



**Verified Carbon
Standard**

COMMUNITY-BASED MANGROVE CONSERVATION AND RESTORATION IN SIERRA LEONE



WEST AFRICA BLUE

Document Prepared by West Africa Blue with support from GreenCollar

Project Title	Community-Based Mangrove Conservation and Restoration in Sierra Leone
Version	1.0
Date of Issue	29-June-2023 this version of the document issued
Prepared By	West Africa Blue and GreenCollar
Contact	85 Main Motor Road, Freetown, Sierra Leone, info@westafricablue.org , www.westafricablue.org

CONTENTS

LIST OF ABBREVIATIONS	4
1 PROJECT DETAILS	6
1.1 Summary Description of the Project	6
1.2 Sectoral Scope and Project Type	7
1.3 Project Eligibility	7
1.4 Project Design	8
1.5 Project Proponent.....	8
1.6 Other Entities Involved in the Project	9
1.7 Ownership	10
1.8 Project Start Date	11
1.9 Project Crediting Period	12
1.10 Project Scale and Estimated GHG Emission Reductions or Removals	12
1.11 Description of the Project Activity	12
1.12 Project Location	18
1.13 Conditions Prior to Project Initiation	20
1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks	21
1.15 Participation under Other GHG Programs	23
1.16 Other Forms of Credit	23
1.17 Sustainable Development Contributions.....	23
1.18 Additional Information Relevant to the Project	24
2 SAFEGUARDS	24
2.1 No Net Harm	24
2.2 Local Stakeholder Consultation	24
2.3 Environmental Impact.....	25
2.4 Public Comments	25
2.5 AFOLU-Specific Safeguards	25
3 APPLICATION OF METHODOLOGY.....	25
3.1 Title and Reference of Methodology	25
3.2 Applicability of Methodology.....	26
3.3 Project Boundary	29
3.4 Baseline Scenario	29
3.5 Additionality	29
3.6 Methodology Deviations	30

4	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS.....	30
4.1	Baseline Emissions	30
4.2	Project Emissions	30
4.3	Leakage	30
4.4	Net GHG Emission Reductions and Removals.....	30
5	MONITORING.....	30
5.1	Data and Parameters Available at Validation	30
5.2	Data and Parameters Monitored	30
5.3	Monitoring Plan	30

LIST OF ABBREVIATIONS

ACI: Africa Conservation Initiative
AFOLU: Agriculture, Forestry, and Other Land Use
AGB: Aboveground Biomass
AGC: Aboveground Carbon
ARR: Afforestation, Re-forestation, and Re-vegetation
AUDD: Avoided Unplanned Deforestation and Degradation
AUWD: Avoided Unplanned Wetland Degradation
BD: Bulk Density
BGB: Belowground Biomass
BGC: Belowground Carbon
BMP: Biodiversity Monitoring Plan
BSA: Benefits Sharing Agreement
CCB: Climate, Community, and Biodiversity
CIW: Conservation of Intact Wetlands
CMP: Co-Management Plan
CTF: Conservation Trust Fund
EPA: Environmental Protection Agency
EU: European Union
FAO: Food and Agriculture Organization
FMP: Forest Management Plan
FPIC: Free, Prior and Informed Consent
FRL/FREL: Forest Reference Level / Forest Reference Emissions Level
GEE: Google Earth Engine
GHG: Greenhouse gas
GoSL: Government of Sierra Leone
ha: Hectares
HCV: High Conservation Value
hh: Households
IFSO: Improved Fish Smoking Oven
IPLCs: Indigenous Peoples and Communities
IRR: Internal Rate of Return
IUCN: International Union for the Conservation of Nature
IUU: Illegal, Unreported, and Unregulated fishing
IWW: Imagine WorldWide
JNR: Jurisdictional and Nested REDD+ program
LB: Leakage Belt
LOI: Loss on Ignition

MOA: Memorandum of Agreement
MoE: Ministry of Environment
MOU: Memorandum of Understanding
MPA: Marine Protected Area
MREF: Minimum reference region size for projecting rate of deforestation
MRV: Monitoring, Reporting, and Verification
NDC: Nationally Determined Contribution
NDVI: Normalized Difference Vegetation Index
NPAA: The National Protected Areas Authority
PA: Project Area
PC: Paramount Chief
PDD: Project Design Document
PRA: Participatory Rural Appraisal
REDD+: Reducing Emissions from Deforestation and Forest Degradation
ROI: Region of Interest
RRD: Reference Region for projecting rate of Deforestation
RWE: Restoring Wetland Ecosystems
SBIA: Social and Biodiversity Impact Assessment
SLL: Sierra Leone Leones (currency)
SOC: Soil Organic Carbon
SRE: Sherbro River Estuary
TBC: The Biodiversity Consultancy
tCO₂e: Tons of Carbon Dioxide Equivalent
TNC: The Nature Conservancy
ToC: Theory of Change
TSF: The Solon Foundation
TW: Tidal Wetland
UNFCCC: United Nations Framework Convention on Climate Change
VCS: Voluntary Carbon Standards
VCU: Verified Carbon Unit
VVB: Validation and Verification Body
WABICC: West Africa Biodiversity and Climate Change project
WRC: Wetland Restoration and Conservation

1 PROJECT DETAILS

1.1 Summary Description of the Project

This grouped project includes mangroves in Moyamba and Bonthe Districts, located south of the Western Peninsula in Sierra Leone. This area covers two of Sierra Leone's four major mangrove estuaries, namely Yawri Bay and the Sherbro River Estuary (SRE).

The SRE contains the largest remaining old-growth mangrove stands in Sierra Leone, with trees up to 55 meters tall. Yet these mangroves are highly threatened due to the growing demand for mangrove wood, which is the primary available resource in the SRE for daily cooking, fish smoking, and housing construction. Yawri Bay is considered one of the most productive fishing grounds in Sierra Leone. However, in recent years, dwindling fish stocks from illegal, unreported, and unregulated (IUU) fishing, has forced these traditional fishing communities to turn to logging and selling mangrove wood for subsistence. The loss and degradation of mangroves further exacerbates the decline in fish stocks, creating a destructive cycle. Mangroves in the area are further threatened by logging activity, rice production, salt mining, and road infrastructure construction.

To prevent further fisheries decline, increasing deforestation emissions, and shoreline erosion resulting from mangrove losses in the project zone, the proposed project activities are mangrove conservation in the SRE and mangrove restoration in Yawri Bay. The project is designed to expand the conservation area in the SRE through subsequent instances over time, with restoration efforts piloted and scaled in Yawri Bay. By scaling conservation and restoration activities, West Africa Blue (hereafter "Blue") will collaborate with communities in the project areas to create a mosaic of community-protected mangrove areas that ultimately encompass the entire project zone.

The project will generate greenhouse gas (GHG) emissions reductions (ERs) by avoiding unplanned mangrove deforestation through mangrove forest conservation and the implementation of sustainable livelihood diversification activities. The project is also designed to increase landscape carbon sequestration through afforestation, reforestation and/or revegetation (ARR) of previously deforested mangrove areas. The grouped project will begin its first instance in the SRE in 2023 with the conservation of 10,624 ha of mangrove forests on Sherbro Island and the restoration of 50 ha of mangroves in abandoned rice paddies and salt mines where mangroves have been cleared but the hydrology remains intact.

