

Blue Carbon Finance Toolbox

First edition: June 2025

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Executive Summary

The Blue Carbon Finance Toolbox provides a comprehensive overview of financial mechanisms and strategies to support the conservation, restoration, and sustainable management of blue carbon ecosystems. These coastal and marine habitats, including mangroves, tidal marshes and seagrasses, play essential roles in climate change mitigation and adaptation, coastal protection, ecosystem functioning, and support coastal livelihoods and communities.

Specifically, the toolbox aims to equip policymakers, financial institutions, project developers, and other stakeholders with knowledge and tools necessary to mobilize funding for blue carbon initiatives. It synthesises current knowledge, best practices, and innovative approaches in blue carbon finance.

Key components include:

Overview of Blue Carbon Finance: Defines the scope and importance of blue carbon finance, highlighting its potential to address climate change while delivering co-benefits for biodiversity and local communities.

Policy Context: Outlines relevant international frameworks and agreements, including the Paris Agreement, the Convention on Biological Diversity, and the Ramsar Convention on Wetlands of International Importance, emphasizing the growing recognition of blue carbon in climate strategies.

Financial Mechanisms: Presents a diverse range of financing approaches, including:

- Public sector approaches (e.g., government funding, taxes, intergovernmental funding)
- Private sector and philanthropic approaches (e.g., impact investing, trust funds, private foundations, corporate social responsibility)
- Market-based approaches (e.g., carbon markets, payment for ecosystem services)
- Alternative approaches (e.g. Debt-for-Swaps, Blue Bonds)

Barriers to Effective Finance: Identifies key challenges including project scale limitations, risk perception, technical complexity, policy uncertainties, geographical imbalance, and ecosystem focus bias.

Enabling Conditions: Outlines strategies for creating conducive environments for blue carbon finance through policy integration, institutional capacity building, international collaboration, financial innovation, data reliability improvements, and public-private partnerships.

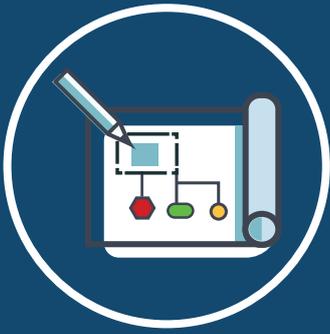
The toolbox serves as a call to action for all stakeholders to leverage these financial tools and strategies to support the vital role of blue carbon ecosystems in addressing global climate and biodiversity challenges.

List of acronyms

AFD	Agence Française de Développement (French Development Agency)
AFOLU	Agriculture, Forestry, and Other Land Use
APEC	Asia-Pacific Economic Cooperation
BCAF	Blue Carbon Accelerator Fund
BCE	Blue Carbon Ecosystem
BC	Blue Carbon
BCEs	Blue Carbon Ecosystems
BCU	Blue Carbon Unit
BNCFF	Blue Natural Capital Financing Facility
CBD	Convention on Biological Diversity
CCM	Climate Change Mitigation
CDM	Clean Development Mechanism
CI	Conservation International
CIS	Climate, Industry, and Society
COP	Conference of the Parties
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
DB	Development Bank
EEZ	Exclusive Economic Zone
ESG	Environmental, Social, and Governance
FAO	Food and Agriculture Organization
FCPF	Forest Carbon Partnership Facility
FPIC	Free, Prior and Informed Consent
GBF	Global Biodiversity Framework
GCF	Green Climate Fund
GEF	Global Environment Facility
GEO	Group on Earth Observations
GHG	Greenhouse Gas
GMA	Global Mangrove Alliance
GMS	Global Mangrove Summit
ICF	International Climate Finance
IFI	International Financial Institution
IOC	Intergovernmental Oceanographic Commission
IPBC	International Partnership for Blue Carbon

IPCC	Intergovernmental Panel on Climate Change
IRD	Institut de Recherche pour le Développement (Research Institute for Development)
KfW	German Development Bank
LDC	Least Developed Country
LIFE	The EU's financial instrument supporting environmental and climate action projects
LULUCF	Land Use, Land-Use Change, and Forestry
MDB	Multilateral Development Bank
MPA	Marine Protected Area
MRV	Measurement, Reporting, and Verification
MSP	Marine Spatial Planning
NAMA	Nationally Appropriate Mitigation Action
NBS	Nature-based solutions
NBSAP	National Biodiversity Strategy and Action Plan
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
PDB	Public Development Bank
PES	Payments for Ecosystem Services
PFES	Payment for Forest Environmental Services
PPP	Public-Private Partnership
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD+	REDD plus conservation, sustainable management of forests, and enhancement of forest carbon stocks
SBE	Sustainable Blue Economy
SBTi	Science Based Targets initiative
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
SMP	Sustainable Management Practice
TNC	The Nature Conservancy
TNFD	Taskforce on Nature-related Financial Disclosures
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
VCS	Verified Carbon Standard
WB	World Bank
WWF	World Wildlife Fund





1. Introduction

The Blue Carbon Finance Toolbox aims to provide the global blue carbon community with an overall guide to understanding and leveraging finance mechanisms that support the conservation, restoration, and sustainable management of blue carbon ecosystems. These ecosystems, namely mangroves, tidal marshes, and seagrasses, play essential roles in mitigating climate change via carbon sequestration and storage, facilitating adaptation to climate change, supporting biodiversity and ecosystem functioning, and sustaining the livelihoods of coastal communities. This toolbox synthesises existing and potential finance mechanisms, identifies gaps, and offers actionable recommendations to enhance the effectiveness of blue carbon finance.

More specifically, the Blue Carbon Finance Toolbox aims to:

1. Synthesise Existing and Potential Finance Mechanisms:

- Identify and categorize finance mechanisms applicable to blue carbon projects.
- Provide examples of application to existing blue carbon activities.

2. Conduct a Gap Analysis:

- Identify gaps in finance mechanisms and regulatory frameworks.

3. Suggest Actionable Recommendations:

- Encourage the use of new potential finance mechanisms and propose enhancements to existing ones to bridge identified gaps.
- Suggest actionable recommendations for policymakers and the wider blue carbon community to optimize blue carbon finance.

This toolbox is designed for the wide blue carbon community, including:



Policymakers:

Government officials and agencies with a mandate in environmental conservation, climate change mitigation and adaptation, and sustainable development.



Public Development Banks (PDBs, including Multilateral, Regional and National Development Banks):

Financial institutions providing funding for development projects and policies, with a focus on sustainability.



Private Sector Investors:

Companies and investors interested in sustainable finance and Corporate Social Responsibility (CSR).



Non-Governmental Organizations (NGOs):

Organizations working on environmental conservation and sustainable development.



Local Communities:

Stakeholders directly affected by and involved in blue carbon activities.

► Blue Carbon Ecosystems

According to the Intergovernmental Panel on Climate Change (IPCC, 2019), all biologically driven carbon fluxes and storage in marine systems that are amenable to management can be considered blue carbon. This currently includes rooted vegetation in the coastal zone, such as mangroves, tidal marshes, and seagrasses.

