

High-Quality Blue Carbon

Practitioners Guide 2024

Version 1.0



www.oceanriskalliance.org

Credits

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Version 1.0

The High-Quality Blue Carbon Practitioners Guide is the first guidance which links funder and market definitions of high-quality project development and financing with sets of activities that can be integrated into project design and management in the field. Although written primarily for carbon crediting projects, the guide can be used with any blue carbon project and provides a library of more than fifty curated resources to suit different project contexts and blue carbon ecosystems.

Activities and performance indicators associated with high quality were developed through consultation with practitioners including suppliers and buyers of blue carbon credits, philanthropic organizations, NGOs and academia, teams managing existing high-quality projects, and representatives of carbon crediting programs. The consultation process

generated interest in how the new approach taken with the Practitioners Guide could be adapted for use with other Nature-based Solutions, including forest carbon projects, applied to inseting projects, or integrated into government reporting structures.

This first iteration of the High-Quality Blue Carbon Practitioners Guide is released as a Version 1.0, recognizing the need for long-term testing in a range of scenarios to ensure this product is suitably comprehensive and robust, while remaining easy to understand and use. Assembling the resources compiled in this Practitioners Guide also revealed gaps in available guidance which require addressing rapidly as we continue to shape a blue carbon market which delivers results for people, nature, and climate.

For further information

Visit the ORRAA website at www.oceanriskalliance.org/resource/high-quality-blue-carbon-principles-and-guidance-2/

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I. Introduction to the High-Quality Blue Carbon Principles and Guidance



Blue Water Mangroves on Mansuar Island. The lack of wave action combined with clear water allow corals to grow very near the surface in this unique environment © Conservation International

I. Introduction to the High-Quality Blue Carbon Principles and Guidance 5

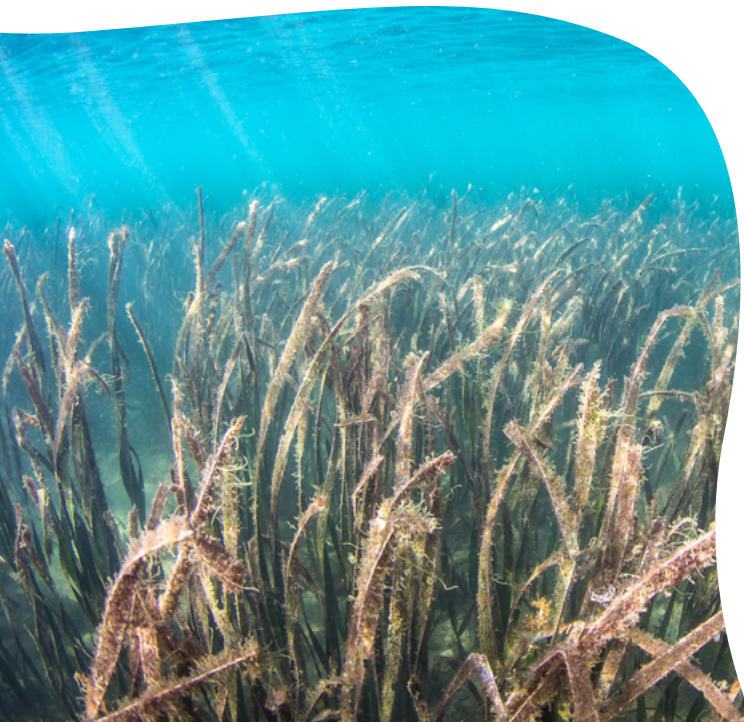
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As the effects of climate change begin to be experienced more frequently and more drastically than ever, the need to reduce human-caused greenhouse gas emissions and effectively decarbonize our society becomes increasingly urgent.

While reducing emissions in line with limiting global warming to 1.5 degrees Celsius must be the priority, there is a recognition that delivering effective emissions reductions has so far been slow, expensive and technologically challenging. There is therefore a need to offset human-caused emissions both through technological solutions, and by protecting and increasing the Earth’s natural capacity to absorb carbon dioxide and other greenhouse gasses.

Coastal vegetated ecosystems, such as mangroves, saltmarshes and seagrass, are increasingly recognized as critical coastal ecosystems. This is due to their ability to provide food, extreme weather protection and support livelihoods, all while harboring incredible biodiversity, enhancing coastal resilience and acting as immense

Seagrass © Matt Curnock, Ocean Image Bank



carbon sinks. This function of efficiently capturing and storing carbon for long periods has led to coastal vegetated ecosystems being described as blue carbon ecosystems.

