PAPUA NEW GUINEA

BLUE CARBON POLICY ROADMAP

2025 - 2028

Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

The Nature Conservancy

Organisations Responsible for drafting the Roadmap

Climate Change and Development Authority and Conservation and Conservation and Environment Protection Authority.

Technical Support

Blue Carbon Technical Working Committee

Technical and Financial Support

The Nature Conservancy, MACBLUE, SPREP, Pacific Community, and GIZ

Disclaimer

The roadmap serves as a guiding framework aimed at enhancing the conservation and sustainable management of blue carbon ecosystems within Papua New Guinea (PNG). While every effort has been made to ensure the accuracy and completeness of the information presented, the nature of the evolving context surrounding climate change policies may necessitate adaptations over time.

The roadmap does not constitute legal advice and does not create any binding obligations. It is intended to facilitate strategic decision-making, stakeholder engagement, and implementation of effective blue carbon initiatives in alignment with national priorities and international commitments.

The Climate Change and Development Authority (CCDA) and the Conservation and Environment Protection Authority (CEPA) do not accept any responsibility for any actions taken or not taken based on the contents of this document. Stakeholders and implementers are encouraged to consult relevant experts and legal entities when interpreting and applying the provisions within this roadmap.

For any questions or further information, stakeholders are encouraged to reach out to CCDA or CEPA directly.

Contact Information

For feedback, inquiries, or further information regarding this roadmap, please contact:

- Climate Change and Development Authority
- Email: info@ccda.gov.pg
- Phone: (+675) 7411 2493

FOREWORD

As climate change presents increasingly complex challenges worldwide, the role of natural ecosystems in mitigating its effects has become more important than ever. Coastal wetlands-such as mangroves, seagrasses, and tidal marshes-stand out as some of the most effective systems for capturing and storing or sequestrating carbon. In PNG, these blue carbon ecosystems are vital not only for absorbing carbon dioxide from the atmosphere but also for preserving biodiversity, protecting our coastlines, and supporting the livelihoods of many communities.

It is with great enthusiasm that we present the “Papua New Guinea Blue Carbon Policy Roadmap.” This roadmap offers a comprehensive framework to strengthen our efforts in conserving and sustainably managing blue carbon resources. It aligns our national priorities with global climate goals, such as those outlined in the Paris Agreement and the United Nations Convention on Biological Diversity.

This document has been developed through extensive collaboration with various stakeholders, including government agencies, private sector, NGOs, academia, community groups, and international partners. It sets out a clear strategic vision for integrating blue carbon initiatives into our national climate policies. The roadmap highlights the importance of community engagement, data-driven decision-making, and robust financial mechanisms to ensure the effective implementation of projects that protect our coastal ecosystems.

Looking ahead, this roadmap will guide our policy development and serve as a pledge to inclusivity, particularly by empowering local communities-especially women and marginalised groups - to take an active role in managing their natural resources. The collective efforts detailed here reflect our shared responsibility to care for our environment and support the rights of those who depend on these ecosystems.

We invite all stakeholders to join in the ongoing implementation of this roadmap, contributing knowledge, resources, and innovative ideas to enhance the resilience of PNG’s blue carbon ecosystems. Together, we can unlock the full potential of these ecosystems to meet our climate goals and build a sustainable future for generations to come.

I am deeply grateful to everyone who has contributed to this important effort and am proud to present this roadmap as a key part of our strategy for a sustainable and resilient future for Papua New Guinea.

DEBRA SUNGI
Acting Managing Director,
PNG Climate Change Development Authority

ACKNOWLEDGEMENT

The development of the " Papua New Guinea Blue Carbon Policy Roadmap" has been a collective effort involving many dedicated individuals and organisations committed to the conservation and sustainable management of our vital blue carbon ecosystems. We extend our sincere gratitvude to all individuals and organisations involved in this important initiative.

We would like to express our sincere appreciation to The Nature Conservancy for their vision and support, which has been essential in guiding the development of this roadmap. A special thanks to New Guinea Prime for their expertise and dedication in leading the development of this roadmap, ensuring it aligns with national priorities and global climate goals.

We are also grateful to the Blue Carbon Technical Working Committee and participants of the various national stakeholders Blue Carbon consultation workshops for sharing their valuable insights and perspectives. Their contributions have been crucial in shaping a roadmap that reflects the diverse needs and interests of PNG's communities and ecosystems.

We also thank the government agencies, local communities, NGOs, and international partners, particularly MACBLUE, SPREP, Pacific Community, and GIZ, whose collaboration was vital during the information gathering and consultation stages. Their input was crucial in shaping the roadmap's objectives and strategies.

Finally, we acknowledge the Climate Change and Development Authority and the Conservation and Environment Protection Authority for their leadership in promoting an inclusive policy environment for blue carbon resource management.

Together, we look forward to implementing this roadmap and advancing the management of our blue carbon ecosystems for the benefit of future generations.

EXECUTIVE SUMMARY

Introduction

Papua New Guinea's Blue Carbon Policy Roadmap (2025-2028) outlines a strategic pathway for developing and implementing a national policy to conserve and sustainably manage blue carbon ecosystems, particularly mangroves, seagrasses, and tidal marshes. These ecosystems store vast carbon stocks, support biodiversity, and sustain coastal livelihoods, positioning PNG as a key contributor to global climate action.

The Roadmap builds on outcomes from the 2023 National Blue Carbon Workshop led by CCDA and TNC, which highlighted the need for a coordinated policy framework, clear tenure systems, gender inclusion, and alignment with existing REDD+ and national development strategies such as StaRS and MTDP IV.

It provides a structured, participatory process involving government, communities, NGOs, and the private sector, ensuring equitable benefit-sharing and inclusive governance. Key outcomes include a clear strategy and timeline for policy development, alignment with PNG's climate and biodiversity commitments, and a monitoring and evaluation framework to guide implementation.

Country Context

PNG is one of the world's most environmentally diverse nations, hosting vast tropical rainforests and globally significant blue carbon ecosystems, namely mangroves, seagrasses, and tidal marshes, that play a vital role in carbon storage, adaptation, and biodiversity conservation. Despite these natural riches, PNG faces major socio-economic challenges, including low literacy, gender inequality, and dependence on natural resource extraction.

The country is highly vulnerable to climate change, with coastal communities exposed to sea-level rise and erosion, and inland areas prone to floods and landslides. Women and rural populations, who rely heavily on coastal ecosystems, are disproportionately affected.

PNG's greenhouse gas profile fluctuates due to land-use changes, particularly deforestation. To address these challenges, PNG is advancing REDD+ and Blue Carbon initiatives to support low-carbon, climate-resilient, and inclusive sustainable development.

Nature-Based Climate Solutions - REDD+ and Blue Carbon

PNG is among the world's most forested countries, with over 33 million hectares of tropical forest that are central to climate regulation, biodiversity, and rural livelihoods. Through REDD+, PNG is reducing deforestation and promoting sustainable forest management under the National REDD+ Strategy (2017-2027), supported by strong monitoring and safeguard systems.

Building on REDD+, PNG is expanding into Blue Carbon initiatives focused on mangroves, seagrasses, and tidal marshes, ecosystems that store vast carbon stocks while protecting coastlines and supporting livelihoods. Integrating Blue Carbon into PNG's existing MRV framework will enhance carbon accounting and access to climate finance.

The revised Climate Change (Management) Act 2015 now includes carbon market provisions for both forests and coastal ecosystems. Community participation and gender inclusion remain key, exemplified by initiatives such as The Nature Conservancy's Mangoro Market Meri project, which empowers women in mangrove conservation and sustainable livelihoods.

Policy and Legal Framework for Coastal Wetland Blue Carbon Ecosystems

PNG's policy and legal framework for blue carbon ecosystems is anchored in national laws, policies, and international commitments that promote the sustainable management of mangroves, seagrasses, and tidal marshes. Key instruments include the Environment Act 2000, Climate Change (Management) Act 2015, Protected Areas Act 2024, and Fisheries Management Act 1998, which collectively safeguard marine and coastal resources.

These are supported by national strategies such as Vision 2050, MTDP IV (2023–2027), StaRS, and the National Oceans Policy (2020-2030), ensuring alignment between climate action, biodiversity conservation, and sustainable development. The National REDD+ Strategy and PNG Action Plan for Enhanced Transparency Framework on AFOLU and REDD+ National Forest Monitoring System (2022-2025) further enable integration of blue carbon data into PNG's climate reporting and NDCs.

Gender equality and inclusive participation are embedded across policies, ensuring equitable benefits for women, youth, and local communities in blue carbon conservation and management.

Needs Analysis for a PNG's Blue Carbon Policy

PNG's coastal ecosystems such as mangroves, seagrasses, and tidal marshes are vital for carbon storage, biodiversity, and coastal resilience but face increasing degradation from unsustainable use and climate impacts. A dedicated Blue Carbon Policy is needed to unify fragmented governance, clarify carbon rights, and integrate coastal ecosystems into national climate and development frameworks.

The policy will strengthen coordination between CCDA and CEPA, align with PNG's NDCs, MTDP IV, and StaRS, and establish systems for monitoring, reporting, and accessing climate finance. It will also promote equitable benefit-sharing and empower women and coastal communities as key stewards of blue carbon resources, linking conservation with sustainable livelihoods and national low-carbon growth.

Key Priority Areas for PNG Blue Carbon Policy

PNG's Blue Carbon Policy identifies five key priority areas to guide the conservation and sustainable use of mangroves, seagrasses, and tidal marshes. These include:

1. Legal, Governance, and Institutional Frameworks - Establishing clear mandates, coordination mechanisms, and inclusive governance between CCDA, CEPA, and communities.

2. Policy and Reporting - Integrating blue carbon into national climate and biodiversity frameworks and ensuring transparent, gender-responsive monitoring.

3. Inventory, Data Collection, and Mapping - Developing a national blue carbon database aligned with NFMS and IPCC methodologies.

4. Community Engagement and Conservation - Promoting community-led management, equitable benefit-sharing, and women's participation.

5. Finance and International Cooperation - Mobilising sustainable finance through carbon markets, PES, and partnerships with GCF, GEF, and others.

Ongoing initiatives such as TNC's Mangoro Market Meri and GIZ's MACBLUE project demonstrate growing

momentum. The policy will build on these efforts to strengthen governance, financing, and data systems, positioning PNG as a regional leader in blue carbon management and climate action.

Vision, Mission and Objectives for PNG Blue Carbon Policy

Vision
To establish PNG as a regional leader in blue carbon management, where coastal and marine ecosystems are sustainably managed, protected, and restored, contributing to climate change mitigation and adaptation, biodiversity protection, and the well-being of local communities.

Mission
To identify, designate and sustainably manage PNG's blue carbon ecosystems by ensuring their conservation, integration into national climate action, and delivering benefits to local communities that depend on these vital resources, while strengthening legal frameworks and enhancing institutional coordination to promote effective governance and collaborative management of these ecosystems.

Goal
To ensure the sustainable management, conservation and restoration of PNG's blue carbon ecosystems, contributing to environmental resilience and the well-being of local communities.

Objective
To promote the long-term conservation and restoration of PNG's blue carbon ecosystems, ensuring their role in climate change mitigation and adaptation, biodiversity protection, and improving the livelihoods of local communities dependent on these resources.

Key Principles
The PNG Blue Carbon policy is guided by four key principles.
I. The principle of equal participation
II. Best practice science
III. Safeguard nature and maximise biodiversity
IV. Empower people

Governance and Operational Arrangements

The Blue Carbon Policy establishes an inclusive governance framework co-led by the CCDA and the CEPA to guide coordination, implementation, and reporting of blue carbon initiatives. It promotes multi-level stakeholder engagement, national to community, ensuring the participation of customary landowners, women, and marginalised groups under Free, Prior, and Informed Consent (FPIC) principles. Two key bodies, the Blue Carbon Technical Working Committee (BCTWC) and Blue Carbon Advisory Committee (BCAC), provide technical and strategic oversight. Supported by strong monitoring, transparency, and capacity-building mechanisms, this governance structure ensures effective collaboration, accountability, and integration of blue carbon ecosystems into PNG's climate policies and sustainable development goals.

Roadmap for Policy Development and Implementation

The 2025-2028 PNG Blue Carbon Policy Roadmap provides a phased approach for developing, implementing, and scaling up the national Blue Carbon Policy. It outlines key actions, objectives, and outcomes aligned with the five policy priority areas: governance, reporting, data management, community engagement, and finance.

Phase 1 (2025): Research and Consultation - Baseline data collection, stakeholder consultations, and identification of barriers and opportunities to inform the policy framework.

Phase 2 (2025-2026): Policy Development and Endorsement - Drafting, reviewing, and finalising the Blue Carbon Policy, followed by official government endorsement and capacity-building programmes for stakeholders and local communities.

Phase 3 (2027-2028): Implementation and Evaluation - Establishment of a monitoring, reporting, and evaluation (M&E) framework; pilot testing and scaling up of Blue Carbon projects; and submission of a final implementation report to government and stakeholders.

Integration of Blue Carbon Ecosystems into PNG's NDC and International Commitments

Integrating mangroves, seagrasses, and tidal wetlands into Papua New Guinea's Nationally Determined Contributions (NDCs) is central to achieving national climate goals under the Paris Agreement. These ecosystems act as major carbon sinks and natural defences against climate impacts. From 2025-2030, PNG will establish a National Blue Carbon Inventory System, adopt IPCC methodologies, and integrate blue carbon into its REDD+ and MRV frameworks. Led by CCDA and CEPA, the process includes policy alignment, pilot projects, capacity-building, and the inclusion of blue carbon targets in future NDC updates.

Financing and Resource Mobilisation

Securing sustainable financing is vital for implementing PNG's Blue Carbon initiatives. The policy promotes a mix of market and non-market mechanisms, including carbon trading, Payments for Ecosystem Services (PES), grants, and public funding to support conservation and community-based projects. Funding will come from national budget allocations and international partners such as the GCF, GEF, ADB, and World Bank, complemented by innovative tools like Public-Private Partnerships, nature bonds, and debt-for-nature swaps. This blended approach aims to mobilise resources, strengthen capacity, and ensure the long-term sustainability of PNG's Blue Carbon initiatives.

Summary and Conclusion

The PNG Blue Carbon Policy Roadmap outlines a national framework to integrate blue carbon ecosystems into climate policies and the NDCs, aligning with global climate goals. It emphasises community participation, traditional knowledge, and gender inclusion to ensure effective and locally driven conservation. The roadmap strengthens data management, capacity-building, financing, and monitoring systems to support sustainable implementation. Its successful execution will enhance governance, attract climate finance, and improve the resilience of coastal ecosystems and communities that depend on them.

Contents

List of Figures

List of Tables

List of Abbreviations

BC: Blue Carbon
BCAC: Blue Carbon Advisory Committee
BCTWC: Blue Carbon Technical Working Committee
BCE: Blue Carbon Ecosystem
UNCBD: United Nations Convention on Biological Diversity
CBOs: Community-Based Organisations
CACC: Central Agencies Coordinating Committee
CCDA: Climate Change and Development Authority
CCMA: Climate Change Management Act
CEPA: Conservation and Environment Protection Authority
DPLGA: Department of Provincial and Local Government Affairs
DJAG: Department of Justice and Attorney General
DLPP: Department of Lands and Physical Planning
DNPM: Department of National Planning and Monitoring
EEZ: Exclusive Economic Zone
FPIC: Free, Prior, and Informed Consent
GCF: Green Climate Fund
GEF: Global Environment Facility
GESI: Gender Equality and Social Inclusion
GHG: Greenhouse Gas
IPCC: Intergovernmental Panel on Climate Change
LMMA: Locally Managed Marine Areas
LLG: Local Level Government
MPA: Marine Protected Area
MRV: Measurement Reporting and Verification
MTDP IV: Medium-Term Development Plan IV (2023-2027)
NAP: National Adaptation Plan
NBSAP: National Biodiversity Strategic Action Plan
NDC: Nationally Determined Contribution
NEC: National Executive Council
NFA: National Fisheries Authority
NOO: National Oceans Office
NOP: National Oceans Policy
NRI: National Research Institute
OSS: Office of State Solicitor
PAP: Protected Areas Policy
PES: Payment for Ecosystem Services
PNG: Papua New Guinea
PNGFA: Papua New Guinea Forest Authority
PPPs: Public-Private Partnerships
REDD+: Reducing Emissions from Deforestation and Forest Degradation
SDGs: Sustainable Development Goals
NSLUP: National Sustainable Land Use Policy
StaRS: National Strategy on Responsible and Sustainable Development
TNC: The Nature Conservancy
UNCLOS: United Nations Convention on the Law of the Sea
UNFCCC: United Nations Framework Convention on Climate Change
UNITECH: Papua New Guinea University of Technology

UNRE: University of Natural Resources and Environment
UPNG: University of Papua New Guinea

1. Introduction

1.1 Overview

The significance of coastal wetland blue carbon ecosystems (hereinafter blue carbon ecosystems) - comprising mangroves, seagrasses, and tidal marshes - has gained increasing recognition as a vital component in the global response to climate change. These ecosystems play a crucial role in carbon sequestration, storing substantial amounts of carbon in their biomass and sediments. PNG is particularly well-positioned in this regard, possessing one of the highest mangrove carbon stocks in the world (Hamilton and Friess,2018). The conservation and sustainable management of these ecosystems not only contribute to climate change mitigation but also provide co-benefits such as biodiversity conservation, enhanced livelihoods for local communities, and improved resilience against climate impacts.

In March 2023, a National Stakeholders Blue Carbon Workshop was convened in Port Moresby, organised by the PNG Climate Change and Development Authority (CCDA) and The Nature Conservancy (TNC). The workshop aimed to assess the status of blue carbon activities in PNG, inform decision-makers about the challenges and opportunities in addressing Blue Carbon, and strengthen coordination among stakeholders. The outcomes of this workshop reaffirmed the commitment to develop a national blue carbon policy that aligns with PNG's national development strategies and international climate commitments.

Figure 1: *Blue Carbon Workshop Participants*

The workshop highlighted the need for a robust policy framework that clearly defines blue carbon ecosystems and establishes tenure regimes that respect local community rights and the specific need to ensure gender is considered. It also emphasised the importance of aligning blue carbon initiatives with existing REDD+ strategies to create a nested approach that integrates various carbon projects. By doing so, PNG can leverage its rich biodiversity and high carbon stocks to contribute meaningfully to global climate efforts while ensuring sustainable development and enhanced community livelihoods.

As PNG moves forward in developing its Blue Carbon Policy Roadmap, it is imperative to consider the political support for low carbon growth, as evidenced in national strategies such as the National Strategy on Responsible and Sustainable Development (StaRS) and the Medium-Term Development Plan 4 (MTDP IV). The successful implementation of blue carbon initiatives will require collaboration among government agencies, local communities, NGOs, and the private sector, ensuring that the principles of fair and equitable sharing of benefits are ensured, and contribute to the overall resilience of coastal ecosystems and communities.

The Blue Carbon Policy Roadmap for PNG (2025 - 2028) will guide Blue Carbon initiatives with clear actions, timelines, and institutional roles, ensuring a structured approach to policy development, capacity building, and

implementation. By providing a long-term vision, the roadmap will support PNG in maximising the ecological, social, and economic benefits of blue carbon ecosystems while strengthening its position in global climate action.

The roadmap will also pave the way for integrating gender equality and social inclusion into the PNG Blue Carbon Policy by ensuring women, youth, and marginalised groups are actively and intentionally involved in decision-making and benefit sharing. It will establish frameworks that promote equitable participation, creating a more inclusive and sustainable approach to blue carbon initiatives in the country.

1.2 Objectives of the Roadmap

The primary objective of this Roadmap is to provide a structured and strategic pathway for the formulation of PNG's Blue Carbon Policy. It seeks to ensure that the Policy is firmly grounded within existing national frameworks and fully aligned with PNG's international commitments on environmental protection, biodiversity conservation, and climate change action.

The roadmap achieves this by synthesising information on blue carbon ecosystems, mapping key stakeholders, and aligning blue carbon ecosystem conservation initiatives with existing national policies and international frameworks. Importantly, it promotes an inclusive and participatory approach that engages government institutions, local communities, women, youth, and other key stakeholders, recognising their vital roles in the sustainable management of blue carbon ecosystems and in advancing equitable, climate-resilient, and biodiversity-positive outcomes for all.

1.3 Expected Outcomes

The Blue Carbon Policy Roadmap is expected to achieve the following outcomes:

I. Establish a clear strategy for policy development, including key milestones, stakeholder engagement, and a timeline for completion, while ensuring broad consensus and clear roles for all stakeholders.

II. Align the policy objectives and targets with PNG's international climate and biodiversity commitments and national priorities, ensuring they reflect diverse perspectives and gain widespread support.

III. A streamlined process for policy formulation, including an approved timeline to keep development on track and ensure effective implementation.

IV. A framework for monitoring and evaluation (M&E) to track the progress of the policy's implementation, measure its effectiveness, and enable adaptive management as needed.

1.4 Formulation of the Blue Carbon Policy Roadmap

The PNG Blue Carbon Policy Roadmap is being developed by CCDA and CEPA, in partnership with TNC and GIZ. This initiative builds on insights from the National Stakeholders Blue Carbon Workshop held in March 2023 in Port Moresby. The workshop brought together stakeholders to evaluate the state of blue carbon activities in PNG, identify challenges and opportunities, and enhance collaboration.

Figure 2: *Technical writeshops for the Blue Carbon Policy Roadmap*

Two technical writeshops for the Blue Carbon Policy Roadmap Technical Working Group were conducted. The first took place from 23-27 September 2024 at Koitaki Country Club in Central Province, and the second was held from 31 March - 2 April 2025 at Lamana Hotel, Port Moresby.

National stakeholder consultations included an initial National Blue Carbon Policy Roadmap Consultation Workshop held on 21-22 August 2024 in Port Moresby. This was followed by a second consultation workshop on 31 May 2025, an internal validation meeting on 15 August 2025, and a final national validation workshop on 23 October 2025, all held in Port Moresby. Additionally, some stakeholders provided feedback electronically without attending the writeshops or workshops in person.

The key documents informing the BC Policy roadmap include the Blue Carbon Situational Analysis Report by TNC, the PNG Blue Carbon Policy and NDC Alignment roadmap, which identifies the five key priority areas outlined in Chapter 5, and the Blue Carbon Legislative Review. Other important sources include PNG National Biodiversity Strategic Action Plan 2019 -2024, Protected Areas Policy Implementation Plan 2018-2028, and the National REDD+ Strategy 2017-2027.

Figure 3*: Participants at the National Blue Carbon Policy Roadmap Consultation Workshop at Stanley Hotel, Port Moresby, August 2024 (PC: MACBLUE, 2024)*

2. Country Context

2.1 Geographic and Environment Overview

PNG is one of the most geographically and environmentally diverse countries in the world. The country comprises of the eastern half of New Guinea island, the four islands of Manus, New Britain, New Ireland and Bougainville, and 600 smaller islets and atolls.

