September 2025

MANGROVE BREAKTHROUGH

GLOBAL MANGROVE ALLIANCE

Mobilizing the Mangrove Breakthrough in Asia

Enabling conditions and priorities for mangrove conservation and restoration action

Mobilizing the Mangrove Breakthrough in Asia

ENABLING CONDITIONS AND PRIORITIES FOR MANGROVE CONSERVATION AND RESTORATION ACTION

This Regional Report - which offers a regional scope for mangrove priorities in Asia - is accompanied by separately downloadable Country Summaries for India, Indonesia, and the Philippines, with more detailed insights of country-specific enabling conditions and priorities for mangrove action.

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Sekatak Buji Aerial View © Tim Kom / Wetlands International

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Partnerships

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1. Introduction

The Mobilizing the Mangrove Breakthrough series of regional reports are designed as accessible reference points for linking global goals on mangrove conservation, protection, restoration, and finance to national and local contexts.

Each regional report gives a high-level overview of the Breakthrough, its key partners, and available resources. It also highlights countries with strong potential for restoration and conservation.

Alongside these reports are separately downloadable Country Summaries, prepared by local and regional experts, that provide more detail on the country-specific enabling conditions for mangrove action on the ground.

Introduction to the Mangrove Breakthrough

Mangroves provide food security, extreme weather protection, and support livelihoods, while harboring incredible biodiversity, building coastal resilience, and acting as immense carbon sinks. These combined benefits make mangrove conservation and restoration a cost-effective strategy to mitigate the dual climate and biodiversity crises.

Mangrove restoration and protection is drastically underfunded compared to the benefits they bring, receiving less than 1% of climate finance. The recently released IUCN Red List of Mangrove Ecosystems categorized half of the world's mangrove provinces as threatened.[1]

The Mangrove Breakthrough, launched at UNFCCC COP27 in Sharm el-Sheikh, provides a framework for State and non-State Actors to work together towards global science-based goals. The Breakthrough and its partners aim to enable the mobilization of USD 4 billion by 2030, boosting actions to restore and protect 15 million hectares — along with the communities and biodiversity that rely on them.

The Breakthrough has been endorsed by over 100 national and subnational governments, NGOs and corporate partners, coordinated globally by a Hub hosted by Ambition Loop. The Breakthrough is guided by a High Level Advisory Council, including representatives from nine stakeholder groups such as the UNFCCC Climate Champions, the Global Mangrove Alliance (GMA), and the Mangrove Alliance for Climate (MAC). The Hub works directly with governments, financial institutions and delivery partners around the world to achieve the Breakthrough goals, in alignment with the implementation of the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework, and the Ramsar Convention on Wetlands.

Achieving the Mangrove Breakthrough's ambitious goals will provide local food security while reducing storm and flood risk for millions of people and protecting billions of dollars' worth of property. It will support unique terrestrial and marine biodiversity and provide vital mitigation benefits through sequestration of 43.5 million tons of CO_2 in living mangrove biomass and 189 million tons of CO_2 in the soil.[2]

Fisherman beside a stilt house in a quiet mangrove village, Philippines © Antal Jafaruddin / Wetlands International

Unpacking the global

Mangrove Breakthrough Goals to the regional level

Based on spatial data from Global Mangrove Watch (GMW)[3] we calculated regional targets for each of the Breakthrough global goals: Halt Loss (Table 1), Restore Half (Table 2) and Double Protection (Table 3).

Dancing mangrove trees of sumba island, Indonesia
© Wetlands International

Goal 1

HALT ANTHROPOGENIC MANGROVE LOSS

Deliberate clearing of mangroves is currently the greatest driver of loss globally (Table 1).[4] Reasons for clearing are variable, ranging from port development, hotels and tourism facilities, or other coastal infrastructure, through to local community reliance on mangrove wood resources for building, firewood, or charcoal.

Conversion to aquaculture, oil palm plantations, and rice cultivation together explain 43% of mangrove losses between 2000 and 2020.[5] Under 'business as usual' rates of mangrove clearance, emissions from loss could reach 2,391 million tonnes of CO_2eq by the end of the century, or 3,392 million tonnes of CO_2eq when considering lost soil carbon sequestration.[6]

Table 1: Human driven loss of mangrove area by region. Note that the technical capacity to effectively differentiate environmental and anthropogenic drivers of loss is much improved with higher resolution datasets from 2010 onwards.

REGION	NET CHANGE 2010-2020 (KM²)	GROSS LOSS 2010-2020 (KM²)	PROPORTION OF LOSS FROM DIRECT HUMAN DRIVERS (%)	TOTAL HUMAN DRIVEN LOSS 2010 – 2020 (KM²)
Asia	-260.85	-2,353.81	68	-1,604.91
Americas	+91.64	-1,573.59	37	-581.63
W Africa	-199.32	-495.10	63	-310.56
Central Africa	-16.55	-51.39	66	-33.73
E Africa	-78.52	-281.59	34	-95.18
Caribbean	-26.15	-276.96	29	-79.64
Middle East	-22.63	-45.78	48	-21.77
Oceania	-136.07	-587.60	15	-86.39
United States	-12.84	-89.34	84	-75.24
World	**-661.30**	**-5,478.20**	**51**	**-2,809.42**

Looking at changes in the net mangrove area can mask the true extent of ongoing loss and the associated emissions and reduction of ecosystem services. As mangrove area expands into suitable habitat, the rate of change may keep pace with loss or destruction elsewhere – this can be seen in the Americas (Table 1) where overall mangrove extent has increased by 91km² between 2010 and 2020 – while at the same time, more than 1500km² were lost.[4]

43%
of mangrove losses (2000–2020) are due to conversion to aquaculture, oil palm, and rice cultivation

Embedded in any action to halt anthropogenic loss of mangroves is the need to effectively address drivers of change, which bring their own challenges. Increased control and restrictions based on environmental impact assessments for mangrove conversion for commercial purposes or other development can be paired with legal obligations to compensate for lost ecosystem services.

For example, Panama's Special Coastal Marine Management Area (ZEMMC) legislation mandates compensation to be paid for damaging use of ecological resources, incorporating the conservation costs and economic value of the natural resources affected.

However, in many locations, community reliance on natural resources is a key driver of degradation or loss. Addressing this in an equitable or socially just way requires providing alternative sources of income, fuel, food, and building materials, along with other measures to improve local living conditions and quality of life – which may be further linked to land rights and broader economic or political stability. There are existing projects which address this effectively at local levels, some using market mechanisms such as carbon credits to subsidize community needs over timescales of 15-40 years.[7,8] At the national level, schemes such as Ecuador's Socio Manglar payments for ecosystem services program operate at large scales, providing income and sustainable management rights in exchange for responsible stewardship of 42% of Ecuador's mangroves.[9]

The rate of anthropogenic mangrove loss is trending downwards.[5] Whether this is due to improved legal protections, awareness of the coastal protection value of intact mangroves, or due to most of the accessible area at risk of development or conversion already being lost is unclear. The Breakthrough aims to explore mechanisms to support and accelerate this downward trend for a goal of no avoidable mangrove loss.

Goal 2

RESTORE HALF OF RECENT LOSSES

Around 11,325 km² of mangrove area has been lost since 1996.[3] Within this area, some 7,939 km² of former mangrove area could potentially be restored,[10] the remainder having been lost to erosion or replaced with hard infrastructure.