Blue carbon is the carbon sequestered, stored or emitted from coastal vegetated ecosystems. Interventions that directly increase carbon removals or reduce emissions due to the conservation, restoration or sustainable management of these ecosystems are collectively known as blue carbon projects.

Nature-based solutions, including sustainable use, effective conservation and restoration of blue carbon ecosystems, are an essential part of our response to the climate crisis as they can deliver multiple mitigation and adaptation benefits. However, these projects are difficult to do well, as coastal blue carbon ecosystems can be both dynamic and sometimes extreme places to work. Additionally, they are rarely removed from human influence, whether that’s pollution and urban development or needs-driven over-extraction of resources in more rural locations.

The private sector has shown interest in investing in blue carbon ecosystems and is expected to play an increased role in funding their restoration and sustainable use. To date, the most prominent pathway for private sector funding has been through the voluntary carbon market.

The release of the [High-Quality Blue Carbon Principles & Guidance](#) was a landmark moment in the blue carbon space. The document highlights the need for safeguards for both people and nature, informs the due diligence processes for investors and buyers, and introduces a pathway for all blue carbon projects to achieve a high-quality standard. By defining high-quality, project developers are incentivized to adopt best practices to increase early stage funding success, long term project success and lower reputational risk for investors. This in turn provides investors with an incentive to seek out

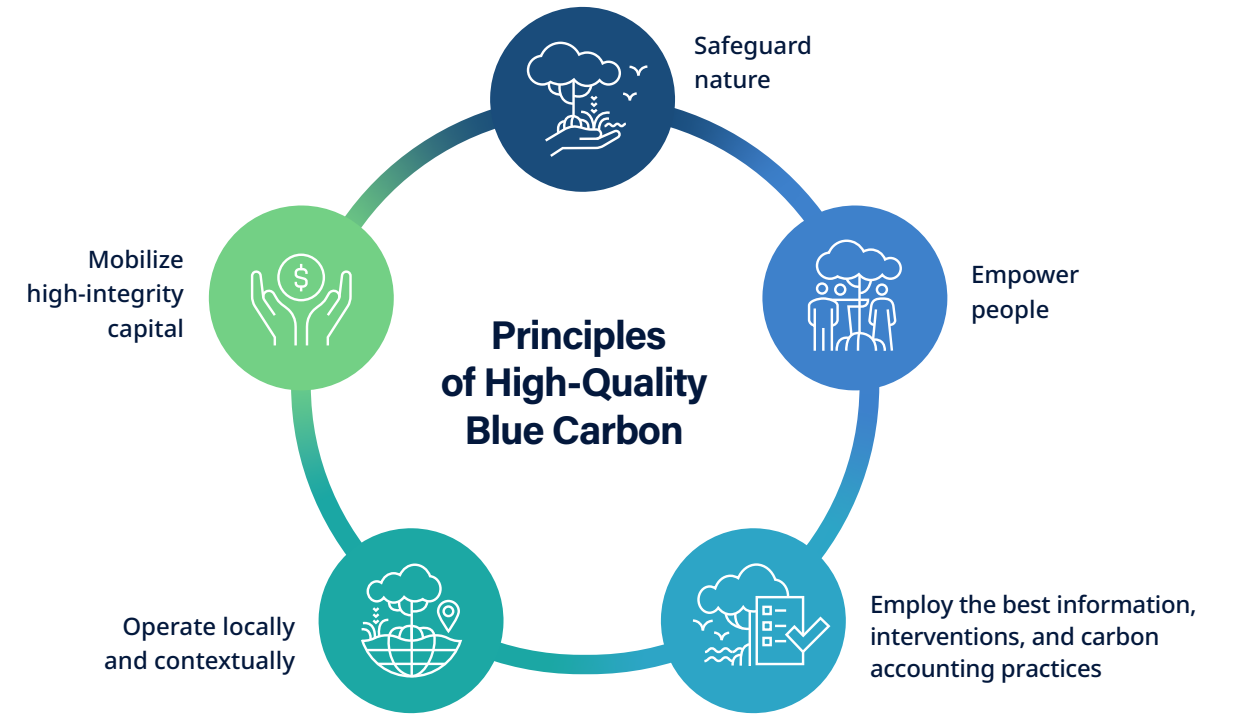


Figure 1: The five High-Quality Blue Carbon Principles.

and support high-quality projects. Thus driving a shift towards a more sustainable and equitable blue carbon market from both suppliers and buyers.

The Principles provide valuable guidance to projects that seek to generate payment for ecosystem services or other value to the community and non-market projects alike. In all cases high-quality projects must still be able to articulate how project activities produce tangible benefits.