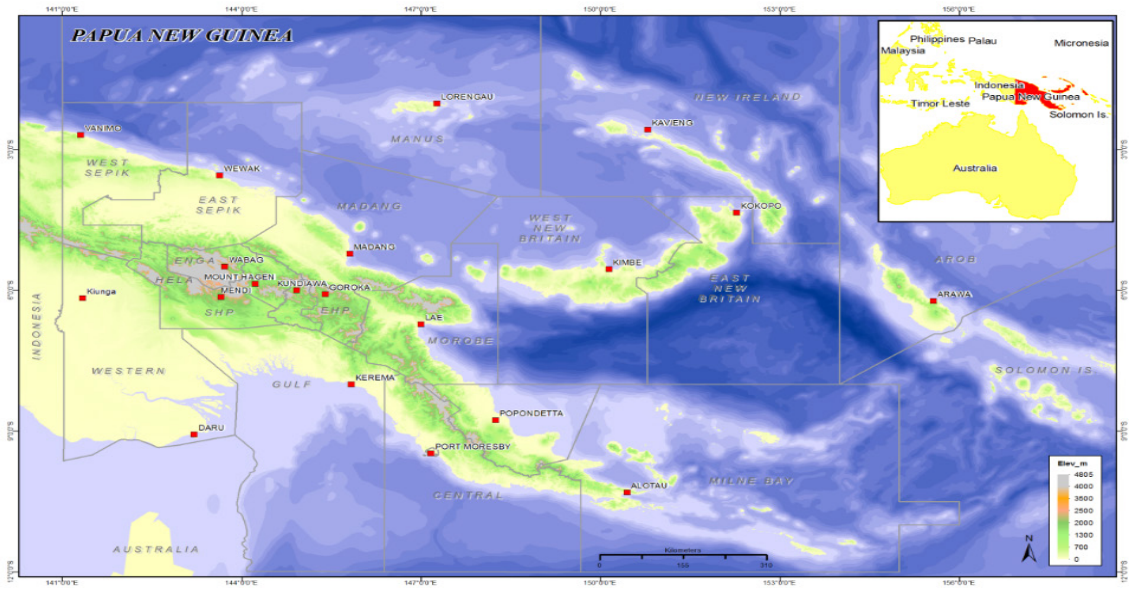


Figure 4: *Map of Papua New Guinea*

PNG's total land area is 462,840 square kilometres (km^2) and its Exclusive Economic Zone is 3,120,000 km^2 making it the largest Pacific island country. It has a coastline of 17p,000 km, more than 5,000 lakes, extensive river systems and wetlands. The species-rich mainland coastline includes more than 8,000 km of mangrove swamps, lagoons, wetlands, coral reefs and atolls, as well as island archipelagos and many offshore islands. PNG's geography is diverse that enables diversity in species, landscapes and ecosystems. The New Guinea Highlands extends the length of the main island of New Guinea and is predominantly tropical highland rainforest and alpine grassland. Dense rainforests, savannahs and grassland are in the lowland and coastal regions, as well as large wetland systems associated with the Sepik and Fly rivers.

PNG's marine and coastal ecosystems are globally recognised for their high level of marine biodiversity, with approximately 2,800 fish species, 10 per cent of the world's total diversity of fish species, over 600 species of coral reefs, 1,000 reef building species, 33 mangrove species (UNESCO 2022) and seagrass flora consisting of 13 species (McKenzie, L.J. et. Al, 2021). PNG's globally significant blue carbon ecosystems include 13,840 km2 of coral reefs4 which constitute about 6 percent of the global coverage, mangroves forests that stretch over 4,524 km² which represents a linear coverage of 33 percent of the entire coastline of the country (Global Mangrove Watch, 2020) and also accounts for 75 percent of the mangroves in the Pacific (UNESCO 2022), and extensive seagrass beds.

PNG houses the third largest rainforest country in the world after Congo and Amazon. The tropical forests in PNG cover about 78 percent (PNGFA 2022) of the total land mass. The forest is described as "an *ecological wonder and one of the last places in the world where large unbroken expanses of tropical rainforest still abound*." (Bryan, J.E., Shearman, P.L. (Eds). 2015) The tectonic history of the land has also endowed the island with oil and gas and precious stones. PNG has been ranked 11th largest gold producer in the world, and 10th in copper

production, and with new mining explorations, may exceed the present production level.[1]

2.2 Socio-Economic Development and Climate Challenges

However, despite its abundant resources, PNG is classified as a developing nation. The country grapples with low socio-economic development indicators, including a literacy rate of just 63.5 percent (Buk Bilong Pikinini 2025), high child mortality, and endemic diseases such as tuberculosis. Weak governance structures, low institutional capacity, and gender inequality further hinder development. PNG's economy primarily depends on the extraction of natural resources, such as agriculture, forestry, fisheries, and mining, with little development of manufacturing industries.

Globally, PNG ranks close to the bottom for gender development, women's economic opportunity are constrained by limited access to credit and land, and rates of gender-based violence are very high. Women in PNG are at a significant social, economic and political disadvantage when compared to women in other countries - and to men in PNG. In coastal areas women rely heavily on blue carbon ecosystems to provide for their families. These considerations are critical when developing a fair and equitable blue carbon roadmap for PNG.

The nation's forests, which hold great potential for REDD+ (Reducing Emissions from Deforestation and Forest Degradation), face increasing pressure due to deforestation driven by logging, agricultural expansion, and infrastructure development. PNG's commitment to combat climate change through REDD+ initiatives offers an opportunity for sustainable development, focusing on low-carbon growth while preserving forests. Alongside traditional forest-based carbon solutions, the country is embracing Blue Carbon as a complementary strategy for climate change mitigation and adaptation.

2.2.1 Impacts and Vulnerability

PNG ranks among the top ten countries globally considered most at risk from the impacts of climate chang (World Risk Report, 2016). Its diverse geography contributes to varying levels of exposure and vulnerability across regions. The highlands, for instance, frequently face heavy rainfall, increasing the likelihood of landslides and flash flooding. Meanwhile, coastal areas, small islands, and low-lying atolls are particularly susceptible to rising sea levels, storm surges, and coastal erosion.

With around 75 to 80 percent of the population living in rural settings, many communities are highly exposed to climate-related hazards (Papua New Guinea's Voluntary National Review, 2020). These populations primarily depend on subsistence agriculture for their daily livelihoods and have limited means to adapt to or recover from climate shocks. Physical isolation caused by mountainous terrain, poor road connectivity, and insufficient infrastructure such as bridges and health centres further restricts access to essential services and economic opportunities.

Women in rural areas are disproportionately affected, often lacking secure land tenure, access to income, credit, and critical resources. This inequality significantly limits their resilience in the face of climate-related disasters.

Young people also represent a vulnerable demographic. Nearly 60 percent of PNG's population is under 25, with many affected by poverty due to limited educational and employment prospects (Papua New Guinea Young People, 2018). Youth literacy rates show disparities as well: about 67 percent of young men and 79 percent of young women are literate (Education for all, 2015). Furthermore, approximately 28.4 percent of individuals aged 15 - 24 are neither working nor enrolled in education or skills training programs (ILO, 2020).

Looking ahead, PNG's climate is expected to undergo notable changes. According to the Commonwealth Scientific and Industrial Research Organization (CSIRO), the country is likely to experience increases in temperature, rainfall intensity, and extreme weather events over the 21st century. Table 1 outlines these projections along with the confidence levels associated with each.

1 https://www.ipa.gov.pg/agriculture/mining/ Accessed 26/03/2021

Climate Variable	Projected Change	Confidence Level
Surface air temperature	Increase	Very high
Sea surface temperature	Increase	Very high
Annual mean rainfall	Increase	High
Seasonal mean rainfall	Increase	High
Intensity/frequency of extreme heat days	Increase	Very high
Intensity/frequency of extreme rainfall days	Increase	High
Incidence of drought	Decrease	Moderate
Frequency of tropical cyclones	Decrease	Moderate
Ocean acidification	Continue	Very high

Table 1: *Climate Projections for PNG. Source: PNG Enhanced NDC (2020)*

2.2.2 Summary of Emissions and Removals for PNG

The recent greenhouse gas (GHG) inventory for PNG is detailed in the Second Biennial Update Report (BUR2), submitted to the UNFCCC in 2022. According to BUR2, PNG's GHG status shifted from a net sink of -12,436 kt CO_2 equivalent in 2000 to a net source of 6,897 kt CO2 in 2016. However, in 2017, PNG returned to being a net sink with total GHG emissions of -1,958 kt CO_2. The fluctuations are primarily driven by the Land Use, Land-Use Change, and Forestry (LULUCF) sector, particularly due to deforestation and degradation. Excluding the LULUCF sector, total net emissions increased from 8,052 kt CO_2 equivalent in 2000 to 10,767 kt CO_2 equivalent in 2017, marking a 34% rise. This increase is mainly attributed to higher fossil fuel consumption in manufacturing industries and construction, as well as road transportation.

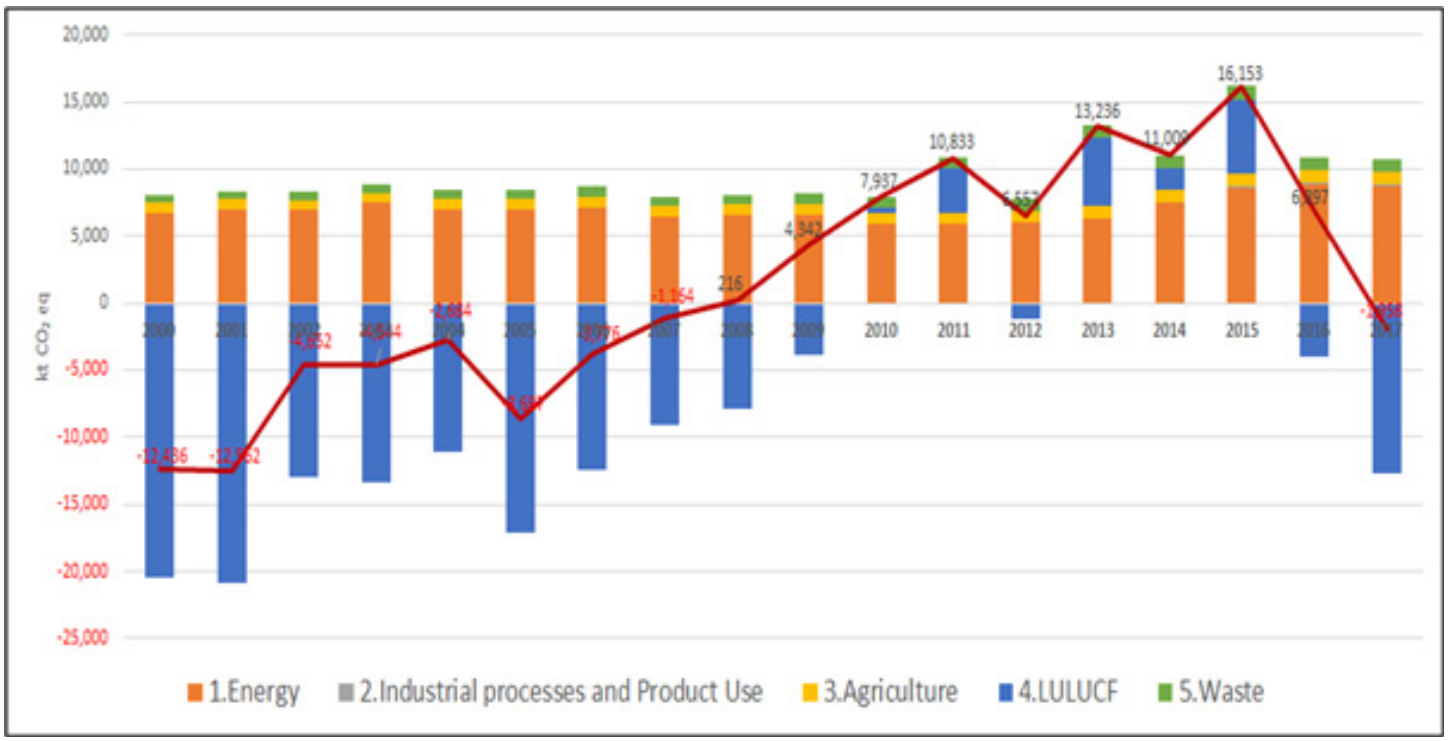


Figure 5: *Total GHG emissions with LULUCF from 2000 to 2017. Source: PNG BUR2 (2022)*

3. Nature-Based Climate Solutions - REDD+ and Blue Carbon

3.1 PNG's Forests and the REDD+ Opportunity

PNG is home to over 33 million hectares of tropical forest, covering approximately 78% of its land area, making it one of the most forested countries in the world. These forests are vital for climate regulation, carbon storage, biodiversity conservation, and the livelihoods of rural communities.

Under the UNFCCC framework, PNG is actively implementing REDD+ (Reducing Emissions from Deforestation and Forest Degradation) as a central pillar of its climate change mitigation strategy. REDD+ provides performance-based financial incentives to countries that reduce emissions through improved forest conservation, sustainable forest management, and enhanced forest carbon stocks.

The REDD+ is led by the CCDA in collaboration with the PNG Forest Authority (PNGFA) and others. Key activities include:

- Reducing deforestation and degradation;
- Promoting sustainable forest management;
- Enhancing forest carbon stocks;
- Supporting conservation and community-based forestry initiatives.

Progress to date includes the development of a National REDD+ Strategy (2017–2027), establishment of a Forest Reference Level (FRL), a functioning National Forest Monitoring System (NFMS) and Safeguards Information System (SIS), and institutional frameworks for monitoring, reporting, and verification (MRV).

As REDD+ implementation progresses into the results-based payment phase, PNG is focusing on strengthening legal frameworks, ensuring inclusive stakeholder participation, and establishing robust benefit-sharing mechanisms to ensure transparent and equitable outcomes for forest-dependent communities.

3.2 Coastal Ecosystems and Blue Carbon

Blue Carbon refers to carbon stored in coastal and marine ecosystems such as mangroves, seagrasses, and tidal marshes. These ecosystems are highly efficient at capturing and storing carbon, providing significant potential for climate change mitigation. PNG's coastal ecosystems-spanning over 46,000 km² of estuaries, bays, lagoons, and coral reefs-are rich in biodiversity and hold immense potential for Blue Carbon projects.

Mangroves, in particular, are a key focus in PNG, which is among the top four countries contributing to global mangrove carbon stocks (Hamilton, S. E., & Friess, D. A. 2018). Given their ability to store significant amounts of carbon in both their biomass and sediments, mangrove restoration and conservation are central to PNG's climate action strategies. In addition to climate mitigation, Blue Carbon projects offer co-benefits, including biodiversity conservation, enhanced coastal adaptation and resilience to climate impacts such as storms and sea-level rise, and the creation of alternative livelihoods for coastal communities.

3.3 Comparative Overview - REDD+ and Blue Carbon

While both REDD+ and Blue Carbon fall under the umbrella of nature-based solutions, they differ in ecosystem type, institutional lead, policy maturity, and geographic focus. REDD+ has a more established framework in PNG, while Blue Carbon is an emerging area with significant potential, particularly for coastal communities.

Feature	REDD+	Blue Carbon
Ecosystem Type	Inland tropical forests	Coastal and marine ecosystems (mangroves, seagrasses, tidal marshes)
Geographic Focus	Highlands, lowlands, forest-rich provinces	Coastal provinces and island regions
Carbon Storage Medium	Forest biomass and soils	Biomass and sediment in coastal ecosystems
Institutional Lead	Climate Change and Development Authority (CCDA), PNG Forest Authority (PNGFA)	Climate Change and Development Authority (CCDA), Conservation and Environment Protection Authority (CEPA)
Policy Maturity	Advanced - PNG has developed a National REDD+ Strategy (2017- 2027), Forest Reference Level (FRL), Safeguard Information System (SIS), and a National Forest Monitoring System (NFMS)	Emerging - PNG is in the process of developing the Pacific region's first National Blue Carbon Policy, expected by 2028
Climate Contribution	Mitigation under NDCs, with potential for adaptation co-benefits	Both mitigation and adaptation; strong potential for Article 6.2 market participation and ecosystem resilience
Main Activities	Reducing emissions from deforestation and degradation, forest conservation, sustainable management, enhancement of carbon stocks, afforestation	Conservation and restoration of mangroves and seagrasses, coastal zone management, nature-based livelihoods
Drivers of Degradation	Commercial logging, forest fires	Urban development, mining, and coastal infrastructure
Carbon Market Engagement	PNG has participated in voluntary markets but imposed a moratorium in March 2022 due to governance gaps; the moratorium has since been lifted with regulatory reforms underway	No registered blue carbon projects in the voluntary carbon market yet; carbon rights in mangrove areas remain unclear.
Carbon Rights	Generally retained by customary landholders; requires clear benefit-sharing mechanisms	Legal clarity still evolving; establishing carbon rights for mangrove areas is an ongoing policy challenge
Community Involvement	Strong emphasis on customary landownership and community engagement through benefit-sharing and consultation mechanisms	Community-led initiatives emerging (e.g. mangrove protection in New Ireland); emphasis on sustainable livelihoods such as fisheries and ecotourism
Co-benefits	Biodiversity conservation, water regulation, cultural values, local employment	Coastal protection, disaster risk reduction, fisheries support, ecotourism, biodiversity resilience
Key Projects and Initiatives	National REDD+ Strategy implementation; PNG's participation in the Forest Carbon Partnership Facility (FCPF); readiness for jurisdictional results-based payments (e.g. ART-TREES)	MACBLUE Project (regional); New Ireland Mangrove and Seagrass Biodiversity Conservation and Livelihoods Initiative
Carbon Market Regulation	In development - the Climate Change (Management) Act 2015 is being revised to incorporate carbon market regulations and a compliance division under CCDA	Same framework expected to regulate blue carbon under Article 6.2 and voluntary markets once established

Threats	Deforestation from large-scale agriculture, infrastructure development	Mangrove loss from mining exploration, unregulated coastal activities
Sustainable Development Linkages	Contributes to PNG's Vision 2050, MTDP IV, and SDGs (e.g. Goals 13, 15)	Supports SDGs (e.g. Goals 13, 14, 15), enhances coastal livelihoods, and integrates gender and social inclusion
GHG Inventory and Reporting	REDD+ emissions/removals are tracked under PNG's NFMS and National GHG Inventory in line with IPCC 2006 Guidelines	Potential to expand NFMS to cover wetlands using the 2013 IPCC Wetlands Supplement; reporting integration is under consideration
MRV System	Established MRV system under CCDA covering forest emissions and REDD+ results-based reporting	Opportunity to build on the existing MRV infrastructure to include mangrove and seagrass carbon through enhanced coordination with CEPA

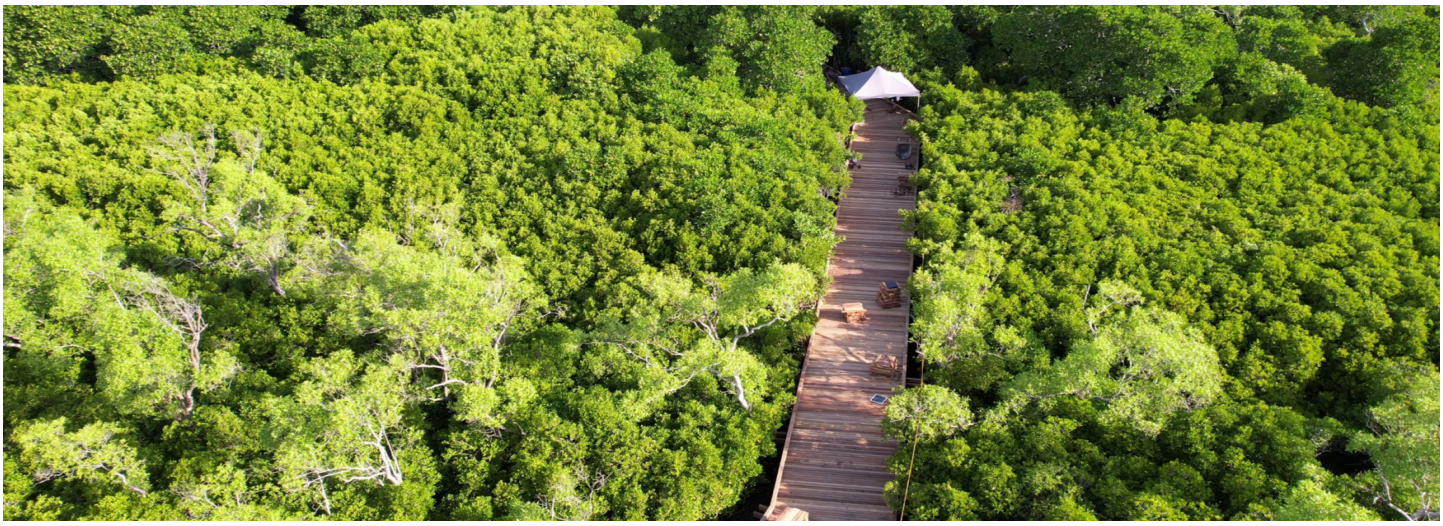
Table 2: *REDD+ vs Blue Carbon in PNG*

3.4 REDD+ and Blue Carbon Integration

The REDD+ framework provides a strong foundation for supporting Blue Carbon initiatives in PNG, particularly through mechanisms such as the Wetlands Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. This extension enables countries to account for carbon emissions and removals in wetlands and coastal ecosystems, including mangroves and seagrass meadows. As such, it offers a pathway for integrating coastal ecosystems into the broader landscape of climate mitigation, while simultaneously enhancing adaptation and resilience outcomes.

PNG has made significant progress in operationalising REDD+, including the development of the Forest Reference Level (FRL), the National REDD+ Strategy (NRS), and a functional national MRV system housed under the CCDA. This MRV system supports the tracking of emissions and removals from land use, land-use change, and forestry (LULUCF) sectors in accordance with REDD+ requirements and uses methodologies consistent with the 2006 IPCC Guidelines and the Wetlands Supplement where applicable.

PNG's MRV system serves as a central data repository for REDD+ reporting and supports the generation of data for the national greenhouse gas (GHG) inventory, a key component of the Biennial Transparency Reports (BTRs) and National Communications (NCs) submitted to the UNFCCC. These inventory arrangements are guided by the Enhanced Transparency Framework (ETF) of the Paris Agreement, which calls for improved completeness, consistency, and comparability of GHG data.