Table 2: Global Mangrove Breakthrough restoration goals

REGION	TOTAL MANGROVE AREA 2020 (KM²)	TOTAL RESTORABLE AREA (KM²)	RESTORE HALF GOAL (KM²)
Asia	57,999.31	3,758.64	1,879.32
Americas	34,844.42	1,785.83	892.92
W Africa	17,200.77	560.34	280.17
Central Africa	4,513.95	54.13	27.07
E Africa	7,634.17	366.21	183.10
Caribbean	6,031.51	442.33	221.17
Middle East	287.62	103.95	51.97
Oceania	16,518.12	772.12	386.06
United States	2,329.12	95.58	47.79
World	**147,358.99**	**7,939.13**	**3,969.56**

The Mangrove Breakthrough goal to "Restore Half" aims to support the restoration or rehabilitation of half of this potential area, for a global goal of approximately 4,000km² in process of recovery by 2030. A separate analysis estimated that reforestation of half of all physically feasible areas in the deforested mangrove regions of the world could promote the uptake of 335.5 – 344.4 million tonnes of CO_2 equivalent globally over a 40-year period.[11]

4,000 km²
of mangroves are approximately targeted for restoration by 2030

Mangroves and needlefish off Mansuar Island
© Conservation International

Goal 3

DOUBLE THE AREA OF MANGROVES UNDER FORMAL PROTECTION

Currently approximately 40% of mangroves globally are under some form of formal protection.[12] Doubling this to 80% is not straightforward, as the percentage of mangrove area protected by each country is extremely variable. Some countries have levels of protection as low as 5% and doubling protection here would be insufficient. Conversely, approximately 50 countries currently have more than 50% of their mangroves within formal protections, so doubling the area under protection is not feasible.

For countries where current protection is below 15%, the GMA goal is a minimum protection of 30%, in alignment with Target 3 of the Global Biodiversity Framework (GBF) 2030 goals.[13] For nations with 45% or more mangrove coverage already protected, achieving 90% protection would be ambitious yet attainable.

40%
of global mangroves are under formal protection

Where greater than 50% of mangrove areas are protected, it is not possible to protect more than 100% so the goal is capped at 90%.[13] Cumulatively, this could increase the global protected area to around two-thirds of the 2020 extent. It is logical for the Mangrove Breakthrough to apply a similar approach, with the additional 14% needed to double global protection being achieved incrementally as more ambitious countries exceed their initial goals over time.

Table 3: Double the area of mangroves under formal protection

REGION	PROTECTED AREA (KM²)	UNPROTECTED AREA (KM²)	PORTION OF MANGROVE AREA WITH PROTECTED STATUS (%)	ADDITIONAL PROTECTED AREA BY ACHIEVING NATIONAL GOALS (KM²)	PORTION OF MANGROVE AREA WITH PROTECTED STATUS BY ACHIEVING NATIONAL GOALS (%)
Asia	15,726.38	42,272.93	27	13,452.00	50
Americas	24,484.08	10,360.34	70	6,525.06	89
W Africa	3,889.78	13,310.99	23	5,174.56	53
Central Africa	2,860.17	1,653.78	63	1,052.50	87
E Africa	3,262.92	4,371.25	43	1,939.97	68
Caribbean	3,327.45	2,704.06	55	2,041.04	89
Middle East	129.10	158.52	45	32.75	56
Oceania	5,551.92	10,966.20	34	5,851.84	69
United States	2,055.40	273.72	88	40.80	90
World	**61,287.20**	**86,071.79**	**42**	**36,110.52**	**66**

Goal 4

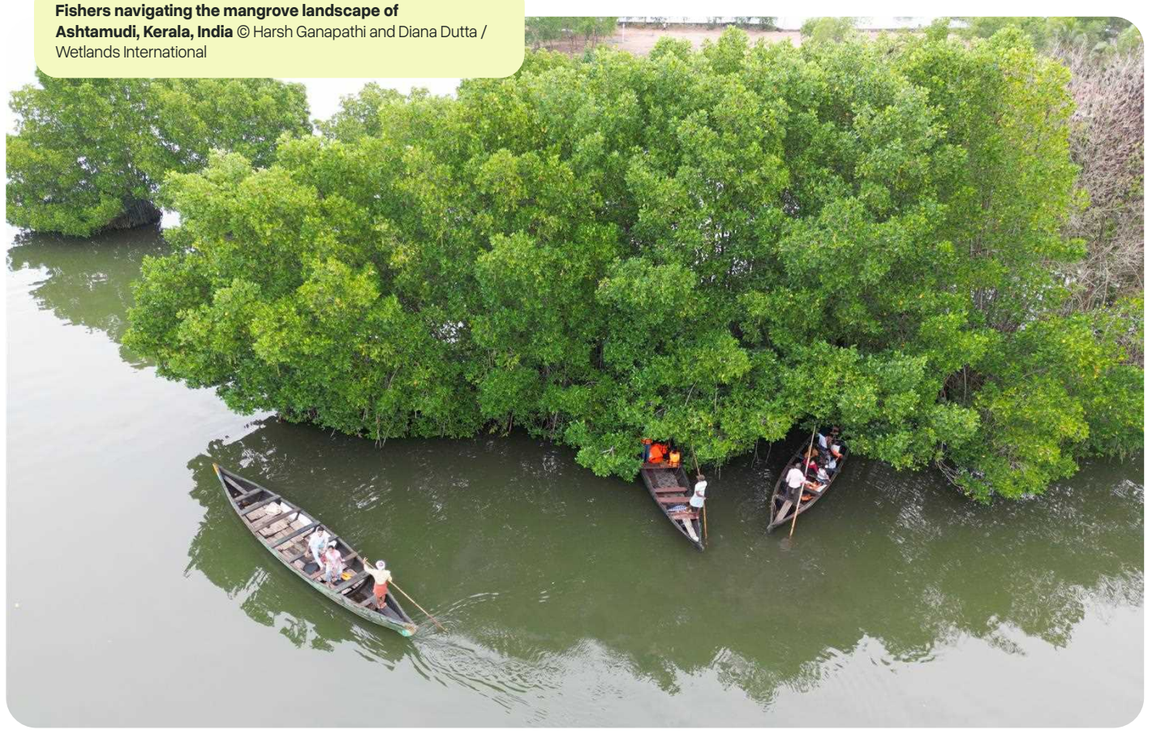
ENSURE SUSTAINABLE FINANCE FOR EXISTING MANGROVE AREAS

Core to achieving the Breakthrough goals is the mobilization of large-scale funding to support locally led action on the ground, and to address overarching impediments to scaling current conservation and restoration efforts. This funding should be multi-sectoral, including private, public, and philanthropic sources, with partnerships such as private-public funding models particularly important.

A new asset class of regenerative mangrove-positive business models is already emerging. Financing conservation areas will remain critical, but sustainable productive businesses also have a vital role to play in creating long-term, market-driven mechanisms to ensure mangroves are more valuable standing than destroyed. Business models like sustainable aquaculture and fisheries, ecotourism, blue carbon crediting, waste infrastructure, and technology enablers can generate real financial returns[14] while building resilient coastal communities and creating a host of environmental benefits.

$4 billion USD
is required by 2030,
with a third of it expected from
commercial sources

Of the estimated US$4 billion investment needed by 2030, around a third – US$1.2 billion – could come from commercial sources. Philanthropic, development, and public finance must deliver the rest. Much of this commercial capital will need to be de-risked through blending with grant and concessional capital in the early stages. Getting the sequencing right will be critical: grant and concessional capital have an outsized role to play in the next few years.