Mangroves are salt-tolerant trees found in tropical and subtropical intertidal zones, thriving in saline conditions. They cover 14.8 million ha globally, with 5.4 million ha protected (FAO 2020). Deforestation from mangroves emitted around 317 MtCO₂e between 2000-2012 (Adame et al. 2021). Mangrove forests not only sequester substantial amounts of carbon but also protect coastal communities from cyclones, support a rich biodiversity, and provide essential resources for local livelihoods

Tidal marshes are coastal wetlands regularly flooded by tidal waters, accumulating sediments and organic material in their deep soils. They are estimated to cover 52,880 km² globally (Worthington et al., 2024). Tidal marshes' intricate root systems and vegetation not only trap and store carbon but also filter pollutants, improving water quality in surrounding areas. They act as natural shock absorbers, protecting inland areas from storm surges and mitigating the impacts of sea-level rise. Tidal marshes serve as vital rest stops and feeding grounds for migratory birds, supporting biodiversity on a continental scale. Moreover, they contribute significantly to local economies by fostering recreational activities such as birdwatching and supporting productive fisheries, thus intertwining ecological value with human livelihoods.

Seagrasses are underwater flowering plants with deep roots, found in shallow coastal waters. Estimates of their global coverage range from 160,387 to 266,562 km², with Australia having the largest area (Mc Kenzie et al., 2020)¹. Similarly to mangroves and tidal marshes, seagrass meadows sequester substantial amounts of carbon but also stabilize seafloors, improve water quality through nutrient filtering, provide critical nursery habitats for commercially important fish species, and support endangered species like sea turtles and dugongs.

Blue carbon ecosystems are pivotal in the global carbon cycle, with the highest rates of nature-based carbon sequestration per area (UNESCO, 2024), though actual rates vary significantly by location and environmental conditions:

- Average of 168 g C m⁻² yr⁻¹ in mangroves
- Average of 242 g C m⁻² yr⁻¹ in tidal marshes
- Average of 83 g C m⁻² yr⁻¹ in seagrasses

Established methodologies for carbon accounting are available and recognized by the IPCC (IPCC, 2014), but also in the voluntary carbon market (VCM) and by selected national standards. The carbon sequestration capacity of these ecosystems is intrinsically linked to their overall health and biodiversity, which in turn supports their resilience to climate change impacts.

Despite their significance, blue carbon ecosystems face widespread degradation and loss, primarily due to coastal development, land-based pollution, aquaculture, unsustainable fishing practices, and climate change impacts, underscoring the urgency of conservation and restoration efforts. It is estimated that the global extent of their coverage has decreased by 20-35% since 1970 (Schindler Murray and Milligan, 2023).

¹ However, these figures are based on existing mapping coverage, which may be incomplete, and actual global extent could differ.

1.1. What is Blue Carbon Finance?

In this document, *blue carbon project* refers to a wide range of initiatives aimed at the conservation, restoration, and sustainable management of coastal and marine ecosystems that store and sequester carbon. These projects not only focus on the ecological aspects of carbon sequestration, but also address policy and institutional frameworks, socio-economic benefits, local livelihoods, and sustainable finance to create enabling conditions for thriving blue carbon ecosystems.

Blue carbon finance refers to the finance mechanisms employed to support a wide range of initiatives aimed specifically at the conservation, restoration, and sustainable management of coastal and marine ecosystems that store and sequester carbon, referred to as blue carbon ecosystems. While it falls under the broader umbrella of “blue finance”, blue carbon finance has distinct characteristics:

- It requires specialized carbon accounting methodologies for coastal environments
- It addresses unique challenges like land tenure rights and sea-level rise
- It combines carbon market access with conservation finance
- It must account for ecosystem migration and coastal dynamics.

This type of finance not only supports the ecological aspects of carbon sequestration, but also the integration of blue carbon in policy and institutional frameworks, it promotes socio-economic benefits, enhances local livelihoods, and ensures sustainable funding.

The scope of blue carbon finance encompasses various financial instruments and approaches. While there are no formal definitions for market-based and non-market-based financing approaches, these include:

- Direct funding mechanisms (e.g., grants, subsidies)
- Market-based instruments (e.g., carbon credits)
- Public-private partnerships (PPPs)
- Alternative financing models (e.g., debt-for-nature swaps, impact investing, blue bonds)

These financial tools aim to support thriving blue carbon ecosystems by mobilizing and allocating resources efficiently and effectively.

The financial sector is increasingly recognizing the potential of natural climate solutions, with the voluntary carbon market alone projected to reach USD 50 billion by 2030 (Taskforce on Scaling the Voluntary Carbon Market, 2021). Within this market, blue carbon holds significant promise. Studies estimate that avoided deforestation credits from just a fifth of the world’s mangroves could generate over USD 1 billion annually (Zeng et al., 2021). The potential impact is even greater for seagrasses, which have suffered higher historical loss rates (Dunic et al., 2021). This potential for financial returns is attracting significant interest. A recent survey revealed that **over half of asset managers view blue carbon as an investment opportunity**, driven by a confluence of factors including stricter environmental regulations and a growing focus on corporate social responsibility (Credit Suisse, 2021). Major banks have estimated a USD 11.1 billion investment need for global mangrove restoration for carbon sequestration alone (Earth Security, 2020). This financial opportunity is not lost on accounting firms and asset managers who see the viability of blue carbon solutions, recognizing their potential to deliver both environmental and economic benefits (KPMG, 2021; Gardiner & Bell, 2021).

► Importance of Blue Carbon in Climate and Biodiversity Strategies

Integrating blue carbon ecosystems into national climate and biodiversity strategies offers a promising avenue for multiple environmental benefits, including climate mitigation, adaptation, resilience, and biodiversity conservation. This approach aligns with the goals of major international agreements:

- The [Paris Agreement](#), adopted under the United Nations Framework Convention on Climate Change (UNFCCC) in 2015, which provides the framework for global climate action. The growing integration of blue carbon in Nationally Determined Contributions (NDCs) to the Paris Agreement reflects an increased recognition of these ecosystems as nature-based solutions (NbS) to climate change mitigation. Beyond carbon sequestration, many countries also acknowledge the adaptation benefits of blue carbon ecosystems in their NDCs (Lecerf et al., 2023).
- The [Kunming-Montreal Global Biodiversity Framework \(GBF\)](#), adopted within the framework of the Convention on Biological Diversity, recognises blue carbon ecosystems' fundamental importance for biodiversity conservation and ecosystem services. Blue carbon ecosystems contribute significantly to various targets outlined in the framework, particularly Targets 1, 2, 3, 7, 8, 10, 11, 12 and 19.
- The [Ramsar Convention on Wetlands of International Importance](#), which emphasizes the critical role of wetlands in building climate resilience and supporting adaptation
- The [Sendai Framework for Disaster Risk Reduction 2015-2030](#), which, whilst not explicitly focused on climate change or biodiversity, recognizes the role of healthy ecosystems for disaster risk reduction and resilience building.

Inclusion of blue carbon in national climate and biodiversity strategies also is a signal for funding needs and many public and private donors may prioritize support based on these political commitments.



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► Stakeholder Spotlight: Public Development Banks (PDBs)

In September 2021, at the Finance in Common Summit in Cartagena, Colombia, several development banks² issued a joint statement referred to as the “Cartagena Call” to declare their commitment to protect and sustainably use the oceans and the blue economy. This was the first time that public development banks (PDBs) publicly recognized the importance of this issue and agreed to work together on a common roadmap, principles, and best practices. The PDBs acknowledged that the ocean is a vital source of carbon sequestration, heat and oxygen regulation, food security, biodiversity, and economic activities, but also a vulnerable area facing multiple threats such as over-exploitation, pollution, and climate change. Therefore, they aim to support projects that not only minimize negative impacts but also enhance positive or regenerative outcomes for the oceans, such as pollution control, wastewater treatment, marine protected areas, mangrove and coastal ecosystem conservation, and integrated coastal area management.