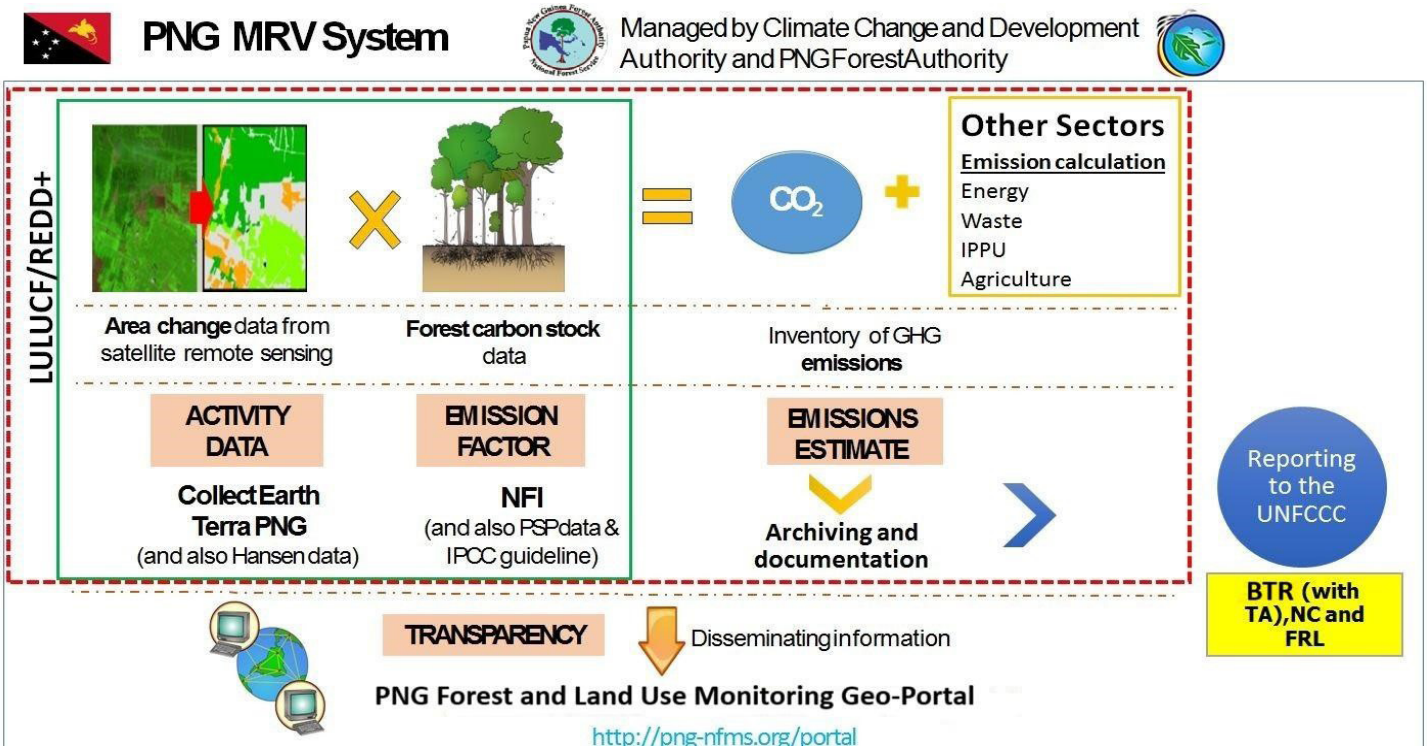


Figure 6: *PNG Measurement Reporting and Verification System*

Recognising the growing importance of Blue Carbon, there is an opportunity to expand the existing REDD+ MRV system to include coastal ecosystems, such as mangroves and seagrass beds. PNG's mangrove areas already fall within jurisdictions where REDD+ activities are taking place, offering natural entry points for integration. By incorporating Blue Carbon data into the national MRV framework, PNG can more comprehensively account for its carbon stocks and fluxes, improve transparency in climate reporting, and strengthen eligibility for results-based payments under international frameworks.

Initial efforts include:

- Mapping and stratification of mangrove forests and seagrass ecosystems using remote sensing and field data;
- Developing emission factors specific to PNG's coastal ecosystems;
- Establishing monitoring protocols aligned with IPCC Wetlands Guidelines and REDD+ safeguards;
- Integrating coastal carbon data into the National GHG Inventory and REDD+ reporting.

As PNG advances towards the results-based payment phase of REDD+, ensuring the inclusion of coastal ecosystems within its MRV system will be crucial for maximising the country's climate finance opportunities and achieving a more integrated, ecosystem-based mitigation and adaptation strategy.

To enable this, the Climate Change Management Act (CCMA 2015) has been revised to include explicit provisions for carbon market regulation, encompassing both terrestrial and marine ecosystems. The CCDA is also establishing a dedicated compliance division to oversee implementation, improve safeguards, and ensure that all carbon trading activities in PNG, whether from REDD+ or Blue Carbon sources, are transparent, credible, and aligned

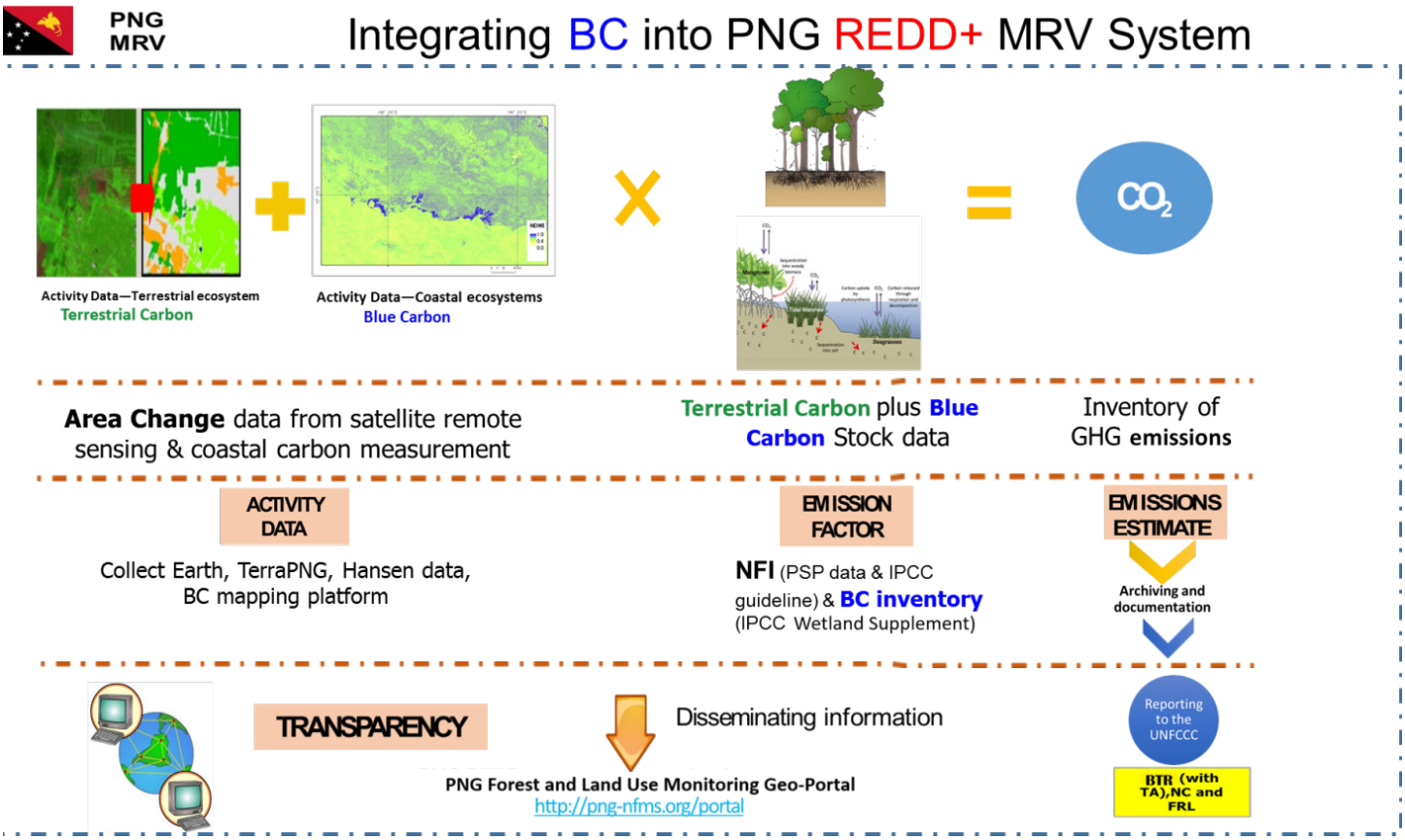


Figure 7: *REDD+ and Blue Carbon Integration*

3.5 Gender and Community Engagement in Blue Carbon Projects

In addition to serving as nurseries for juvenile fish, blue carbon ecosystems such as mangroves critically support the food security and livelihoods of many coastal communities. Women and their children particularly rely heavily on mangroves, and for fish, crabs and shellfish for household consumption, and sale for cash income. However, women are often excluded when these areas are negotiated for blue carbon and other development projects. Women are not consulted and tend to do the bulk of childcare and household tasks, thus reducing their available time to participate in decision-making and income generation associated with development including blue carbon.

The Mangoro Market Meri (MMM) initiative, led by The Nature Conservancy (TNC), exemplifies efforts to empower women in coastal communities by engaging them in mangrove restoration and conservation activities. The MMM project focuses on improving livelihoods, promoting ecotourism, and integrating women into Blue Carbon projects. In four provinces- Madang, Manus, Milne Bay, and Central - local women participate in activities such as mangrove planting, nursery management, and food harvesting, while also contributing to the broader conservation goals of the project.

Although these projects are still in their pilot phases and lack formal legal protection for conservation, they highlight the potential for community-based Blue Carbon initiatives to promote sustainable economic development, especially for women in rural areas.

Box 1: What are Blue Carbon Initiatives?

Blue Carbon initiatives, as used in this document, refer to efforts aimed at the conservation and restoration of coastal wetland ecosystems, specifically mangroves, seagrasses, and tidal marshes, as well as the development of projects under the blue carbon market. These efforts include both general conservation activities and initiatives designed to generate carbon credits through verified blue carbon methodologies.

4. Policy and Legal Framework for Coastal Wetland Blue Carbon Ecosystems

The policy and legal framework governing coastal wetland blue carbon ecosystems in PNG comprises a range of interlinked national laws, policies, and international commitments that collectively guide the management, conservation, and sustainable use of marine and coastal environments. These instruments provide the foundation for safeguarding key blue carbon ecosystems, including mangroves, seagrasses, and tidal, which play a vital role in climate change adaptation and mitigation, biodiversity conservation, and community resilience.

4.1 Key multilateral environment agreement (MEAs)

a) United Nations Convention on Biological Diversity (UNCBD)

The UNCBD focuses on three pillars: conserving biodiversity, sustainably using its resources, and equitably sharing its benefits. These principles protect ecosystems, promote responsible resource use, and ensure fair distribution of benefits, including to local communities.

b) United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is focused on stabilising greenhouse gas emissions and addressing climate change. It also oversees the Kyoto Protocol and Paris Agreement to promote global action on climate goals.

c) RAMSAR Convention on Wetlands of International Importance

Aimed at conserving wetlands of international importance, promoting their sustainable use to protect biodiversity and support ecosystem services like water regulation and climate mitigation.

d) United Nations Convention on the Law of the Sea (UNCLOS)

Focuses on the protection and preservation of the marine environment, obligating States to safeguard it and take measures to prevent, reduce, and control pollution from various sources, including land-based activities, vessels, and installations. It also emphasises cooperation among States and the preservation of rare ecosystems and habitats of endangered marine species.

e) Sustainable Development Goals (SDGs)

The SDGs were adopted on 25 September 2015 and took effect in 2016 as a global agenda balancing the social, economic, and environmental dimensions of sustainability. Of the 17 SDGs, Goal 13 focuses on climate action, urging measures to combat climate change and its impacts. Goal 14 aims to conserve and sustainably use oceans and marine resources, while Goal 15 seeks to protect terrestrial ecosystems, forests, and biodiversity, combat desertification, and reverse land degradation.

4.2 Constitutional Basis

The Preamble of PNG's National Constitution (fourth Goal) declares the conservation and sustainable use of natural resources and the environment for the collective benefit of all and for future generations.This constitutional foundation is operationalised through several key national laws and policies as listed below.

4.3 Key national laws

a) Organic Law on Provincial Government and Local Level Government

The Organic Law on Provincial Government and Local-Level Government establishes PNG's three-tier governance system, comprising (i) national, (ii) provincial and region, and (iii) local levels (district, ward, and village). It grants provincial governments the authority to create laws, enabling decentralised governance.

b) The Environment Act 2000

The Environment Act 2000 provides an overarching legislative framework for the protection of PNG's environment from harm and for the sustainable use of resources and control of development in PNG and gives effect to the National Goals and Directive Principles articulated in the Constitution. It defines 'customary rights to use water or land' as rights governed by custom and either actively utilised or expected to be used in a customary manner within a reasonable timeframe.

c) Conservation and Environment Protection Authority Act 2014

The Conservation and Environment Protection Authority Act 2014 establishes CEPA, outlining its functions to conserve and protect the environment. It also provides guiding principles and objectives to assist the Minister and CEPA in fulfilling their statutory duties.

d) Protected Areas Act 2024

Provides a legal framework for establishing a national system to manage protected areas across PNG. It supports the goal of protecting 30% of the country's land, aligning with international conservation targets. The Act provides a framework for developing policies on biodiversity conservation, cultural heritage protection, and law enforcement within these areas, ensuring sustainable management and long-term environmental protection.

e) Climate Change (Management) Act 2015 ((amended 2021, 2023)

Provides an overarching framework for Climate Change Adaptation and Mitigation in Papua New Guinea. Integration of climate change concerns into development planning and policies at all levels of government.

f) Maritime Zones Act 2015

This Act establishes PNG's maritime jurisdiction, including its territorial sea and Exclusive Economic Zone (EEZ), in accordance with the United Nations Convention on the Law of the Sea (UNCLOS). It defines the archipelagic waters and continental shelf, granting PNG exclusive rights to explore and manage marine resources within these zones.

g) Fisheries Management Act 1998

The Act governs fishing and management of marine resources in PNG. It aims to provide sustainable and equitable benefits through effective management of fisheries.

h) Local Level Government (LLG) Administration Act 1997

The LLG Administration Act 1997 implements the Organic Law on Provincial Governments and Local-Level Governments, providing the legal framework for the administration and governance of local-level governments in PNG.

4. 4 Key national policies and plans

a) Vision 2050

The PNG Vision 2050, guided by seven strategic pillars, outlines the nation's long-term aspiration for a "Smart, Wise, Fair, Healthy, and Happy Society" by 2050 and aims to rank among the top 50 countries in the UN Human Development Index. Pillar 5 emphasises protecting the environment and ensuring sustainability, aligning with biodiversity conservation and the sustainable use of natural resources as key priorities for economic planning.

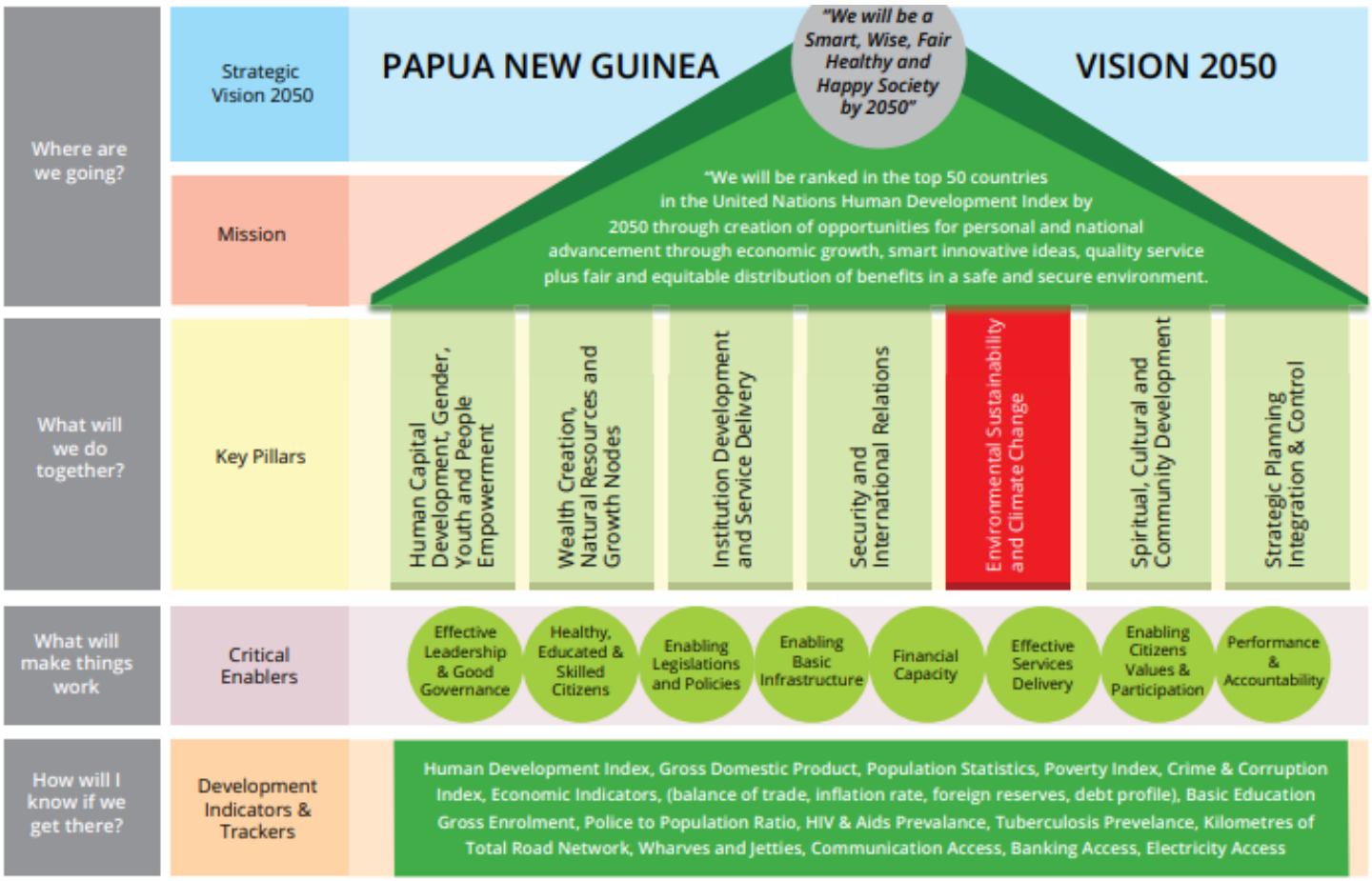


Figure 8: *Papua New Guinea Vision 2050*

b) Development Strategic Plan 2010-2030 (DSP)

The PNG Development Strategic Plan 2010-2030 outlines the government's vision to transform PNG into a middle-income country by 2030, aligning with the principles of the Constitution and providing directives to drive economic and social development. The plan emphasises the sustainable management of natural resources and the conservation of biodiversity, recognising their critical role in supporting long-term economic growth and environmental sustainability.

c) Medium Term Development Plan IV (MTDP IV) 2023-2027

The Medium-Term Development Plan IV (2023-2027) outlines PNG's strategy to grow its economy to K200 billion by 2030 and double internal revenue, aligning with the government's broader development agenda. Achieving these goals requires all government agencies and stakeholders to integrate, align, and complement their programs with the MTDP IV Strategic Priority Areas, including SPA 10 on Climate Change and Natural Environment Protection.

d) National Strategy for Responsible Sustainable Development (StaRS)

Redefines PNG's development roadmap by prioritising economic growth based on renewable resources rather than extractive activities. It emphasises environmental preservation and sustainable use by adding economic value to natural resources, aligning with the national vision of a "*Smart, Wise, Fair, Healthy, and Happy Society by 2050*." The environment is one of StaRS' three pillars of sustainable development, which is defined as meeting current needs without compromising the ability of future generations to meet theirs.

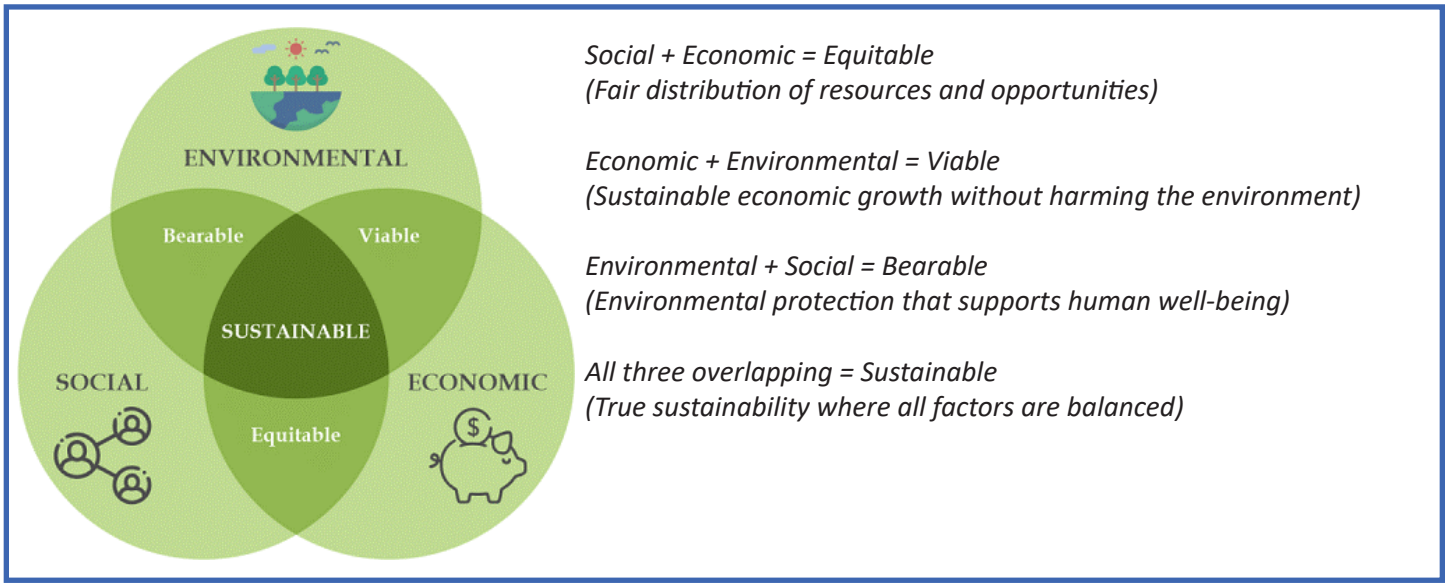


Figure 9: *STARS Development Strategy*

e) National Climate Compatible Development Management Policy (NCCDMP) 2014

The NCCDMP serves as PNG's blueprint for achieving climate resilience and a carbon-neutral pathway through sustainable economic development, combining strategies for economic growth with climate change mitigation and adaptation.

f) Protected Areas Policy 2014

The Protected Areas Policy 2014 establishes a framework for managing and conserving biodiversity in PNG, guided by five key pillars that support the creation of a network of terrestrial and marine protected areas. It has five overarching pillars that provide the framework for the establishment of network of terrestrial and marine protected areas in the country.

g) National Oceans Policy 2020-2030 (NOP)

This policy aims to implement a national system of Marine Spatial Planning and establish joint management of coastal waters by national and provincial governments. It emphasizes sustainable management of marine resources and the protection of coastal ecosystems.

h) National Public Service GESI Policy

The PNG NPS GESI Policy focuses on gender mainstreaming, ensuring policies and programs consider impacts on both men and women at all stages. It is guided by core values of respect, equity, diversity, and fair decision-making, aiming to address disparities faced by women and marginalized groups, including limited leadership opportunities and discrimination.

i) Nationally Determined Contributions (NDCs)

PNG is a signatory to the Paris Agreement and has committed to enhancing its NDCs, which include intentions to incorporate Blue Carbon initiatives into national climate strategies. While Blue Carbon data is not yet included in the current NDC (NDC 2.0), there is a clear commitment for future inclusion. Notably, the previous NDC included a commitment to develop a Blue Carbon Policy, and this roadmap represents a direct outcome of that commitment.