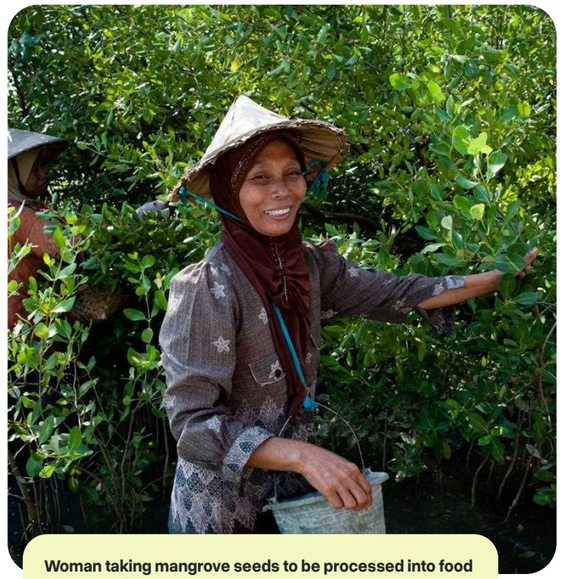


Fishers navigating the mangrove landscape of Ashtamudi, Kerala, India © Harsh Ganapathi and Diana Dutta / Wetlands International

Mangrove Breakthrough

Guiding Principles

Countries and other stakeholders endorsing the Breakthrough commit to implementing science-based mangrove restoration and management in a fair and equitable way.



Woman taking mangrove seeds to be processed into food © Nanang Sujana / Wetlands International

The Guiding Principles serve as guardrails which guide endorsers towards sustainable and effective conservation and restoration of mangrove ecosystems in a way that benefits both nature and people. There are six principles:

1. **Safeguard nature and maximize biodiversity**
2. **Employ the best information and practices**
3. **Empower people**
4. **Align to the broader context – operate locally and contextually**
5. **Design for sustainability**
6. **Mobilize high-integrity capital**

Application of the Mangrove Breakthrough Guiding Principles in practice is supported by the **High-Quality Blue Carbon Principles: Practitioner's Guide.**[15]

Mangrove Breakthrough

Delivery Partners

Together with an alliance of 57 non-state early supporters and partners, the Breakthrough is endorsed by a total of 37 national and state governments, and a formal partnership with the Mangrove Alliance for Climate and its 23 country members. Cumulatively these countries represent around 60% of the world's mangrove area.

GLOBAL MANGROVE ALLIANCE

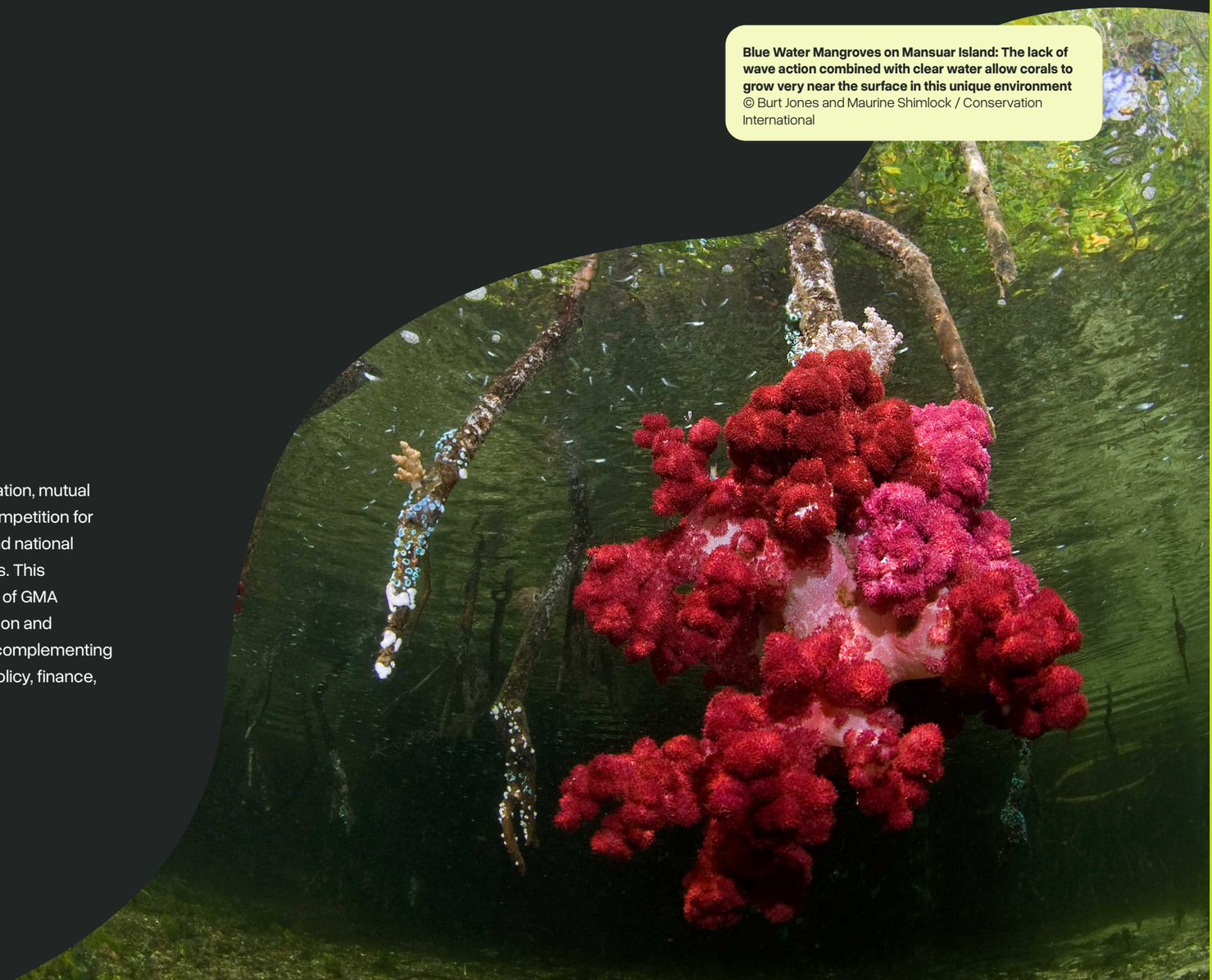
The Global Mangrove Alliance (GMA) includes over 100 member organizations, bringing together technical experts, civil society organizations, governments, local communities, businesses, funding agencies, and foundations to accelerate a comprehensive, coordinated, global approach to mangrove conservation and restoration at a scale that matters. The GMA has also formed 14 National Chapters, bringing together NGOs, academics, and other stakeholders within individual countries into national alliances, in coordination with the global membership team.

Each chapter fosters cross-cutting collaboration, mutual support, and coordination while reducing competition for limited funding. Their work is centered around national action plans developed by chapter members. This innovative model aims to increase the share of GMA activities focused on-the-ground conservation and restoration efforts, and knowledge sharing, complementing the global membership's ongoing work on policy, finance, best practice, and capacity strengthening.

