Odette, staff housing located beside the mangroves sustained only minimal damage.
- Conservation actions: Nay Palad protects 104 hectares of mangroves and launched the “Mangroves for Life” initiative, which includes an annual budget of ~$10,000 for mangrove activities, partnerships with the Zoological Society of London, Mindanao State University, and DENR for biodiversity research and monitoring, education programs for staff and local schools, including children’s books and games on mangroves and bird species, and a focus on preservation of existing mangroves rather than replanting.
- Global Sustainability: Nay Palad has been a member of The Long Run Initiative for over a decade, applying its 4Cs framework - Conservation, Community, Culture, and Commerce - across all operations. This membership embeds mangrove stewardship into a recognized sustainability framework and connects Nay Palad to a global network of regenerative tourism leaders.

Community engagement. Ongoing initiatives include hosting field trips and mangrove awareness activities for both local and international schools, as well as collaborating with the barangay and government units on environmental management efforts such as cleanups and reporting wildlife-related incidents within the mangrove areas to authorities. These reports have involved potential shooting incidents affecting species such as bats and the vulnerable Philippine Duck (anas luzonica). Efforts to raise awareness of the mangrove ecosystem’s biodiversity have also been strengthened by engaging Nay Palad’s internal community. Staff participated in species identification through interactive photo and video submissions, helping document and celebrate the rich wildlife found within the mangroves. Nay Palad is exploring ways to extend benefits by working with local fisherfolk to feature mangrove-sourced shellfish and crabs in Nay Palad’s culinary experiences. The broader vision is to deepen community partnerships, fostering shared responsibility for mangrove protection and creating future opportunities for fisherfolk and women’s livelihood programs.

Replicability: While coastal development has often led to mangrove loss, Nay Palad offers a replicable model that flips this paradigm by:

- Treating mangroves as both natural infrastructure and part of brand identity, understanding how mangroves contribute to different critical aspects of a healthy and sustainable business.
- Integrating conservation into guest experiences and storytelling, not as an add-on but as part of the business’ DNA.
- Partnering with scientific institutions and local communities to ensure credibility and shared stewardship.
- Collecting data on key performance indicators, including hectares of mangroves under conservation, number of species of flora and fauna present, number of buildings, and other physical assets within the zone of protection.

Mangrove-Positive Landscape in Senegal

Approximately one-fifth of the world's mangroves are found in Sub-Saharan Africa, and 70 percent of these are found in West Africa.[22] Senegal's coastlines, especially the Sine-Saloum and Casamance deltas, are home to approximately 185,000 hectares of mangrove forests, which provide invaluable services to both biodiversity and local communities.[23] The mangroves act as natural buffers, protecting shorelines from erosion and flooding, support one of the world's richest and most diverse ecosystems, and serve as nurseries for fish, shrimp, oysters, and other marine species essential to local livelihoods.

Despite their ecological and cultural importance, Senegal lost about 25 percent of its mangroves between the 1970s and 2010 primarily due to droughts, wood harvesting, and infrastructure development that obstructed water flow. The primary drivers of mangrove loss in Senegal are a combination of climate-related and anthropogenic, with droughts, deforestation, and damming of rivers and streams having claimed a total surface area of approximately 45,000 hectares of mangroves.[24] However, since the 2000s, Senegal's mangroves have witnessed a modest recovery. Over a 16-year period, scientists measured an expansion of 48 square kilometers or 2 percent, linked to both natural recovery as well as targeted conservation efforts.[25]

Critical economic activities for people who live in proximity to mangroves include artisanal fishing and smallholder rice farming - two activities that can be deeply impacted by mangroves. For the fishers, mangroves provide crucial habitat for spawning and juvenile fish, protecting fish stocks. For rice farmers, the mangroves help prevent salinization of groundwater that makes rice cultivation extremely challenging. Based on the success of mangrove restoration activities in the Casamance region between 2008 and 2018, a report commissioned by the Livelihoods Fund found that as many as 15 percent of previously abandoned rice fields could be rehabilitated because of restored mangrove ecosystems providing protections against salt water intrusion.[26]

STAKEHOLDER LANDSCAPE

A coalition of national institutions, NGOs, civil society, and finance actors drive the enabling environment for mangrove-positive action in Senegal.

Government Institutions. The government provides the regulatory and policy backbone for mangrove protection and sustainable use. The Ministry of

Environment, Sustainable Development and Ecological Transition leads national policy, supported by technical agencies like the Centre de Suivi Écologique (CSE), which manages ecological monitoring and climate adaptation funding. Senegal's 2023 Environment Law (Code de l'environnement), along with the Code of Fishing and Code of Forests, set the rules for ecosystem use, while a Marine Protected Areas (MPA) policy designates and manages priority coastal zones such as the Saloum Delta. These policies are aligned with the long-term national strategy, Senegal 2050, which explicitly includes sustainable development as a central pillar and commits to the sustainable management of natural ecosystems. At the local level, the governance capacity of municipal governments plays a leading role in the efficacy of mangrove protection efforts.

Senegal's MPAs are an important aspect of governance where the national policy meets the implementation priorities and capacities of local government. Originally conceived as a tool to restrict and control fishing activities, new policy guidance in 2013 shifted MPA management into a more collaborative and multi-stakeholder effort that strives to integrate communities' sustainable development needs and support socio-economic development.[27] While these interests can be constrained by resource scarcity at the local level, the involvement of communities in MPA management opened the door for increased civil society participation in the conservation and restoration of Senegal's coastal wetlands and mangrove ecosystems.