Overall, the grouped project will reduce deforestation in over 74,000 ha of mangroves, preventing the emission of 245,000 tCO₂e per year, on average, over the first 10 years. The grouped ARR activities will expand to 2,000 ha, projected to sequester an additional 13,000 tCO₂e per year, on average, in the first 20 years.¹

Using a comprehensive theory of change approach to address the drivers of mangrove deforestation, the project is centered around five primary components to be developed in consultation with local communities: (1) mangrove conservation awareness and education; (2) mangrove restoration and sustainable mangrove forest management with community-led monitoring; (3) promoting the adoption of

¹ tCO₂e estimates are net of deductions for leakage and non-permanence.

alternative construction materials through integrated woodlot training and the ‘Build with Bamboo’ Initiative; (4) promoting the adoption of fuel-efficient small wood cookstoves and Improved Fish Smoking Ovens (IFSOs); (5) introduction to alternative sources of income and sustainable livelihoods for income diversification.

In addition to climate benefits, the project expects to deliver exceptional benefits to biodiversity via habitat conservation and restoration, including habitat range for over 100 species listed in the IUCN Red List, the Important Bird and Biodiversity Area (IBA), and the Key Biodiversity Area (KBA) databases. The thousands of households located in the project zone will also see wide-ranging and important benefits, such as direct and indirect employment, training in alternative livelihood practices and income diversification, improved health outcomes through cleaner cooking, financial inclusion, reduced vulnerability to climate change, and other socio-economic benefits that are supported by the project and provided by healthy mangrove ecosystems.

The project is being developed in collaboration with the Government of Sierra Leone, namely the Ministry of the Environment and Climate Change and the Ministry of Finance, with the intention of forming a close working relationship with the National Protected Areas Authority (NPAA) and Conservation Trust Fund (CTF). Additional guidance, involvement in field activities and other support has been provided by Sierra Leone’s EPA and FDA.

1.2 Sectoral Scope and Project Type

The project falls within Sectoral Scope 14, Agriculture, Forestry, Land Use (AFOLU). The project’s Combined Categories are (1) Reduction of Emissions from Deforestation and forest Degradation (REDD+) and Conservation of Intact Wetlands (CIW), with the type of activity being Avoiding Unplanned Wetland Deforestation (AUWD); and (2) Afforestation, Reforestation and/or Revegetation (ARR) and Restoration of Wetland Ecosystems (RWE), with tidal wetland restoration combined with conversion to forest or revegetation as activity type.

The project is a grouped project.

1.3 Project Eligibility

The grouped project falls within the scope of the VCS Program outlined in section 2.1 of the VCS Standard v.4.4, and complies with the rules and requirements of AUWD activities and the ARR and RWE requirements. These requirements are listed in section 3 of the VCS Standard v.4.4 for AFOLU projects, including the following:

- The project will account for carbon dioxide (CO₂), one of the Kyoto Protocol GHGs.
- The project will not lead to the violation of any applicable laws.
- The project is eligible as a REDD+ AFOLU project due to its eligible activities with the goal of Avoiding Unplanned Wetland Deforestation (AUWD) and Restoration of Wetland Ecosystems (RWE) through Afforestation, Reforestation and/or Revegetation (ARR).
- The project will use the latest applicable methodology approved by the VCS Program, i.e., it is anticipated that the project will use the upcoming updated version of VM0033 v.2.0 Methodology for Tidal Wetland and Seagrass Restoration. This update is anticipated to use the avoided emission

procedures in the Combined REDD+ Methodology currently under development, alongside a further iteration of the existing ARR+RWE approach. These requirements are described in section 3.2 of this Project Document.

- The mangrove forest area within the project boundary meets an internationally accepted definition of forest and has been a forest for at least 10 years before the project start date.
- The project is not located within a jurisdiction covered by a Jurisdictional REDD+ Program.
- The project does not convert native ecosystems, nor drain native ecosystems or degrade hydrological functions, to generate GHG credits. In the ARR+RWE areas, the project provides evidence that clearing or conversion occurred at least 10 years before the proposed project start date.
- The project accounts for changes from the soil organic carbon pool, and thus adheres to both REDD+ and WRC Standard requirements.
- The grouped project is designed to have all its instances last longer than 30 years.

The ARR activity does not include harvesting and therefore the 'Long-term Average GHG Benefit' requirements do not apply to the project.

All non-permanence, leakage, baseline re-assessment, and other methodological requirements will be closely followed throughout the project to ensure its eligibility.

1.4 Project Design

- ☐ The project includes a single location or installation only
- ☐ The project includes multiple locations or project activity instances, but is not being developed as a grouped project
- ☒ The project is a grouped project

Eligibility Criteria

This is a grouped project with the following eligibility criteria for the inclusion of new project activity instances:

1. Project activity instances must be located within the coastal areas of Sierra Leone.
2. Project activity instances must demonstrate forested tidal wetland management practices that meet the eligibility criteria set forth in the Combined REDD+ and VM0033 Methodologies.

1.5 Project Proponent

Organization name	West Africa Blue
Contact person	Shaun Ramanat
Title	Partner

Address	85 Main Motor Road, Freetown, Sierra Leone
Telephone	+232 78 100 580
Email	info@westafricablue.org

1.6 Other Entities Involved in the Project

Organization name	Government of Sierra Leone- Ministry of Finance
Role in the project	Partner
Contact persons	Sheku A. Fantamadi Bangura
Titles	Minister of Finance
Address	Treasury Building, George Street, Freetown, Sierra Leone
Telephone	+232 99 641 438
Email	safbangura@mof.gov.sl

Organization name	Government of Sierra Leone- Ministry of Environment
Role in the project	Partner
Contact persons	Specific contacts at the Ministry of Environment will be provided in the PD submitted for validation

Organization name	GreenCollar
Role in the project	Partner
Contact person	Blanca Bernal
Title	Senior Technical Expert
Address	ASN Co Building, 2 Hickson Road, The Rocks Sydney 2000
Telephone	+612 9252 9828
Email	contact@greencollar.com.au

Organization name	Coastal Chiefdoms of Bonthe and Moyamba Districts
Role in the project	Partners
Contact persons	PC Chernor Anshun Ngabay (N'Dema) PC Alfred Square (Bendu-Cha) PC Thomas L. Koroma (Sittia) PC Regent Thomas L Tucker (Imperri) PC Regent Chief Bangalie (Nongoba Bullom) PC John Jibao Russel (Lower Banta) Speaker Alex H Kamara (Kagboro) PC Regrent (Rebbie) Charse Balaka Caulker (Bumpeh) PC Joseph Solone (Tamindale) PC Robert Coker (Bagruwa)
Titles	Paramount Chiefs
Address	NA
Telephone	+232 7867 5889 (N'Dema) +232 7642 5087 (Bendu-Cha) +232 7664 2981 (Sittia) +232 7659 5934 (Imperri) +232 7838 9107 (Nongoba Bullom) +232 7861 3854 (Lower Banta) +232 7675 2390 (Kagboro) +232 7663 7516 (Rebbie) +232 7677 7776 (Bumpeh) +232 7439 6774 (Tamindale) +232 7684 3623 (Bagruwa)
Email	NA

1.7 Ownership

Blue has been engaging with communities in the SRE since 2011 on various development initiatives. Starting in August 2021, Blue commenced discussions and collaboration with communities and the Government of Sierra Leone (GoSL) on blue carbon project development in the SRE and Yawri Bay. A

Memorandum of Understanding for the development of blue carbon projects (MOU) in the project area was then executed with eleven chiefdoms in Bonthe and Moyamba Districts, Blue, and The Ministry of The Environment (MoE). The MOU includes key stakeholders from each chiefdom, including Paramount Chiefs (PCs), Town Chiefs, Chiefdom Councils, representatives of Women, representatives of Youth, and other key figures such as the Mayor of Bonthe Town, the largest town in the area. The MOU establishes the intent of all parties to collaborate to develop and implement carbon offset projects and anticipates further collaboration on stakeholder consultation, developing a benefit sharing agreement, and entering into subsequent agreements as required regarding the project.