PNG's NDC implementation aligns with the UNFCCC Gender Action Plan (COP 23, 2017), which promotes gender equality and women's empowerment in climate action. In line with this, the Blue Carbon Policy and Roadmap adopt gender-responsive approaches that ensure inclusive participation, equitable benefits, and stronger roles for women and youth in managing coastal ecosystems and building climate resilience.

j) The National REDD+ Strategy 2017-2027

The REDD+ strategy is relevant to Blue Carbon as it addresses forest management and conservation, including mangroves. The strategy aims to create a framework for sustainable forest management that can also apply to coastal ecosystems.

k) National Biodiversity Strategies and Action Plans 2019-2024(NBSAPs)

The PNG NBSAP provides a policy framework and roadmap for integrating biodiversity conservation and protected areas into national development. It guides provincial and district authorities, civil society, and the private sector, emphasising biodiversity as a cornerstone of sustainable development. It is the main way that countries implement the UNCBD at the national level.

l) Protected Areas Policy Implementation Plan 2018-2028

The Protected Areas Policy Implementation Plan (2018-2028) helps guide various organizations, agencies, and local communities in establishing new Protected Areas across PNG. It outlines a clear vision for a network of Protected Areas, which includes Special Management Areas, Community Conservation Areas, Locally Managed Marine Areas, and National Parks. The plan also focuses on safeguarding PNG's unique biological and cultural heritage, with support from a sustainable funding model that incorporates biodiversity, payments for environmental services, and capacity-building initiatives throughout the country.

m) PNG Action Plan for Enhanced Transparency Framework on AFOLU and REDD+ National Forest Monitoring System 2022-2025

The ETF action plan aims to address gaps in the AFOLU greenhouse gas inventory and outlines how to implement the projects and actions included in PNG's Enhanced NDC Implementation Plan. The plan also provides a framework for integrating coastal wetland blue carbon into the current national GHG inventory system (MRV system) at the CCDA, which will enable PNG to incorporate blue carbon targets into its NDCs.

n) Provincial Mangrove Policies

Some provinces such as Manus and West New Britain have developed specific mangrove management plans that outline local strategies for conserving and restoring mangrove ecosystems, which are vital for Blue Carbon projects.

5. Needs Analysis for a PNG's Blue Carbon Policy

5.1 Importance of a Dedicated Blue Carbon Policy

Developing a dedicated Blue Carbon Policy for PNG is important because of multiple interlinked environmental, governance, and socioeconomic reasons that point to the urgent need for an integrated national approach to protecting coastal and marine ecosystems, particularly mangroves, seagrasses, and tidal marshes, which are the country's key blue carbon systems.

Below are the key points highlighting the importance of developing a dedicated Blue Carbon Policy for PNG:

1. Coastal Ecosystems Provide Critical Environmental and Economic Services

PNG's extensive coastal ecosystems of 13,840 km² of coral reefs, 4,200 km² of mangroves, and large seagrass beds, support food security, fisheries productivity, and biodiversity conservation. However, the unsustainable extraction, sedimentation, and climate change are degrading these systems, threatening both livelihoods and ecological stability

A Blue Carbon Policy would ensure these ecosystems are managed not just as biodiversity assets, but also as natural carbon sinks vital to national climate goals.

2. Mangroves and Seagrasses Are Declining

There is a rapid loss of mangrove forests, particularly in the Gulf of Papua, due to unsustainable harvesting rates. These ecosystems serve as breeding grounds for species such as shrimp and fish and as buffers against coastal erosion. A policy framework could safeguard these habitats through sustainable management incentives, payment for ecosystem services (PES), and integration with coastal development planning.

3. Fragmented Legal and Institutional Frameworks

The marine and coastal management responsibilities are scattered across multiple agencies (e.g., NFA, CEPA, provincial governments), with no unified legal or policy framework integrating biodiversity, fisheries, and climate adaptation

A Blue Carbon Policy would fill this gap by providing an integrated framework that aligns biodiversity conservation, sustainable use, and climate change adaptation and mitigation.

4. Weak Integration of Climate Change Adaptation and Mitigation

Mangrove planting and vulnerability assessments are already underway through the CEPA, CCDA, TNC and other organisations. However, these actions lack an overarching policy to coordinate implementation.

Developing a Blue Carbon Policy would strengthen the integration of coastal ecosystem conservation with national climate change adaptation and mitigation strategies.

5. Opportunity for Community Empowerment and Livelihoods

There is significance of community-based management systems (e.g., Locally Managed Marine Areas - LMMAs) and traditional practices (such as *tambu* reef closures) in sustaining marine ecosystems.

A Blue Carbon Policy can institutionalise such approaches, ensure inclusive participation of communities, women, and youth, while connecting local conservation to national carbon financing and benefit-sharing systems.

6. Climate Finance and Sustainable Development Potential

There is strong potential for Payment for Ecosystem Services (PES) mechanisms and carbon markets to incentivize conservation efforts while minimising reliance on the national budget.

A Blue Carbon Policy could unlock carbon finance opportunities, linking PNG's coastal and marine conservation efforts to international markets (e.g., voluntary carbon markets, GEF, and GCF), thereby promoting sustainable blue economy development.

5.2 Gaps in Blue Carbon Policy and Legal Frameworks

Policy Environment

Current policies such as the Protected Area Policy primarily focus on inland and freshwater wetlands, neglecting the crucial role that coastal wetlands play in carbon storage and climate resilience. Additionally, MPAs and PAs are oriented towards biodiversity conservation and ecosystem protection, but do not emphasise the carbon sequestration capabilities of coastal ecosystems. These policies also lack clear mechanisms for carbon accounting, reporting, and verification, which are critical for supporting climate action and meeting international commitments. Although the Climate Change (Management) Acts of 2015, 2021, and 2023 establish frameworks for project approval, permit issuance, and benefit sharing, specific procedures and operational guidelines, particularly for carbon trading, are either unavailable to the public or remain underdeveloped. For example, while permit application and approval processes for carbon market projects are outlined in legislation, they have yet to be fully operationalised.

Furthermore, the lack of coastal zone development guidelines that explicitly incorporate ecosystem-based management and blue carbon considerations restricts opportunities for mainstreaming climate mitigation and adaptation goals across development planning processes.

There is a pressing need for harmonised dispute resolution and environmental planning frameworks to address overlapping mandates among agencies responsible for coastal governance. These institutional overlaps often hinder coordinated implementation, monitoring, and reporting of blue carbon initiatives.

Land Tenure, Carbon Markets, and Carbon Rights

PNG faces significant legal and institutional challenges in advancing blue carbon initiatives due to ambiguity around carbon rights and land tenure. Although the 2021 amendments to the Climate Change (Management) Act introduced structured procedures for project approval and benefit sharing, they do not define the legal status of carbon rights, creating uncertainty over ownership and the ability to trade sequestered carbon in blue ecosystems. This is particularly problematic in a context where 97% of mangrove lands fall under customary tenure, often leading to conflicting land claims and weak contract enforcement. Furthermore, while customary land rights are recognized, there is no clear legal framework to determine whether carbon rights can be monetized or transferred independently from land rights, limiting market participation. The complex regulations under the Land Act 1996 regarding private leaseholds and restrictions on leasing customary land to foreigners further hinder project implementation by complicating land access. The current legal landscape does not specifically address how blue carbon rights intersect with traditional land tenure laws, which may vary across regions and communities. This inconsistency can create legal risks and undermine project viability (FAIR Carbon, 2024).

Article 6 Participation

In 2016, PNG ratified the Paris Agreement through the United Nations Paris Agreement (Implementation) Act

2016, legally binding the country to meet its international climate commitments. The Climate Change (Management) (Amendment) Act 2023 introduced a new section (Section 78C) to guide PNG's engagement in international carbon markets under Article 6 of the Agreement, particularly regarding cooperative approaches and corresponding adjustments. In alignment with this, PNG signed an Implementation Agreement with Singapore to collaborate on the development and transfer of carbon credits. This agreement requires that mitigation projects utilise internationally approved methodologies, such as those by Verra (VCS), Gold Standard (GS4GG), American Carbon Registry (ACR), or Global Carbon Council (GCC), and apply corresponding adjustments to avoid double counting.

Despite this progress, integrating Blue Carbon into Article 6 mechanisms remains challenging. Methodological gaps specific to coastal ecosystems such as the lack of standardised measurement, reporting, and verification (MRV) protocols for mangroves and seagrasses make it difficult to establish robust baselines and demonstrate additionality. Furthermore, current Article 6 frameworks have been predominantly focused on terrestrial carbon projects (e.g., REDD+), with limited operational precedents or guidance for including Blue Carbon initiatives. Uncertainties around carbon rights in coastal and marine areas, customary tenure, and benefit-sharing mechanisms also complicate the eligibility of Blue Carbon projects under international carbon trading frameworks. To fully participate under Article 6, PNG will need to strengthen its technical capacity, clarify legal frameworks, and develop appropriate methodologies tailored to Blue Carbon ecosystems. These steps will ensure that coastal carbon sinks are not only accounted for but also leveraged as credible assets in global climate markets.

Precedents of Nature-Based Carbon Projects

There are currently six nature-based carbon projects in PNG certified under Verra's Verified Carbon Standard (VCS), yet none of these involve mangroves or other blue carbon ecosystems. This highlights the early stage of blue carbon development in the country and the need for targeted interventions to build a pipeline of coastal carbon projects.

Project Name	Standard	Proponent	Type (AFOLU Activity)	Methodology	Size (Ha)	Status
Integrated REDD+ Project in Papua New Guinea	VCS	Kanaka Management Services Private Limited	Reduced Emissions from Deforestation and Degradation (REDD)	VM0015	1,317,082	Under development
Conservation of Native Forest in the Biodiversity Hotspot of PNG	VCS + CCB	WeAct Pty Ltd.	Reduced Emissions from Deforestation and Degradation (REDD)	VM0015	226,843	Under validation
REDD+ Project in Oro Province of Papua New Guinea	VCS	Kanaka Management Services Private Limited	Reduced Emissions from Deforestation and Degradation (REDD)	VM0015	418,000	Registration and verification approval requested
PNG Communities BEST REDD - Tavolo Project	VCS + CCB	FORCERT Limited	Reduced Emissions from Deforestation and Degradation (REDD)	VM0007	21,782	Registration and verification approval requested

NIHT Topaiyo REDD+	VCS + CCB	NIHT Inc.	Reduced Emissions from Deforestation and Degradation (REDD)	VM0009	110,000	Registered
April Salumei REDD Project	VCS + CCB	Rainforest Project Management Limited	Improved Forest Management (IFM); Reduced Emissions from Deforestation and Degradation (REDD)	VM0007, VM0010	196,703	Registered

Table 3. *Carbon Projects in PNG registered under Verra*

5.3 Rationale for Establishing a Blue Carbon Policy for PNG

PNG rich blue carbon ecosystems, comprising mangroves, seagrasses, and tidal marshes, play several critical ecological and socio-economic roles. They provide breeding grounds for fish that are essential to food security and livelihoods, serve as habitats for threatened marine species such as turtles and dugongs, and act as natural buffers that protect coastal communities from storm surges and erosion. Economically, the country exports approximately USD 255 million worth of fisheries annually and contributes 18 percent of the global tuna industry (NFA 2024). Across roughly 4,000 rural coastal communities in 15 maritime provinces, many people depend on artisanal fishing, hunting, and gardening, with limited cash income to meet basic needs (UN PNG 2024).

Women, in particular, play a vital role in coastal livelihoods, heavily relying on natural resources to support their families and communities. They are actively involved in harvesting, processing, and marketing marine products. In some areas, female fishers contribute 20-50% of the annual catch, and women are estimated to be responsible for 60-80% of total national food production (FAO, 2018; Harper et al., 2013). Recognising this ecological, economic, and cultural significance, there is a pressing need for a structured and inclusive approach to conserve and manage blue carbon ecosystems sustainably.

PNG's forthcoming Blue Carbon Policy will serve as a strategic framework to protect, restore, and sustainably manage these ecosystems, while also integrating local knowledge and community-driven initiatives. It aims to align blue carbon conservation efforts with national climate, biodiversity, and sustainable development targets, including the implementation of PNG's enhanced Nationally Determined Contributions (NDCs), the Medium-Term Development Plan IV (MTDP IV), and the National Strategy for Responsible Sustainable Development (StaRS).

The CCDA and the Conservation and Environment Protection Authority (CEPA) are leading the development of the policy. CCDA is responsible for national climate policy, including carbon market regulations, while CEPA manages biodiversity conservation and the protection of marine and coastal ecosystems. Their collaboration ensures that climate and environmental priorities are jointly addressed.

PNG is also a party to several Multilateral Environmental Agreements, including the UNFCCC, the Convention on Biological Diversity (UNCBD), the United Nations Convention on the Law of the Sea (UNCLOS), the Ramsar Convention, and the 2030 Agenda for Sustainable Development. The Blue Carbon Policy will specifically align with the UNFCCC and the UNCBD. Under the Paris Agreement, to which PNG is a signatory, recent guidance from the Intergovernmental Panel on Climate Change (IPCC) now allows countries to include blue carbon

6. Key Priority Areas for PNG Blue Carbon Policy

6.1 The Key Priority Areas

Recognising the ecological, economic, and cultural significance of blue carbon ecosystems, there is a pressing need for a structured approach to their conservation and sustainable use. The PNG Blue Carbon Policy will provide a framework to protect these vital habitats while integrating local knowledge and community-driven initiatives. The policy will prioritise five (5) key priority areas, with a strong emphasis on gender equality and social inclusion to ensure effective implementation and sustainability.

The PNG Blue Carbon Policy will incorporate the following key priority areas:

I. Legal, governance, and institutional frameworks

by identifying The PNG Blue Carbon Policy will establish a coherent legal and institutional framework to regulate, coordinate, and facilitate the sustainable management of blue carbon ecosystems. This framework will clearly define mandates, roles, and responsibilities among competent authorities, promote inter-agency coordination, and ensure accountability and transparency in implementation. It will also provide for the systematic collection, management, and reporting of blue carbon data, consistent with national monitoring, reporting, and verification (MRV) systems and international obligations under the UNFCCC and related conventions.

To ensure effective execution, the policy will strengthen institutional capacities through legislative alignment, institutional strengthening, and targeted technical and operational training for designated agencies. Provisions will also be made for the allocation of adequate financial and human resources to enable competent institutions to fulfil their statutory functions.

Furthermore, the policy will establish mechanisms to facilitate structured participation of local communities and customary resource owners in planning, management, and benefit-sharing arrangements related to blue carbon conservation and restoration initiatives. Such participation will be guided by principles of Free, Prior and Informed Consent (FPIC), equitable access to benefits, and community-based management practices recognised under national legislation.

Gender equality and social inclusion will form a cross-cutting principle of the policy framework. Institutional mechanisms will be developed to ensure equitable representation of women, youth, and other marginalized groups in governance structures and decision-making processes, including the provision of capacity-building programmes tailored to their specific needs and socio-economic contexts.

II. Policy and Reporting

The PNG Blue Carbon Policy will facilitate the integration of blue carbon ecosystems into existing national climate and biodiversity policy frameworks, including the Nationally Determined Contributions (NDCs), National Biodiversity Strategy and Action Plan (NBSAP), and other relevant sectoral strategies. While existing marine and coastal programs under the CEPA are already reflected within the NBSAP and related marine conservation frameworks, the Blue Carbon Policy will serve to complement and strengthen these efforts by explicitly incorporating the carbon mitigation, adaptation, and ecosystem service values of mangroves, seagrasses, and tidal marshes. This integration will ensure that national commitments are translated into legally anchored and actionable measures for the conservation, restoration, and sustainable management of blue carbon ecosystems.

The Policy will establish standardized procedures and protocols for data collection, reporting, and information exchange across government agencies, research institutions, and stakeholders. It will provide for the creation of a national reporting mechanism consistent with the Enhanced Transparency Framework (ETF) of the Paris Agreement, ensuring that blue carbon contributions are transparently monitored and reported.

Furthermore, the Policy will include provisions for community-level data and reporting systems, enabling local stakeholders to contribute to national monitoring and verification processes. This will ensure that traditional and local knowledge is recognized as an integral component of national datasets. Provisions will also be made for periodic reviews and audits to assess policy performance and compliance with national and international commitments.

Gender equality and social inclusion principles will underpin all reporting processes, ensuring equitable participation and recognition of the roles of women, youth, and marginalized groups in monitoring and knowledge-sharing.

I. Inventory, data collection, and mapping

The Policy will establish a nationally coordinated blue carbon inventory and information management system, serving as the central repository for spatial, ecological, and socio-economic data on blue carbon ecosystems. This database will include information on ecosystem extent, condition, carbon stocks, restoration potential, degradation trends, and socio-economic dependencies, in alignment with the National Forest Monitoring System (NFMS) and other relevant national systems.

Legal mandates will be provided to relevant national institutions such as the Climate Change and Development Authority, the Conservation and Environment Protection Authority, and the National Fisheries Authority to conduct periodic assessments, mapping, and reporting on blue carbon resources. These activities will be guided by internationally recognised methodologies such as the IPCC Wetlands Supplement (2013) and national MRV protocols.

To ensure inclusivity, the Policy will promote structured participation of local communities, women, and underrepresented groups in data collection and mapping activities. Traditional ecological knowledge will be recognised and integrated into spatial assessments, particularly in community-managed coastal areas. Targeted capacity-building programs will be designed to enhance the technical and participatory skills of community members, with specific training tailored to address gender-based and social barriers to participation.

All data generated will be made accessible to authorised users and policymakers to support evidence-based decision-making, project development, and reporting to both national and international bodies.

I. Community engagement and conservation

The Policy will mandate the conduct of comprehensive gender and social analyses as a prerequisite for all blue carbon initiatives to ensure that proposed interventions are socially inclusive, culturally appropriate, and equitable. Such analyses will assess existing power relations, socio-economic dependencies, and customary land-use dynamics, thereby informing the design of interventions that deliver fair and inclusive outcomes for all community members.

The Policy will institutionalise community-based management approaches as a core implementation modality, recognising the central role of customary resource owners, women, and youth in conserving and restoring blue carbon ecosystems. Mechanisms will be established to promote Free, Prior and Informed Consent (FPIC) and benefit-sharing frameworks, ensuring that communities are meaningfully engaged throughout planning, implementation, and monitoring stages.

Local knowledge, cultural practices, and traditional governance systems will be formally integrated into conservation and restoration strategies, ensuring cultural legitimacy and local ownership. Women, who often hold critical roles in resource stewardship, will receive targeted institutional support through training, leadership programs, and livelihood diversification initiatives.

The Policy will also provide for the registration and legal recognition of community-based organisations (CBOs) engaged in blue carbon management, enabling them to participate in national reporting, co-management agreements, and conservation partnerships. This will promote local stewardship and accountability in the long-term protection of blue carbon ecosystems.

I. Finance and international cooperation

The policy will establish an enabling framework for sustainable blue carbon financing, promoting diversified and innovative mechanisms to support conservation, restoration, and sustainable management initiatives. This will include access to public, private, and international sources of finance, such as grants, concessional loans, results-based payments, and market-based instruments.

Specific financing pathways will encompass carbon market participation, Payment for Ecosystem Services (PES) mechanisms, blue bonds, and climate-risk insurance schemes, in line with national legislation and the PNG Carbon Market Regulation (2023). These instruments will aim to mobilise private sector investment while ensuring environmental integrity, social safeguards, and equitable benefit-sharing.

The policy will also promote international and regional cooperation through partnerships with global institutions, donor agencies, and multilateral funds such as the Green Climate Fund (GCF), Global Environment Facility (GEF), and Adaptation Fund. Such cooperation will facilitate knowledge exchange, technical assistance, and capacity enhancement for blue carbon monitoring and restoration.

A gender-responsive budgeting framework will be integrated into financial planning and resource allocation processes to ensure equitable access to funds and opportunities. This approach will be informed by detailed gender analyses that identify where targeted investments are necessary to support the effective participation of women and other marginalised groups in blue carbon initiatives.

6.2 Status of Blue Carbon Activities in PNG

PNG has significant Blue Carbon potential, particularly due to its extensive mangrove and seagrass ecosystems. In recent years, various initiatives have emerged to enhance the understanding, conservation, and sustainable management of these critical coastal ecosystems. These initiatives span across community-based projects, donor-funded programs, policy frameworks, and research efforts.

Community-Based Blue Carbon Initiatives

Several community-led initiatives have been established to promote the conservation and restoration of Blue Carbon ecosystems. For instance, TNC has been actively working with local communities to protect and restore mangroves as part of broader coastal resilience programs. The TNC's Mangoro Market Meri (MMM) initiative, focuses on empowering women in these conservation efforts. This program operates in areas such as Bootless Bay, located near the capital city, Port Moresby. Through MMM, women engage in activities like replanting mangroves and developing sustainable livelihoods linked to mangrove ecosystems. Moreover, Infinity Blue (PNG) Limited, a marketing company in PNG, is involved in blue carbon projects. These projects, such as the New Ireland Mangrove and Seagrass Biodiversity Conservation project, aim to conserve biodiversity and generate blue carbon credits.

Initiative / Project	Lead Organisation	Location	Focus Areas	Key Activities
Mangoro Market Meri (MMM)	The Nature Conservancy (TNC)	Bootless Bay, near Port Moresby	Women's empowerment, sustainable livelihoods, mangrove conservation	Mangrove replanting, income generation linked to ecosystems
New Ireland Mangrove and Seagrass Biodiversity Conservation Project	Infinity Blue (PNG) Limited	New Ireland Province	Biodiversity conservation, blue carbon credit generation	Habitat conservation, carbon project development

Table 4: *Major Community-based Blue Carbon initiatives in PNG*

Blue Carbon Initiatives Led by NGOs and Development Partners

Donor-funded initiatives have also played a crucial role in advancing Blue Carbon activities in PNG. One such program is the MACBLUE project by GIZ, which has been instrumental in assessing the potential of Blue Carbon in the Pacific region, including PNG. MACBLUE, in collaboration with TNC, has supported data collection, stakeholder engagement, and the development of frameworks for integrating Blue Carbon into climate strategies. Another major initiative was the WCS Mangrove Rehabilitation for Sustainably Managed Healthy Forests (MARSH) Project, funded by USAID, which focuses on mangrove restoration, coastal resilience, and enhancing carbon sequestration. Furthermore, the Indo-Pacific Carbon Offset Scheme (IPCOS), a bilateral agreement between PNG and Australia, provides capacity-building support for carbon-related projects, including policy development and training programs. Organisations such as the Global Environment Facility (GEF) and UNDP have also supported projects aimed at ecosystem-based adaptation and mangrove conservation.