Civil Society and NGOs. Civil society organizations and NGOs play a critical role in mangrove restoration, community mobilization, and technical implementation in Senegal. These organizations have been instrumental in pioneering restoration approaches and supporting local communities in developing sustainable livelihoods linked to mangrove conservation. Multiple organizations are active in mangrove conservation and restoration efforts. Because of limited government funding, the grant finance channeled through civil society organizations is critical to supporting Senegal's mangroves. At the local level, small local NGOs are deeply engaged in mangrove-related projects, and community contributions to their efforts are immense, boosted by the importance of mangrove in local life and culture. For example, the Livelihoods Fund's 2018 impact report found that 95 percent of community members interviewed claimed at least one positive impact from mangroves on their lives or livelihoods.[28]

Financial Institutions. Senegal's microfinance sector provides the primary financial services to coastal communities engaged in mangrove-related livelihoods, though most institutions currently provide loans without specific focus on mangrove conservation or sustainable practices. Several institutions including PAMECAS, Caurie Microfinance, U-IMCEC, and Fansoto have recently adopted or are developing social and environmental policies, with some incorporating exclusion clauses prohibiting tree cutting and polluting activities, while Credit Mutuel (the largest MFI in Senegal) actively provides working

capital loans to shrimp fishermen and other mangrove-dependent businesses. Despite growing interest in environmental issues, these institutions do not yet offer specific financial products for mangrove-related businesses, and their information systems typically cannot identify or track mangrove-related activities. La Banque Agricole (LBA) represents a unique case among Senegal's formal banking institutions, with deep mangrove expertise through past project management and accreditation to both the Green Climate Fund (2021) and Adaptation Fund (2025). LBA is positioned to offer concessional financing with lower interest rates and longer maturity (15-20 years) for mangrove-positive businesses, although it has yet to seriously explore this opportunity.

Banks primarily receive funding from the Central Bank and development finance institutions such as IFC, AFD, and African Development Bank, while MFIs receive funding from investors (Grameen Crédit Agricole, Oikocredit, Symbiotics, Triple Jump, INCOFIN, Kiva, SEN'Finance, Teranga Capital), banks (BNDE, BNP Paribas, LBA, Ecobank), and development funds and projects.

MANGROVE-POSITIVE LENDING EXAMPLE: SHRIMP FARMING IN CASAMANCE REGION

Shrimp fishing represents one of the most important economic activities in Senegal's mangrove ecosystem, with production in the Casamance region estimated at about 70 tons per month.[29] Mr. N from Adeane village and Mr. C from Koundioundou village exemplify the traditional shrimp fishing businesses in the area. They have practiced shrimp fishing for over three decades. The fishermen understand the role that healthy mangroves play in shrimp reproduction, providing a secure place for juvenile shrimp to grow before moving into deeper water. This direct dependence creates strong economic incentives for conservation when fishermen are engaged in management and given voice in resource governance.

Both fishermen use motorized canoes and authorized nets (mesh large enough for juvenile shrimp to escape from) for fishing. Production varies significantly by season, with Mr. C averaging 150-200 kg per day and Mr. N averaging 60-80 kg per day during good seasons (May-July), though production can drop to as low as 10-15 kg per day in the off season. In addition to fishing for himself, Mr. C also buys from other fishermen before selling, operating as both producer and local aggregator. They sell shrimp to local traders and hotels in the region, especially in Cap Skirring, for up to FCFA 4,000 (about $7) per kilogram, indicating strong market demand and economic viability.

Role in conservation and access to finance. Both villages are part of the Kassa Balantacounda MPA, and the fishermen serve on the MPA Management Committee. Through this role they contribute actively to mangrove conservation by educating community members about the importance of mangroves and responsible fishing practices, conducting inspection missions 2-3 times per month to monitor fishing practices, and participating in mangrove

replanting activities. This model demonstrates how engaging resource users directly in governance creates accountability and aligns economic interests with conservation outcomes.

Both fishermen have received loans from Credit Mutuel, the largest Microfinance institution in Senegal, demonstrating that MFIs are already serving mangrove-related businesses. Mr. C received FCFA 1,500,000 (about $2,500) as working capital for his shrimp business with a one-year tenure and 14% interest rate, and reports being satisfied with the provider and having no uncovered financial needs. Mr. N received FCFA 750,000 (about $1,250) twice with 12-month terms but was denied a third loan because of his age. Both men have successfully paid their interest installments and are able to stay in good standing with the MFI based on their mangrove-positive shrimp businesses.[30]

Impact and sustainability considerations. The loans provided working capital that enabled the fishermen to maintain and operate motorized canoes, purchase authorized fishing nets and equipment, continue operations through seasonal variations in catch, and in Mr. C's case, operate at a larger scale as an aggregator. The year-round nature of shrimp fishing, combined with strong market prices, makes this a significant livelihood activity that supports families and contributes to the regional economy. However, according to the MPA technical team, there are areas where practices could be improved. Fishermen operate year-round without giving a biological pause to shrimps, which are critical to allowing natural regeneration of stocks. Additionally, the impact of motorized canoe usage has not been studied in detail and may impact the ecosystem.[31]

Lessons and replication potential. Shrimp fishing represents substantial, year-round economic activity in Senegal's mangrove regions, with established market demand and viable business operations. Credit Mutuel and other MFIs are already providing working capital loans to shrimp fishermen, demonstrating commercial viability and willingness to serve this sector. However, these loans are not currently structured to incentivize or monitor sustainable practices. The direct dependence of shrimp fishing on healthy mangroves, combined with fishermen's active participation in MPA Management Committees, creates a strong foundation for developing mangrove-positive financial products. By incorporating sustainability criteria, technical assistance, and monitoring mechanisms, financial institutions could support business growth while reinforcing conservation practices. The estimated 70 tons per month of shrimp production in the region represents significant economic activity and corresponding opportunity to finance mangrove-positive businesses at scale.

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