After extensive consultation with traditional community authorities and members, Blue also entered into 50-year lease agreements in March 2022 across five chiefdoms of the SRE, namely Bagruwa, Bendu-Cha, N'Dema, Sittia, and Tamindale. The leases were filed with the district administration of the SRE and approved by the Chief Administrator and Magistrate of Bonthe District. Six neighboring chiefdoms (i.e., Imperri, Nongoba Bullom, Lower Banta, Kagboro, Bumpeh, and Rebbie) then also expressed interest in joining the project. Following ongoing consultation, these additional six leases will be finalized and are expected to be executed in 2023. Together, the eleven chiefdoms cover the total area planned for the project, including the leakage belt.

Under the Provinces Land Act (CAP 122) of Sierra Leone (see section 1.14 of this document for additional detail on land tenure in Sierra Leone), land in chiefdoms is vested in the PC and their Chiefdom Council. According to CAP 122, a “non-native” can only occupy land in the chiefdom, whether under communal, family, or individual tenure, with the consent of the Chiefdom Council. Under Tribal Authorities Ordinance (CAP 61), the Chiefdom Council has the power to make by-laws dealing with “setting aside of land in or near a town for development of the town and the general benefit of inhabitants of that town and its villages.” The Chiefdom Council falls under the jurisdiction of the District Administration where all land leases and similar documents are required to be registered and filed, which Blue has completed. Traditional land tenure and governance systems clearly establish that the land belongs to the community and that the community may lease the land to a third party. The leases therefore do not infringe on any customary ownership rights.

The leases specify that the land is granted for conservation and other activities designed for “conserving and protecting the mangrove forests in order to preserve the ecological value of the demised premise to the environment.” The leases also indicate that further consultation is required in “demarcating the location and extent of the conservation areas.” Further, the leases specify the transfer of rights to Blue of any certified emissions reduction credits.

The leases are reviewed every seven years and can be extended if agreed upon by the parties. The leases represent the formal consent for Blue to undertake conservation-related activities in the chiefdoms and establish Blue’s legal right to operate the project.

The leases and MOU establish the basis for further engagement with the GoSL and consultation with community partners under the principles of Free, Prior and Informed Consent (FPIC) to research, test, design, and implement the project, including the creation of an equitable and transparent benefits sharing agreement.

1.8 Project Start Date

The project start date is July 1, 2023. This marks the beginning of expanded project activity implementation following an initial research phase of select activities that commenced in March 2023 and was accompanied by community engagement and awareness and education seminars.

1.9 Project Crediting Period

The project will have a 50-year crediting period beginning on July 1, 2023, and ending on June 30, 2072, with the possibility to renew for an additional 30-year period.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project are:

- ☐ <20,000 tCO₂e/year
- ☐ 20,000 – 100,000 tCO₂e/year
- ☒ 100,001 – 1,000,000 tCO₂e/year
- ☐ >1,000,000 tCO₂e/year

1.11 Description of the Project Activity

Mangroves in the Southern Province of Sierra Leone (Bonthe and Moyamba districts) are disappearing at a fast rate, driven by the unsustainable mangrove wood harvest for daily cooking, fish smoking, housing construction, conversion to rice paddies or salt mines, and the expanding footprint of a growing population. Furthermore, unsustainable fishing and shellfish collection practices, mainly by international IUU trawlers, have diminished the fish stock, forcing local communities to harvest additional mangrove wood to be sold as an alternative income. Throughout the project area, mangrove overexploitation and deforestation have led to significant coastline erosion. Communities have tried to reinforce their shorelines over the past 20 years to stop erosion while continuing to harvest mangroves, but failed to stop soil loss (e.g., village in Sittia; Figure 1).



Figure 1. A village in the north of Sittia is seen via satellite in 2005 (left), 2014 (middle), and 2022 (right).

To reverse this trend, Blue has designed a grouped mangrove conservation and restoration project, in close collaboration with local communities and local and international experts. Mangrove conservation will generate emission reductions by avoiding the existing unplanned mangrove deforestation in the area, whereas mangrove restoration will increase carbon sequestration in the landscape by recovering mangrove vegetation cover in deforested mangrove areas. The goal of this project is to protect the remaining mangrove areas in the SRE and enhance mangrove cover in Yawri Bay to prevent further mangrove loss and coastal erosion, safeguard its rich biodiversity, and increase the overall resilience of Sierra Leone's coastal communities by integrating sustainable mangrove use into daily activities. Following initial consultations with local communities, exploration of local environmental and socioeconomic drivers, and review of best practices in community-based mangrove conservation, Blue has developed the following strategic blue carbon conservation activities to address current drivers of mangrove loss:

- Mangrove conservation awareness and education
- Mangrove restoration and sustainable mangrove forest management with community-led monitoring
- Promoting the adoption of alternative construction materials through integrated woodlot training and the 'Build with Bamboo' Initiative
- Promoting the adoption of fuel-efficient small wood cookstoves and Improved Fish Smoking Ovens
- Introduction to alternative sources of income and sustainable livelihoods for income diversification

Blue will conduct research, engage with community partners, and pilot different project activities during the early stages of project implementation (i.e., in 2023) with increasing focus on the most successful project activities for the project's lifetime. Potential ideas will be explored, piloted, and narrowed down through continuous community consultation. Community engagement will be conducted following the guidelines established by FPIC. Blue is developing a comprehensive Environmental and Social Protections Framework (E&S Framework) that includes a community consultation plan and protocols to ensure FPIC of indigenous peoples and local communities (IPLCs) living in and around the project area. The E&S Framework sets forth the key principles needed to ensure the project encompasses a human-rights-based approach to conservation and facilitates independent and collaborative discussions and decision-making by the IPLCs in the project area throughout the life of the project.

Potential income diversification activities will be piloted in collaboration with experts following thorough research to determine best practices and learn from the experiences of other projects around the world. All training will be conducted using a 'train the trainer' model, in which individuals trained in any activity by Blue staff will be then able to train other community members, allowing organic dissemination of conservation and livelihood practices to the greatest extent possible.

1.11.1 Mangrove Conservation Education and Awareness

SRE communities acknowledge experiencing the end effects of mangrove loss (e.g., erosion, declining fish stocks) but, as noted in Blue's engagement with communities to-date, understanding is greatly enhanced when exposed to examples of the negative impacts of mangrove use on their livelihoods. Education and awareness campaigns are a core component of the project and are underway, including curriculum design and facilitation on climate change, the importance of mangroves, carbon credits, and Blue's proposed carbon project. For example, communities report knowing that mangroves are spawning

grounds for fish, but understanding is enhanced through demonstrations that show evidence of the different shellfish productivity between pristine and degraded mangrove sites (Figure 2).

Blue is working with its team of Community Coordinators and outreach committees to develop local knowledge and train-the-trainers protocols. Conservation Ambassadors will be established in key communities throughout the project area, who will act as the primary resident resources on conservation-related activities, education, and training.

Blue has also partnered with Rising Academies and Imagine Worldwide (IWW) to work with an initial 13 existing schools in the project area to enhance learning opportunities through tablets, powered by solar installations where required, to improve learning outcomes in literacy and numeracy. Blue is exploring the potential to work with local schools to integrate climate change, mangrove conservation, sustainable resource management, and the significant benefits of environmental stewardship into the educational curriculum while enabling school-based initiatives such as a community garden or tree plantings. This environmental curriculum is also being developed for adults, and learning times for members of the broader community will be offered.



Figure 2. Informational image displaying the results of a crab-catching demonstration in pristine and degraded mangroves.

1.11.2 Community-based Monitoring

In the project area, mangrove degradation from wood harvesting and clearing for agricultural land has been described by a senior member of Gendema town as “uncontrolled and indiscriminate” (USAID, 2020). Piles of mangrove wood being transported for sale are a common sight, as well as the degradation due to the harvest (Figure 3). Frequent harvest inhibits natural mangrove recruitment as seedlings are trampled or grazed and erosion eats away at the land remaining to be recolonized.