Over the past few years, PDBs have significantly increased their engagement in blue carbon projects, recognizing the critical role these ecosystems play in climate change mitigation and adaptation. Public development banks are now offering a diverse range of support for blue carbon initiatives, including direct financial assistance through grants and concessional loans, technical expertise for project development and implementation, and policy guidance to integrate blue carbon into national climate strategies. For example, the World Bank’s PROBLUE multi-donor trust fund has supported blue carbon projects in countries like Indonesia and Mozambique, while the Asian Development Bank launched its Ocean Finance Initiative to catalyse investment in sustainable blue economy projects, including blue carbon. Many PDBs have explicitly incorporated blue carbon into their climate and biodiversity frameworks, reflecting a growing understanding of its importance in achieving global climate goals. The Inter-American Development Bank (IDB) has been particularly active, supporting blue carbon credit systems in Trinidad and Tobago and regional blue carbon Monitoring, Reporting, and Verification (MRV) initiatives.

Notable trends include an emphasis on blended finance approaches (which combine public or philanthropic funds with private capital to mitigate risks and enhance returns for private investors) to catalyse private sector investment, increased focus on developing blue carbon methodologies and standards, and a shift towards larger-scale, programmatic approaches that can achieve greater impact. The Green Climate Fund’s support for Kenya’s “Source to Sea” project exemplifies this trend towards comprehensive, landscape-scale interventions. Some PDBs are also exploring innovative financing mechanisms such as blue bonds and insurance products tailored to blue carbon projects, as demonstrated by the Seychelles’ blue bond supported by the World Bank and Global Environment Facility and the Mesoamerican Reef Insurance Programme supported by the KfW [Kreditanstalt für Wiederaufbau].

Despite this progress, blue carbon financing from PDBs remains a small fraction of their overall climate finance portfolios, indicating significant room for growth and further engagement in this sector. It is also worth noting that while PDBs are increasing support for blue carbon initiatives, critics argue that they continue to finance activities that can damage coastal ecosystems through other parts of their portfolios. A comprehensive approach requires PDBs to:

- Review their entire investment portfolio for coastal impact
- Phase out funding for activities harming blue carbon ecosystems
- Align all financing with coastal and marine conservation goals
- Develop institution-wide safeguards for blue carbon protection.

² Agencia Española de Cooperación Internacional para el Desarrollo (AECID), Agence Française de Développement (AFD), Bancoldex, Caribbean Development Bank (CDB), CAF - development bank of Latin America and the Caribbean, Cassa Depositi e Prestiti (CDP), European Investment Bank (EIB), International Development Finance Club (IDFC), International Fund for Agricultural Development (IFAD), Inter-American Development Bank (IDB) and Latin American Association of Development Financing Institutions (ALIDE).





2. Overview of Blue Carbon Finance Mechanisms

This section provides an overview of the various finance mechanisms applicable to blue carbon projects (**Table 1**). These include public funding from national and international sources, private investments, carbon markets, and philanthropic contributions. This overview also covers the role of innovative finance mechanisms like blue bonds and payments for ecosystem services (PES), which are emerging as significant contributors to blue carbon finance.

Table 1. Overview of Blue Carbon Finance Mechanisms.

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Public Sector Approaches					
Government Funding & Domestic Budgets	Government funding involves various mechanisms through which governments allocate financial resources, such as Direct Budget Allocations, Grants and Subsidies, Tax Incentives and Rebates, International Development Aid, Bonds, Environmental Funds and Local Administration Funding. The OECD provides the most recent estimate of domestic budgets spending on biodiversity from 80 countries as USD 67.8 billion per year (OECD, 2020).	Directly funds blue carbon projects. Adversely, it can also support perverse subsidies and promote harmful activities.	National to international scale projects: 1,000-10,000ha (CSIRO, 2022)	<ul style="list-style-type: none"> • Australia's Blue Carbon Ecosystem Restoration Grants • France's National Biodiversity Strategy (in French) 	<ul style="list-style-type: none"> • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • Unlocking Blue Carbon Development: Investment Readiness Framework for Governments • Blue Carbon Country Readiness Framework: A Decision Tree Approach to Blue Carbon Readiness • High-Quality Blue Carbon Principles and Guidance: A Triple-Benefit Investment for People, Nature, and Climate • The Mangrove Breakthrough Priority Financial Mechanism #6 • Detox Development: Repurposing Environmentally Harmful Subsidies • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy
Taxes, Levies, Surcharges	Revenue generated from specific activities directed towards blue carbon initiatives, including: <ul style="list-style-type: none"> • Coastal Development Impact Fees: Charges on new coastal constructions to offset environmental impacts. The process is similar to wetland mitigation banks and impact-related offsets. The process, however, differs from wetland mitigation banks (which generate tradeable credits through restoration) and impact-related offsets (which directly fund conservation actions), as they are mandatory fees that go into general environmental funds. • Tourism Eco-Tax: Fees collected from tourists to support local ecosystem conservation. • Carbon-Intensive Industry Levy: Charges on high-emission industries to fund carbon sequestration projects. 	Supports blue carbon projects by linking revenue collection to activities protecting coastal ecosystems.	Multiple Scales	<ul style="list-style-type: none"> • Seychelles' Tourism Environmental Sustainability Levy • Palau's Pristine Paradise Environmental Fee (Formerly EIF) • Belize's "conservation fee" 	<ul style="list-style-type: none"> • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy

³ Scales are mainly based on CSIRO (2022) recommendations where available. Actual applicability may vary depending on specific project circumstances and local conditions. Mechanisms without a specified scale may be applicable at multiple levels.

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Public Sector Approaches					
Taxes, Levies, Surcharges	<ul style="list-style-type: none"> Recreational Boating and Fishing Surcharge: Additional fees on licenses to support marine habitat conservation. Port Authority Blue Carbon Fee: Charges on port activities to fund nearby blue carbon ecosystem restoration. Wetland mitigation banks: Regulatory mechanism requiring compensation for permitted wetland impacts through purchase of credits from approved restoration/conservation sites. <p>The revenue is typically earmarked for specific blue carbon projects, ensuring a dedicated funding stream for conservation and restoration efforts. This approach aligns with the «polluter pays» principle and helps internalize environmental costs into economic activities.</p>				
Intergovernmental Funding and Public Development Banks (PDBs)	<p>Financial support from international organizations, notably PDBs for environmental projects in developing countries, usually in the form of grants. Key features include:</p> <ul style="list-style-type: none"> Dedicated Blue Carbon Programs: Many institutions have established specific initiatives for coastal and marine ecosystems, such as the World Bank's PROBLUE trust fund and the Global Environment Facility's Blue Forests Project. Funding Mechanisms: <ul style="list-style-type: none"> Grants for project preparation, feasibility studies, and small-scale interventions Concessional loans for larger restoration and conservation projects Results-based financing tied to verified carbon sequestration or ecosystem improvements Technical Assistance & Policy Support: <ul style="list-style-type: none"> Carbon accounting and monitoring in coastal ecosystems Development of blue carbon methodologies and standards Capacity building for local communities and governments 	Provides substantial funding for blue carbon projects in developing nations.	National to international scale projects: 1,000-10,000ha (CSIRO, 2022)	<ul style="list-style-type: none"> World Bank's PROBLUE and WAVES programs GEF's Blue Forests Project & Small Grants Program EU's LIFE Blue Natura program Green Climate Fund Blue Natural Capital Financing Facility (BNCF) Blue Carbon Accelerator Fund (BCAF) The Kiwa Initiative 	<ul style="list-style-type: none"> Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows Unlocking Blue Carbon Development: Investment Readiness Framework for Governments Deep Blue: Opportunities for Blue Carbon Finance in Coastal Ecosystems Responsible Finance for Blue Carbon Ecosystems The Blue Carbon Handbook Blue Carbon Foundations Course Fair Carbon's Blue Carbon Academy