Project / Initiative	Donor / Partner	Dates	Key Focus Areas	Support Provided
MACBLUE Project	GIZ (in collaboration with TNC)	2023-2026 (TBC)	Blue Carbon potential assessment, integration into climate strategies	Data collection, stakeholder engagement, framework development
MARSH Project	USAID / Wildlife Conservation Society (WCS)	2012-2015	Mangrove restoration, coastal resilience, carbon sequestration	Ecosystem rehabilitation and capacity development
IPCOS (Indo-Pacific Carbon Offset Scheme)	Bilateral: PNG & Australia	2019 - present (TBC)	Capacity building for carbon-related initiatives	Policy development, training programs
Various Ecosystem Projects	GEF and UNDP	Ongoing	Ecosystem-based adaptation, mangrove conservation	Technical and financial support

Table 5: *Donor-funded Blue Carbon projects in PNG*

Public-Private Partnerships in Blue Carbon

In recent years, there has been growing recognition of the role the private sector, particularly the extractive and energy industries, can play in supporting blue carbon initiatives. Public-Private Partnerships (PPPs) are increasingly being explored to facilitate investment, technical support, and shared monitoring responsibilities. For example, ExxonMobile PNG Limited operating in PNG has begun to engage in carbon offset initiatives and environmental stewardship programs in Western Province that align with blue carbon objectives.

Policy and Governance Initiatives in Blue Carbon

Several policy initiatives have laid the foundation for integrating Blue Carbon into national frameworks. The Coral Triangle Initiative (CTI) is one of the key regional programs that PNG participates in, focusing on marine protected areas and sustainable marine resource management, including the conservation of mangroves and seagrass habitats. Additionally, the recently developed Carbon Market Regulation provides an opportunity to structure and regulate blue carbon projects, ensuring that they align with national development goals and international climate commitments.

Research and Data Collection Efforts

Research institutions such as the University of Papua New Guinea (UPNG) and international partners, including the Commonwealth Scientific and Industrial Research Organisation (CSIRO), have conducted studies on PNG's mangrove ecosystems and their carbon sequestration potential. However, research on seagrass and tidal marshes ecosystems remains limited, representing a key gap in understanding Blue Carbon dynamics in PNG. While existing studies have provided valuable insights, there is currently no centralised national database for Blue Carbon ecosystems, which is critical for informing policy and project development.

6.3 Gaps and Challenges in the Key Priority Areas

PNG has demonstrated commitment to protecting its coastal and marine ecosystems through national frameworks, international conventions, and ongoing efforts to develop a Blue Carbon Policy. However, the effective implementation of these efforts is constrained by a number of interrelated challenges. These challenges cut across legal, institutional, technical, and financial dimensions, and must be addressed to ensure the success of the Blue Carbon agenda.

Priority Area	Key Challenges/Gaps
I. Legal, Governance, and Institutional Frameworks	• No lead institution is formally mandated to oversee Blue Carbon initiatives. • Overlapping responsibilities exist between CCDA, CEPA, and PNGFA. • Weak coordination between national and sub-national agencies causes fragmented implementation. • Legal uncertainty remains around carbon rights, particularly in coastal and marine areas under customary tenure. • There is no Marine Protected Area (MPA) legislation that incorporates Blue Carbon ecosystem values.

II. Policy and Reporting	• PNG lacks a comprehensive national Blue Carbon policy and specific legislation for mangrove protection. • The current policy landscape is fragmented, with limited coordination among CCDA, CEPA, and the DJAG Oceans Office. • No centralised reporting mechanism exists for tracking Blue Carbon initiatives across sectors. • There is limited inclusion of gender and Indigenous Peoples and Local Communities (IPLCs) in policy formulation and oversight.
III. Inventory, Data Collection, and Mapping	• Technical capacity is limited, and there is insufficient research on Blue Carbon ecosystems. • Standardised methodologies for measuring Blue Carbon ecosystems are lacking. • Critical data gaps exist, particularly for seagrass and tidal marsh ecosystems. • There is no centralised or accessible national database for Blue Carbon data. • Integrating Blue Carbon data into national GHG inventories and REDD+ MRV systems is challenging.
IV. Communities and Conservation	• Community-Based Organisations (CBOs) lack institutional support and consistent funding. • Women, youth, and IPLCs are underrepresented in decision-making processes. • Government agencies have limited capacity to support and scale up community-led conservation initiatives. • Benefit-sharing mechanisms are weak or undefined. • Access to public funds such as the Public Investment Program (PIP) is difficult at the community level.
V. Finance and International Cooperation	• Access to international climate finance and carbon markets remains limited. • PNG lacks a clear national strategy for sustainable financing of Blue Carbon initiatives. • There are no established standards for Blue Carbon certification or benefit-sharing. • Operational guidelines under new carbon market regulations are still pending. • Weak regulation of nearshore ecosystems and undefined maritime boundaries make project development more difficult.

Table 6: *Existing Gaps in the PNG Blue Carbon Policy Priority Areas*

6.4 Opportunities for Advancing Blue Carbon in PNG

PNG has a unique opportunity to leverage its natural capital, evolving legal framework, and growing institutional readiness to scale up Blue Carbon as a credible strategy for climate change mitigation, biodiversity conservation, and sustainable development. Recent reforms, legal instruments, and market developments provide a strong foundation to integrate Blue Carbon into national policy, climate finance mechanisms, and international carbon markets.

Policy Integration

The development of a national Blue Carbon Policy provides an overarching framework for PNG to consolidate, harmonise, and operationalise its existing environmental and climate-related legislation and policy instruments. It ensures coherence between climate change mitigation, biodiversity conservation, and marine resource management within a single enforceable framework.

The Policy will create synergies with and be implemented pursuant to specific national legislation, including:

- The Climate Change (Management) Act 2015, and its 2021 and 2023 Amendments, which provide the legal mandate for the Climate Change and Development Authority (CCDA) to regulate climate-related activities, including carbon market participation, carbon credit project permitting, and benefit-sharing mechanisms as stipulated under Section 78C.

- The Environment Act 2000, which establishes the regulatory framework for environmental assessment, pollution control, and ecosystem protection, providing the statutory basis for safeguarding coastal and marine habitats from degradation and unsustainable use.

- The Conservation Areas Act 1978 and the Protected Areas Policy (2014), which collectively govern the declaration, management, and protection of ecologically significant areas, including mangroves, coral reefs, and seagrass ecosystems, under the jurisdiction of the Conservation and Environment Protection Authority.

- The National Oceans Policy (2020), which promotes integrated ocean governance and marine spatial planning, ensuring that blue carbon ecosystems are recognised as key natural assets contributing to ocean health, carbon sequestration, and climate resilience.

- The Forests Act 1991 and associated REDD+ Policy (National REDD+ Strategy 2017), which provide complementary legal provisions for managing forest carbon and ecosystem services, offering a parallel model for blue carbon regulation and benefit-sharing.

Importantly, the Blue Carbon Policy will embed Gender Equality, Disability, and Social Inclusion (GEDSI) principles, as well as safeguards for Free, Prior and Informed Consent (FPIC), ensuring that policy implementation upholds the rights of customary landowners, women, youth, and vulnerable groups. These social and environmental safeguards will be applied consistently with the National Gender Equality Policy (2021), the National Disability Policy (2015-2025), and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

Through these linkages, the Blue Carbon Policy will operationalise a legally coherent framework that integrates environmental management, climate governance, and community participation, thereby strengthening PNG's compliance with Article 6 of the Paris Agreement and other international commitments on sustainable ocean and climate governance.

Capacity Building

The Blue Carbon Policy presents an opportunity to strengthen PNG's national capacity for Monitoring, Reporting, and Verification (MRV) of coastal carbon ecosystems. Building upon existing infrastructure developed under the National REDD+ Programme, the policy will enable the integration of blue carbon data into the country's established MRV systems, including the Forest and Land Use Monitoring Geo-Portal, and the National Forest Monitoring System (NFMS).

These systems will be expanded to incorporate carbon and ecosystem data on mangroves, seagrasses, and tidal marshes, applying methodologies consistent with the IPCC 2013 Wetlands Supplement and other relevant

UNFCCC guidance. The Conservation and Environment Protection Authority and the National Oceans Office (NOO), in coordination with the Climate Change and Development Authority, will lead technical training and institutional strengthening programmes to enhance national expertise in coastal carbon accounting, spatial monitoring, and ecosystem valuation.

The policy will also institutionalise climate-specific capacity-building initiatives, including certified training modules, provincial awareness programmes, and integration of blue carbon data within higher-education curricula. These measures will ensure sustained national competence for the long-term management and reporting of blue carbon resources under both domestic law and international commitments.

Institutional Strengthening and Market Readiness

PNG has undertaken significant institutional and legal reforms to strengthen the governance of its emerging carbon market and to restore regulatory credibility. Following the moratorium on voluntary carbon market (VCM) activities imposed in March 2022, the Government enacted the Climate Change (Management) (Amendment) Act 2023 and the Climate Change (Management) (Carbon Markets) Regulation 2024. These instruments collectively establish a comprehensive legal framework for the approval, registration, and management of carbon market activities, including Blue Carbon initiatives.

The framework provides for permit issuance, benefit-sharing arrangements, project reporting requirements, customary landowner protections, and investor accountability. In accordance with Section 78C of the Act, all carbon-related projects must obtain CCDA approval and demonstrate compliance with Free, Prior and Informed Consent (FPIC) requirements before implementation.

In April 2025, PNG lifted the VCM moratorium, signalling readiness for both compliance and voluntary market participation. Under this reformed framework, Blue Carbon projects are recognised as eligible carbon activities, subject to transparent registration, carbon credit transfer protocols, and public disclosure procedures.

Localised models such as FORCERT's Benefit from Environmental Services Trust (BEST) demonstrate the potential of regulated, community-led initiatives in generating environmental and social co-benefits. The Blue Carbon Policy will promote the replication and scaling up of such models within coastal ecosystems to strengthen governance, support sustainable livelihoods, and enhance access to climate finance.

Environmental and Economic Context

PNG is one of the world's most ecologically diverse nations, home to an estimated 5% of global biodiversity (CTC PNG 2025) and approximately 75% of the Pacific's mangrove forests, comprising 43 recorded mangrove species (UNESCO 2022). The 2022 National GHG Inventory recorded net negative emissions of -1,958 $ktCO_2e$, highlighting the country's vital role as a natural carbon sink.

The formal inclusion of mangroves and seagrasses within PNG's GHG inventory and NDCs represents a significant advancement in integrating Blue Carbon into national climate targets.

However, despite its environmental wealth, PNG remains a lower-middle-income country, with approximately 40% of the population living below the poverty line (UNICEF 2022). The country's Ease of Doing Business Index (59.8; World Bank 2025) highlights ongoing challenges in project delivery and private-sector confidence. Consequently, the success of Blue Carbon governance must be anchored in sustainable development, community empowerment, and transparent accountability frameworks that ensure equitable benefit-sharing and reinvestment of carbon revenues into local development.

International Support

The implementation of the Blue Carbon Policy will leverage international cooperation and financing mechanisms available under multilateral climate and biodiversity frameworks. PNG is eligible to access grants, technical assistance, and concessional finance through the GEF, the GCF, the United Nations Environment Programme (UNEP), and the World Bank Group, including its International Finance Corporation (IFC).

In 2023, PNG formalised an Article 6 Implementation Agreement with Singapore, enabling the generation and transfer of Internationally Transferred Mitigation Outcomes (ITMOs) based on methodologies from Verra, Gold Standard for the Global Goals (GS4GG), ACR, and GCC. The country also signed an MoU with Blue Carbon LLC, strengthening PNG's visibility in emerging carbon markets.

At the regional level, PNG participates in the Coral Triangle Initiative (CTI) and the Pacific Blue Carbon Initiative, which promote integrated coastal management, community stewardship, and gender-responsive approaches to marine conservation. The policy will encourage alignment with these regional platforms to enhance knowledge exchange, ensure policy coherence, and facilitate joint project development in alignment with Pacific regional priorities and the 2050 Strategy for the Blue Pacific Continent.

Community Engagement and Livelihood Improvement

Blue carbon initiatives provide a significant opportunity to enhance community resilience and local development across PNG's 4,000-plus coastal communities spanning 15 maritime provinces. Women contribute up to 50 percent of coastal fish catches and nearly 80 percent of household food production (Kinch & Bagita 2003), yet continue to face systemic barriers to land ownership, finance, and participation in climate-related projects.

The policy will institutionalise inclusive and participatory engagement mechanisms by building upon established best practices such as Locally Managed Marine Areas (LMMAs), community-based eco-tourism, sustainable fisheries, and nature-based enterprises. Customary land tenure, legally recognised under the Land Act 1996 and the Land Groups Incorporation Act 1974, enables land groups and communities to legally manage and lease mangrove and coastal areas for conservation or commercial purposes.

All community-based projects will be subject to FPIC procedures, as prescribed under the Climate Change (Management) Act and the National REDD+ Development Guidelines. The policy will further strengthen CBOs through targeted training, micro-finance access, and capacity-building programmes, enabling equitable participation in carbon markets and coastal resource management while safeguarding customary rights.

Strengthening Legal and Regulatory Frameworks

The Policy provides a platform to clarify, streamline, and strengthen institutional mandates between the CCDA and the CEPA. While CCDA will serve as the lead agency and policy custodian responsible for overall coordination, reporting, and alignment with national climate frameworks, CEPA will act as a co-implementing authority with statutory jurisdiction over marine and coastal biodiversity conservation, environmental safeguards, and protected area management.

To ensure complementarity rather than overlap, a formal review of institutional mandates, administrative structures, and coordination mechanisms will be undertaken. This review will establish clear roles, shared responsibilities, and standard operating procedures between CCDA and CEPA, particularly on project screening, environmental impact assessment, and safeguard compliance.

Implementation will adopt a harmonised safeguards framework that integrates CEPA's existing environmental and biodiversity protection standards with CCDA's climate safeguards, including those set out in the National REDD+ Development Guidelines. This approach will ensure consistent application of FPIC, grievance redress, and

equitable benefit-sharing arrangements across all blue carbon initiatives.

Furthermore, the Policy will support the legal establishment of blue carbon crediting and trading frameworks under the Climate Change (Management) (Carbon Markets) Regulation 2024, ensuring that carbon market mechanisms are environmentally sound, socially inclusive, and compliant with both CCDA and CEPA safeguard requirements.

Utilisation of Existing Frameworks

2000 2017(?), Protected Area Act (2025)PNG can accelerate Blue Carbon implementation by leveraging and harmonising existing legislation and policy instruments, including:

- the *Climate Change (Management) Act (2015, as amended 2021 & 2023)*;
- the *Land Act 1996* and *Land Groups Incorporation Act 1974*;
- the *Environment Act 2000*;
- the *National Oceans Policy 2020*; and
- the forthcoming *Protected Areas Act 2025*.

These frameworks collectively recognise community ownership and provide mechanisms such as State Lease and lease-leaseback arrangements, allowing customary groups to legally engage in conservation and carbon initiatives. Integrating blue carbon considerations within these existing instruments will ensure legal certainty, minimise duplication, and create a coherent policy environment for sustainable blue carbon ecosystem management.

Utilisation of the Ward Recording System

The Ward Recording System (WRS), which is currently used by provincial and local-level governments to collect community-level socio-economic data, offers an existing platform that can be expanded to include Blue Carbon ecosystem monitoring indicators. Under the Blue Carbon Policy, the WRS will be adapted to record information on mangrove health, seagrass coverage, coastal resource use, and local conservation activities alongside socio-economic data.

Local ward recorders who are community-based officers, will be trained and equipped to collect this information using standardised forms and mobile data tools developed in coordination with the CCDA, the CEPA, and the National Statistical Office (NSO).

Data gathered through the WRS will feed into the national Blue Carbon database and contribute to gender-disaggregated and community-level reporting on Blue Carbon ecosystems. This approach will ensure that local knowledge informs national reporting to CCDA and CEPA, while also empowering communities, particularly women and youth groups, to actively participate in ecosystem monitoring, stewardship, and decision-making processes.

Awareness and Advocacy

Public education, stakeholder awareness, and participatory communication are critical for advancing Blue Carbon literacy and policy ownership. The Policy will promote national awareness campaigns to highlight the ecological, cultural, and economic value of blue carbon ecosystems, linking conservation with climate resilience, food security, and sustainable livelihoods.

Box 2: Utilisation of Ward Record system to collect data at the sub-national level

The Ward Record can be effectively used for data collection at the sub-national level in various ways, as outlined in the Organic Law on Provincial Governments and Local-level Governments. Here are the key methods for leveraging the Ward Record for data collection:

1. Comprehensive Community Profiles: The Ward Record can be used to create detailed profiles of communities within each ward. This includes demographic information, socio-economic status, health indicators, education levels, and access to services.
2. Monitoring Service Delivery: The Ward Record serves as a tool for monitoring the delivery of public services (health care, education, infrastructure, etc.) at the local level to identify gaps and areas for improvement. This data can inform decision-making and resource allocation.
3. Facilitating Community Participation: The Ward Record can be utilised to engage community members/residents in the data collection process. This participatory approach can enhance the accuracy and relevance of the data collected and promote a sense of ownership and accountability among community members.
4. Assessing Development Needs: Local governments can use the Ward Record to assess the development needs (socio-economic) of different wards which can help authorities to prioritise development initiatives and allocate resources more effectively to address the specific needs of each ward.
5. Tracking Changes Over Time: The Ward Record allows for longitudinal data collection, enabling local governments to track changes (population growth, shift in economic activities, etc.) in community conditions over time, which is useful for evaluating the impact of policies and programmes.
6. Supporting Policy Formulation: Data collected through the Ward Record can inform the formulation of local policies and strategies. By providing evidence-based insights into community needs and challenges, local governments can develop targeted interventions that are more likely to achieve desired outcomes.
7. Enhancing Accountability: The Ward Record can serve as a basis for holding local authorities accountable for their actions and decisions. By making data publicly available, community members can monitor the performance of local governments and advocate for improvements where necessary.
8. Facilitating Coordination Among Agencies: The Ward Record can be used to facilitate coordination among various government agencies and stakeholders involved in service delivery and development planning. By sharing data across agencies, local governments can ensure a more integrated approach to addressing community needs.

Generally, customary land ownership plays a significant role in coastal areas, where local communities often have traditional rights over land and resources. This customary framework can influence the management and protection of coastal ecosystems.

Strengthening current structures and mechanisms at both the national and sub-national levels, including Local-Level Governments (LLGs) and Wards, is essential for ensuring effective governance. Key legislative instruments, such as the Organic Law on Provincial Governments and Local-level Governments and the PNG LLG Administration Act of 1997, provide a foundation for aligning Blue Carbon initiatives with established local governance frameworks.

7. Vision, Mission and Objectives for PNG Blue Carbon Policy

7.1 Vision

To establish PNG as a regional leader in blue carbon management, where coastal and marine ecosystems are sustainably managed, protected, and restored, contributing to climate change mitigation and adaptation, biodiversity protection, and the well-being of local communities.

7.2 Mission

To identify, designate and sustainably manage PNG's blue carbon ecosystems by ensuring their conservation, integration into national climate action, and delivering benefits to local communities that depend on these vital resources, while strengthening legal frameworks and enhancing institutional coordination to promote effective governance and collaborative management of these ecosystems.

7.3 Goal

To ensure the sustainable management, conservation and restoration of PNG's blue carbon ecosystems, contributing to environmental resilience and the well-being of local communities.

7.4 Objective

To promote the long-term conservation and restoration of PNG's blue carbon ecosystems, ensuring their role in climate change mitigation and adaptation, biodiversity protection, and improving the livelihoods of local communities dependent on these resources.

7.5 Key Principles

The PNG Blue Carbon policy is guided by four key principles.

I. The principle of equal participation

II. Best practice science

III. Safeguard nature and maximise biodiversity

IV. Empower people

8. Governance and Operational Arrangements

While PNG has made notable progress in REDD+ related initiatives, which can include mangrove blue carbon, there is a need to develop the necessary policy and legal framework and MRV systems for Blue Carbon initiatives in the country. This includes improving governance structures for the Voluntary Carbon Market and enhancing the implementation of REDD+ within its existing framework. Ongoing revisions to the Climate Change Management Act (CCMA) and the development of carbon market-related policies reflect PNG's commitment to establishing a robust governance framework for carbon projects,including blue carbon projects.

8.1 Stakeholder Engagement

Effective and inclusive stakeholder engagement is critical to the success of PNG's Blue Carbon Policy. Given the complexity of managing coastal ecosystems, stakeholder consultation must be structured, multi-level, and sustained, spanning national, provincial, district, local-level governments (LLGs), and ward-level institutions. A strong emphasis should be placed on reaching marginalised groups, particularly customary landowners and coastal communities who directly depend on coastal/marine ecosystems for their livelihoods.

CEPA and CCDA are the mandated agencies dealing with blue carbon ecosystem. Despite their mandates, the on-the-ground presence of these agencies remains limited, creating a gap in effective engagement, technical support, and coordination. To address this, greater institutional integration and collaboration between CCDA, CEPA, and other government agencies is essential, particularly in joint planning, stakeholder mapping, and the delivery of technical capacity-building at the community level.

Community-Based Organisations (CBOs) are vital facilitators of grassroots engagement and project delivery, especially in remote and vulnerable areas. However, limited accessibility and lack of structured support mechanisms often hinder their participation. The Blue Carbon Policy should therefore establish a formal platform or coordinating body to guide, support, and strengthen the role of CBOs, while also facilitating cross-sectoral information sharing. This platform should be two-way, enabling CBOs and local communities to access information, while also feeding ground-level insights into national decision-making processes.

At the ward and LLG levels, stakeholder engagement must build on existing structures, including Protected Area Management Committees initiated by CEPA, while also supporting new ward development planning efforts that integrate blue carbon considerations. Local leadership, including ward councillors and district administrators, should be capacitated to lead and monitor blue carbon initiatives using a "ground-up" approach to technical capacity building.

The private sector, particularly businesses involved in coastal development, fisheries, tourism, and carbon trading, must also be engaged. Clear guidelines and communication channels should be developed to clarify private sector roles, responsibilities, and opportunities for participation, ensuring alignment with environmental safeguards and community priorities. In doing so, private sector actors can also be empowered to support emerging local enterprises and CBOs through funding, capacity support, and value chain integration.