Figure 3. Large mangrove logs are removed (left) and transported to villages for sale (right).

Previous attempts at establishing protected areas to slow mangrove deforestation and allow natural regeneration have not been successful. Community-level harvesting persists without alternative options for cooking and construction materials, and limited resources for monitoring and enforcement leaves no capacity to prevent boats coming from other areas to harvest mangrove wood to sell into urban areas. Our socioeconomic survey is currently assessing if many people from the Leakage Belt or other areas outside of the SRE regularly come in to harvest mangrove wood. Blue will be able to provide more information on this before the PD submitted for validation.

In combination with the income diversification activities, Blue seeks to minimize the risks of illegal mangrove harvesting by creating a network of community forest stewards who can document the status of mangrove plots throughout the project area. By employing the community directly, Blue will enable the bottom-up adoption of conservation and sustainability practices. Three categories of new local job positions will be created and financed by the project. These will include Forest Stewards, Mangrove Monitors, and Biodiversity Surveyors. It is expected that several hundred community members will be offered employment in these roles. Each employee community member will be supplied with a device and an app that captures geotagged photos and sends them to a central repository, allowing Blue to monitor ground conditions in real time. Forest Stewards will be officially trained and hired by Blue to patrol and monitor mangrove areas full-time within the project area. These Stewards will be trained in non-confrontational, education-based management of unsustainable mangrove harvest, while the ability to send the precise time and location of encroachments will allow Blue to raise the offenses within the project's governance structure and more broadly, to the relevant authorities. Mangrove Monitors will be hired and trained to work with Forest Stewards in patrolling mangrove areas. These positions will expand Blue's monitoring capacity and ability to ground-truth satellite-based monitoring in more areas. Biodiversity Surveyors will be tasked with geotagging photos of wildlife encountered in the project area with a specific focus on locating and documenting rare and protected species.

1.11.3 'Build with Bamboo' Initiative

Mangrove wood is the most common traditional building material in the project area. Living huts are woven from mangrove roots and concrete construction is supported by mangrove poles (Figure 4). This frequent use of harvested wood for construction (29% of household wood use) creates demand for additional clearcutting and degradation (EU, 2022).



Figure 4. Left: Huts woven from mangrove roots. Right: Concrete construction supported by mangrove poles.

There are large stands of bamboo growing throughout the project area, yet there appears to be limited current use of the resource. Blue has planned a 'Build with Bamboo' campaign to co-align with the project start date to raise awareness on the potential applications of bamboo and share information on its

benefits as a construction material. Bamboo Ambassadors will be selected and trained to serve as community education coordinators and promote bamboo use. Areas with access to existing bamboo stands will be mapped and given priority consideration for targeted outreach campaigns. Areas without access to existing stands will be given priority consideration for bamboo seedling distribution when they become available. Furthermore, Blue plans to establish bamboo nurseries in key hubs so that in future stages of the project bamboo seedlings may be made available to households in the cookstove program. In addition to growing bamboo, these nurseries may be used to feature proof-of-concept bamboo construction designs. For example, structures used to create shade for seedlings with thinly thatched palm branches may be built out of bamboo. Blue intends for these nurseries to demonstrate other concepts and livelihoods as well, providing a gathering place for educational community workshops and training.

1.11.4 Improved Cookstoves and Improved Fish Smoking Ovens (IFSOs)

The predominant form of cooking in the SRE is the simple three-stone fire, whose lack of thermal retention requires the frequent gathering of large wood logs. Sixty percent of household wood is thereby used as fuel (EU 2022). Moreover, having open fires in poorly ventilated households results in unsafe air quality conditions and leads to increased frequency of asthma, heart and respiratory diseases, and lung cancer, particularly for women and children who spend the most time in and around the cooking area. Traveling far distances to collect large wood pieces causes unnecessary physical strain on women and puts them at risk.

Improved cookstoves are designed to increase thermal retention and efficiency and thus require smaller pieces of wood. This solution simultaneously reduces pressure on mangrove harvest while improving health, safety, and quality of life conditions for women and children. Blue is currently working with community volunteers to research and test cookstove designs that are well liked, effective, and can be easily made with local materials. Cookstove Ambassadors (mostly women) will be trained in the skill of building and repairing these cookstoves following a ‘trainer of trainers’ approach. Cookstove Ambassadors will teach households how to properly use and maintain their stove, as well as techniques for sustainably sourcing small-stick fuelwood. In later phases, bamboo will be made available for households as an alternative wood source.

In the SRE, lack of refrigeration for preserving fish means that the daily catch must be preserved by salting and sun-drying or smoking over a banda (Figure 5). Reports from Blue’s Community Coordinators indicate that the return of fishing boats is often marked by dense plumes of smoke rising from the villages. Mangrove wood is especially prized for smoking.

To address mangrove use for fish smoking as well as traditional cooking, Blue plans to work with communities and expert advisors to design an Improved Fish Smoking Oven (IFSO). IFSOs, like improved cookstoves, are aimed at increasing thermal efficiency to reduce the amount of wood needed to smoke the fish. The Food and Agriculture Organization (FAO) is working on an IFSO design in Yagoi (Southern



Figure 5. Woman next to her banda, the traditional method for smoking and preserving fish in the SRE.

Province), whose design, implementation, and community uptake will provide useful insights into what Blue can implement in the SRE.

1.11.5 Integrated Woodlots

To address mangrove wood demand in the SRE, Blue is exploring the potential for developing woodlots dedicated to providing alternative cooking and construction material. In Blue's initial community-level questionnaire, all surveyed respondents expressed openness to trying alternative wood materials if they are available.

On the smallholder farming household scale (0.5-2 ha subsistence-level plots), a large emphasis will be given to growing integrated wood and food lots through soil-friendly techniques of agroforestry and companion planting. On a larger scale, Blue is considering the establishment of communal village-level woodlots of bamboo, moringa, Acacia, and other alternatives. Acacia wood is commonly used in furniture manufacturing and to make support beams for construction. Acacia trees can also help restore depleted soils by fixing atmospheric nitrogen. Additional fruit and wood-producing species are being considered through ongoing consultation with local communities. Woodlots will be managed by community members employed by the project. They will be taught and equipped to sustainably manage woodlots (e.g., concepts like pollarding vs whole-tree harvesting).

Blue has two small pilot programs underway: one is a woodlot testing five species of trees in Bonthe Town in the project area and the second, a nursery located at Blue's office in Freetown, used as a demonstration site and starting point for disseminating species of interest and creating additional nurseries throughout the project area.

1.11.6 Income Diversification

Communities in the SRE depend on fisheries for their livelihood (Mondal, 2017), but as fish stocks are depleted fishermen and women are forced to turn to harvesting and selling mangrove wood for subsistence. During Blue field visits, community members in the SRE have commented: "when there are no fish, we must cut down trees."

Mangrove wood harvested for timber is either sold locally or exported outside the SRE (e.g., to Tombo and Freetown). Reports indicate that mangrove wood harvesters can earn about 4 million SLL (USD336) per month selling timber (EU, 2022). This economic incentive to cut mangroves is expected to be responsible for much of the observed mangrove deforestation in the SRE (USAID, 2020).

To address the need for livelihoods other than fisheries and mangrove harvesting, and to augment the employment created through other project activities (e.g., roles in education, conservation, restoration, woodlot management), Blue is exploring several direct alternatives through consultation with communities and experts. Examples of potential income diversification activities under consideration in this project are beekeeping, dry season farming, aquaponics, moringa plantations, sustainable fishing and oyster farming, and sustainable mangrove resource use.