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Public Sector Approaches					
Debt-for-Nature/ Climate Swaps	Debt forgiveness in exchange for environmental conservation commitments. ⁴ This financial instrument is commonly used to finance the implementation of a national regulation or action plan based on international standards for conservation and restoration.	Frees financial resources for blue carbon projects and promotes long-term conservation.	National	<ul style="list-style-type: none"> • Seychelles' debt-for-nature swap • Barbados' debt conversion • Ecuador Debt-for-Nature conversion 	<ul style="list-style-type: none"> • The Blue Carbon Handbook • Responsible Finance for Blue Carbon Ecosystems • The Mangrove Breakthrough Financial Roadmap Priority #3 (Debt for mangrove positive small and medium-sized enterprises [SMEs]) and Priority #7 (External sources of public finance) • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy
Bilateral Donors	<p>Bilateral funding involves financial and technical assistance provided by one country directly to another to support various development projects.</p> <p>Bilateral funding is a critical source of support for blue carbon initiatives, especially in developing countries, where financial resources and technical expertise may be limited. This funding can come in the form of Official Development Assistance (ODA), Direct Financial Aid, Programmatic Support, Technical Assistance and Capacity-Building as well as Collaborative Research & Development.</p>	Supports blue carbon projects through direct financial aid.	National to subnational	<ul style="list-style-type: none"> • UK Blue Carbon Fund and Blue Planet Fund • Blue Natural Capital Financing Facility (BNCFF) • Blue Carbon Accelerator Fund (BCAF) 	<ul style="list-style-type: none"> • Coastal "Blue" Carbon: A Revised Guide to Supporting Coastal Wetland Programs and Projects Using Climate Finance and Other Financial Mechanisms • The Blue Carbon Handbook • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy
Blended Finance	Blended finance is an approach that combines public or philanthropic funds with private capital to mitigate risks and enhance returns for private investors. Public or philanthropic funds can provide first-loss capital, protecting private investors from initial losses.	Mitigates initial risks and attracts private investors for blue carbon projects.	Local to national	<ul style="list-style-type: none"> • Mikoko Pamoja project in Kenya • ORRAA's Sea Change Impact Financing Facility (The Octopus Desk) • Blue Carbon Accelerator Fund (BCAF) 	<ul style="list-style-type: none"> • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • The Blue Carbon Handbook • Responsible Finance for Blue Carbon Ecosystems • The Mangrove Breakthrough Financial Roadmap Priority #2 (Global Fund for Mangroves) • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy

⁴ However, while debt-for-nature swaps can provide short-term financial relief and conservation funding, they do not address the underlying structural issues that drive countries to pursue environmentally harmful resource extraction in the first place. The "Exporting Extinction" report argues that without addressing fundamental inequities in the international financial system- including unequal access to capital, currency hierarchies that favour wealthy nations, and trade conditions that perpetuate extractive economic models- such financial instruments may provide only temporary solutions while leaving intact the forces that compel countries to prioritize resource exploitation over environmental protection (Dempsey et al., 2024). Any debt-for-nature program should therefore be considered as just one component of a broader strategy to reform international financial structures that currently incentivize environmental degradation.

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Public Sector Approaches					
Public-Private Partnerships (PPPs)	Collaborative agreements between government and private sector companies. They leverage private sector expertise and capital while maintaining public oversight, often using blended finance mechanisms that combine public funds, private investment, and carbon credit revenues. PPPs can facilitate large-scale coastal ecosystem restoration, develop blue carbon credit platforms, or create sustainable coastal enterprises.	Combines public oversight with private efficiency for blue carbon projects.	Scales with government, from local to national	<ul style="list-style-type: none"> • Indonesia's Building with Nature PPP • ORRAA's Sea Change Impact Financing Facility 	<ul style="list-style-type: none"> • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • Unlocking Blue Carbon Development: Investment Readiness Framework for Governments • Responsible Finance for Blue Carbon Ecosystems • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy
Common Asset Trusts	These are innovative governance structures designed to manage and protect natural capital assets, including blue carbon ecosystems, as public goods for the benefit of current and future generations.	Provides structured long-term financing for the protection and management of blue carbon habitats.	Local to national	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Common Asset Trusts for Blue Commons Stewardship • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy
Rolling Covenants	Rolling covenants are flexible legal agreements attached to property titles that allow landowners to continue productive use of coastal land in the short term, while requiring changes in land use over time to accommodate the inland migration of blue carbon ecosystems as sea levels rise. These covenants specify triggers, such as projected inundation dates or actual shoreline retreat, that prompt the phasing out of current land uses (e.g., agriculture) and the creation of buffer zones to allow for ecosystem migration. This approach balances immediate economic needs with long-term conservation goals for coastal blue carbon habitats.	Helps protect and expand coastal wetlands and blue carbon ecosystems.	Local Projects: 10-100ha (Bell-James et al., 2021.)	<ul style="list-style-type: none"> • N/A • [explored in Australia for managing coastal zones, no application as yet] 	<ul style="list-style-type: none"> • Rolling covenants to protect coastal ecosystems in the face of sea-level rise