To enable implementation, access to development financing mechanisms such as the Public Investment Program (PIP) must be addressed. Limited access to such funds continues to hinder local-level implementation and cross-agency collaboration. As such, the policy should explore mechanisms for co-financing, and joint proposals across agencies, ensuring that CBOs and LLGs have a direct pathway to seek and access financial support.

The overall stakeholder engagement strategy should be grounded in what works for local communities, respecting customary systems, using the Free, Prior, and Informed Consent (FPIC) approach, and promoting co-designed solutions that strengthen both environmental and social outcomes.

Box 3: Stakeholder engagement process at the national and sub-national levels, as defined in the Organic Law on Provincial Governments and Local-level Governments

The stakeholder engagement process at the national and sub-national levels, as defined in the Organic Law on Provincial Governments and Local-level Governments, involves several key components:

1. Consultation with Provincial Governments: When there is a proposal to develop a natural resource in a province, the appropriate National Minister must consult with the Provincial Government of that province. This ensures that local authorities are involved in decisions that affect their regions.
2. Liaison with Landowners: The National Government, along with the Provincial and Local-level Governments, is required to fully liaise with landowners regarding the development of natural resources. This emphasises the importance of engaging local communities and stakeholders who have a direct interest in the resources being developed.
3. Establishment of Forums: The law provides for the establishment of natural resource development forums, which facilitate discussions and participation among various stakeholders, including government entities and local communities. These forums are intended to address the consultation process and the extent of participation in resource development.
4. Role of the National Economic and Fiscal Commission: The Commission is tasked with conducting cost and benefit analyses related to the development of natural resources and making this information available to the National Executive Council. This process involves assessing the impacts of development on national and local levels, thereby engaging stakeholders in the evaluation of potential benefits and drawbacks.
5. Reporting and Recommendations: The National Economic and Fiscal Commission is also responsible for making yearly reports and recommendations to the National Executive Council, which includes input from various stakeholders involved in the governance and management of provincial and local-level matters.

While the *Organic Law* establishes a broad governance framework for stakeholder consultation and participatory decision-making, the **CCDA** and CEPA frameworks provide specific legal and procedural mechanisms for obtaining *Free, Prior and Informed Consent (FPIC)* in the context of environmental and climate-related projects.

- Under the Climate Change (Management) Act (2015, as amended 2021 and 2023) and the Climate Change (Management) (Carbon Markets) Regulation 2024, FPIC is a **mandatory procedural requirement** for all climate-related activities, including carbon market and blue carbon projects. The process requires that customary landowners are fully informed of project objectives, implications, and benefit-sharing arrangements prior to consent. CCDA guidelines further stipulate that FPIC documentation must accompany all project registration and permitting processes.

- Similarly, the Environment Act 2000 and associated CEPA procedures require environmental impact assessment (EIA) consultations to incorporate FPIC principles, ensuring that communities affected by proposed developments are engaged early, meaningfully, and without coercion. CEPA's process emphasises disclosure, participatory monitoring, and the integration of traditional ecological knowledge in environmental decision-making.

Together, these frameworks establish a coherent approach where:

- The *Organic Law* provides the constitutional foundation for provincial and community consultation;

- CCDA's regulatory framework ensures FPIC compliance in all climate and carbon-related initiatives; and

- CEPA's EIA procedures operationalise FPIC principles in environmental approvals and safeguards.

8.2 Project Governance

Effective governance is crucial for the successful development and implementation of the Blue Carbon Policy project in PNG. A clear governance structure will help engage stakeholders, improve coordination among various entities, and ensure accountability throughout the project's lifecycle.

8.2.1 Operational mode

The operational mode of the Blue Carbon Policy development project will focus on collaborative governance and include several key components:

I. *Inter-Agency Coordination:* CCDA and CEPA will establish a Blue Carbon Technical Working Committee made up of representatives from key government agencies, private sector, academia/research institutions, and Civil Society Organisations. This committee will serve as a central coordination hub to ensure all policy development and implementation efforts align with national climate objectives, including PNG's NDCs. The committee will also guide the integration of technical and regulatory issues, including carbon accounting and alignment with national GHG inventories and adaptation strategies.

II. *Stakeholder Engagement:* The project will prioritise inclusive engagement with local communities, women and youth, non-governmental organisations (NGOs), academic institutions, and private sector representatives. Stakeholder engagement will also incorporate dialogue on land and resource ownership, particularly the recognition of customary land and user rights over coastal and marine areas. This inclusive approach will promote local ownership of Blue Carbon initiatives and acknowledge the critical roles and rights of Indigenous peoples in coastal ecosystem stewardship.

III. *Decentralised Management:* The project will adopt a decentralised management approach, empowering provincial and local governments to play an active role in blue carbon initiatives. This will allow the project management team to tailor management actions to the unique ecological and socio-economic challenges faced in different provinces, enhancing effectiveness and responsiveness.

IV. *Monitoring and Evaluation Framework:* A robust Monitoring and Evaluation (M&E) framework will be established to track the progress and impact of the blue carbon policy development. This framework will set clear performance indicators, facilitate regular assessments, and include feedback mechanisms to adjust project strategies as needed.

Together, CCDA and CEPA will jointly develop and maintain a Blue Carbon Monitoring and Evaluation Protocol that:

- Establishes harmonised indicators covering both climate and biodiversity outcomes;
- Aligns with national and international standards (UNFCCC, CBD, IPCC, and SDG frameworks);
- Ensures data interoperability between climate (MRV) and biodiversity (NBSAP) databases; and
- Includes community-based monitoring and feedback mechanisms for continuous improvement.

Periodic evaluations will be conducted jointly by CCDA and CEPA, with results submitted to the National Climate Change Board (NCCB) and relevant sectoral committees.

V. *Capacity Building and Training:* Ongoing training programs and knowledge-sharing initiatives will be conducted to strengthen the institutional and technical capabilities of those involved in policy development and implementation. Training will include modules on NDC integration, land tenure issues,

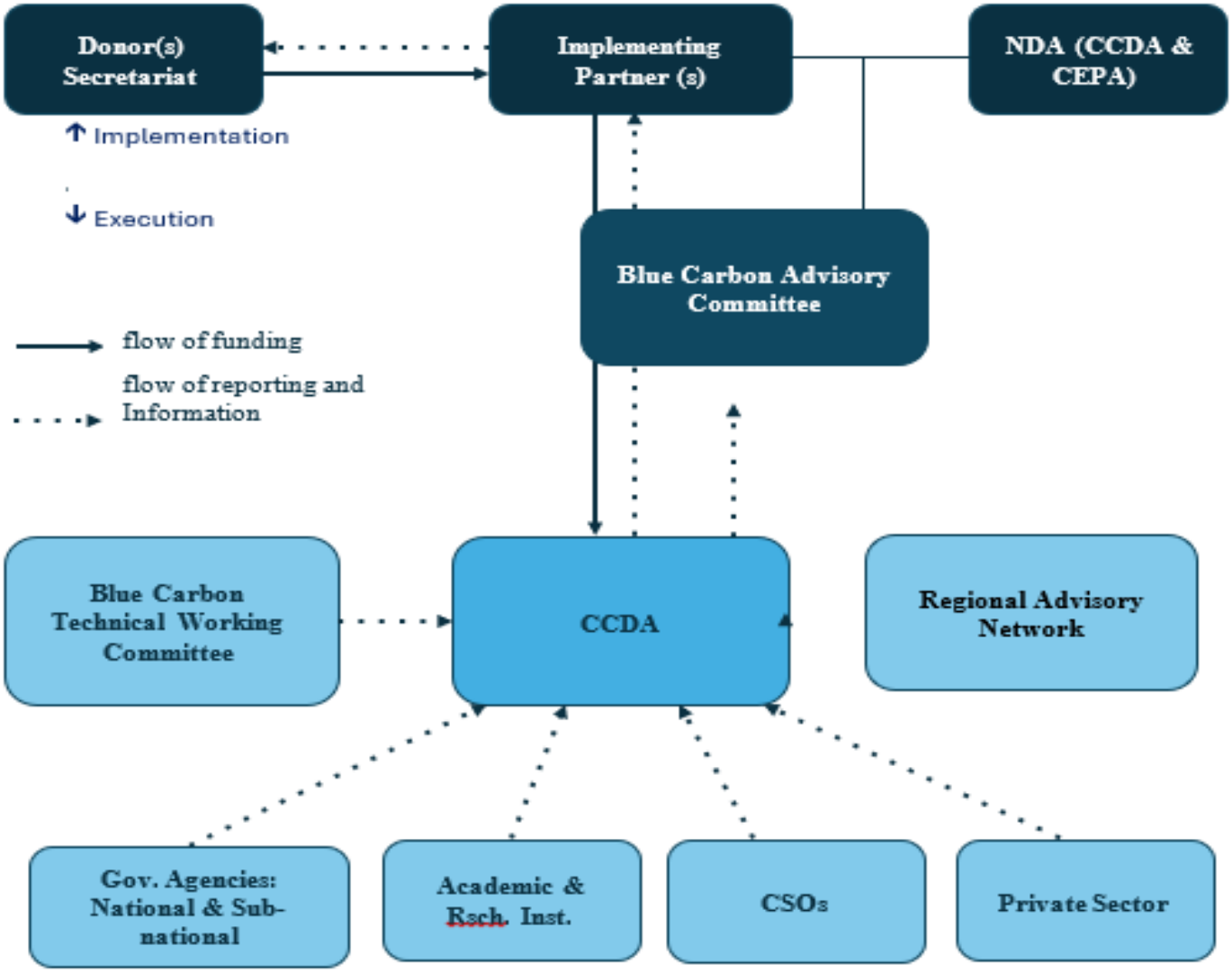


Figure 9: *Overview of the governance structure for the development of the PNG Blue Carbon Policy*

At present, the CCDA does not hold a formal mandate specifically covering Blue Carbon ecosystems, highlighting the need to identify and leverage existing institutional mechanisms to support policy development and implementation. A key institutional challenge remains the absence of a clear consensus on which agency will serve as the primary custodian of the Blue Carbon Policy. While it is anticipated that CCDA will assume the lead coordinating role, the CEPA will continue to act as a co-implementing partner, particularly on marine and biodiversity-related components.

To address this, a comprehensive institutional and administrative review of both CCDA and CEPA will be undertaken during the policy development and write-up phase. This review will examine the current mandates, organisational structures, and operational capacities of both institutions to determine the most efficient and legally coherent arrangement for housing the Blue Carbon Policy.

In the interim, it is proposed that Blue Carbon initiatives be integrated under CEPA's existing Marine and Coastal Program, leveraging its established operational systems and technical expertise in coastal and marine ecosystem management. Concurrently, CCDA will lead the policy coordination, climate reporting, and MRV-related functions, ensuring alignment with national climate governance mechanisms.

Final institutional arrangements will be deliberated and endorsed by the Blue Carbon Advisory Committee upon completion of the draft policy, prior to formal adoption by the National Executive Council (NEC). This phased approach will ensure that the policy is supported by an evidence-based institutional structure that clearly defines roles, avoids duplication, and enhances inter-agency collaboration in managing PNG's blue carbon ecosystems.

Climate Change and Development Authority (CCDA): Responsible for climate-related policies. Working closely with CEPA and TNC in coordinating the daily execution of the blue carbon policy development.

Conservation and Environment Protection Authority (CEPA): Responsible for the conservation of marine and coastal ecosystems, including the management of Marine Protected Areas (MPAs).

Implementing partners: Support the government and stakeholders in advancing the Blue Carbon Policy.

Donor: Provides financial support, technical assistance, and resources for the development of the Blue Carbon Policy.

Blue Carbon Advisory Committee (BCAC): The BCAC is the advisory body that will oversee and coordinate strategic aspects of the work relating to Blue Carbon Policy development. Composed of representatives from key sectors, this committee provides high-level guidance and strategic advice throughout the BC policy development process.

Regional Advisory Network: Support PNG's Blue Carbon Policy development and implementation by providing technical assistance, capacity building, policy guidance, regional coordination, and facilitating access to climate finance and research, ensuring alignment with regional and international strategies.

Blue Carbon Technical Working Committee: Responsible for formulating the Blue Carbon Policy by leading research, stakeholder engagement, coordination with institutions, policy drafting and revision, and supporting its approval and implementation.

Stakeholders: Stakeholders (Gov. agencies – NOO, DPLLGA, NFA, etc; academia; CSOs; private sector) work together to align efforts, share information, and provide technical guidance to ensure effective blue carbon policy development and implementation.

8.4 Blue Carbon Technical Working Committee

The Blue Carbon Technical Working Committee (BCTWC) brings together key agencies and organisations to support the technical aspects of PNG's Blue Carbon initiatives. The committee's role is to provide expertise across areas such as conservation, marine spatial planning, fisheries, and research. Table 1 outlines the BCTWC's composition, highlighting each organisation's roles and responsibilities in advancing Blue Carbon conservation and sustainable management efforts.

Organisation	Roles and responsibilities
Climate Change and Development Authority	Serves as the National Designated Authority (NDA) and provides oversight and coordination for Blue Carbon initiatives in line with PNG's NDCs.
Conservation and Environment Protection Authority	Manages conservation areas, marine protected areas, locally managed marine areas, intertidal wetlands, and Ramsar sites. The PA Act 2024 strengthens CEPA's mandate in biodiversity conservation, sustainable resource management, and ecosystem protection

National Oceans Office	Leads marine spatial planning, marine scientific research, and exploration in high seas and PNG's Exclusive Economic Zone (EEZ) boundaries.
PNG Forest Authority	Oversees forest inventory management related to Blue Carbon and coastal forest ecosystems.
National Fisheries Authority	Manages commercial fisheries, develops fisheries management plans, and promotes sustainable coastal livelihoods.
DPLGA/sub-national governments	Facilitates local project implementation and coordinates with stakeholders in potential Blue Carbon project sites.
Office of the State Solicitor	Manages legal clearance processes and ensures compliance with national and international legal standards.
Department of National Planning and Monitoring	Coordinates aid with development partners and oversees project implementation within the Public Investment Program (PIP).
Department of Lands and Physical Planning	Addresses land tenure issues relevant to Blue Carbon project sites and promotes landowner engagement.
Academia (UPNG, UNRE, NRI)	Act as research hubs, providing scientific support and technical expertise for Blue Carbon studies and conservation efforts.
TNC	Implements conservation and restoration projects, contributing technical expertise for Blue Carbon ecosystem management.
WCS	Leads conservation and restoration projects focused on biodiversity and Blue Carbon ecosystem health.
FORCERT	Develops eco-service payment initiatives to incentivise local and community-led Blue Carbon conservation activities.

Table 7: *The composition of the BCTWC*

Organisation	**Roles and responsibilities**
CCDA	Chairs the committee as the National Designated Authority (NDA) and oversees Blue Carbon policy development and coordination.
CEPA	Serves as Co-Chair, focusing on conservation and management of marine protected areas, locally managed marine areas, intertidal wetlands, and Ramsar sites.
National Oceans Office	Leads in marine spatial planning, marine scientific research, and exploration within PNG's Exclusive Economic Zone (EEZ) and high-seas boundaries.
PNG Forest Authority	Provides expertise on forest inventory management and relevant Blue Carbon ecosystem issues.
National Fisheries Authority	Manages commercial fisheries, fisheries management plans, and supports sustainable coastal livelihoods through Blue Carbon initiatives.
DPLLGA	Coordinates project implementation at local levels, identifying potential Blue Carbon project sites and liaising with sub-national governments.
DJAG/OSS	Provides legal advisory services to ensure compliance with national and international laws impacting Blue Carbon projects.
DNPM	Facilitates aid coordination with development partners and manages project implementation under the Public Investment Program (PIP) funding.
DLPP	Addresses land tenure issues critical to the success of Blue Carbon projects, promoting clarity and local engagement.
Department of Works and Highways	Supports infrastructure development planning in coastal areas, ensuring integration of climate resilience and ecosystem preservation into project designs.
National Maritime Safety Authority	Regulates maritime activities, ensures safe navigation, and monitors coastal and marine zones that may be designated for Blue Carbon conservation.

UPNG	Provides higher-education support through research, science, and technology, contributing to Blue Carbon knowledge and training.
UNRE	Engages in research and technology within the higher education sector, through research, science and technology in supporting sustainable Blue Carbon management initiatives and training.
NRI	Functions as a research institution, generating data and policy recommendations to inform Blue Carbon strategies.
TNC	Implements conservation and restoration projects, contributing technical expertise for Blue Carbon ecosystem management.
WCS	Leads conservation and restoration projects focused on biodiversity and Blue Carbon ecosystem health.
Development Partners	Provides technical and financial support, enhancing resource mobilization and capacity building for Blue Carbon initiatives.

Table 8: *The composition of the BCAC*

9. Roadmap for Policy Development and Implementation

The 2025-2028 roadmap outlines each phase of policy development, actions, objectives, activities and outcome. Table 6 provides detail information on each action, outcome, and objective, laying out a step-by-step pathway toward achieving PNG's Blue Carbon Policy goals.

Year	Quarter	Phase	Action	Key Priority Area addressed	Objective	Activities	Outcome
2025	Q1	Phase 1: Research and Data Collection	A. Research and Baseline Data Collection, enabling condition assessment, and identification of barriers and opportunities.	Inventory, data collection, and mapping	Carbon stock assessments, ecosystem mapping, and barrier identification	A.1 Collect and analyse baseline data on Blue Carbon ecosystems	Baseline data collected, barriers and opportunities identified, Situation Analysis developed and validated.
						A.2 Assess enabling conditions and barriers to Blue Carbon management.	
	Q2		B. Stakeholder Engagement and Consultations	Community engagement and conservation	Stakeholder consultations and engagement, collaboration with international partners	B.1 Conduct initial stakeholder consultations	Initial consultations conducted; Vision Statement & Key Priority Areas validated.
	Q3					B.2 Engage stakeholders to validate vision statement, mission, and key elements of the BC policy.	
						B.3 Organise public consultations and workshops to gather input on the BC policy draft outline	Final Blue Carbon Policy outline/skeleton based on stakeholder input.
	Q4	Phase 2: Policy Develop		Policy and Reporting	Develop the Blue Carbon policy, incorporating stakeholder feedback	C.1 Draft the policy and align it with the domestic policies (NDCs, REDD+, etc.) and relevant	Draft policy completed, aligned with the relevant domestic policies and international commitments.

						international commitments (UNFCCC, CBD, etc.). **C.2** Conduct stakeholder consultations and incorporate feedback from stakeholders into the policy draft	
2026	Q1					**6.3** Review and refine the draft policy through expert consultations, ensuring legal coherence, institutional feasibility, and stakeholder consensus. **C.4** Circulate the revised draft policy for final feedback from stakeholders, including government agencies (both national and sub-national), academia, private sector, NGOs, and international partners.	Revised Blue Carbon Policy draft circulated
	Q2		**D. Policy Endorsement and Approval**	Legal, governance, and institutional frameworks	Submit finalised Blue Carbon Policy to the government.	**D.1** Prepare a presentation of the finalised Blue Carbon Policy for submission to the NEC. **D.2** Present Blue Carbon Policy to the NEC for official approval.	Official government approval of the Blue Carbon Policy
	Q3		**E. Capacity Building and**	Community engagement and conservation	Launch capacity-building programs for local communities, government officials, and stakeholders.	**E.1** Conduct training workshops for local communities, government officers and stakeholders on BC conservation	Training completed, public awareness raised, and the implementation plan operationalised.

			Awareness Raising			practices and policy implementation. **E.2** Develop and disseminate awareness materials on the new BC policy.	
	Q4				Develop detailed implementation plan, including roles, responsibilities, and timelines.	**E.3** Assessment & Baseline Data Collection **E.4** Implementation plan development and stakeholder engagement **E.5** Finalise and implement the Blue Carbon Implementation plan	
2027	Q1	Phase 3: Implementation and Evaluation	**F. Monitoring, Reporting, Evaluation, and Scaling Up**	Policy and reporting	Establish M&E framework for Blue Carbon projects.	**F.1** Develop a M&E framework for BC projects. **F.2** Pilot-test M&E framework in selected BC project sites. **F.3** Train stakeholders on data collection, monitoring, and reporting protocols.	M&E framework developed, tested, and stakeholders trained for effective implementation and reporting.
	Q2			Finance and international cooperation	Evaluate pilot Blue Carbon projects, identify lessons learned, and refine the policy.	**F.4** Complete evaluation report with recommendations	Evaluation report finalised
	Q3				Scale up successful Blue Carbon projects to additional regions and communities.	**F.5** Initiate at least three new Blue Carbon projects	New projects launched in 3 coastal regions of PNG
2027-28	Q4 Q1-Q4 (2028)			Policy and reporting	Conduct a comprehensive review of the Blue Carbon Policy implementation and its overall impact.	**F.6** Submit final report on Blue Carbon Policy implementation to government and stakeholders	Final report submitted

10. Integration of Blue Carbon Ecosystems into PNG's NDC and International Commitments

The integration of blue carbon ecosystems into PNG's NDC is important under the Paris Agreement framework. These ecosystems such as mangroves, seagrasses, and other coastal wetlands play a critical role in carbon sequestration, contributing directly to climate change mitigation and helping PNG meet its emission reduction targets. Likewise, blue carbon ecosystems are key elements of climate adaptation and resilience, acting as natural buffers, protecting coastal communities from storm surges, sea-level rise, and erosion. Recognising and incorporating blue carbon ecosystems into the NDC framework is therefore a key component in achieving PNG's climate commitments and is a high-level target of CCDA.

In alignment with International Frameworks, PNG is encouraged to adopt methodologies provided by the IPCC and other international guidelines such as the "2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands". These frameworks offer standardised methods for including coastal wetlands in greenhouse gas inventories, which ensures that Blue Carbon ecosystems are formally recognised in climate governance.

Nevertheless, challenges in Data and Methodologies present a barrier to effective integration. The 2023 National Stakeholders Blue Carbon Workshop report identifies complex guidelines and limited national data as significant obstacles. To address these, enhanced data collection processes and standardised methodologies are required, allowing PNG to accurately account for Blue Carbon ecosystems in its climate targets.

Revising the existing REDD+ framework to incorporate "nested" Blue Carbon projects is recommended. This involves aligning carbon pools within the REDD+ strategy to include Blue Carbon initiatives, ensuring compatibility with both the current REDD+ framework and future NDC updates.

Political Support and Policy Development are crucial to the success of integrating Blue Carbon ecosystems into PNG's climate strategies. The National Stakeholders Blue Carbon Workshop 2023 report emphasises the need for clear policies that support the development and integrity of Blue Carbon projects, facilitating their recognition within PNG's broader national and international climate commitments.

The Co-benefits of blue carbon projects extend beyond carbon sequestration alone. Blue Carbon projects support biodiversity conservation, enhance the livelihoods of local communities, and build resilience to climate change. Recognising these co-benefits within PNG's NDCs and international commitments reinforces the role of blue carbon initiatives in contributing to sustainable development goals.