Income diversification activities will be enhanced by the development of the supporting financial infrastructure. Blue will explore mechanisms to create market linkages, supply chains for the sale of products, and access to low-cost capital through Village Savings and Loans Associations (VSLAs). The bolstering of existing VSLA service offerings will include expansion of service range, upgrading of governance and security, potential loan fund capitalization (as necessary) and connection to digital 'mobile money' financial services platforms available in the region.

While it is possible that not all alternatives will prove feasible, Blue will consult with community partners to identify, research, test, and pilot those most appropriate for the project area.

- **Beekeeping:** Blue will work with communities to map areas of mangrove bees and determine which villages actively utilize the honey resource. Villages engaged in honey gathering would be educated in sustainable harvesting practices and trained in swarm capture to transition to organized beekeeping. In villages where beekeeping is an interest but the presence of honeybees is unknown, baited bee boxes would be placed in the mangroves to attempt to attract wild hives. A group of PCs has been engaged in October 2022 to pilot beekeeping in their communities.
- **Dry Season Farming:** Farming is mostly a rainy season activity. Overcoming dry season weather offers an opportunity to farmers. Shade cloth or palm fronds effectively shelter the crop from the heat without the significant capital investment of a greenhouse. Many SRE villages have groundwater pumps that have been installed by a local NGO; this water source can be used sustainably for dry-season shaded irrigation in a drip irrigation system.
- **Aquaponics:** Blue intends to work with local and international partners and NGOs to assess affordable aquaponics systems that can be constructed with local materials. Small-scale testing will be used to optimize techniques and choice of fish and plant stocks for future expansion. Due to constraints in obtaining fingerlings, initial project phases will focus on the use of hydroponics, where nutrients are delivered by adding ‘compost tea’ made from nutrient-rich leaves. Hydroponics has aquaponics’ benefits of water efficiency and increased yield without the additional benefit of fish production provided by aquaponics.
- **‘More-inga’ Initiative:** *Moringa oleifera* is an extremely fast-growing and drought-resistant tree, native to most subtropical regions of the world. The tree grows in home gardens around Freetown, Bonthe Town, Shenge, and some smaller villages close to the Junction. Moringa’s leaf is a “superfood” with the potential to help alleviate chronic malnutrition in the SRE, yet the plant is not commonly used for nutrition. Blue plans to launch a ‘More-inga Initiative’ to spread awareness of the many health benefits of eating Moringa and the potential to use its fast-growing wood as firewood or wood-fuel briquettes for cookstoves. Furthermore, training will be provided in small business development for Moringa products, offering additional income diversification potential to reduce the harvesting and selling of mangrove wood for subsistence. The use of Moringa was presented to PCs from Bonthe and Moyamba in October 2022, who also visited the Moringa nursery at Blue’s office in Freetown.
- **Sustainable fishing and oyster farming:** The provision of an alternative sustainable fishing method that relies on mangroves has the potential for carry-on effects in conservation, fisheries management, and alternative livelihood development. Typical oyster harvesting involves cutting mangrove roots to remove the oysters, leaving no structure behind for new oysters to attach and grow. Blue’s educational materials and workshops will include information on the importance of removing oysters carefully without cutting mangrove roots to ensure the future viability of oyster harvesting. Blue is also exploring the suitability of oyster farming in the SRE, which can be conveniently set up in proximity to villages. The oyster farming structures create habitat for other organisms as well, increasing local populations of desired species like shrimp and crab.

1.12 Project Location

The grouped project comprises 74,034 ha of mangroves across eleven chiefdoms (Table 1) in the Southern Province districts of Bonthe and Moyamba. Avoided mangrove deforestation activity instances

will be added to the project following the sequence depicted in Table 2 and Figure 6. The project includes a mangrove restoration activity on 2,000 ha which previously had mangrove cover before deforestation, that will also be added to the grouped project in sequential activity instances. The first restoration instance will be on 50 ha, as shown in Table 3. Areas and specific locations of any following restoration instances adding up to the planned 2,000 ha of restoration will be determined before the PD is submitted for validation.

Table 1. Chiefdoms within the boundaries of the grouped project area, where coordinates designate an example mangrove area in each chiefdom.

Chiefdom	Coordinates
Sittia	7°33'31.7"N 12°38'16.0"W
N'Dema	7°35'29.3"N 12°53'30.6"W
Nongoba Bullom	7°23'28.8"N 12°28'12.8"W
Bendu-Cha	7°29'07.0"N 12°25'54.4"W
Imperri	7°38'25.7"N 12°27'03.6"W
Lower Banta	7°45'45.9"N 12°23'44.4"W
Bagruwa	7°45'36.9"N 12°31'30.6"W
Tamindale	7°44'38.1"N 12°41'53.5"W
Kagboro	7°54'50.3"N 12°53'05.9"W
Rebbie	8°09'56.7"N 12°55'27.2"W
Bumpeh	8°05'07.2"N 12°47'34.6"W
Bonthe Municipality	7°31'45.5"N 12°30'03.1"W

Table 2. Avoided mangrove deforestation project activity instances, indicating the year in which each instance will be added to the grouped project, cumulative activity area, instance name and location, and corresponding chiefdoms.

Activity Instance	Year Instance added	Cumulative Activity area (ha)	Instance name and location	Chiefdoms
1	1	10,624	PA1, Bonthe Island	Sittia
2	2	14,984	PA2, Bonthe Island	Sittia, N'Dema
3	3	42,582	PA3, SRE	Sittia, N'Dema, Bendu-Cha, Imperri, Bagruwa, Tamindale
4	4	74,034	PA4, SRE (Full project area)	Sittia, N'Dema, Nongoba Bullom, Bendu-Cha, Imperri, Lower Banta, Bagruwa, Tamindale, Kagboro, Rebbie, Bumpeh

Table 3. First mangrove restoration activity instance, indicating the locations of restoration areas, the current land uses, the sizes (ha), and the coordinates of the sites. *Note:* Areas and specific locations of any following

restoration instances adding up to the planned 2,000 ha of restoration will be determined before the PD is submitted for validation.

Location of Restoration Area	Current Land Use	Area (ha)	Coordinates
Pinto West	Prior salt mine	25	7°44'21.6"N 12°44'46.7"W
Pinto East	Prior salt mine	15	7°43'02.0"N 12°40'36.0"W
Delkin	Prior rice paddy	8	7°37'25.3"N 12°44'42.8"W
Haengen Sae	Cleared mangrove area	2	7°36'41.3"N 12°33'29.2"W