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Private Sector Approaches					
Trust Funds	A legal structure in which a neutral third party manages and disburses funds from various sources (e.g. grants, levies, payments for ecosystem services) to support environmental or social outcomes. Designs include endowment funds (using investment returns), sinking funds (disbursing capital over time), and revolving funds (replenished through fees, taxes, etc).	Can provide a transparent, accountable mechanism to combine and disburse funds from multiple sources for the long-term management and protection of blue carbon ecosystems. Suitable for structuring PES related to blue carbon.	Multiple scales	<ul style="list-style-type: none"> • Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) • North Efate Conservation Trust (NECT) in Vanuatu • ORRAA's Sea Change Impact Financing Facility 	<ul style="list-style-type: none"> • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • Unlocking Blue Carbon Development: Investment Readiness Framework for Governments
Bonds (Green, Municipal, Blue, Impact)	Bonds are debt-based financial instruments used to raise capital in global markets for various purposes, including sustainable and environmentally focused projects. These include green bonds, which fund environmentally beneficial projects; blue bonds, specifically targeting marine and coastal ecosystem initiatives; municipal bonds issued by local governments for public projects including environmental improvements; and impact bonds that link financial returns to measurable social or environmental outcomes. They offer fixed terms and interest rates, with proceeds dedicated to defined sustainable activities.	Raises capital for blue carbon initiatives, ensuring transparency and environmental integrity.	Regional projects: 100-1,000 ha and National to international scale projects: 1,000-10,000ha (CSIRO, 2022)	<ul style="list-style-type: none"> • Seychelles' Sovereign Blue Bond • HSBC's Mangrove Bond • BBVA and IFC Colombia Blue Bond • Belize Blue Bond • Indonesia's Samurai Blue Bond • ORRAA's Sea Change Impact Financing Facility - Blue Bonds Incubator (BBI) 	<ul style="list-style-type: none"> • Bonds to Finance the Sustainable Blue Economy: A Practitioner's Guide • Unlocking Blue Carbon Development: Investment Readiness Framework for Governments • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • The Mangrove Breakthrough Financial Roadmap Priority #7 (External sources of public funding) • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Private Sector Approaches					
Ecosystem Service Insurance	<p>Ecosystem Service Insurance is an innovative finance mechanism designed to protect and restore natural ecosystems by providing insurance coverage for their ecological functions and services. This concept goes beyond traditional insurance models by recognizing the value of intact ecosystems and the services they provide. This type of insurance aims to safeguard the ecological functions of ecosystems, ensuring their continued ability to deliver vital services such as carbon sequestration, flood protection, water purification, and biodiversity support. In the event of damage or degradation to the insured ecosystem, the policy can fund restoration efforts or compensate for the loss of ecosystem services. Key aspects of Ecosystem Service Insurance include:</p> <ul style="list-style-type: none"> • Risk transfer: Transfers the financial risk of ecosystem damage from local stakeholders to insurers, providing a safety net for communities and ecosystems. • Parametric or indemnity-based: Can be structured as parametric insurance (triggered by predefined environmental parameters) or indemnity insurance (based on actual assessed damage). • Trust fund model: Premiums can be pooled from multiple beneficiaries (e.g., coastal property owners) into a trust fund that purchases the insurance. • (For parametric insurance) Rapid response funding: Enables quick disbursement of funds for immediate post-disaster ecosystem restoration. <p>As extreme weather events intensify due to climate change and the impacts on coastal ecosystems increase such insurance provides a financial buffer for ecosystem restoration.</p>	Provides financial support for timely restoration of blue carbon ecosystems after damage.	Local to regional	<ul style="list-style-type: none"> • MAR Insurance Programme • ORRAA's Save the Waves Project and Partnership with MarViva 	<ul style="list-style-type: none"> • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • The Mangrove Breakthrough Financial Roadmap Priority #5 (Mangrove-linked Insurance) • Restoration Insurance Service Company (RISCO)

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Private Sector Approaches					
Impact Investing	Investments aimed at generating positive social and environmental impact alongside financial return.	Attracts capital for initiatives restoring and protecting blue carbon ecosystems.	Multiple scales	<ul style="list-style-type: none"> • The “Arrecifes del Sureste” MPA in the Dominican Republic • Danone’s Livelihoods Carbon Fund • ORRAA’s Sea Change Impact Financing Facility (Nautilus Ocean Guarantee; Outrigger Ocean Impact Fund) 	<ul style="list-style-type: none"> • High-Quality Blue Carbon Principles and Guidance: A Triple-Benefit Investment for People, Nature, and Climate • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • IUCN’s Investing for Ocean Impact podcast
Corporate Social Responsibility (CSR)	Companies’ ethical obligation to contribute positively to society and the environment.	Supports blue carbon projects through funding, resources, and expertise.	Multiple scales	<ul style="list-style-type: none"> • Apple’s investment in mangrove restoration in Colombia 	<ul style="list-style-type: none"> • N/A
Civil Society Organisations (CSOs) and NGOs	Funding and initiatives led by civil society organizations and non-governmental organizations.	Supports blue carbon projects through innovative business models and community-driven conservation efforts.	Multiple scales	<ul style="list-style-type: none"> • Conservation International’s Blue Carbon Program • The Nature Conservancy’s Blue Carbon initiatives 	<ul style="list-style-type: none"> • High-Quality Blue Carbon Principles and Guidance: A Triple-Benefit Investment for People, Nature, and Climate • Blue Carbon Foundations Course • Fair Carbon’s Blue Carbon Academy
Microfinance & Sustainability-Linked Loans (SLLs)	Expanding access to microloans for individuals and small businesses engaged in blue carbon conservation and restoration efforts. This can include traditional microfinance through local microfinance institutions (MFIs), as well as more sophisticated models where investors provide upfront capital in exchange for priority rights to future benefits (e.g., Livelihoods Fund ’s model of pre-financing restoration projects in exchange for future carbon credits).	Facilitates small-scale initiatives and enterprises that support blue carbon ecosystem preservation, restoration, and sustainable use, empowering local communities and promoting grassroots environmental stewardship.	Local Projects: 10-100ha ⁵	<ul style="list-style-type: none"> • ORRAA’s Ocean Eye Project • ORRAA’s Sea Change Impact Financing Facility: Microloans for mangrove restoration projects, loans to local fishermen for adopting sustainable practices 	<ul style="list-style-type: none"> • The Mangrove Breakthrough Financial Roadmap Priority #4 (Mangrove-Positive Microfinance)

⁵ Small scale due to the nature of the funding mechanism.

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Private Sector Approaches					
Private or Corporate Foundations	Funding from private or corporate foundations for conservation projects, usually in the form of grants.	Provides substantial financial support for blue carbon ecosystem conservation and restoration.	Multiple scales	<ul style="list-style-type: none"> • UBS Philanthropy • Business Alliance to Scale Climate Solutions 	• N/A
Cause-related Marketing (CRM)	Collaboration between business and nonprofit to benefit a cause while driving business objectives.	Raises awareness and funds for blue carbon projects through product sales linked to environmental causes.	Multiple scales	<ul style="list-style-type: none"> • Patagonia's co-founded Conservation Alliance 	• N/A
Market-based Approaches					
Payment for Ecosystem Services (PES)	Payment for Ecosystem Services (PES) is a market-based mechanism in which beneficiaries or users of ecosystem services provide payments to the stewards or providers of those services. Through PES, communities or landowners managing coastal habitats can receive financial incentives for their conservation efforts. Typically, a buyer (such as a government, NGO, or private company) pays the ecosystem service provider (like a local community) for achieving predetermined ecological and social outcomes and providing labour. For blue carbon projects, this often involves quantifying the amount of carbon sequestered or emissions avoided through conservation or restoration activities.	Provides sustainable funding for blue carbon conservation efforts.	Local Projects: 10-100ha (CSIRO, 2022)	<ul style="list-style-type: none"> • Vietnam's PFES program • Mikoko Pamoja Project in Kenya 	<ul style="list-style-type: none"> • Protecting Seagrass Through Payments for Ecosystem Services: A Community Guide • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows • Unlocking Blue Carbon Development: Investment Readiness Framework for Governments • Coastal "Blue" Carbon: A Revised Guide to Supporting Coastal Wetland Programs and Projects Using Climate Finance and Other Financial Mechanisms • Responsible Finance for Blue Carbon Ecosystems • Harnessing the climate mitigation, conservation and poverty alleviation potential of seagrasses: prospects for developing blue carbon initiatives and payment for ecosystem service programmes • Livelihoods Carbon Funds (LCF) • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Market-based Approaches					
Article 6 of the Paris Agreement	Article 6 of the Paris Agreement establishes a framework for international cooperation on climate change mitigation, offering significant potential for offering potential to scale and fund nature-based projects like blue carbon that contribute to climate ambition. It provides three mechanisms: cooperative approaches to carbon trading (Article 6.2), a centralized UNFCCC-governed crediting mechanism (Article 6.4), and non-market approaches (Article 6.8). For blue carbon, Article 6.2 allows countries to trade Internationally Transferred Mitigation Outcomes (ITMOs) ⁶ , potentially including credits from mangrove restoration or seagrass conservation, to meet their Nationally Determined Contributions (NDCs).	Facilitates the inclusion of nature-based projects like blue carbon in international carbon markets.	Local Projects: 10-100ha and regional projects: 100-1,000ha (CSIRO, 2022)	<ul style="list-style-type: none"> • Singapore and Ghana's Implementation Agreement to Collaborate on Carbon Credits 	<ul style="list-style-type: none"> • Article 6 of the Paris Agreement on UNFCCC website • UNFCCC SBSTA 60 Guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement and in decision 2/CMA.3. Draft conclusions • Coastal Blue Carbon and Article 6: Implications and Opportunities • Blue Carbon Foundations Course • Fair Carbon's Blue Carbon Academy & Blue Carbon Project Enabling Conditions Map • IORA Blue Carbon Hub's Finance Webinar • IPBC's Knowledge Exchange - Introduction to financing opportunities for blue carbon • Article 6 Explainer
National Carbon Markets	National Carbon Markets are regulatory frameworks established by governments. These can be either regulatory (mandatory cap-and-trade systems) or voluntary national standards. While some operate as mandatory cap-and-trade systems, others like Australia's Emissions Reduction Fund (ERF), France's Low Carbon Label, and similar initiatives in Thailand and Japan function as voluntary national standards that provide frameworks for carbon crediting without mandatory participation. In a cap-and-trade system, the government sets an overall emissions limit and issues allowances that can be traded among participants.	Blue carbon projects can enhance carbon sequestration and conservation and support national climate goals.	Local Projects: 10-100ha and regional projects: 100-1,000 ha (CSIRO, 2022)	<ul style="list-style-type: none"> • The Australian Carbon Credit Unit (ACCU) Scheme • The French "Label Bas Carbone" (Low Carbon Label) Methodologies for Mangroves and Seagrasses (both in French) 	