MANGROVE ALLIANCE FOR CLIMATE

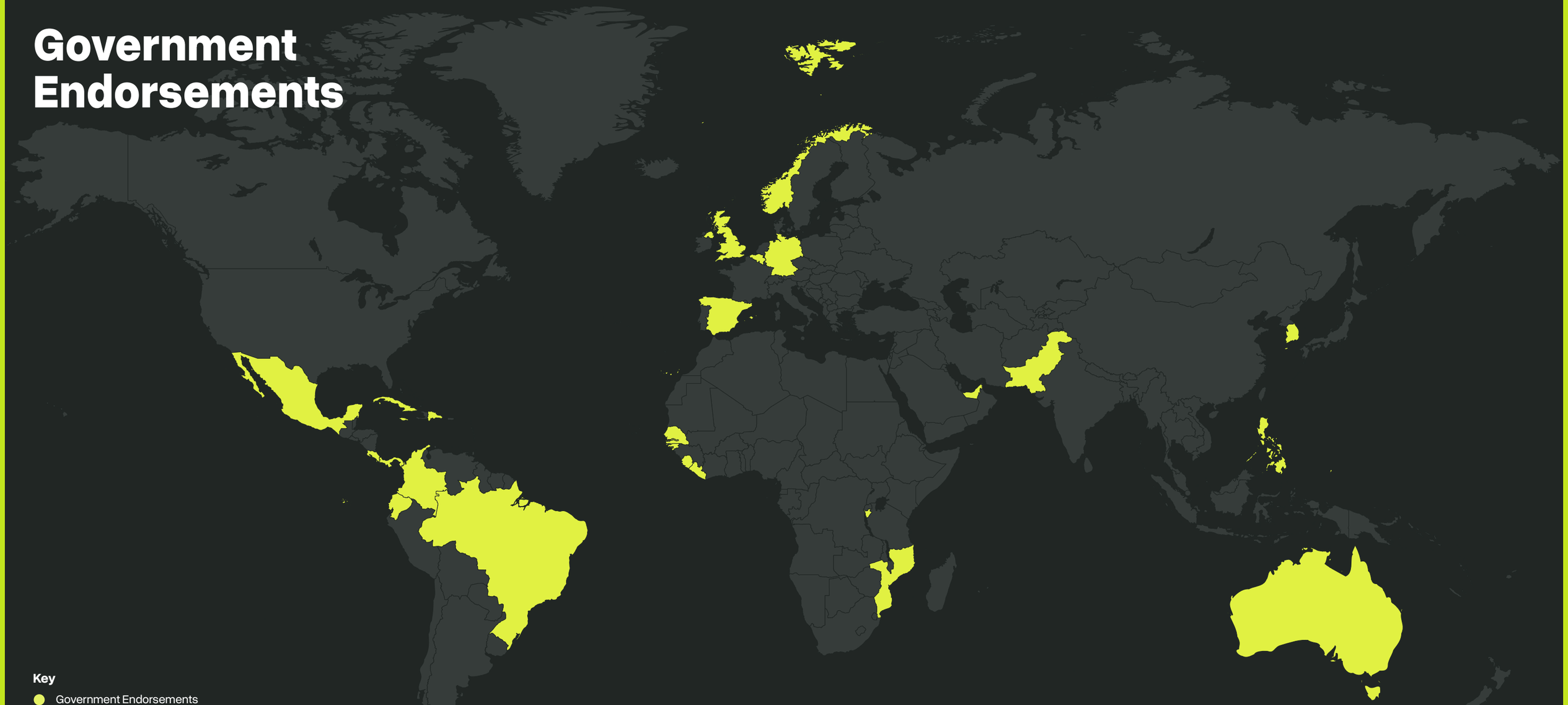
At UNFCC COP27, the United Arab Emirates and Indonesia launched the Mangrove Alliance for Climate (MAC) to support, enhance, and expand mangrove forests globally as a nature-based solution against climate change.

The MAC follows a voluntary approach, with members determining their own commitments towards restoring mangrove forests, promoting multilateral cooperation, and sharing knowledge. Since 2024 the MAC formally supports and works with the Mangrove Breakthrough.



Blue Water Mangroves on Mansuar Island: The lack of wave action combined with clear water allow corals to grow very near the surface in this unique environment
© Burt Jones and Maurine Shimlock / Conservation International

Government Endorsements



Key

- Government Endorsements

Government Endorsements by May 2025

Australia
Belgium
Burundi
Costa Rica
Colombia
Cuba
Dominican Republic
Ecuador
Gambia
Germany
Guinea-Bissau
Jamaica
Liberia
Mexico
Mozambique
Norway
Pakistan
Palau
Panama
Philippines
Senegal
Sierra Leone
South Korea
Spain
United Arab Emirates
United Kingdom

Subnational Governments

Atlantio, Colombia
Bolívar, Colombia
César, Colombia
Baranquilla, Colombia
Cartagena, Colombia
Cordoba, Colombia
Sucré, Colombia
Yucatán, Mexico
Quintana Roo, Mexico
Rio de Janeiro, Brazil

Mangrove Breakthrough

Key Tools & Resources

GLOBAL MANGROVE WATCH

The Global Mangrove Watch (GMW) is a free online mapping and data platform which provides accessible global and national mangrove datasets.

Data on the location and spatial extent of mangroves is crucial for the protection and conservation of mangrove forests.

Since 2018, GMW has provided a time series of global mangrove extent maps from 1996 to 2020. The GMW mangrove extent dataset is now in its fourth iteration, with the GMW v4.0 released in 2024.[4] A key element of the GMW approach has been the use of both optical and radar satellite data, and the iterative improvement of the extent maps through the incorporation of user feedback. The new 2020 GMW v4.0 baseline has a spatial resolution of 10 x 10 meters, sufficient to be applied at both nationally and locally relevant scales.[16]

The overall accuracy of the GMW v4.0 map was estimated at 95.3% and provides the baseline spatial data underpinning these reports. Where they exist, national mangrove maps and datasets have also been included in country summaries, especially when they provide the baseline for national commitments, mangrove management planning or restoration initiatives.

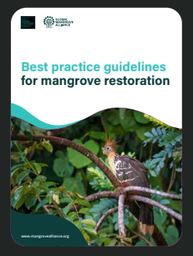
Key Resources

The Mangrove Breakthrough Financial Roadmap

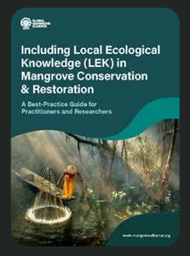
The State of the World's Mangroves 2021

The State of the World's Mangroves 2022

The State of the World's Mangroves 2024



Best practice guidelines for mangrove restoration



Local Ecological Knowledge (LEK)

THE MANGROVE BREAKTHROUGH FINANCIAL ROADMAP

To achieve the Breakthrough goals, it is essential to mobilize large-scale funding from government, private sector, and philanthropy to support locally led action on the ground and address overarching impediments to scaling current conservation and restoration efforts.

Developed by Systemiq in partnership with the UN Climate Champions and the GMA, and in collaboration with the Financial Services Taskforce of the Sustainable Markets Initiative, the Financial Roadmap for the Mangrove Breakthrough makes the case for using financial instruments in innovative and complementary ways. It offers in-depth analysis and detailed recommendations for a synergistic toolbox of financial instruments that can together mobilize private, public, and philanthropic capital at speed and scale, and shows why creating the right enabling conditions will be key to their success.

STATE OF THE WORLD'S MANGROVES REPORTS

Published by the GMA, the State of the World's Mangroves reports highlight advances to safeguard these ecosystems. Member contributions showcase progress towards science and understanding, collaboration and information sharing, practical management interventions, and the many policy, legal, and financial tools that will help to secure a better future for these ecosystems.