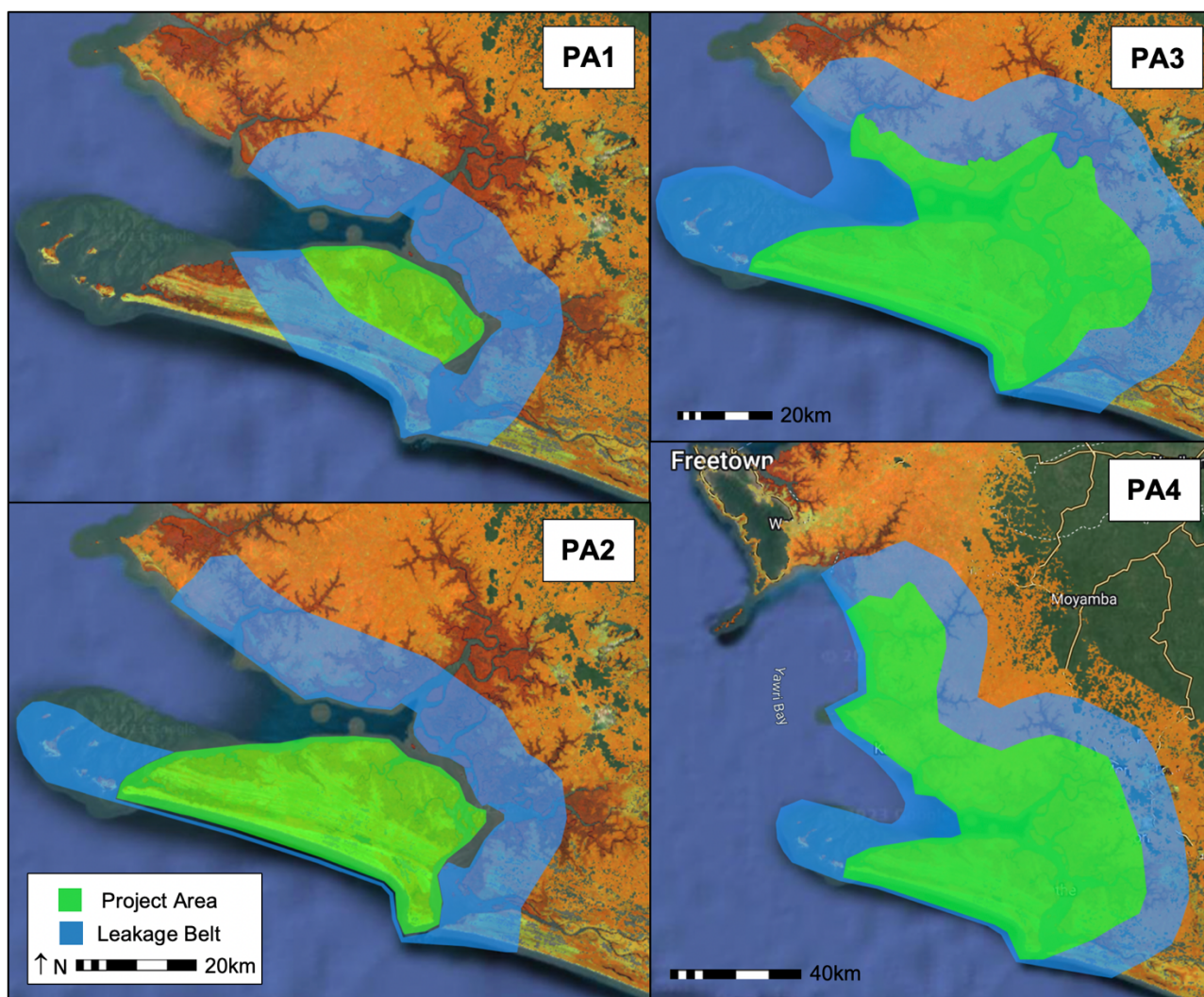


Figure 6. The four expansion stages of Blue's conservation Project Area (PA 1 – 4 as described in Table 2) are shown (green) with their respective Leakage Belts (blue) within the Project Zone.

1.13 Conditions Prior to Project Initiation

1.13.1 Avoided mangrove deforestation activity

- **Ecosystem type:** Mangrove forests encompassing pristine mangrove areas and degraded/deforested mangrove areas along SRE's coast over a coastal mud substrate.
- **Current and historical land-use:** The current and historical land use is mangrove forests with areas that have been degrading rapidly due to unsustainable overharvesting of mangrove wood.
- **Has the land been cleared of native ecosystems within 10 years of the project start date?**
☐ Yes ☒ No

1.13.2 Mangrove restoration activity

- **Ecosystem type:** Secondary/restored mangrove forests over coastal mud substrate.
- **Current and historical land-use:** The historical land-use was mangrove forest. The areas have been deforested for rice paddies and salt mining over 10 years ago (Table 3) which are currently abandoned due to coastal erosion. The tidal hydrology of the sites remains intact, and the current land use is muddy bare ground.
- **Has the land been cleared of native ecosystems within 10 years of the project start date?**
☐ Yes ☒ No

Analysis of satellite imagery shows that targeted restoration areas have been cleared of mangroves more than 10 years from the project start date.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The proposed project complies with relevant local, regional, and national laws, statutes, and regulatory frameworks in Sierra Leone. Blue has reviewed these frameworks in consultation with local counsel and designed the project and leases to comply with the relevant laws and policy instruments, including:

- In 2022, the Parliament of Sierra Leone enacted two new legislations, the **Customary Land Rights Act** and the **National Land Commission Act**. These new pieces of legislation aim to eliminate discrimination under customary laws in the management and administration of the land. They benefit individual landowners by placing the land ownership and decision-making in their hands, requiring FPIC for all land-based investments. The governance structure around land ownership and the right to transfer (through leases or otherwise) land ownership have been amended accordingly in Sierra Leone. Before these new Legislations were passed (see CAP 61 and CAP 122 below), the Chiefdom Council had the right to execute leases on behalf of the communities provided it was for the town's development and benefit of the inhabitants, and the Chiefdom Council had to grant consent before a non-native could occupy land in the chiefdom whether the land was under communal, family, or individual tenure. The five existing lease agreements with the chiefdoms of Bagruwa, Bendu-Cha, N'Dema, Sittia, and Tamindale were executed prior to the enactment of the new legislations and discussions with the government and communities on these leases commenced over two years ago. The existing lease agreements are in compliance with the applicable laws in Sierra Leone that were in force at the time they were executed and remain valid and enforceable. Local counsel in Sierra Leone confirmed the validity and enforceability of the existing lease agreements and indicated no

additional steps need to be taken by any party in relation to the existing lease agreements. Blue is committed to ensuring compliance with the new legislation and is working with local counsel to develop new templates of agreements compliant with it for the additional six chiefdoms. Blue is also consulting with the communities, local authorities, and local counsel to ensure any new institutions established and decision-making frameworks instituted under the new legislations are respected and considered during the stakeholder consultations on the project.

- The **Tribal Authority Ordinance (CAP 61)** from 1960 establishes Chiefdom Councils. Section 4 of the CAP 61 provides for exercise of powers conferred on the Chiefdom Council by its statutes or Customary Law. The statutory powers exercised by the Chiefdom Council in relation to land are contained in CAP 61 and the Provinces Land Act of CAP 122. Under section 16(1) the Chiefdom Council has the power to make bylaws dealing with "Setting aside of land in or near a town for development of the town and the general benefit of inhabitants of that town and its Villages". The Chiefdom Council can also institute action in its own name in matters of a land dispute with other chiefdoms or to recover land from a non-native.
- Under the **Provinces Land Act (CAP 122)**, land in chiefdoms is vested in the Paramount Chiefs and their Chiefdom Council. The Chiefdom Council is an amorphous body created by customary law comprising the Paramount Chief and his closest advisors, key title holders and principal members of the chiefdom. This body primarily provides advice to the Paramount Chiefs and is an avenue for them to consult in the exercise of his traditional powers. Section 3(1) of CAP 122 requires the Chiefdom Council to grant consent before a non-native occupies land in the provinces, whether the land is under communal family or individual tenure, where a non-native is a person who is not entitled by birthright to land in the provinces. Regarding Lease Agreements, Section 3 of CAP 122 regulates leases on provincial land, covering rent, lease term, lease purpose, provisions in relation to construction, and establishes a rent review period of such leases every seven years by the District Officer subject to appeal. The existing lease agreements executed by the five chiefdoms are in compliance with the principles of contract in the provision of CAP 122 and that of leases of provincial property.
- The **Local Government Act No.1 of 2004** categorizes Sierra Leone into districts, towns, and cities. The chiefdoms are a subset of localities consisting of towns, headed by a Paramount Chief whose powers were largely based on customary laws which were codified in parliamentary legislation. The Chiefdom Council was under the jurisdiction of the district administration and all land leases and similar documents were required to be filed with the district administration.
- Section 170 of the **Constitution of Sierra Leone** lays out what constitutes the laws of Sierra Leone and enumerates in uncertain terms the said laws to include Customary Laws, laws made under the authority of Parliament, and rules of Equity amongst others. As provided for in section 171(15) of the Constitution, any law can be voided and be of no effect if the law or rule is inconsistent with the Constitution.
- Section 4 of **Registration of Instrument Law (CAP 256)** further provides for all agreements in relation to land to be registered within 30 days of the date of execution for the agreement to be enforceable.