Table 7 outlines key priority areas, targets, indicators, timelines, and lead agencies for integrating blue carbon ecosystems into PNG's climate commitments.

Year	Quarter	Action	Indicators	Responsible Agencies
2025	Q1 – Q2	- Develop policy framework for blue carbon integration within PNG's NDC. - Initiate Data Collection for mangroves, seagrasses, and coastal wetlands/tidal marshes. - Identify Capacity Gaps in data management and methodologies.	- 1 blue carbon policy draft developed - Baseline data collection initiated in at least 3 coastal provinces. - 1 capacity assessment report completed.	CCDA, CEPA, DJAG/ NOO, PNGFA, Conservation NGOs, DPLLGA/Provincial Governments, UPNG, UNRE
	Q3 – Q4	- Adopt IPCC Methodologies and conduct training workshops on international guidelines for Blue Carbon data. - Begin Stakeholder Consultations on co-benefits of Blue Carbon initiatives. - Establish clear carbon sequestration targets for blue carbon ecosystems (mangroves, seagrasses, and coastal wetlands/tidal marshes) and implement a robust monitoring, reporting, and verification framework for these ecosystems.	- Minimum of 3 training workshops conducted . - Participant feedback and training effectiveness assessment. - 1 stakeholder consultation report. - Revised NDC 2025 includes explicit blue carbon sequestration target - Blue carbon ecosystem measurement and reporting is integrated into existing MRV system at CCDA.	CCDA, CEPA, PNGFA
2026	Q1 – Q2	- Establish National Blue Carbon Inventory System aligned with international standards. - Develop Standardised Methodologies for data collection, monitoring, and reporting.	- Inventory system operational. - Methodologies developed and approved. - Data management framework established.	CCDA, CEPA, PNGFA, NOO, NFA
	Q3 – Q4	- Incorporate Blue Carbon ecosystems into PPNG's National REDD+ Framework and National MRV system by recognising them as carbon pools in carbon accounting and GHG reporting systems (NDCs, BTRs, NCs). - Pilot Blue Carbon Projects to test methodologies and gather data on ecosystem-based emission reductions.	- Revised REDD+ framework document. - Pilot project results report. - Data on emission reductions collected.	CCDA, CEPA, PNGFA, & DPLLGA/relevant local governments

2027	Q1 – Q2	- Draft and Approve Policy Recommendations based on pilot findings. - Build Institutional Capacity within lead agencies and local governments for Blue Carbon data management.	- 1 policy recommendation paper approved - At least 3 institutional training sessions conducted - Capacity of at least 3 local agencies assessed and documented	CCDA, CEPA, PNGFA
	Q3 – Q4	- Finalise NDC Update with Blue Carbon Integration, ensuring clear targets and timelines. - Enhance Stakeholder Engagement through regional workshops	- Finalised NDC document with Blue Carbon components. - Number of stakeholders engaged. - Workshop feedback/ results.	CCDA, CEPA, PNGFA
		Integrate Blue Carbon into BTR and national GHG inventory (next submission 2027)	- updated BC chapter and tables	CCDA
2028	Q1 – Q2	- Complete Final Assessment on Blue Carbon integration progress and adjust strategies.	- Assessment report published.	CCDA, CEPA, PNGFA
	Q3 – Q4	- Launch Monitoring Program to track Blue Carbon's role in climate strategies and community resilience.	- Monitoring program guidelines published.	CCDA, CEPA
2029	Q1 – Q2	- Conduct Periodic Review of Blue Carbon projects and update methodologies as needed. - Strengthen community engagement efforts and assess co-benefits for biodiversity and livelihoods.	- Review report completed. - Number of community engagement activities conducted. - Assessment of co-benefits documented.	CEPA, CCDA, DPLLGA, & local NGOs
	Q3 – Q4	- Expand Data Collection efforts to include additional coastal regions and refine emission reduction calculations for Blue Carbon ecosystems.	- Expanded data collection report. - Revised emission reduction calculations. - New coastal region data integrated.	CCDA, CEPA, PNGFA, NFA
2030	Q1 – Q2	- Assess Long-term Impact of Blue Carbon projects on PNG's climate and sustainable development goals. - Integrate findings into national reporting and international climate commitments.	- Long-term impact assessment report. - Findings included in national reports. - Stakeholder feedback on findings.	CCDA, CEPA

2030	Q3 – Q4	- Finalise NDC Update with Blue Carbon Integration, ensuring clear targets and timelines. - Submit Updated NDC to the UNFCCC, fully incorporating Blue Carbon ecosystems. - Launch Long-term Monitoring Program to track Blue Carbon's role in climate strategies and community resilience.	- Updated NDC submitted. - Monitoring program guidelines published. - Initial monitoring data collected. - Assessment report published.	CCDA, CEPA

11. Financing and Resource Mobilisation

In the context of PNG, securing adequate funding and resources is critical for the successful implementation and scaling of Blue Carbon initiatives. Given PNG's unique geographic, economic, and social circumstances, a multi-faceted approach to financing is required to ensure long-term sustainability and effectiveness.

PNG can utilise a combination of market and non-market mechanisms. Market mechanisms, such as carbon trading and ecosystem services markets, provide opportunities for generating revenue through the sale of carbon credits derived from restored and conserved Blue Carbon ecosystems. In contrast, non-market mechanisms, including grants and subsidies, can support community-based conservation efforts and sustainable practices without the pressure of market dynamics.

Funding from the national government will play a crucial role in bolstering these initiatives, particularly through the allocation of budgetary resources to conservation programs and local development projects that align with Blue Carbon objectives. Moreover, PNG can leverage international conventions and agreements, such as the GEF and the GCF, which offer financial assistance to developing countries for climate change mitigation and adaptation.

Additionally, multilateral development banks, such as the Asian Development Bank (ADB) and the World Bank, can provide vital funding and technical support for Blue Carbon projects. These institutions can facilitate investments in infrastructure and capacity-building initiatives that enhance the resilience of coastal communities while promoting sustainable land-use practices.

To illustrate the range of potential financing pathways available to PNG, the following table outlines various funding mechanisms and resources that the country can explore and utilise to support Blue Carbon initiatives.

Funding Mechanism	Type	Description	Examples
Carbon Trading	Market Mechanism	Generates revenue through the sale of carbon credits from restored and conserved Blue Carbon ecosystems.	Carbon markets, voluntary carbon offsets
Ecosystem Services Markets	Market Mechanism	Provides revenue opportunities from ecosystem services provided by Blue Carbon ecosystems.	Payments for Ecosystem Services (PES)
Grants	Non-Market Mechanism	Supports community-based conservation efforts and sustainable practices without market pressures.	GEF, bilateral aid programs
Subsidies	Non-Market Mechanism	Financial assistance aimed at encouraging sustainable practices and conservation initiatives.	Government incentives for conservation projects
National Government Funding	Public Funding	Allocated budgetary resources to conservation programs and local development projects aligned with Blue Carbon objectives.	National budget for environmental programs
International Funds	Public Funding	Financial assistance from global entities for climate change mitigation and adaptation initiatives.	GCF, GEF
Multilateral Development Banks	Institutional Support	Provide funding and technical support for projects, facilitating investments in infrastructure and capacity-building.	ADB, World Bank
Public-Private Partnerships (PPPs)	Collaborative Funding	Collaborative arrangements between government entities and private sector organisations to finance and implement Blue Carbon initiatives.	Joint ventures for conservation projects
Nature Bonds	Innovative Financing	Debt instruments issued to finance conservation projects, with returns potentially linked to conservation outcomes.	Environmental impact bonds, sustainability-linked bonds
Debt-for-Nature Swaps	Innovative Financing	A portion of a country's debt is forgiven in exchange for government commitments to invest in environmental conservation, including Blue Carbon projects.	Debt restructuring tied to conservation targets

Table 11: *Various funding mechanisms and resources that PNG can explore and utilise for Blue Carbon initiatives*

12. Summary and Conclusion

12.1 Summary

The integration of Blue Carbon into national policies is a cornerstone of the PNG Blue Carbon Policy Roadmap. By emphasising the necessity of incorporating Blue Carbon into national climate strategies, including the NDCs, the roadmap seeks to align local efforts with global climate commitments. This integration is crucial for ensuring that PNG can effectively contribute to international climate goals, thereby reinforcing its position in the global arena of climate action.

A significant focus of the roadmap is on stakeholder engagement and community involvement in blue carbon conservation efforts. By promoting community engagement, the policy will integrate local knowledge and practices into conservation strategies. This approach ensures that the initiatives are culturally relevant and supported by the communities that rely on these ecosystems, promoting a sense of ownership and responsibility among local populations.

Data collection and capacity building are also critical components of the roadmap. The establishment of a centralised database for blue carbon ecosystems will facilitate systematic data collection and mapping, empowering organisations to conduct regular inventories and assessments of blue carbon ecosystems. Furthermore, the implementation of training programs is designed to build local capacity for effective data management and reporting, thus enhancing the overall effectiveness of blue carbon initiatives.

The roadmap highlights the importance of financial mechanisms and international cooperation in supporting blue carbon projects. Establishing these financial mechanisms, including grants and partnerships with international organisations, is essential for the successful implementation of conservation initiatives. This financial support will not only sustain ongoing efforts but also leverage external resources to achieve PNG's blue carbon goals, ensuring that financial constraints do not hinder progress.

Lastly, a robust monitoring, reporting, and evaluation framework is proposed to track the progress of blue carbon initiatives. This framework will ensure that stakeholders are trained in data collection and reporting protocols, enabling effective evaluation of project outcomes. Through this systematic approach, lessons learned can be identified, paving the way for future scaling and refinement of blue carbon strategies.

The successful implementation of the Blue Carbon Policy Roadmap is expected to produce several positive outcomes. These include a clear strategy for developing and implementing the Blue Carbon Policy, with defined roles and responsibilities for stakeholders, which will enhance collaboration and accountability. Additionally, the roadmap aims to promote broad consensus among stakeholders, ensuring that diverse perspectives are reflected in the policy. Enhanced local stewardship of Blue Carbon ecosystems through community-based initiatives is also anticipated, leading to greater conservation success. Finally, improved data management and reporting capabilities will support better-informed policymaking, ultimately contributing to the sustainable management of PNG's Blue Carbon resources.

12.2 Conclusion

In conclusion, the PNG Blue Carbon Policy Roadmap is an important tool for addressing climate change while promoting the sustainable management of coastal ecosystems. By promoting and enhancing collaboration among stakeholders, integrating local knowledge, and establishing robust financial and monitoring frameworks, PNG can enhance its resilience to climate impacts and contribute to global efforts in climate change mitigation and adaptation. The successful execution of this roadmap will not only benefit the environment but also support the livelihoods of communities that rely on these critical ecosystems. Moving forward, it is crucial that all stakeholders remain committed to the goals and objectives outlined in this roadmap, ensuring a sustainable and resilient future for PNG's Blue Carbon ecosystems and resources.

References

Bryan, J.E., Shearman, P.L. (Eds). 2015. The State of the Forests of Papua New Guinea 2014

Climate Change and Development Authority (CCDA). (2023). *Climate Change (Management) Act Amendments*. Port Moresby, Papua New Guinea: CCDA.

Climate Change and Development Authority (CCDA). (2023). *National Adaptation Plan (NAP)*. Port Moresby, Papua New Guinea: CCDA.

Climate Change and Development Authority (CCDA). (2023). *Climate Change (Management) (Carbon Market) Regulation*. Port Moresby, Papua New Guinea: CCDA.

Climate Change and Development Authority (CCDA). (2017.). *National REDD+ Strategy*. Port Moresby, Papua New Guinea: CCDA.

Climate Change in the Pacific. Scientific Assessment and New Research. Volume 2. Country Reports. (2011).

Conservation and Environment Protection Authority (CEPA). (1978). *The Conservation Areas Act*. Port Moresby, Papua New Guinea: CEPA.

Conservation and Environment Protection Authority (CEPA). (2014). *Conservation and Environment Protection Authority Act*. Port Moresby, Papua New Guinea: CEPA.

Conservation and Environment Protection Authority (CEPA). (2019). *National Biodiversity Strategic Action Plan (NBSAP) 2019-2024*. Port Moresby, Papua New Guinea: CEPA.

Conservation and Environment Protection Authority (CEPA). (2024.). *Protected Area Policy*. Port Moresby, Papua New Guinea: CEPA.

Convention on Biological Diversity (CBD). (2010). *Aichi Biodiversity Targets*. Montreal, Canada: Secretariat of the CBD.

Coral Triangle Center. (n.d.). Papua New Guinea. Coral Triangle Center. Retrieved July 28, 2025, from https://www.coraltrianglecenter.org/papua-new-guinea/

CSIRO. (n.d.). *Research projects on mangrove and blue carbon ecosystems*. Commonwealth Scientific and Industrial Research Organisation, Australia.

Department of Foreign Affairs. (2015). *Maritime Zones Act*. Port Moresby, Papua New Guinea: Department of Foreign Affairs.

Department of Justice and Attorney General (DJAG) – National Oceans Office (NOO). (2020). *National Oceans Policy (NOP) 2020-2030*. Port Moresby, Papua New Guinea: DJAG.

Department of Lands and Physical Planning (DLPP). (2023). *National Sustainable Land Use Policy (SLUP)*. Port Moresby, Papua New Guinea: DLPP.

Department of National Planning and Monitoring (DNPM). (2010). *Papua New Guinea Development Strategic Plan 2010-2030*. Port Moresby, Papua New Guinea: DNPM.

Department of National Planning and Monitoring (DNPM). (2010). *PNG Vision 2050*. Port Moresby, Papua New Guinea: DNPM.

Department of National Planning and Monitoring (DNPM). (2023). *Medium-Term Development Plan IV 2023-2027*. Port Moresby, Papua New Guinea: DNPM.

Department of National Planning and Monitoring (DNPM). (2014). *National Strategy for Sustainable Development (STAR)*. Port Moresby, Papua New Guinea: DNPM.

Donato, D.C., Kauffman, J.B., Murdiyarso, D., Kurnianto, S., Stidham, M., & Kanninen, M. (2011). Mangroves among the most carbon-rich forests in the tropics. Nature Geoscience, 4, 293–297. https://doi.org/10.1038/ngeo1123

Earth Journalism Network. (2020). The Role of Local Communities in Conserving Mangroves and Seagrasses in Papua New Guinea. Earth Journalism Network.

Education for All 2000 – 2015: Achievements and Challenges. (2015)
FAIR Carbon. (2024, February). Enabling conditions for blue carbon projects: Papua New Guinea. https://www.faircarbon.org/papua-new-guinea

FAO (2018). The role of women in small-scale fisheries of Papua New Guinea.

FORCERT. (n.d.). *Community-led environmental conservation initiatives*. Papua New Guinea.

Hamilton, S. E., & Friess, D. A. (2018). Global carbon stocks and potential emissions due to mangrove deforestation from 2000 to 2012. *Nature Climate Change, 8*(3), 240 - 244.

Harper, S., Zeller, D., Hauzer, M., Pauly, D., & Sumaila, U. R. (2013). Women and fisheries: Contribution to food security and local economies. Marine Policy, 39, 56 - 63.

International Labour Organization. Youth Labour Statistics. (2020).

Locally Managed Marine Areas (LMMA) Network. (2000). *Community-based coastal ecosystem management programs*.
Kinch, J., & Bagita, J. (2003, May). Women in fisheries in Milne Bay Province, Papua New Guinea: Past initiatives, present situation and future possibilities. Women in Fisheries Information Bulletin, (12), 32–37. Secretariat of the Pacific Community.

Mangrove Watch. (n.d.). *Mangrove Watch Database*. Available from https://mangrovewatch.org/.

MARSH Project. (2015). *Mangrove Rehabilitation for Sustainably Managed Healthy Forests*.

McKenzie, L.J. et. al (2021) Seagrass ecosystems fo the Pacific Island Countries and Territories: A global bright spot. Marine Pollution Bulletin

Mcleod, E., Chmura, G.L., Bouillon, S., Salm, R., Björk, M., Duarte, C.M., ... & Silliman, B.R. (2011). A blueprint for blue carbon: Toward an improved understanding of the role of vegetated coastal habitats in sequestering CO_2. Frontiers in Ecology and the Environment, 9(10), 552–560. https://doi.org/10.1890/110004

Murray, L. S., & Milligan, B. (Eds.). (n.d.). *The Blue Carbon Handbook: Blue carbon as a nature-based solution for climate action and sustainable development*.

National Fisheries Authority (NFA). (1998). *Fisheries Management Act*. Port Moresby, Papua New Guinea: NFA.

National Fisheries Authority (NFA). (2017). *Roadmap for Coastal Fisheries and Marine Aquaculture (2017-2026)*. Port Moresby, Papua New Guinea: NFA.

National Ocean Services, (2024). Coastal Blue carbon. Accessed on 5 February 2025 from: The world's coastal ecosystems - coastal salt marshes, mangrove forests, and seagrass meadows - are incredibly efficient at capturing and storing large quantities of carbon

Papua New Guinea Forest Authority (2022) *Papua New Guinea Forest and Land Use Change 2000-2019.* PNGFA. Port Moresby

Papua New Guinea's Voluntary National Review 2020- Progress of Implementing the Sustainable Development Goals. (2020).

Seagrass Watch. (n.d.). *Seagrass Watch Database*. Available from https://seagrasswatch.org/.
Shearman, P. L., Bryan, J. E., Ash, J., Hunnam, P., Mackey, B., & Lokes, B. (2008). The State of the *Forests of Papua New Guinea: Mapping the Extent and Condition of Forest Cover and Measuring the Drivers of Forest Change in the Period 1972–2002*. University of Papua New Guinea.

TNC. Women Guardians of the Mangroves. Available at: https://www.nature.org/en-us/about-us/where-we-work/asia-pacific/asia-and-the-pacific-women-in-conservation/women-guardians-of-the-mangroves/
UNESCO (2022) Mangrove ecosystems of Papua New Guinea. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000382220

UNESCO. (2022). Mangrove ecosystems of Papua New Guinea. UNESCO. Retrieved July 28, 2025, from UNESCO Digital Library via UNESDOC

UNICEF. (2022). Papua New Guinea Country Office Annual Report 2022. UNICEF. Retrieved July 31, 2025, from UNICEF website

United Nations. (2015). *Sustainable Development Goals (SDGs)*. New York, USA: United Nations.

United Nations Convention on the Law of the Sea (UNCLOS). (1982).
United Nations Framework Convention on Climate Change (UNFCCC). (2015). Paris Agreement. Bonn, Germany: UNFCCC Secretariat.
United Nations Papua New Guinea (2024) Policy Brief on Climate Change and Biodiversity Conservation in Papua New Guinea

USAID. (2021). *Papua New Guinea - Land Tenure and Property Rights Country Profile*. United States Agency for International Development. https://www.land-links.org/country-profile/papua-new-guinea/
World Bank. (2020). Doing Business 2020: Economy Profile - Papua New Guinea. Washington, DC: World Bank Group. Retrieved July 31, 2025, from World Bank Doing Business website

Annex I: Details of Blue Carbon Policy Roadmap Activities

A. Research and Baseline Data Collection, Enabling Condition Assessment, and Identification of Barriers and Opportunities

A.1 Collect and Analyse Baseline Data on Blue Carbon Ecosystems

In this phase, the primary focus is on gathering essential baseline data related to Blue Carbon ecosystems (BCE) across PNG. The goal is to identify the location, extent, and health of BC ecosystems such as mangroves, seagrass beds, and salt marshes. This data collection is vital for mapping carbon stocks, understanding the carbon sequestration potential of these ecosystems, and assessing their status in terms of environmental health. Detail mapping and inventory of these ecosystems will allow for a better understanding of their spatial distribution and provide a scientific basis for policy formulation.

The baseline inventory will not only cover carbon stock assessments but also extend to other aspects, including biodiversity, ecosystem services, and threats to these ecosystems. For example, data on changes in BCEs, such as deforestation in mangroves or degradation in seagrass beds, will be captured through spatial analysis tools such as the PNG Deforestation Alerts and Monitoring System[1], the PNG Forest and Land Use Monitoring Geo-Portal[2].and mangrove and seagrass extent and change cover maps from Digital Earth Pacific[3]. This can be cross-referenced with ecosystem services data to assess the impacts of these changes on local livelihoods, biodiversity, and the ecosystem services they provide, such as coastal protection and fishery support. Mapping will help identify historical and current drivers of degradation, enabling targeted interventions.

It is also important to identify existing projects and data sources, including those managed by organisations such as PNGFA, FORCERT, and CEPA, to ensure that efforts are not duplicated, and existing methodologies can be improved and standardised for long-term monitoring. Existing global data sets, such as those from Seagrass Watch and Mangrove Watch, will also be utilised. The data collected will play a key role in integrating Blue Carbon into national climate commitments, such as PNG's NDCs, while addressing threats and risks to these vital ecosystems.

To further enhance data collection and management, national research institutions will be equipped with the capacity to adopt standardised methodologies for multi-purpose inventories. This includes not only carbon stock data but also information on biodiversity and ecosystem services, factoring in equity issues like the differentiated use of mangrove resources by men and women. The data collected will play a key role in informing the development of the blue carbon policy and will enable the integration of blue carbon into national climate commitments such as the NDCs while addressing threats and risks to these vital ecosystems.

A.2 Assess Enabling Conditions, Legal Frameworks, and Barriers to Blue Carbon Ecosystem Management

After the data collection, the next step involves assessing the existing enabling conditions and legal frameworks governing Blue Carbon management in PNG. This includes identifying gaps and overlaps in current laws, policies, and institutions related to BCE conservation, Legal frameworks, such as the Conservation Areas Act 1978 and the PNG Conservation and Environment Protection Authority Act 2014, will be reviewed to assess how effectively they address Blue Carbon ecosystems.

This assessment will help align the Blue Carbon Policy with PNG's overarching legislation and policies, such as the Climate Change (Management) Act and National REDD+ strategy, and international commitments under the Paris Agreement and the UNCBD. Additionally, the review will explore social, economic, and institutional barriers that may hinder the effective management of Blue Carbon ecosystems. This includes assessing traditional land tenure systems in mangrove areas and how local communities engage with BC ecosystems for livelihood purposes. The outcome of this assessment will help shape recommendations for policy adjustments and highlight the need for new legislative or administrative measures to support Blue Carbon initiatives.

1 https://my.gfw-mapbuilder.org/v1.latest/index.html?appid=c8e4162ef1dd4891aad9b560ac88e55b

2 https://png-nfms.org/

3 www.digitalearthpacific.com

International and national Policy Alignment

The Blue Carbon Policy will complement existing national frameworks, such as PNG's NDCs), the National REDD+ Strategy, the NBSAP, the National Sustainable Land Use Policy (NSLUP), and other climate change and environmental policies. On the international level, it will align with commitments that PNG is a party to, namely the UNFCCC, the UNCBD, and the Agenda 2030 and its SDGs. Below is a detailed breakdown of these key policies and strategies and how the Blue Carbon Policy will integrate with them.