The adoption of the High-Quality Blue Carbon Principles is not limited to blue carbon crediting projects and thus their adoption has been seen across a wide array of stakeholders. For example, the High-Quality Blue Carbon Principles have been referenced in both national and international ocean conservation guidance, including the [Ocean Panel Blue Carbon Handbook](#), and the [Roadmap for High Integrity Marine Natural Capital Markets in](#)

[the UK](#). The [Best practice guidelines for mangrove restoration](#) adopted the core principles and added one more “Design for Sustainability”. This references restoration projects which are typically financed and managed for shorter timescales than crediting projects:

Design for Sustainability: All projects have risks to sustainability that may occur beyond the project lifetime. Creating sustainable mangrove projects and programs needs to be inclusive of how these initiatives will last into the future, including financing, threat abatement, community stewardship and climate change.

The Principles were also adopted by the [Mangrove Breakthrough](#) where over 68 partners and an additional 27 governments (as of 2024) have endorsed the Breakthrough and thus the Principles.

Although written primarily for blue carbon crediting projects, this Practitioners Guide may be applied to a range of project types, from marine protected areas to sustainable ecosystem positive businesses, in order

to support the necessary scaling up of high-quality project delivery. This document has been written with mangroves, saltmarshes and seagrasses in mind, but can also be applied to new activities in new ecosystems if and when they become available. This report does not lay out a new standard; rather, it distills existing and emerging knowledge, guidance and best practices for application in the blue carbon context.



Gazi mangroves © Julia Jung/ACES

The Mangrove Breakthrough

The Mangrove Breakthrough is an ambitious initiative led jointly by governments, NGOs and financiers. It aims to create a step change in action for mangroves by unlocking USD 4 billion and securing the future of 15 million hectares of mangrove forests by 2030.

Launched at UNFCCC COP27, the Mangrove Breakthrough is part of the UNFCCC's 2030 Breakthrough Agenda and builds on the work by the [Global Mangrove Alliance \(GMA\)](#).

The Breakthrough was established in recognition of the outstanding values of mangroves for people and nature and the need to step up action for this precious ecosystem. It provides a science-based target, derived from data presented in the [Global Mangrove Watch](#) platform and the [State of the World's Mangroves](#) reports.

“The High-Quality Blue Carbon Principles and Guidance gave us an incredible starting point, allowing us to craft a set of guidelines specifically tailored for mangrove ecosystems. Since their ratification, these guidelines serve as the rallying point for our growing community, ensuring our actions are high-quality, science driven, and aimed to benefit both people and biodiversity.”

Ben Christ, The Mangrove Breakthrough.

The Mangrove Breakthrough adopted the High-Quality Blue Carbon Principles and Guidance as the foundation for its own set of [Guiding Principles](#), including [Design for Sustainability](#) highlighted above.

An initiative of the size and scope of the Mangrove Breakthrough is designed to support coordinated jurisdictional or landscape-scale conservation and restoration efforts.

I.0.I Blue carbon project types

Blue carbon projects do not always mean blue carbon crediting projects. The production and sale of carbon credits is just one option for funding the conservation or restoration of blue carbon ecosystems, to which the Principles apply. Other funding methods, where the Principles can help guide selection and support, include traditional grant funding, impact investment, CSR or ESG spending and a variety of new market mechanisms, including nitrogen and biodiversity credits. Innovative financial products include blue bonds, debt for nature swaps and leveraging the insurance value of coastal protection provided by blue carbon ecosystems in order to subsidize their restoration or maintenance.

Emerging project types include sustainable aquaculture based on the reintroduction of native coastal vegetation to stabilize dike walls, rehabilitation of areas which are no longer viable for production and recreating small but vital refuges for biodiversity. Gray-green infrastructure projects blend nature and engineering to establish stretches of blue carbon ecosystems in strategic locations. These help counter erosion or reduce storm surge damage, offering a sustainable alternative to high-emission concrete shore defenses.

I.0.II What does this guide do?

Buyers, investors and funders of blue carbon projects have been quick to adopt the High-Quality Blue Carbon Principles to guide strategies, RFPs and due diligence procedures. However applying them in practice requires building an understanding of what high-quality looks like across a range of ecosystems, project settings and activity types.

For investors, this guide will facilitate their assessments of projects based on alignment with high-quality and inform their decisions on where to invest. It can also support investors to build dialogue with project developers in recognition that the integration of high-quality into projects is an ongoing process.

For project managers, there is a need to be able to qualify and articulate how their work meets or exceeds expectations of high-quality, and to be able to embed these concepts into their ongoing work.