Regarding carbon rights, there is no specific legal framework for the regulation of carbon rights in Sierra Leone. The Counsel for the Environment Protection Agency recently indicated a bill on carbon rights had been taken to parliament and remains at the legislative stage undergoing Parliament review. One of the points Parliament insisted must be included in the bill is a regime regulating carbon emissions reductions. It is unknown when the final bill will be approved and enforced. Once a draft is finalized Blue will be able to evaluate the parameters of the regulation on carbon emission reductions. In the absence of this legislation, carbon rights are presumed to reside with the land and trees under common law principles and customary law recognized in Sierra Leone, and the leases transfer these rights to Blue.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has not been registered nor is seeking registration under any other GHG program. The improved cookstoves and IFSO activities implemented as part of the project will also not be registered under the VCS or any other GHG program.

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG program.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

☐ Yes

☒ No

1.16.2 Other Forms of Environmental Credit

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

☐ Yes

☒ No

Supply Chain (Scope 3) Emissions

This section is not applicable as the project does not involve supply chain (Scope 3) emissions.

1.17 Sustainable Development Contributions

The project activities described in section 1.11 of this document and partnerships with local institutions in government and education (see sections 1.7 and 1.11) will allow the project to contribute towards numerous Sustainable Development Goals (SDGs), including SDGs 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-Being), 4 (Quality Education), 5 (Gender Equality), 6 (Clean Water and Sanitation), 8 (Decent Work and Economic Growth), 10 (Reduced Inequalities), 11 (Sustainable Cities and Communities), 13 (Climate Action), 14 (Life Below Water), and 15 (Life on Land). The project will register with Verra's Climate, Community, and Biodiversity (CCB) program to demonstrate these impacts. The project impacts on these SDGs will undergo monitoring, reporting, and verification at least every five years through the VCS and CCB system.

The project contributes to achieving Sierra Leone's Government commitments to the United Nations Framework Convention on Climate Change (UNFCCC) in its 2021 Nationally Determined Contributions (NDCs). Sierra Leone does not have a national forest inventory or forestry management information system, so forest and land use emissions are not included in its NDC's GHG inventory (UNFCCC, 2021). Yet Sierra Leone's NDC targets CO₂ ERs through a combination of sector-specific initiatives, innovation, and technology transfer, included in the country's Medium-Term National Development Plan which

identifies the blue economy and coastal ecosystem management as priority areas for climate change mitigation and adaptation. The country intends to implement the REDD+ framework and has undergone various preliminary Readiness programs, yet to date Sierra Leone does not have a national REDD+ Strategy or implementation framework, nor a plan in place towards establishing a Forest Reference Level/Forest Reference Emission Level (FRL/FREL) or a National Forest Inventory System.

The NDCs identify private-sector financing as a key indicator to monitor. The Ministry of the Environment holds the primary coordinating authority for carbon projects in Sierra Leone and as mentioned above, Blue has an MOU in place for the development of a blue carbon project with the Ministry.

The NDCs make additional references of specific relevance to the project, specifically:

- Page 20: *As a priority for climate change mitigation, the blue economy in Sierra Leone incorporates traditional maritime industries such as fisheries, tourism, mining, boat building, aquaculture systems, and carbon stored in mangrove and seagrass ecosystems. The fisheries sector for instance is a major source of jobs and a key driver of mangrove deforestation in coastal communities in Sierra Leone, which can have a major impact on the country's blue carbon stock. These analyses inform an understanding of the current change in the country's blue carbon stock, including losses or gains over time in mangrove and seagrass resources.*
- Page 24: *Sierra Leone will develop a blue carbon initiative for the Sierra Leone River and Bonthe-Sherbro River Estuaries to conserve vast mangrove and seagrass resources while sequestering tree and soil organic carbon. [...] Sierra Leone proposes plans to restore, enhance, and manage about 5,000 ha of its vastly degraded mangrove resources over the next 10 years.*

1.18 Additional Information Relevant to the Project

1.18.1 Leakage Management

Section to be completed in the PD submitted for validation.

1.18.2 Commercially Sensitive Information

No commercially sensitive information has been excluded from this project description document.

1.18.3 Further Information

Section to be completed in the PD submitted for validation.

2 SAFEGUARDS

Section to be completed in the PD submitted for validation.

2.1 No Net Harm

Section to be completed in the PD submitted for validation.

2.2 Local Stakeholder Consultation

Section to be completed in the PD submitted for validation.

2.3 Environmental Impact

Section to be completed in the PD submitted for validation.

2.4 Public Comments

Section to be completed in the PD submitted for validation.

2.5 AFOLU-Specific Safeguards

Section to be completed in the PD submitted for validation.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The project activity avoided unplanned mangrove deforestation through tidal wetland conservation (AUWD) was designed according to Verra's new Combined REDD Methodology currently under development, with an expected public release in July 2023². Based on the Combined REDD Methodology the project intends to use the updated versions of the following tools:

- JNR Risk Mapping Tool, VT0007, v.0.1, 15 April 2021.
- JNR Allocation Tool, v.4.0, 15 April 2021.
- VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry, and Other Land Use (AFOLU) Project Activities, v.3.0, 1 February 2012.
- AFOLU Non-Permanence Risk Tool, v.4.0, 19 September 2019.

Ultimately this project will fall under a revision to VM0033 for tidal wetlands. However, it is understood that this revision will not be available until sometime in 2024 and will itself be built on the processes and procedures in the Combined REDD Methodology. If the updated VM0033 is available prior to project validation this methodology will be used, regardless, the processes in the Combined REDD Methodology are considered in this listing.

The project activity tidal wetland restoration (RWE+ARR) was designed according to Verra's VM0033 Methodology for Tidal Wetland and Seagrass Restoration, v2.0.

Additional methodological modules applicable to the project AUWD and RWE activities and not incorporated directly in the Combined Methodology are:

Baseline and Leakage Modules:

² <https://verra.org/methodologies/redd-methodology/>

- Determination of Jurisdictional Activity Data Baseline for Unplanned Deforestation (JADB-UD), v.1.0, 30 March 2022.
- Estimation of Baseline Greenhouse Gas Emissions within the project area and leakage belt from Unplanned Deforestation (BL-UD), v.1.0, 30 March 2022.
- Estimation of baseline carbon stock changes and greenhouse gas emissions in tidal wetland restoration and conservation project activities (BL-TW, VMD0050), v.1.0, 8 Sept. 2020.
- Estimation of emissions from ecological leakage (LK-ECO, VMD0044), v.1.0, 9 March 2015.

Monitoring Modules

- Methods for monitoring of carbon stock changes and greenhouse gas emissions and removals in tidal wetland restoration and conservation project activities (M-TW, VMD0051), v.1.0, 8 Sept. 2020.

Additionality Module:

- Demonstration of additionality of tidal wetland restoration and conservation project activities (ADD-AM, VMD0052), v.2.0, 30 Sept. 2021.

Carbon Pools Modules

- Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools (CP-AB, VMD0001), v.1.1, 30 Dec. 2010.
- Estimation of carbon stocks in the soil organic carbon pool (CP-S, VMD0004), v.1.0, 30 Dec. 2010.