THE MANGROVE BREAKTHROUGH NDC TASK FORCE

The NDC Task Force brings together policy and mangrove experts from international and local environmental organizations to provide technical policy guidance, coordinate knowledge sharing and access to mangrove data, and facilitate institutional and stakeholder coordination for Mangrove Breakthrough countries preparing their 2025 Nationally Determined Contribution (NDC).

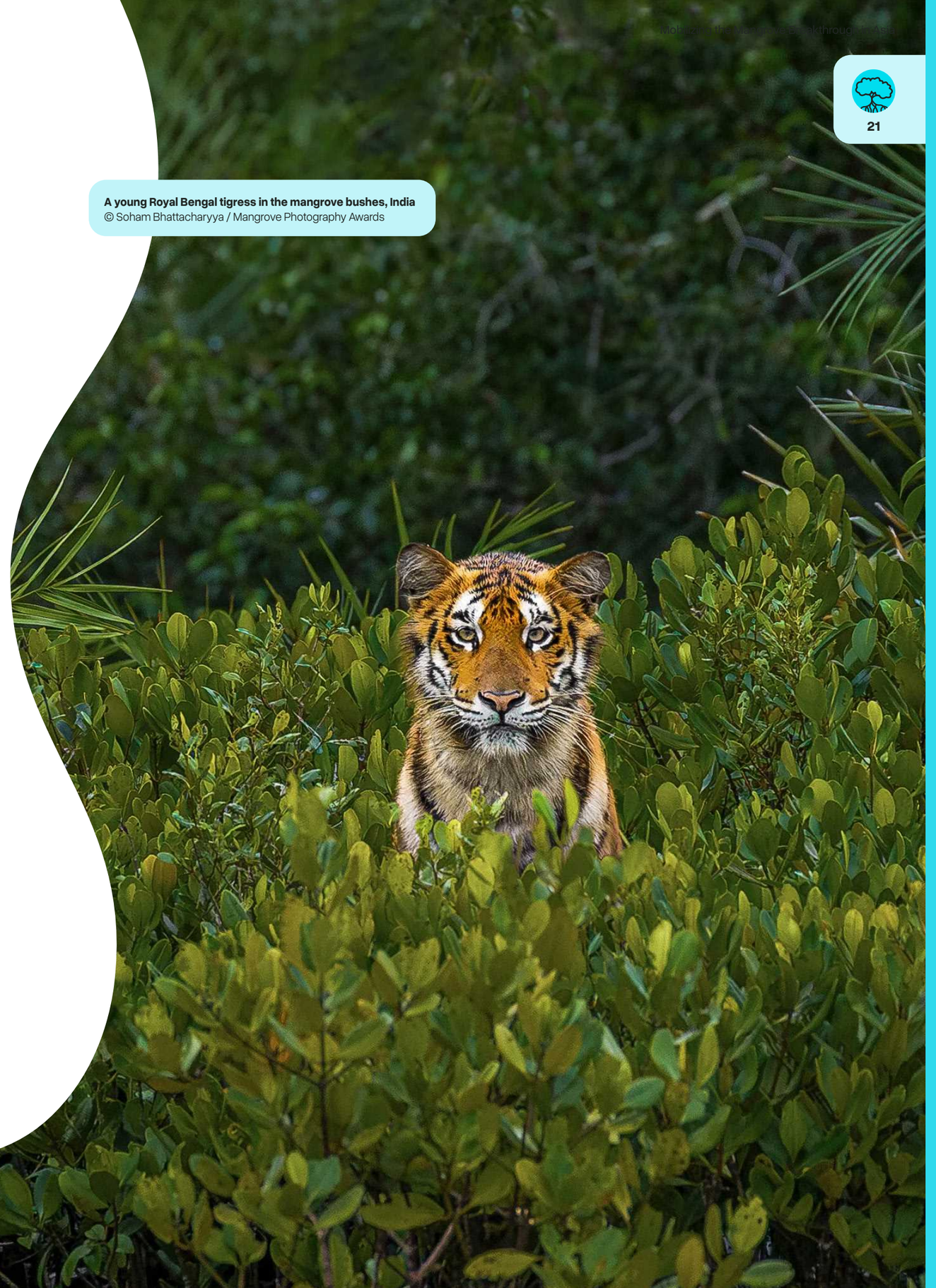
Urgent large-scale funding is required from governments, private sectors, and philanthropy to meet the **Mangrove Breakthrough goals**

BEST PRACTICE GUIDELINES FOR MANGROVE RESTORATION

The Best Practice Guidelines for Mangrove Restoration brings together the latest accumulated local and scientific knowledge about mangrove restoration best-practices into one comprehensive resource. Unlike traditional mangrove planting programs, Community-Based Ecological Mangrove Restoration (CBEMR) is a participatory approach to restoring degraded mangrove ecosystems by addressing the root causes of degradation, which can dramatically increase implementation success.[17] Combined with project design and management approaches and a detailed module on Blue Carbon, the aim of the guideline is to align mangrove practitioners, NGOs, governments, scientists, industry, local communities, and funders around accepted best-practices for science-based and inclusive mangrove restoration.

INCLUDING LOCAL ECOLOGICAL KNOWLEDGE

Local Ecological Knowledge (LEK) is the knowledge, practices, and beliefs gained through extensive personal observation of and interaction with local ecosystems which is shared among local resource users and is typically handed down through generations of local inhabitants, often Indigenous.[18] Including Local Ecological Knowledge in Mangrove Restoration & Conservation was designed to help mangrove researchers and practitioners include local ecological knowledge in their projects.



A young Royal Bengal tigress in the mangrove bushes, India
© Soham Bhattacharyya / Mangrove Photography Awards

2.

Mobilizing the Mangrove Breakthrough

With more than 120 mangrove countries worldwide, there is a need to understand how the Breakthrough global goals can be realized in individual countries, and where governments, financers, and implementing organizations can focus their efforts to create viable starting points for achieving the goals.

Action is needed at all levels and at all scales, from bilateral financing for national mangrove restoration and sustainable use initiatives, to boutique funding solutions for microscale projects which provide critical local services.

Using remote sensing data, the Breakthrough global goals are broken down across three regions – Asia, West Africa, and the Americas, defining goals which are achievable at national scales and identifying countries with the greatest areas for potential restoration and protection.

Presented in this report are summaries of the enabling conditions for large scale mangrove action in selected countries identified as key to achieving the Breakthrough goals in each region. Drawing on a wide network of regional and local experts, each country summary uses a standardized format including existing government initiatives, land tenure and management structures, and implementation capacity through GMA national chapters and other partnerships.

Scaling Impact, Overcoming Barriers

Over the past decades a diverse community of mangrove professionals, including representatives from civil society, government, and private sector, along with local communities has worked collectively to conserve and restore mangrove resources. This community has built valuable experiences and achieved successes across a variety of settings. They have demonstrated innovative approaches to community-based conservation, tested novel approaches to restore degraded areas, and introduced sustainable livelihoods that contribute to a mangrove-based economy. Together, these efforts have strengthened both the impact and business case for investing in mangrove conservation and restoration.

Yet, across geographies this community has encountered recurrent barriers that limit both the scalability and long-term sustainability of their interventions. Transforming these barriers into enabler conditions is crucial for turning the tide for mangroves.