Despite there being many types of blue carbon projects, they all have commonalities. Investors and credit buyers need to be confident in their claims, have clear terms and agreements and follow local legal requirements. Project managers need to address the needs of people, navigate

complex land tenure and legal processes, work with governments, design and implement projects which are rooted in ecological best practice and secure sustainable funding to monitor long-term.

By understanding the common challenges across project types, it is possible to identify where guidance exists and create a central point to access a suite of blue carbon resources.

I.0.III Who is this guide for?

This guide has been designed to enable restoration and conservation practitioners, government and philanthropic funders, carbon credit producers and buyers, and investors in blue carbon ecosystems to build a shared understanding of how high-quality principles are put into practice.

The High-Quality Blue Carbon Progress Wheel tool and this guide can be applied to both crediting and non-crediting projects. However, as a companion piece to the High-Quality Blue Carbon Principles and Guidance, there is a focus on meeting the needs of investors and project proponents that are seeking access to the carbon market.

The Progress Wheel tool and this guide can be applied to both crediting and non-crediting projects.

I.0.IV How to use this guide

This guide is a follow-up to the High-Quality Blue Carbon Principles Guidance document released at the UNFCCC Climate COP27. It can also be used as a standalone document and serve as a central reference point for blue carbon practitioners, or used in conjunction with the [HQBC Progress Wheel tool](#) to support integration of the High-Quality Blue Carbon Principles into project design and adaptive management.

Each section contains links to free and accessible guidance that is specific to the principles being discussed. This is supported by case studies demonstrating how existing high-quality projects have addressed specific challenges.



CBEMR Training in the Rufiji Delta, Tanzania
© Dom Wodehouse, Mangrove Action Project

I.1 Introducing the Progress Wheel tool

Following the release of the High-Quality Blue Carbon Principles, engagement with early adopters identified demand for a structured way to integrate the principles into project design, and communicate to stakeholders and prospective funders how projects aligned with expectations of high-quality.

The accompanying HQBC Progress Wheel serves two main purposes:

- As an adaptive management and planning tool, which enables users to track progress towards high-quality outcomes from project inception onwards, identify areas of change and inform adaptive management decisions.
- As a reporting and communications tool which provides a clear visual aid in communicating project progress in a format which can be easily understood by funders and other project participants.

The “Progress Wheel” is an application of the [Society for Ecological Restoration “Recovery Wheel”](#). Designed as a tool to track ecosystem recovery in restoration projects, the Wheel can be customized to track and report on different metrics, depending on the project’s needs. There are existing versions published for [mangrove restoration tracking](#)¹ and [social benefits monitoring](#).

¹ Cadier, Charles, Bayraktarov, Elisa, Piccolo, Renee, Adame, Maria Fernanda (2020) Indicators of Coastal Wetlands Restoration Success: A Systematic Review. *Frontiers in Marine Science* 7 DOI=10.3389/fmars.2020.600220 <https://www.frontiersin.org/articles/10.3389/fmars.2020.600220>



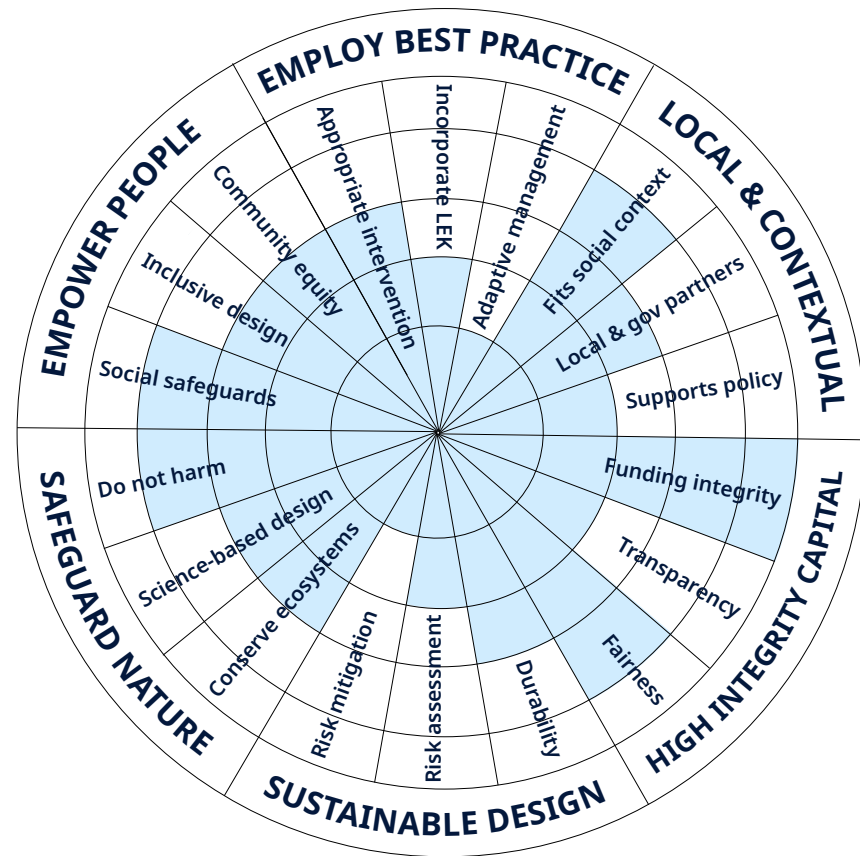
Gazi Mangroves © Anthony Ochieng Onyango/ACES