Miscellaneous Modules

- Methods for stratification of the project area (X-STR, VMD0016), v.1.2, 30 Dec. 2010.

3.2 Applicability of Methodology

The project AUWD activity meets all applicability conditions (Table 4) listed in the published version of the new Combined REDD Methodology as of April 13, 2023.

Table 4. Applicability conditions of the Combined REDD Methodology for the AUWD project activity.

Applicability Condition	Justification/Explanation
Where the land use transition in the baseline case is forest land to non-forest land, meeting the definition of unplanned deforestation.	The land use transition in the baseline scenario is forest land (i.e., mangroves) to non-forest land (i.e., bare lands and croplands).
Where the project involves activities aimed at avoiding unplanned deforestation.	The project addresses avoided unplanned deforestation in tidal wetlands (AUWD) through wetland conservation activities (CIW).
Where agents of deforestation in the baseline scenario clear the land for tree harvesting, settlements, agricultural crop production, ranching, or aquaculture.	The main mangrove deforestation drivers are clearing for tree and wood harvesting and unsustainable use of the mangrove resources.

The proposed AUWD activity in the project area does not meet any of the conditions under which the Combined REDD+ Methodology is not applicable, listed in Table 5.

Table 5. Conditions under which the Combined REDD Methodology does not apply for the AUWD project activities.

Condition under which methodology is not applicable	Justification/Explanation
VCS AUDef projects located in a jurisdiction with a registered VCS JNR forest reference emission level (FREL) or JNR program.	The project area is not located in a jurisdiction with any JNR program.
Where land is legally authorized and documented to be converted to non-forest.	The mangrove forests in the project area are not legally converted to non-forests.
Where agents of deforestation in the baseline scenario clear land for large-scale industrial agriculture, ranching, or aquaculture.	The main driver of deforestation in the project area is smallholder wood collection and unsustainable use of the mangrove resources.
Where in the baseline scenario wetlands are being drained.	No wetlands are drained in the baseline scenario.
Where drainage occurs in the project scenario.	There is no drainage in the project scenario.
Where leakage avoidance activities include: - Agricultural lands that are flooded to increase production (e.g., rice paddy) - Intensifying livestock production through use of feed-lots and/or manure lagoons.	Leakage avoidance activities do not include either of these activities.
Where in the baseline scenario post-deforestation land use constitutes reforestation.	There is no known reforestation in the baseline scenario post-deforestation.

The Project ARR+RWE activity meets all applicability conditions listed in the latest version of the VM0033 Methodology (Table 6). Furthermore, the proposed ARR+RWE does not meet any of the conditions under which VM0033 is not applicable (Table 7).

Table 6. Applicability conditions of the VM0033 for the ARR+RWE project activity.

Applicability Condition	Justification/Explanation
Project activities which restore tidal wetlands (including seagrass meadows, per this methodology's definition of tidal wetland) are eligible.	The project will restore mangrove forests (i.e., tidal wetlands).

Project activities may include any of the following, or combinations of the following: a) Creating, restoring and/or managing hydrological conditions (e.g., removing tidal barriers, improving hydrological connectivity, restoring tidal flow to wetlands or lowering water levels on impounded wetlands) b) Altering sediment supply (e.g., beneficial use of dredge material or diverting river sediments to sediment-starved areas) c) Changing salinity characteristics (e.g., restoring tidal flow to tidally restricted areas) d) Improving water quality (e.g., reducing nutrient loads leading to improved water clarity to expand seagrass meadows, recovering tidal and other hydrologic flushing and exchange, or reducing nutrient residence time) e) (Re-)introducing native plant communities (e.g., reseeding or replanting) f) Improving management practice(s) (e.g., removing invasive species, reduced grazing)	The project will reintroduce native plant communities through reseeding and/or replanting. Future activity instances might include restoring and/or managing hydrological conditions.
Prior to the project start date, the project area: a) Is free of any land use that could be displaced outside the project area, as demonstrated by at least one of the following, where relevant: i) The project area has been abandoned for two or more years prior to the project start date; or ii) Use of the project area for commercial purposes (i.e., trade) is not profitable as a result of salinity intrusion, market forces or other factors. In addition, timber harvesting in the baseline scenario within the project area does not occur; or iii) Degradation of additional wetlands for new agricultural sites within the country will not occur or is prohibited by enforced law. OR b) Is under a land use that could be displaced outside the project area, although in such case baseline emissions from this land use must not be accounted for, and where degradation of additional wetlands for new agricultural/aquacultural sites within the country will not occur or is prohibited by enforced law. OR c) Is under a land use that will continue at a similar level of service or production during the project crediting period (e.g., reed or hay harvesting, collection of fuelwood, subsistence harvesting).	The ARR+RWE activity instances in the project area occur in either abandoned land due to its unsuitability for crop production or in bare land/deforested mangrove forests due to unsustainable wood collection. Any potential leakage risk due to the ARR+RWE activity will be accounted for and discounted from the project VCU.
Live tree vegetation may be present in the project area and may be subject to carbon stock changes (e.g., due to harvesting) in both the baseline and project scenarios.	The project does not anticipate live tree vegetation being present in the ARR+RWE areas.
The prescribed burning of herbaceous and shrub aboveground biomass (cover burns) as a project activity may occur.	The project does not anticipate cover burns occurring in the ARR+RWE areas.

Where the project proponent intends to claim emission reductions from reduced frequency of peat fires, project activities must include a combination of rewetting and fire management.	The project will not claim ERs from activities related to peat fires.
Where the project proponent intends to claim emission reductions from reduced frequency of peat fires, it must be demonstrated that a threat of frequent on-site fires exists, and the overwhelming cause of ignition of the organic soil is anthropogenic (e.g., drainage of the peat, arson).	The project will not claim ERs from activities related to peat fires.
In strata with organic soil, afforestation, reforestation, and revegetation (ARR) activities must be combined with rewetting	There are no organic soil strata within the ARR+RWE project area.

Table 7. Conditions under which VM0033 does not apply for the ARR+RWE project activities.

Condition under which methodology is not applicable	Justification/Explanation
1) Project activities qualify as IFM or REDD.	The proposed ARR+RWE activities do not qualify as IFM or REDD.
2) Baseline activities include commercial forestry.	The baseline scenario does not include commercial forestry.
3) Project activities lower the water table, unless the project converts open water to tidal wetlands, or improves the hydrological connection to impounded waters.	The proposed ARR+RWE activities will not lower the water table.
4) Hydrological connectivity of the project area with adjacent areas leads to a significant increase in GHG emissions outside the project area.	Increases in GHG emissions outside the project area are not expected because the project does not plan to alter hydrological connectivity in the landscape.
5) Project activities include the burning of organic soil.	There are no organic soil strata within the ARR+RWE project area.
6) Nitrogen fertilizer(s), such as chemical fertilizer or manure, are applied in the project area during the project crediting period.	Fertilizers will not be applied in the proposed ARR+RWE activities.

3.3 Project Boundary

Section to be completed in the PD submitted for validation.

3.4 Baseline Scenario

Section to be completed in the PD submitted for validation.

3.5 Additionality

Section to be completed in the PD submitted for validation.

3.6 Methodology Deviations

Section to be completed in the PD submitted for validation.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Section to be completed in the PD submitted for validation.

4.2 Project Emissions

Section to be completed in the PD submitted for validation.

4.3 Leakage

Section to be completed in the PD submitted for validation.

4.4 Net GHG Emission Reductions and Removals

Section to be completed in the PD submitted for validation.

5 MONITORING

5.1 Data and Parameters Available at Validation

Section to be completed in the PD submitted for validation.

5.2 Data and Parameters Monitored

Section to be completed in the PD submitted for validation.

5.3 Monitoring Plan

Section to be completed in the PD submitted for validation.