Repair of hydrological channels in North Kalimantan, Indonesia © Wetlands International

Enabler I

Mobilizing Mangrove Partnerships

Many conservation programs are carried out in isolation, lacking shared strategies with mangrove stakeholders for achieving transformative change. This fragmentation hinders the achievement of large-scale, lasting impact across mangrove landscapes. Grassroots organizations, local governments and indigenous communities living in mangrove areas as well as scientists underpinning work with the latest insights are critical to designing, implementing, and evaluating programs.

Each country summary identifies a selection of key organizations active in the national mangrove space. Where they are present, the membership of GMA national chapters are listed, offering points of contact for international donors interested in supporting on-the-ground initiatives and building relationships with local implementing organizations. Government-led initiatives are identified, to provide context on national ambition and leadership and to inspire opportunities for potential public-private partnerships.

Enabler II

Incubate finance and investment

There is a need to increase funder commitments for mangroves and to ensure these resources are channeled to high quality projects and over suitable timescales. Where international funding is appropriate, it should be aligned with and be supportive of national initiatives.

Each country summary reports on national mangrove management or restoration plans, existing government-led initiatives, the status of blue carbon markets and other extant financial mechanisms. Where data is available, summaries also include estimates of the value of mangrove ecosystem services to national and local economies.

Enabler III

Enhance policies and governance

Policies, plans, and legislation related to climate, biodiversity, and sustainability differ widely between countries in how they prioritize action for mangroves and whether there are safeguards to prevent mangrove degradation or overexploitation. Jurisdictions and land ownership arrangements in intertidal mangrove zones are often unclear, complicating effective governance.

Each country summary outlines the current state of mangrove-related policy and governance at national and subnational levels. This includes identifying the government bodies responsible for mangrove management, national goals for mangroves or blue carbon ecosystems policy, and relevant commitments communicated through international frameworks such as a country's NDC or National Biodiversity Strategy Action Plan (NBSAP).

Enabler IV

Develop knowledge and capacities

While global understanding of mangrove trends, values, management, and restoration approaches has grown rapidly, local interpretations of best practices still vary. In addition, barriers such as language, isolation, education levels, and time constraints may hinder access to global resources.

Each country summary presents, where possible, insights into the local and national context, the application of best practices and existing implementation capacity.

Collectively, these enablers allow the identification of intervention areas focused on fostering transformative collaboration and building an enabling environment for on-the- ground action in critical mangrove regions. These areas are essential to achieve the overarching Breakthrough goals.

Although these intervention steps are relevant across all mangrove geographies and are essential to achieving the Breakthrough goals, their specific application depends on the local context in any target region. **As such, these regional and national summaries of enabling conditions, government and civil society initiatives, implementation capacity, and potential for action represent a critical first step towards the planning of effective interventions.**

3. Mobilizing the Mangrove Breakthrough: Asia

AUTHORS

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Asia is home to the largest areas of mangroves in the world, totaling 58,236 km² distributed across 18 countries: Indonesia, Myanmar, Malaysia, India, Thailand, Philippines, Vietnam, Pakistan, Bangladesh, Cambodia, China, Sri Lanka, Brunei, Singapore, Timor-Leste, Taiwan, Maldives and Japan. This is around 40% of the 150,000 km² of mangroves remaining globally in 2020 according to Global Mangrove Watch.[4]

Community member of Berkah Alam from Surodadi Village conducting monitoring of mangrove growth and water quality in a mixed mangrove aquaculture pond
© Wetlands International

Mangrove Breakthrough

Goals

HALT ANTHROPOGENIC LOSS OF MANGROVES

Comparison of net change in mangrove area across Asia with gross loss reveals a startling difference – gross loss being some 9x greater than net (Table 4). This is likely due to the expansion of mangrove range and colonization of new areas driven by climate change, plus increased protection and natural and assisted recovery in some locations masking severe loss in others. Based on the below data, halting avoidable human-driven destruction of mangroves could quickly realize a shift to annual net gains in mangrove area.

-260.85 km²
accounts for the amount of mangrove loss that occurred between 2010-2020 in Asia

Table 4: Loss of mangroves in Asia due to human causes, 2010-2020[4]

REGION	NET CHANGE 2010-2020 (KM²)	GROSS LOSS 2010-2020 (KM²)	PROPORTION OF LOSS FROM DIRECT HUMAN DRIVERS (%)	TOTAL HUMAN DRIVEN LOSS 2010 – 2020 (KM²)
Asia	-260.85	-2,353.81	68	-1604.91

While awareness of issues such as the damage caused by deforestation, aquaculture expansion, and climate change is growing, it remains unevenly distributed. Coastal communities, especially those whose livelihoods directly depend on mangroves, tend to have a higher awareness. Within the private sector awareness generally appears to be low, except among businesses involved in sustainability initiatives or voluntary carbon offsetting projects.

Circumference measuring of mangrove trees in Papua, Indonesia © Conservation International Indonesia

Government recognition of the importance of reducing mangrove loss appears relatively high across Asia. This is reflected in the specific inclusion of mangroves or blue carbon in the Nationally Determined Contributions (NDC's) to the Paris Climate Agreement of more than half the countries in the region.

Some commentators attribute this to recognition of the coastal protection function of mangroves following the tragic 2004 Indian Ocean tsunami. Policymakers need to strike a difficult balance between the needs of economic development and the protection of mangroves which provide nature-based solutions for climate related threats. Recent trials of sustainable aquaculture methods coupling increased yield and reduced area for shrimp production with mangrove rehabilitation have been demonstrated to be viable and could be scaled up to reduce further loss. Efforts to quantify the value of ecosystem services to local and national economies, and clearly defined links to fisheries productivity and food security, may also support the prioritization of keeping mangroves intact.

RESTORE HALF

Historically, loss of mangrove area in Asia has been high, resulting in large – although often fragmented – areas of previously cleared mangroves no longer in productive use and potentially available for restoration. In fact, almost half of the potential mangrove restoration area in the world can be found in Asia – and restoring half of it would achieve 47% of the Mangrove Breakthrough global restoration goal.

An aerial view of a narrow coastal village surrounded by dense mangrove forests, Indonesia
© Witteveen+Bos / Wetlands International

Table 5: Restoring half of potential restoration area in Asia

NET MANGROVE AREA LOST SINCE 1996 (KM²)	TOTAL RESTORABLE AREA IN ASIA (KM²)	REGIONAL RESTORATION GOAL BY 2030 (KM²)	PERCENTAGE OF GLOBAL RESTORATION GOAL (%)
-2,813	3,758.64	1,879.32	47

Resolving land tenure is the most common barrier to effective action. This includes defining which government departments hold jurisdiction over intertidal wetlands, and whether there are established and accessible pathways to secure management rights for conservation purposes. In some Asian countries this challenge is further complicated by uncertainties around ownership or management of abandoned aquaculture ponds, as well as the need to track down any entities or individuals who may hold residual claims to potential restoration sites.

Mangrove restoration in Asia, as elsewhere, is far more complex than simply planting seedlings. Whether intact or restored mangrove areas will persist in the long-term will depend on:

- Increased uptake of proven science-based restoration approaches, which include assessments of substrate conditions, hydrology and history of the area prior to restoration.
- Clarification of land tenure and recognition of community rights to use the areas sustainably.
- Clearly defined jurisdiction and institutional capacity of the relevant national and subnational agencies to enforce conservation regulations.
- Engaged stakeholders with shared vision for mangrove restoration and increased flow of (blended public and private) finance to drive large scale action.