⁶ Noting that these function through accredited standards like CDM or REDD+.

Mechanism	Description	Relevance to Blue Carbon	Typical Project Scale ³	Examples	Guidance and Support Material
Market-based Approaches					
Biodiversity Credits	A biodiversity credit is a certificate that represents a measured and evidence-based unit of positive biodiversity outcome that is durable and additional to what would have otherwise occurred. Credits can be generated for species protection, habitat conservation, or ecosystem restoration.	Provides an additional revenue stream for blue carbon projects by recognizing broader ecosystem benefits. It allows for credit stacking with carbon credits.	Multiple scales	<ul style="list-style-type: none"> • Biodiversity Credit Alliance • South Australia's Biodiversity Credit Exchange • Plan Vivo's Biodiversity Standard • Green Collar's NaturePlusTM biodiversity credit scheme 	<ul style="list-style-type: none"> • State of Voluntary Biodiversity Credit Markets: Current Supply & Demand Dynamics
Credit Stacking	Generating and selling multiple types of environmental credits from a single project. Projects can generate income from multiple sources (e.g., carbon credits, biodiversity credits, and water quality credits). For instance, impact-related offsets can be integrated into credit stacking strategies, allowing projects to generate both impact compensation credits and other environmental credits (carbon, biodiversity) from the same activities.	Maximizes revenue for blue carbon projects by tapping into various markets. Credit stacking recognizes the multiple benefits of blue carbon ecosystems beyond just carbon sequestration.	Multiple scales	<ul style="list-style-type: none"> • The Nature Conservancy's Blue Carbon Resilience Credits 	<ul style="list-style-type: none"> • Blue Forest Finance: Financing the Protection and Restoration of Blue Forests and Meadows (page 21) • State of Voluntary Biodiversity Credit Markets: Current Supply & Demand Dynamics
Credit Stapling	Carbon and biodiversity credits from different/separate projects are combined and sold together as a single product to one purchaser. In some instances, the credit is "stapled" to a physical product or commodity.	Enables linking of separate blue carbon and biodiversity projects.	Local to national	<ul style="list-style-type: none"> • The Wilderlands Biological Diversity Unit's "Coorong alive body" project⁷ 	<ul style="list-style-type: none"> • State of Voluntary Biodiversity Credit Markets: Current Supply & Demand Dynamics
Credit Bundling	Carbon and biodiversity credits generated from the same project/area are packaged and sold together to a single purchaser.	Allows integration of multiple ecosystem values from same site.	Local to national	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • State of Voluntary Biodiversity Credit Markets: Current Supply & Demand Dynamics

⁷ In this example, the credit is "stapled" to a product so that the purchase of the product comes with a credit.





3. Common Barriers to Effective Blue Carbon Finance

The financing needs to restore and conserve blue carbon ecosystem are substantial. **Annual costs to restore mangroves, tidal marshes, and seagrasses to their historical baseline levels by 2050 are estimated between USD 27-37 billion per year** (Deutz et al., 2020). Specifically:

- Mangrove restoration: USD 0.3-1.6 billion per year
- Tidal marsh restoration: USD 4.8-14.4 billion per year
- Seagrass restoration: USD 21.7 billion per year

To put these figures in context, current funding for biodiversity conservation stands at approximately USD 124-143 billion annually. However, estimates suggest that reversing the biodiversity decline by 2030 will require an additional USD 722-967 billion per year ([UNDP BIOFIN](#)).

From a climate finance perspective, in 2022, developed countries provided and mobilized USD 115.9 billion, exceeding the goal set under the UNFCCC for developed countries to mobilize USD 100 billion annually for climate action in developing countries. Public climate finance accounted for close to 80% of the total, with a significant increase in private finance mobilised, which reached USD 21.9 billion in 2022 (OECD, 2024).

Several studies (CSIRO, ICF, Needelman et al.) have identified a set of common barriers to effective blue carbon finance.

1) Project Scale (surface)

Many blue carbon projects, especially in developing countries, are small-scale (10-100 ha) and struggle to attract large-scale investments. The [CSIRO Blue Forest Finance report](#) (CSIRO, 2022) suggests that different financing mechanisms are appropriate for various project sizes, with local projects (10-100 ha) better suited for Payments for Ecosystem Services (PES), while larger national to international scale projects (1,000-10,000 ha) are more appropriate for blue bonds and multilateral development institutions. One potential solution to overcome the scale barrier is project aggregation – for example, pooling multiple landowners’ projects under a single financing mechanism, as demonstrated by parametric insurance pooling funds. Further research is needed to categorize blue carbon projects by investment size across different scales, which would help match financing mechanisms to project budgets more effectively.

2) Risk Perception

According to the IFC report [Deep Blue - Opportunities for Blue Carbon Finance in Coastal Ecosystems](#) (2023), blue carbon projects often face high risk profiles due to factors such as uncertain carbon sequestration rates, potential for reversal, and complex land tenure issues.

3) Technical Complexity

The need for sophisticated measurement, reporting, and verification (MRV) systems can be a barrier, especially for smaller projects or those in less developed regions (Needelman et al., 2018). This barrier can be reduced by accepting standardized default values and models, as demonstrated by some carbon credit standards like the [Australian Carbon Credit Unit scheme's tidal introduction method](#).