- The Blue Carbon Policy will also align with several international commitments that PNG is a party to:

International Agreement	PNG's Commitment	Linkage to Blue Carbon Ecosystems (BCEs)
United Nations Framework Convention on Climate Change (UNFCCC)	NDC targets, Paris Agreement commitments	BCEs such as mangroves and seagrasses contribute significantly to carbon sequestration, aligning with PNG's climate mitigation goals under the Paris Agreement. Also, BCEs are key elements of climate adaptation and resilience, acting as natural buffers, protecting coastal communities from storm surges, sea-level rise and erosion.
Paris Agreement	PNG submitted its Second NDC (2020) with commitments to reduce emissions and strengthen resilience	BCEs enhance both mitigation (via carbon storage) and adaptation (via coastal protection), aligning with Article 5 and Article 7 of the Paris Agreement which promote ecosystem-based approaches.
United Nations Convention on Biological Diversity (UNCBD)	Aichi Targets, Post-2020 Global Biodiversity Framework	The BC Policy supports the conservation and restoration of marine biodiversity, directly contributing to global biodiversity targets.
RAMSAR Convention on Wetlands	PNG is a contracting party; committed to the wise use and conservation of wetlands of international importance	Blue carbon ecosystems like mangroves and coastal wetlands fall under RAMSAR's scope, promoting sustainable management and conservation of BCEs.

United Nations Convention on the Law of the Sea (UNCLOS)	PNG is a party; obligated to protect and preserve the marine environment	BCEs support marine ecosystem health and productivity, which are integral to fulfilling UNCLOS obligations related to marine environmental protection and sustainable use of marine resources.
Sustainable Development Goals (SDGs)	SDG 13 (Climate Action), SDG 14 (Life Below Water)	The Blue Carbon Policy aligns with SDG 14 by protecting and restoring coastal and marine ecosystems, and with SDG 13 by addressing climate change through carbon sequestration and adaptation enhancement.

The Blue Carbon Policy will also align with several international commitments that PNG is a party to:

- Alignment with International Commitments and Agreements

International Agreement	**PNG's Commitment**	**Linkage to Blue Carbon Ecosystems (BCEs)**
United Nations Framework Convention on Climate Change (UNFCCC)	NDC targets, Paris Agreement commitments	BCEs such as mangroves and seagrasses contribute significantly to carbon sequestration, aligning with PNG's climate mitigation goals under the Paris Agreement. Also, BCEs are key elements of climate adaptation and resilience, acting as natural buffers, protecting coastal communities from storm surges, sea-level rise and erosion.
Paris Agreement	PNG submitted its Second NDC (2020) with commitments to reduce emissions and strengthen resilience	BCEs enhance both mitigation (via carbon storage) and adaptation (via coastal protection), aligning with Article 5 and Article 7 of the Paris Agreement which promote ecosystem-based approaches.
United Nations Convention on Biological Diversity (UNCBD)	Aichi Targets, Post-2020 Global Biodiversity Framework	The BC Policy supports the conservation and restoration of marine biodiversity, directly contributing to global biodiversity targets.

RAMSAR Convention on Wetlands	PNG is a contracting party; committed to the wise use and conservation of wetlands of international importance	Blue carbon ecosystems like mangroves and coastal wetlands fall under RAMSAR's scope, promoting sustainable management and conservation of BCEs.
United Nations Convention on the Law of the Sea (UNCLOS)	PNG is a party; obligated to protect and preserve the marine environment	BCEs support marine ecosystem health and productivity, which are integral to fulfilling UNCLOS obligations related to marine environmental protection and sustainable use of marine resources.

The table below shows the national policy alignment:

- National Policy Alignment with Blue Carbon

Overarching Policies, Sectoral Policies, Plans, and Strategies	**Responsible Agencies**	**Linkage to Blue Carbon Ecosystems**
PNG Vision 2050	Department of National Planning and Monitoring (DNPM)	PNG's long-term development strategy emphasises sustainability and resilience, providing a foundation for incorporating Blue Carbon ecosystems as a key component of environmental and climate goals.
Papua New Guinea Development Strategic Plan 2010-2030	DNPM	The BC Policy will help achieve the environmental sustainability goals outlined in the Development Strategic Plan, particularly those related to coastal and marine ecosystems.
National Strategy for Sustainable Development (StaRS)	DNPM	The BC Policy will complement the StaRS strategy by integrating sustainable practices for BCE management and supporting ecosystem-based adaptation for coastal communities.
Medium-Term Development Plan (MTDP IV) 2023-2027	DNPM	MTDP IV's climate change, environment, and biodiversity targets will integrate Blue Carbon as part of the national effort to reduce carbon emissions and enhance coastal resilience.
PNG SDG Goal 13 - 30x30 Roadmap	DNPM	The BC Policy will support SDG 13 (climate action) and SDG 14 (life below water), particularly the implementation of actions under Climate Governance and Biodiversity.
Climate Change (Management) Act (Amendments) 2023	CCDA	The BC Policy will align with the overall goals of the CCMA Amendments 2023, which emphasizes carbon sequestration, ecosystem conservation, and resilience-building, linking to BCEs such as mangroves.

Conservation and Environment Protection Authority Act 2014	CEPA	The CEPA Act mandates the protection and conservation of natural ecosystems, which includes Blue Carbon ecosystems like mangroves, seagrass, and salt marshes.
Protected Areas Act 2024	CEPA	Establishes a legal framework for the designation, management, and governance of protected areas, enhancing the conservation of Blue Carbon ecosystems by ensuring their long-term protection and sustainable use.
The Conservation Areas Act 1978	CEPA	Provides a mechanism to legally protect Blue Carbon ecosystems in PNG, contributing to their conservation, biodiversity protection, and sustainable management.
Maritime Zones Act 2015	Department of Foreign Affairs	This Act establishes PNG's maritime jurisdiction, including its territorial sea and Exclusive Economic Zone (EEZ), in accordance with the United Nations Convention on the Law of the Sea (UNCLOS). ● Declaration of MPAs which may be designated as (a) a fishing reserve (b) a marine park (c) a marine reserve (d) a Particularly Sensitive Sea Area (PSSA) ● All requirements for Marine Scientific Research.
Fisheries Management Act 1998	National Fisheries Authority (NFA)	The Act governs fishing and management of marine resources in PNG.
Protected Area Policy 2014	CEPA	The BC Policy will align with the Protected Area Policy, specifically by ensuring that marine protected areas (MPAs) include critical BCEs like seagrasses, mangroves, and tidal marshes.
National Oceans Policy (NOP) 2020-2030	DJAG – National Oceans Office (NOO)	The NOP sets a framework for the sustainable management of marine resources, and the BC Policy will align with this by focusing on sustainable Blue Carbon ecosystem management.
National Biodiversity Strategic Action Plan (NBSAP) 2019-2024	CEPA	The BC Policy supports NBSAP goals, particularly regarding the protection of marine biodiversity and ecosystem restoration, both of which include Blue Carbon ecosystems.
Roadmap for Coastal Fisheries and Marine Aquaculture (2017-2026)	NFA	This roadmap includes goals related to sustainable aquaculture and fisheries, which intersect with the Blue Carbon Policy through the preservation of mangroves and seagrasses that serve as breeding grounds for marine life.
National Sustainable Land Use Policy (NSLUP)	Department of Lands and Physical Planning (DLPP)	The NSLUP covers land-based ecosystems, including mangroves. The Blue Carbon Policy will complement this by focusing on seagrass beds and tidal marshes, which are not explicitly covered under SLUP.

National Adaptation Plan (NAP)	CCDA	Strategic Action 5.2 calls for coastal rehabilitation and protection of marine ecosystems, a direct linkage with the Blue Carbon Policy's focus on restoring mangroves, seagrass beds, and tidal marshes.
Nationally Determined Contribution (NDC)	CCDA	The BC Policy will contribute to PNG's updated NDC by quantifying carbon sequestration from BCEs and incorporating it as a nature-based solution for climate change mitigation and adaptation.
National REDD+ Strategy	CCDA	The inclusion of mangrove conservation and afforestation activities under the REDD+ strategy ensures synergy with Blue Carbon conservation goals.
Provincial Mangrove Plans	DLPGA/Provincial Government	outline local strategies for conserving and restoring mangrove ecosystems

The Blue Carbon Policy will fill the gaps left by other national frameworks, particularly in relation to ecosystems like seagrass and tidal marshes, which are less explicitly addressed by current policies such While the current policies cover land-based ecosystems, including mangroves, the Blue Carbon Policy will ensure that marine ecosystems are adequately protected, particularly by leveraging ongoing work under the National Oceans Policy and the National Marine Program.

B. Stakeholder Engagement and Consultations

B.1 Conduct Initial Stakeholder Consultations

Engaging stakeholders is a critical step in ensuring that the development of the Blue Carbon Policy is inclusive and participatory. Initial consultations with key stakeholders, including government agencies, local communities, civil society organizations, and international partners, will be conducted to gather inputs and validate the policy's vision and key priority areas. This engagement will help ensure that the Blue Carbon Policy aligns with the interests and needs of different groups while securing their buy-in and commitment to future implementation. It is important to ensure that all parties are aware of their roles and responsibilities in the context of Blue Carbon management. Furthermore, it is essential to recognise community-led conservation projects/initiatives, identify their needs and constraints, and consider equity in these community-led initiatives. The consultations should also identify the threats and the existing mechanisms for resolving disputes, enabling a broad understanding of the landscape in which the policy will operate.

B.2 Engage Stakeholders to Establish Vision Statement and Key Priority Areas for the BC Policy

This activity focuses on working with stakeholders to develop a shared vision and establish the key priority areas for the Blue Carbon Policy. Through a series of workshops and discussions, stakeholders will help define the long-term goals and objectives of the policy. These priority areas may include biodiversity conservation, climate change mitigation, sustainable livelihoods, and the protection of coastal ecosystems. The challenges faced by the government in dealing with conservation deeds will be considered to ensure that the vision is realistic and attainable. Additionally, the policy should support community efforts in conservation and promote approaches that improve community while providing provisions on how to deal with community conservation initiatives outside of the managed areas. The outcome will be a unified vision statement and a clear set of priorities that guide the drafting of the policy.

B.3 Organise Public Consultations and Workshops to Gather Input on the BC Policy Draft

Outline

To ensure the policy reflects broad-based input, public consultations and workshops will be held to gather feedback on the initial outline or draft of the Blue Carbon Policy. These consultations will be open to a wide range of participants, including local communities, NGOs, academia, and private sector stakeholders. Input from these sessions will be integrated into the policy draft to ensure it is responsive to the needs and concerns of those most affected by its implementation. It is vital for the BC policy to guide the operations of the different players in the BC conservation initiatives, especially in establishing new conservation areas. Furthermore, CEPA should outline the government process in place to develop new community conservation projects by CBOs. The policy should also call for the application of the Community-Based Natural Resource Management Process in managing conservation projects in the country. This approach will enable stakeholders to feel included and represented in the decision-making process.

C. Policy Drafting

The policy drafting process for PNG's Blue Carbon Policy is designed to ensure that the policy is thorough, inclusive, and well-aligned with both national priorities and international commitments. This process involves several key stages:

C.1 Draft the Blue Carbon Policy and Align it with Domestic Policies and International Commitments

The first phase focuses on drafting the Blue Carbon Policy document, emphasising the protection and restoration of Blue Carbon ecosystems to support ecosystem health, biodiversity conservation, and community livelihoods. These ecosystems-mangroves, seagrass beds, and salt marshes-provide essential services, including coastal protection, habitat for marine life, and sustainable livelihood opportunities for local communities. Safeguarding these ecosystems aligns with PNG's NBSAP and its broader environmental commitments.

In addition to promoting ecosystem resilience and community well-being, the policy will also align with national climate and carbon strategies, including PNG's NDCs under the Paris Agreement, REDD+ strategies, and the Carbon Market Regulation. By integrating Blue Carbon ecosystems into national climate mitigation frameworks, PNG can enhance its ability to meet both climate and biodiversity targets. The policy will establish clear targets and actions for the protection and sustainable management of Blue Carbon ecosystems, reinforcing their role in sequestering carbon and mitigating climate change.

For instance, PNG ranks among the top fifteen countries with a well-developed mangrove environment, covering 574,867 m^2 (The Nature Conservancy, Situation Analysis Report, 2021). These mangrove ecosystems store significant amounts of carbon and contribute to both climate mitigation and coastal resilience. Ensuring their conservation and restoration will not only help PNG achieve its NDC targets by 2030 but also support biodiversity conservation goals under the UNCBD and NBSAP.

The Blue Carbon policy will provide the foundation for an integrated approach that balances environmental sustainability, community development, and climate action, positioning Blue Carbon ecosystem conservation as a key strategy for achieving PNG's national and international commitments.

To ensure that gender equality and social inclusion (GESI) principles are embedded in the policy, the drafting will include information on how the Blue Carbon Policy promotes equitable benefits for all sectors of society, including marginalised groups such as women, youth, and Indigenous communities.

It should outline specific actions that enhance access to resources, opportunities, and decision-making processes for these groups, ensuring that the policy contributes to inclusive economic growth and social development.

C.2 Conduct Stakeholder Consultations and Incorporate Feedback into the Policy Draft

Following the initial drafting, stakeholder consultations will be held to gather feedback from key sectors. The feedback process will ensure that the policy is practical and addresses on-the-ground concerns. For example, local communities living near Blue Carbon ecosystems - like those in Manus, Gulf, and Western - will play a critical role in the policy's success, given their reliance on coastal resources. Stakeholder feedback will be essential to shape practical approaches for resource management, conservation, and carbon benefits distribution.

C.3 Review and Refine the Draft Policy through Expert Consultations

This phase will involve consultations with legal and policy experts to ensure that the draft policy is coherent, legally sound, and enforceable. Given the multi-sectoral nature of Blue Carbon ecosystems, experts will refine the policy by ensuring its alignment with existing laws, such as the Conservation Areas Act 1978, the Environment Act 2000, and the Marine Protected Areas legislation. Expert consultations will also focus on clarifying roles and responsibilities for key institutions - such as CEPA, CCDA, and provincial administrations - to ensure smooth implementation. Addressing legal overlaps and gaps between national and sub-national governance structures will be crucial for the policy's effectiveness.

C.4 Circulate the Revised Draft Policy for Final Feedback

After incorporating expert input, the revised Blue Carbon Policy draft will be circulated for final feedback from all stakeholders. This step ensures that all critical voices are heard before the policy is formally submitted for approval. National agencies, sub-national governments, international organisations, and academic institutions like UPNG and UNRE will also provide inputs to refine the document further. The circulation process aims to ensure the policy's practical implementation across diverse coastal ecosystems and communities in the country. This stage is particularly important to verify that the policy reflects the unique social, environmental, and economic dynamics of PNG's Blue Carbon ecosystems.

D. Policy Endorsement and Approval

D.1 Preparing NEC Submission Documents for Blue Carbon Policy Approval

With the final draft of the Blue Carbon Policy completed, the next step is to prepare the necessary submission documents for the NEC. These documents will provide a structured overview of the policy, including its objectives, key actions, expected outcomes, and its alignment with national policies and international commitments. The submission will also highlight the policy's role in supporting climate change mitigation and adaptation, coastal ecosystem conservation, and socio-economic co-benefits.

D.2 Coordinating the Review Process with Key Agencies

Before submission to the NEC, the policy documents will be reviewed by CCDA, CEPA, and the CACC. This step ensures that all necessary approvals, endorsements, and technical inputs are secured before the policy is formally presented. Any requested revisions or additional requirements from these agencies will be incorporated to strengthen the policy's case for approval.

D.3 Securing NEC Approval and Facilitating Implementation

Following the review process, the Blue Carbon Policy will be submitted to the NEC for endorsement and official approval. The presentation of the policy to the NEC will be prepared based on specific requests from CACC. NEC approval is a critical step in institutionalizing the policy, securing high-level political support, and integrating it into national governance frameworks. Endorsement at this level will also facilitate resource allocation, ensuring that the policy is backed by the necessary financial, technical, and institutional support for effective implementation.

E. Strengthening Capacities and Raising Awareness for Blue Carbon Policy Implementation

E.1 Conduct Training Workshops for Local Communities, Government Officers, and Stakeholders

Capacity building is essential for the effective implementation of the Blue Carbon Policy. Training workshops will be conducted for local communities, government officials, and other stakeholders to enhance their understanding of Blue Carbon conservation practices and the policy's objectives. These workshops will focus on practical skills, including participatory mapping of BC ecosystem areas, and will incorporate best practices from previous projects like the MARSH

project. Participants will learn how to conduct carbon stock assessments and ecosystem monitoring using standardized methods, ensuring consistency in data collection across different sites. The training will also address climate resilience, teaching local stakeholders how to incorporate traditional knowledge into Blue Carbon restoration efforts.

E.2 Develop and Disseminate Awareness Materials on the New BC Policy

Public awareness campaigns will be launched to inform the general public and key stakeholders about the Blue Carbon Policy and its importance for climate change mitigation and coastal ecosystem protection. This will include collaborations with national and local media outlets, as well as social media platforms, to ensure wide outreach. Educational materials, such as brochures, videos, and community outreach programs, will be developed to raise awareness about the role of Blue Carbon ecosystems in PNG's environmental and economic future. These materials will highlight success stories from local communities involved in Blue Carbon projects, demonstrating the tangible benefits of conservation, including enhanced fisheries, improved livelihoods, and protection against storm surges.

E.3 Finalise Blue Carbon Implementation Plan

A detailed implementation plan will be developed to guide the policy's roll-out. This plan will include specific actions, timelines, roles, responsibilities, and resource requirements for each phase of implementation. The implementation plan will draw on existing frameworks to ensure alignment with national climate goals. It will also integrate capacity-building efforts into each phase, ensuring that government agencies, NGOs, and local communities have the knowledge and tools to execute the policy effectively. A key component will be the establishment of regional Blue Carbon working groups, which will provide ongoing technical support and ensure coordination across provinces. The plan will operationalise the policy and ensure that all stakeholders are clear on their roles in achieving the policy's goals.

F. Monitoring, Reporting, Evaluation, and Scaling Up

F.1 Develop a Monitoring and Evaluation Framework for BC Projects

A robust M&E framework will be established to track the progress of Blue Carbon initiatives and measure their impact on carbon sequestration, biodiversity, and community livelihoods. This framework will include indicators for monitoring ecosystem health, carbon stocks, and the effectiveness of policy interventions. The M&E framework will draw from existing models, such as the REDD+ M&E framework used in PNG, and include specific metrics related to ecosystem health, including mangrove deforestation rates, seagrass health indicators, and community participation rates in Blue Carbon conservation activities.

F.2 Pilot-Test M&E Framework in Selected BC Project Sites

The M&E framework will be pilot tested in selected Blue Carbon project sites across PNG. Initial pilot sites will be chosen based on ecological and socioeconomic significance, focusing on areas with substantial mangrove coverage, such as the Gulf and parts of New Ireland provinces. This will allow for the refinement of data collection methods, evaluation criteria, and reporting protocols before the framework is rolled out nationwide. The pilot phase will also help identify any challenges or gaps in the M&E system that need to be addressed.

F.3 Train Stakeholders on Data Collection, Monitoring, and Reporting Protocols

To ensure effective monitoring and reporting, training sessions will be conducted for stakeholders involved in the Blue Carbon projects. This will include training on data collection techniques, use of monitoring tools, and reporting protocols. The training will integrate local knowledge, particularly from communities that rely on BC ecosystems for livelihoods and will involve collaboration with institutions such as the UPNG, UNRE, PNG Forest Research Institute, TNC, CEPA, and CCDA for technical capacity building. The goal is to build local capacity to manage and report on Blue Carbon initiatives.

F.4 Complete Evaluation Report with Recommendations

After the pilot phase, an evaluation report will be completed, summarizing the lessons learned and providing recommendations for scaling up successful Blue Carbon initiatives. This report will include key data, such as carbon sequestration potential, restoration success rates, and the socioeconomic impact on local communities. It will inform the refinement of the policy and the expansion of Blue Carbon projects to additional provinces.

F.5 Initiate New Blue Carbon Projects in Additional Provinces

Based on the success of the initial projects, at least three new Blue Carbon projects will be launched in other coastal regions of PNG. These projects will focus on expanding the conservation and restoration of BC ecosystems, building on the knowledge and experience gained from the pilot projects. The new provinces will be selected based on a combination of ecological need and community readiness, prioritising areas identified in spatial analysis as having significant Blue Carbon potential and vulnerability.

F.6 Submit Final Report on Blue Carbon Policy Implementation to Government and Stakeholders

A detail final report will be submitted to the government and stakeholders, detailing the overall impact of the Blue Carbon Policy, lessons learned, and recommendations for future actions. This report will include detailed analysis of carbon sequestration achievements and biodiversity improvements, as well as suggestions for long-term funding and governance mechanisms to sustain Blue Carbon projects. It will mark the completion of the initial phase of policy implementation and provide a foundation for ongoing efforts to protect PNG's Blue Carbon ecosystems.

Annex 2: PNG Ecosystem Service Valuation Report and Carbon Stock + Biodiversity Threat Assessment and LMA reports

A. PNG Ecosystem Services Valuation Report 2025 (Matari Inc)

(Use this link to create hyper link of the above mentioned document: https://docs.google.com/document/d/1jwmfICSENx1W6oloC0kp4meOhDxJ46eH/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true)

B. PNG Carbon Stock Assessment Report & Biodiversity Threat Assessment 2025 (Alluvium)

(Use this link to create hyper link of the above mentioned documents: (i) PNG Carbon Stock Assessment Report - use this link: https://docs.google.com/document/d/1wZm4NR86u1z_OCCiAuH68dGdrouLFMP9/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true,

and (ii) Biodiversity Threat Assessment 2025 (Alluvium) - use this link: https://docs.google.com/document/d/1Dbs8r09A9DutjVuQbjFu5-7Krmp4qn7-/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true)

C. LMA Reports for New Ireland Province - 2025 (WCS PNG)

i) Bagatere (use this to create hyperlink: https://docs.google.com/document/d/1bGSM6Kt8t-O4A5PJVzN27SKcT-0lywF9/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true)

ii) Lapai (use this to create hyperlink: https://docs.google.com/document/d/1jvtEA2ZroogYtKxjT9BMRzCJLGlT6C0P/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true)

ii) Tome (use this to create hyperlink: https://docs.google.com/document/d/13bGVOQ4r2-hSMTXKNmQTfQDx8qxkOzId/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true)

iv) Sivasat (use this to create hyperlink: https://docs.google.com/document/d/1PTZSFp4oPP36veZV-6r6Eh7OkxbZsmUY/edit?usp=sharing&ouid=101308770155568168887&rtpof=true&sd=true)