Shifting approaches to mangrove restoration away from monoculture plantations to more successful science-based restoration approaches is progressing slowly. This is due to several factors, including demand from funders or official targets based on numbers of propagules or new trees planted rather than long-term ecological outcomes, and easy availability of unsuitable subtidal mudflat areas for rapid planting. Increasing requirements for multi-year monitoring of planting or restoration efforts could produce transparent data on success rates and inform positive changes in restoration approaches and goal setting. The Global Mangrove Alliance and **Mangrove Action Project** build restoration capacity from global to local levels, while **The World Economic Forum** and **Ocean Risk and Resilience Action Alliance** are engaged in donor and **investor education** on appropriate project goals and **high-quality implementation.**

Land tenure issues and slow adoption of science-based methods are major barriers to **successful mangrove restoration in Asia**

DOUBLE PROTECTION

Analyses by the GMW show that around 27% of mangroves in Asia are under some form of formal protected area designation with a national average of 35%.[4] The Mangrove Breakthrough goal to double protection varies based on individual national context:

- National mangrove protected area <15%: increase to 30%
- National mangrove protected area 16-45%: double protected area
- National mangrove protected area >45%: increase to 90%

This recognizes that it is unfeasible to double protection for countries with, for example, 70% of mangroves already protected.[13] To double protected mangrove area in Asia as a whole, national goals would need to be exceeded by a cumulative 2,275 km^2 (Table 5). Due to the globally significant mangrove area in Indonesia, doubling protection there from 25% to 50% would secure an additional 7,343km^2 – realizing more than half of the regional goal.

Community participation in mangrove restoration
© Wetlands International

Table 6: Doubling mangrove protection in Asia

TOTAL PROTECTED MANGROVE AREA IN ASIA (KM^2)	PORTION OF MANGROVE AREA WITH PROTECTED STATUS	ADDITIONAL PROTECTED AREA FOR REGIONAL AVERAGE OF 30%	ADDITIONAL PROTECTED AREA TO DOUBLE REGIONAL TOTAL	ADDITIONAL PROTECTED AREA FOR REGIONAL AVERAGE OF 80%
15,726.38	42,272.93	27	13,452.00	50

In some countries, such as India, where the inclusion of mangroves in protected areas may be minimal, mangroves may be subject to other forms of legal protection, such as national or local laws prohibiting cutting or felling.[19] This level of protection typically applies to only the trees rather than the ecosystem itself. The effectiveness of such laws is influenced by local economic realities, community reliance on natural resources or limited enforcement capacity. An important component of increasing protection, which is highly linked to the long-term effectiveness, is making sure that they are equitable for people that rely on mangroves as a resource alongside the ecological benefits.

Forthcoming updates to NDCs are expected to reflect further increased ambition across the region and include language relevant to all three of these goals. In some countries, mangroves are defined as forest and therefore included in Forest Reference Emissions Levels (FRELs), National Greenhouse Gas Inventories (NGHGIs) and Agriculture, Forestry and Other Land Use (AFOLU) NDC policy targets by default.

Country selection process for regional readiness reports

Given the impracticality of producing written reports for all 120+ mangrove countries, an evidence-based selection process was used to identify focus countries for inclusion in each of three regional readiness summaries: Asia, West Africa and the Americas.

Spatial data supplied by the GMW was used to identify countries with the greatest potential restoration area, and the largest area of unprotected mangroves.

Restoration area was prioritized over unprotected area to create a shortlist of countries with a total cumulative restoration area equal to around 120% of the regional restoration goal.

To mobilize early funder and investor interest and engagement, focusing efforts on strategically selected geographies can create impact at scale and demonstrate the effectiveness of the Mangrove Breakthrough as a mechanism for cooperation and leadership, building momentum towards sustainable finance. Supporting and scaling up implementation in a handful of key countries in Asia has the potential to significantly accelerate progress toward global Breakthrough goals.

An evidence-based selection process was used to identify focus countries for three regional readiness summaries: **Asia, West Africa and The Americas**

ing the growth of a planted mangrove, Philippines
ni Narayanan / Conservation International

Restorable area and unprotected area

Asian countries with the greatest restoration and increased protection potential[4]:

COUNTRY	RESTORABLE AREA (KM²)
Indonesia	**2,032.03**
Myanmar	602.98
Philippines	**230.78**
India	**170.97**
Viet Nam	155.63
Malaysia	**138.61**

COUNTRY	UNPROTECTED AREA (KM²)
Indonesia	**22,190.78**
Myanmar	5,287.14
Malaysia	4,509.37
India	**3,272.16**
Thailand	2,369.05
Philippines	**1,896.82**

Map 1: Spatial data for Breakthrough goals

Key

- Mangroves
- Countries
- Country Boundaries
- Mangrove Protected (% of national mangrove extent)
- Restorable Area (% of Asia restoration target)

Pakistan
India
Bangladesh
Myanmar
Sri Lanka
Thailand
Cambodia
Vietnam
Philippines
Brunei
Malaysia
Singapore
Indonesia
East Timor

Financial stability and investor confidence

It would be short-sighted to restrict analysis to spatial data only: both political will and financer confidence to fund or invest in any country are critical factors. Publicly available corruption, political stability, and ease of doing business indices combined with gross domestic product (GDP) growth and inflation rates were used to evaluate high level financial stability, and if there may be a case for funder hesitancy (Fig 1).