4) Policy and Regulatory Uncertainties

Lack of clear national policies on blue carbon in many countries creates uncertainty for investors (Vanderklift et al., 2019). This extends beyond simple policy gaps to include fundamental governance challenges such as:

- Limited recognition of blue carbon ecosystems within existing management frameworks
- Overlapping jurisdictional management between different agencies and levels of government. The management of blue carbon ecosystems often suffers from fragmented governance structures. For example, mangrove ecosystems frequently fall under the divided responsibility of multiple national institutions—from agriculture and fisheries to coastal zone management, natural resources, and environmental departments. This administrative fragmentation creates significant coordination challenges for effective ecosystem management.
- Unclear land tenure and resource rights. Blue carbon ecosystems exist in transition zones between land and sea where legal frameworks often fragment across different government agencies with contradictory mandates. This complexity is compounded by inadequate recognition of traditional and customary rights held by coastal communities who have managed these ecosystems for generations.

These governance issues collectively create barriers for project development and investment.

5) Geographical Imbalance

Current funding tends to concentrate in certain regions or countries with more developed carbon markets or stronger institutional capacities, potentially neglecting high-potential areas in less developed regions (IFC, 2023).

6) Ecosystem Focus

There is a tendency to focus on mangrove ecosystems rather than seagrass meadows or tidal marshes due to their higher carbon sequestration rates and easier quantification. This bias is further reinforced by two factors:

1. The ability to adapt existing forest carbon methodologies, particularly REDD+ frameworks to mangrove projects. While the methodological transferability from REDD+ offers advantages for mangrove projects, it potentially undervalues other important blue carbon ecosystems like seagrasses and tidal marshes that require different approaches and additional research (Jones, 2021).
2. Gaps in fundamental scientific understanding of seagrasses and tidal marshes (Hejnowicz et al., 2015), which hampers methodology development for these ecosystems, including:
 - Highly variable carbon sequestration rates across regions and species (CSIRO, 2022)
 - Limited understanding of below-ground carbon dynamics
 - Insufficient remote sensing capabilities for monitoring
 - Incomplete data on restoration success rates and timeframes.

Funding gaps manifest differently across the project lifecycle, creating distinct barriers at each stage. For instance, initial funding for baseline assessments, stakeholder engagement, and project design can be difficult to secure because the return on investment remains highly uncertain in early stages. However, additional research is required to better understand the specific challenges faced at the various cycles of the projects: feasibility and development stage, implementation stage and long-term monitoring and verification.



4. Proposed Recommendations to Overcome Barriers to Effective Blue Carbon Finance

By addressing gaps and misalignments, and implementing targeted solutions, the blue carbon finance landscape can be improved, channelling more resources into impactful projects and enhancing the overall effectiveness of blue carbon initiatives. The following section provides a set of proposed actionable recommendations to overcome barriers to effective blue carbon finance.

1) Use Blended Finance

Blended finance approaches can be used to de-risk investments and attract private capital. For example, [The Mangrove Breakthrough Financial Roadmap](#) suggests the establishment of “a blended finance fund deploying concessional and grant funding into de-risking instruments to unlock additional commercial capital for mangrove-positive business models. The fund should be structurally linked to pipeline origination mechanisms.” Additionally, the Livelihoods Carbon Fund uses a blended finance model to support large-scale ecosystem restoration projects.

2) Aggregate Projects

To address the issue of scale, smaller projects could be aggregated to create more attractive investment opportunities. The World Bank suggests using:

- 1. Pooling schemes:** These mechanisms combine multiple small-scale blue carbon projects under a single management structure, allowing them to:
 - a.** Share administrative and technical costs (like MRV systems)
 - b.** Access larger-scale financing opportunities

- c.** Reduce individual transaction costs (for example, the Livelihoods Carbon Fund pools multiple coastal restoration projects under one investment vehicle).
- 2. Trust funds:** These provide a financial and governance structure to:
 - a.** Aggregate and manage funds from multiple sources
 - b.** Distribute resources across various projects
 - c.** Ensure long-term financial sustainability.

These aggregated projects often use a different financing approach where investors fund the entire project rather than paying per unit of carbon, accepting the overall returns this creates. This holistic funding model can make aggregation more feasible by reducing the complexity of carbon accounting across multiple small sites.

3) Implement known tools and financial instruments

The development of financial tools like blue bonds, resilience bonds, and parametric insurance can help attract diverse sources of capital. [HSBC's Mangrove Bond](#) is a notable example of innovative financing specifically designed for blue carbon ecosystem restoration and conservation.

4) Enhance Donor Coordination

Improved coordination among multilateral and bilateral donors can help ensure more efficient allocation of resources and avoid duplication of efforts.

5) Build Overall Capacity

Investing in local capacity for project development, MRV, and financial management can help overcome technical barriers and make projects more attractive to investors.

6) Strengthen Policy and Regulatory Frameworks (see also Chapter 5)

Strengthening national and international policy frameworks is crucial for addressing funding gaps. This includes:

- Enhancing the regulatory environment to support carbon credit generation from blue carbon projects. The blue carbon credit market is still in its early days, however several pioneering initiatives have already been making strides, such as the Mikoko Pamoja project in Kenya. The World Bank is notably funding a project which includes

a Carbon Market Readiness sub-component meant to integrate Blue Carbon Credit Market Infrastructure as per the Blue Carbon Readiness Framework ([Belize Blue Cities and Beyond Project -P181064](#)).

- Addressing blue carbon projects as part of holistic marine ecosystem and community financing approaches. Rather than funding projects in isolation, integrating blue carbon initiatives into broader marine conservation and sustainable development programs can enhance their impact and financial sustainability, as outlined in frameworks such as the [Marine 30x30 Finance Principles](#). This systems-based approach enables better coordination across activities and agencies while reducing costs through increased efficiencies.
- Providing incentives for private sector participation: Implement tax breaks, subsidies, and other economic incentives to attract private investments into blue carbon projects.





5. Creating Enabling Conditions for Effective Blue Carbon Finance

This section provides recommendations for creating a conducive environment for effective blue carbon finance.

Strengthening Policy and Regulatory Frameworks (see also Chapter 4)

- **Integrating blue carbon into national climate and biodiversity strategies:** By explicitly including blue carbon commitments in Nationally Determined Contributions (NDCs) and National Biodiversity Strategies and Action Plans (NBSAPs), countries can signal their priorities and create enabling conditions to attract finance for blue carbon. This policy integration allows blue carbon initiatives to access a wider range of public, private, and international funding sources focused on climate action and biodiversity conservation.
- **Developing clear national strategies for blue carbon,** as exemplified by Costa Rica's National Blue Carbon Strategy.
- **Addressing policy gaps:** Ensure that existing blue carbon ecosystem management and land tenure rights are clearly defined.
- **Simplifying regulatory processes:** Simplify and clarify permitting and approval processes to reduce the bureaucratic burden on project developers.

Protecting Local Communities

Financing of blue carbon projects should align with principles of integrity, ethics, and respect for local communities and ecosystems, as per the [High-Quality Blue Carbon Principles and Guidance](#).

- Ensuring that social and environmental safeguards are integrated into these projects is crucial. This involves adhering to best practices that protect the rights and livelihoods of local communities, maintaining transparency and accountability in project execution, and preserving the ecological integrity of blue carbon ecosystems. By prioritizing these safeguards, blue carbon projects can achieve sustainable outcomes that benefit both the environment and the people who depend on these vital ecosystems.

Building Institutional and Community Capacity

- **Enhancing Technical Skills:** Offer training programs for local stakeholders, including project managers and community members, on the latest methodologies for carbon accounting, monitoring, and project implementation. Ensuring technical competency is crucial for generating reliable data, verifying project outcomes, and attracting investment.
- **Promoting Sustainable Livelihoods:** Develop programs that support alternative, sustainable livelihood options for coastal communities, ensuring they have viable economic alternatives that do not degrade blue carbon ecosystems. This helps protect the rights and interests of local populations while preserving the ecological integrity of these vital habitats.
- **Promoting Community Engagement:** Develop community outreach programs to ensure that local populations understand the benefits of blue carbon projects and are actively involved in their design and implementation. This fosters a sense of ownership and commitment, enhancing the long-term success of these initiatives.

- **Supporting Research and Development:** Fund research in new technologies and methods for monitoring and verifying carbon sequestration, to support the credibility and scalability of blue carbon markets. This will also help reduce costs in the long term as more cost-effective methods are developed.

Increasing International Collaboration and Knowledge Sharing

- **Leveraging existing platforms, participatory initiatives and networks** for sharing best practices, research findings, and financial strategies among countries and institutions involved in blue carbon:
 - ◆ Engage with established global initiatives like [the International Partnership for Blue Carbon \(IPBC\)](#), [the Blue Carbon Initiative \(BCI\)](#), the [Global Ocean Decade Programme for Blue Carbon \(GO-BC\)](#), the **High-Level Ambition Group for Blue Carbon (HILAG)**, the [Global Mangrove Alliance](#), and [the Mangrove Breakthrough](#) for scientific expertise and policy support.
 - ◆ Utilize regional partnerships such as the Indian Ocean Rim Association (IORA) Blue Carbon Hub. Other regional intergovernmental groups could implement similar models: CARICOM, ASEAN, among others.
 - ◆ Foster cross-sectoral collaboration among governments, NGOs, research institutions, and the private sector.
- **Leveraging global funding mechanisms:** Utilize international climate funds such as the Green Climate Fund, the Global Environmental Facility and others to finance large-scale blue carbon projects and policies, especially in developing countries.

Fostering Innovation in Financial Tools for Blue Carbon

- **Developing Specialized Blue Carbon Funds:** Establish funds dedicated to supporting the full lifecycle of blue carbon projects, from initial assessment (e.g., pre-feasibility or feasibility) through to long-term monitoring. These funds can provide crucial capital for early-stage project development, which is often a significant barrier to entry. They can also offer grants, concessional

loans, and technical assistance to ensure projects are scientifically sound and financially viable.

- **Expanding Insurance Products:** Create insurance products that mitigate the risks associated with blue carbon projects, encouraging more significant private sector investment. This includes indemnity insurance for unforeseen environmental impacts and parametric insurance that provides quick payouts after specific events such as storms or floods.
- **Innovating Financial Instruments:** Introduce financial instruments such as blue bonds and sustainability-linked loans specifically tailored for blue carbon initiatives. For instance, innovative processes to fund and/or aggregate small projects to create a scalable investment opportunity could be explored.
- **Leveraging Carbon Markets:** Facilitate access to carbon markets by developing and standardizing methodologies for quantifying and verifying carbon sequestration in blue carbon ecosystems. This enables projects to generate and sell carbon credits, creating a revenue stream that can support their long-term sustainability. Ensuring high standards and transparency in carbon credit transactions can build investor confidence and enhance market participation.
- **Blockchain technology** offers a transparent, secure, and efficient way to manage carbon credit trading. By leveraging blockchain, blue carbon projects can ensure the integrity of carbon credits, from issuance to retirement. Blockchain technology can facilitate carbon credit trading by using smart contracts, decentralized ledgers, and tokenization to ensure transparency, security, and efficiency.

Ensuring the Availability of Reliable and Consistent Data

Reliable and consistent data on blue carbon ecosystems are critical for multiple reasons:

1. *Carbon Credit Markets:* Precise measurements of carbon sequestration and storage are necessary to quantify credits, ensure additionality, and verify long-term carbon storage.
2. *Demonstrating Conservation and Restoration:* Robust data helps make a compelling case for preserving and restoring blue carbon ecosystems by quantifying climate mitigation potential, biodiversity benefits, and ecosystem services.

3. *Informing Sustainable Management Practices:* Accurate data on ecosystem health, carbon fluxes, and human impacts can guide sustainable management practices, helping balance economic activities with ecosystem preservation.
4. *Supporting Policy Development:* Reliable data informs the development of effective policies for blue carbon ecosystem protection and ensures that use of and development in blue carbon ecosystem areas are sustainable.
5. *Assessing Climate Change Impacts:* Consistent long-term data is vital for understanding how climate change affects blue carbon ecosystems, and in turn blue carbon ecosystems contribute to mitigating climate change, informing adaptation strategies and resilience planning.
6. *Economic Valuation:* Accurate data on the ecosystem services provided beyond carbon sequestration, is crucial for their full economic valuation. This helps distinguish economic valuation from the narrower financial returns.
7. *Monitoring Project Outcomes:* Reliable data is necessary to track the success of restoration and conservation projects, ensuring accountability and informing adaptive management.
8. *Parametric Insurance:* Accurate and consistent data is fundamental for developing parametric insurance products for blue carbon ecosystems. These insurance mechanisms, which pay out based on predefined parameters (e.g., storm intensity, sea level rise), require robust datasets to establish triggers and assess risks. Reliable data enables the design of more effective and financially viable insurance products, potentially unlocking new sources of funding for blue carbon conservation and restoration.

By implementing these recommendations, the blue carbon community can create a stronger foundation of reliable and consistent data. This will support the development of credible projects, inform effective policies, enable innovative financial products, and ultimately help realize the full potential of blue carbon ecosystems as nature-based solutions for climate change mitigation and adaptation, while also supporting sustainable development and biodiversity conservation.

Strengthening Public-Private Partnerships

Strengthening partnerships between public agencies and private entities is crucial to increasing funding for blue carbon activities. In order to build and maintain effective

public-private partnerships (PPPs) for blue carbon finance, designing mutually beneficial arrangements that leverage private expertise and resources for public conservation goals is crucial. Public-private partnerships should be structured in a way that balances risks between public and private sectors. Governments can manage policy and regulatory risks, while private entities handle operational and market risks. For example, simplifying regulatory processes and providing economic incentives such as tax breaks and subsidies can significantly enhance private sector participation.





6. Conclusion and call to action

This report serves as a call to action for all stakeholders involved in or affected by blue carbon activities to leverage existing and potential finance mechanisms to support the conservation, restoration, and sustainable management of blue carbon ecosystems.

In particular, financial institutions and investors are urged to explore innovative financing models that provide long-term support for blue carbon activities, while policymakers are encouraged to adopt and implement the proposed actionable recommendations to create conducive environments for the various blue carbon initiatives.

By synthesizing research and suggesting actionable recommendations, this report aims to equip all relevant parties with the knowledge and tools necessary to advance blue carbon actions globally, ensuring that these initiatives contribute effectively to the global climate and sustainability agenda.



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