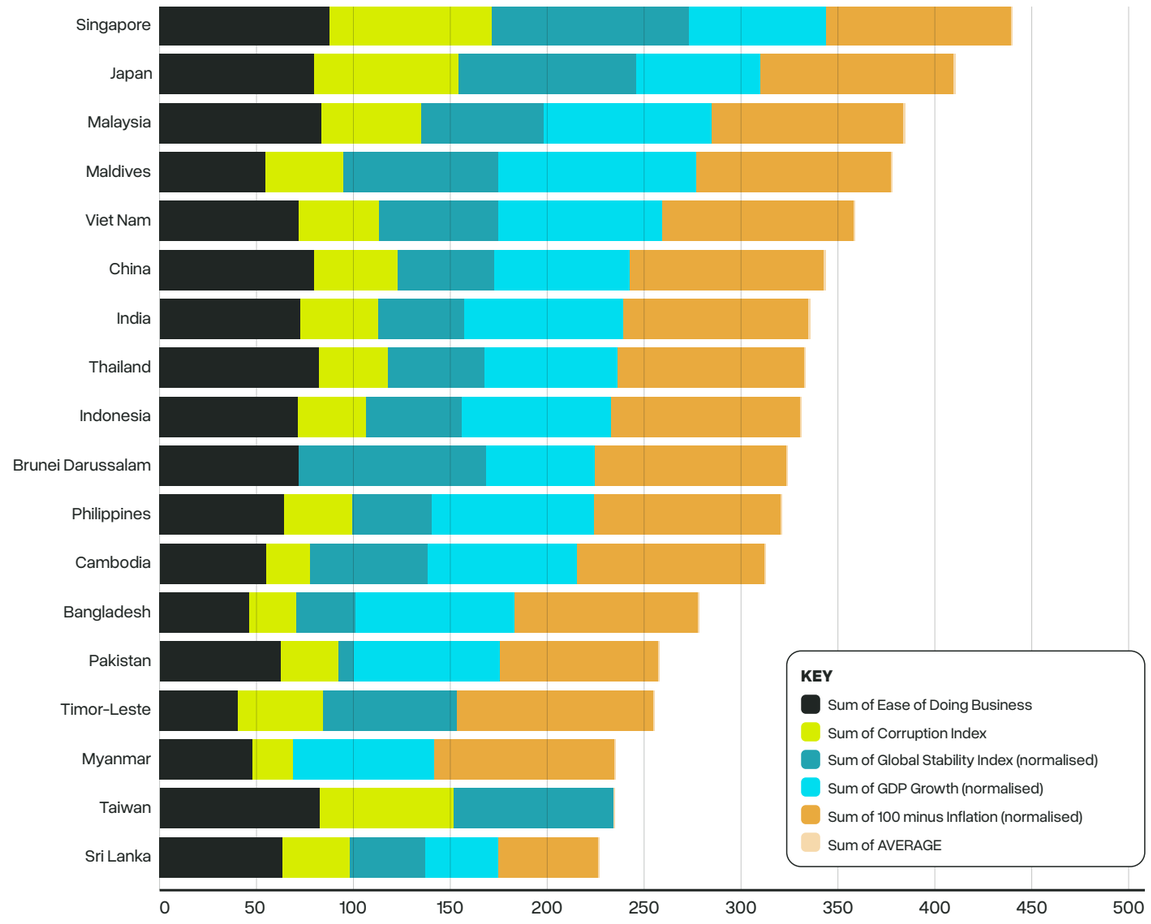


Figure 1: The ease of doing business and corruption indices both assign a value of 1-100. The differing scales used by the global stability and growth indices set values were normalized to provide a comparable 1-100 value. Finally, to include inflation as an indicator we subtracted the rate of inflation at the time of this analysis (March 2024) from 100 – so low inflation confers a higher score. These values were then combined into a single value of 5-500 allowing simplified visual comparison.

Mangrove landscape at Pichavaram, Tamil Nadu, South India © Harsh Ganapathi

HIGH-IMPACT LOCATIONS FOR MANGROVES

The world's remaining mangrove stocks are concentrated in 750 regions around the planet's tropical and sub-tropical belt. Just 40 locations – known as the M40 – hold nearly 70% of the world's mangroves and store some 3 billion tonnes of CO_2e.[20]

Notably, 21 of the M40 locations are in seven Asian countries, with Indonesia being home to 12 of the 21 locations.[20] The **M40 Cities** concept was published by Earth Security in 2021, based on insights from their 2020 report Financing the earth's assets the case for mangroves and draws on research by IUCN, UNEP, the GMA and lessons from the two Mangrove Bond pilots in the Philippines and Australia.

THE BIODIVERSITY FINANCE INITIATIVE

The Biodiversity Finance Initiative (BIOFIN), a global partnership spearheaded by UNDP and the European Commission, supports countries to enhance their financial management of biodiversity and ecosystems.

750 Regions
around the planet's tropical and sub-tropical belt hold the world's remaining mangrove stocks

To date, 40 countries, 8 of which are in the Americas, have commenced national BIOFIN processes, aimed at supporting the implementation of National Biodiversity Strategy and Action Plans (NBSAPs) and achieving national biodiversity targets.

The countries with greatest restoration and protection potential were also cross-referenced with countries which included M40 locations and which are participating in BIOFIN.

International commitments by country

Map 2: Map of international commitments by country

Key

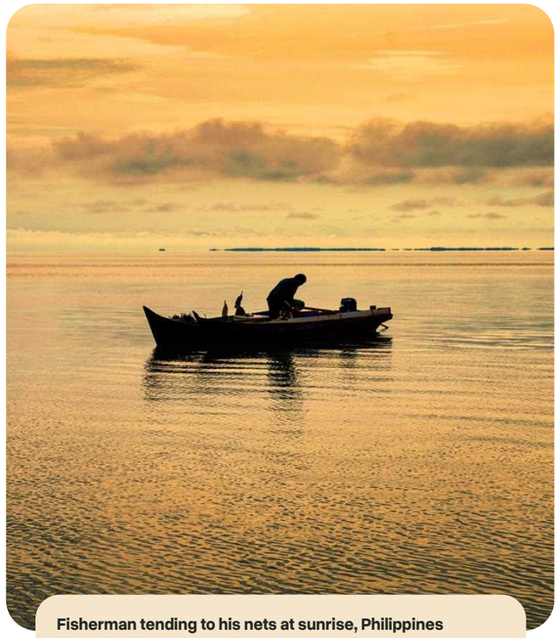
- Mangroves or blue carbon referenced in Nationally Determined Contribution
- Mangroves count towards mitigation targets
- Mangroves contribute to adaptation targets
- Submitted Wetland Inventory

China
Japan
Bangladesh
In Progress
Pakistan
Planned
India
Myanmar
Vietnam
Taiwan
Thailand
Cambodia
In Progress
Philippines
In Progress
Sri Lanka
Maldives
Malaysia
Singapore
Brunei
Indonesia
In Progress
Timor-Leste

A range of indicators were used to assess the potential alignment between government policies, national targets, and the goals of the Mangrove Breakthrough. These included whether countries had published national goals or made international commitments that reference mangroves or blue carbon in their NDC, completed a RAMSAR national wetlands inventory, the presence of projects producing blue carbon credits for the voluntary carbon market, and engagement in financial mechanisms such as debt for nature swaps or blue bonds. Information on the inclusion of mangroves in National Adaptation Plans (NAPs) and updated NBSAPs was sparse, especially as adaptation targets are often included within NDCs and therefore covered within that analysis. Additionally NAPs and NBSAPS were not always available in English, so were excluded from this selection process.

As a final step, official endorsement of the Mangrove Breakthrough, membership of the MAC, and the presence of GMA national chapters and members actively engaged in mangrove conservation or restoration in each country were all considered. Overall, this analysis supported the selection of Indonesia, the Philippines, and India as having the highest potential for decisive mangrove action and inclusion in this regional readiness report.

Creation of a zigzag pattern of hydrological channels in North Kalimantan to mimic the natural flow pattern and enable mangrove propagules and seeds from nearby healthy mangroves to reach the abandoned ponds
© Wetlands International



Fisherman tending to his nets at sunrise, Philippines
© Wetlands International

Myanmar, although having both high restoration and potential data, is not included in this report due to ongoing instability and related challenges to effectively channeling funding into the country. However, it should be noted that out of all countries monitored in real time by GMW, Myanmar has the highest number of annual mangrove loss alerts and should become a priority for future support.

This analysis supported the selection of **Indonesia, India** and the **Philippines** as having the highest potential for decisive mangrove action and inclusion in this regional readiness report

Restoration area was the primary defining factor in this selection, however this does skew selection away from smaller countries and island states. This should not be interpreted as these being less important, rather that due to limitations in time and capacity, only a subset of countries could be profiled in detail.

Mangrove protection and restoration particularly remains a critical priority for island states under threat by storms and sea level rise. The templates used to produce these country summaries will be made available for others to replicate the analysis and extend coverage to additional countries over time.

Sea grass on ocean floor, Mansuar Island, Dampier Strait
© Burt Jones and Maurine Shimlock

September 2025

MANGROVE BREAKTHROUGH

GLOBAL MANGROVE ALLIANCE

Mobilizing the Mangrove Breakthrough in Asia

Enabling conditions and priorities for mangrove conservation and restoration action