Iterations of this tool are becoming more common across the ecosystem restoration space and project managers are increasingly familiar with how to use it. This guide is explicitly linked to the structure of the Progress Wheel, which is adapted to demonstrate project alignment with both the High-Quality Blue Carbon Principles and the Mangrove Breakthrough principles. It can be applied to any blue carbon ecosystem project at any point of the project’s development and management/monitoring.

We know that project implementation is a continuum and achieving the highest quality is not expected from day one. This guide is not about a static quality “score” but rather about tracking and communicating progress towards high-quality actions and outcomes. Thus, we have named it the Progress Wheel.

1.1.1 Instructions for use

The tool works by asking project managers to assess performance in key metrics by selecting the scenario most aligned with their project, using pre-defined criteria. This produces both a numerical value and a visual output:



HIGH-QUALITY PRINCIPLE	PROGRESS LEVEL (1-5)
PRINCIPLE 1. Safeguard Nature	
Conserve ecosystems	3.0
Science-based project design	3.0
Do no harm	4.0
PRINCIPLE 2. Empower People	
Social safeguards	4.0
Inclusive project design	3.0
Community equity	3.0
PRINCIPLE 3. Employ Best Practice	
Appropriate interventions	3.0
Incorporate local knowledge	2.0
Adaptive management	1.0
PRINCIPLE 4. Operate Locally and Contextually	
Operate according to social context	4.0
Local & government partners	3.0
Advance supporting policies	2.0
PRINCIPLE 5. High Integrity Capital	
Funding integrity	5.0
Financial transparency	2.0
Fair agreements and contracts	4.0
PRINCIPLE 6. Design for Sustainability	
Durability	3.0
Risk assessment	2.0
Risk mitigation	1.0

Figure 2: The Progress Wheel enables project managers to align performance with the High-Quality Blue Carbon Principles. Adapted from: McDonald T., Jonson J. and Dixon K. W. (eds) (2016) National Standards for the Practice of Ecological Restoration in Australia. Restoration Ecology S1: 1-340. Modified with permission for the High Quality Blue Carbon Principles by Mark Beeston 2024.

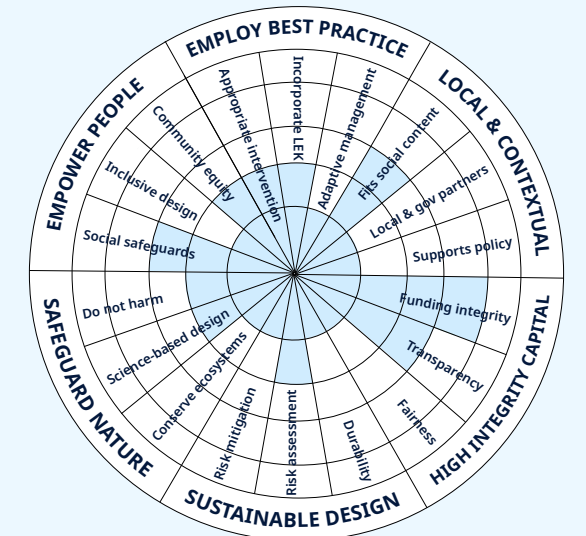
The Progress Wheel introduces a simplified process where the project assessor selects statements describing a range of project activities and matches them to their own project.

The tool consists of six sections, one for each principle. Each section is completed based on key criteria and various scenarios under each. The user selects the most applicable scenario for each criteria, which automatically generates a numeric output and an 'Evaluation Form'. Not all criteria will apply to all projects. For example, assessment of climate mitigation protocols or carbon standards used may not apply to a non-crediting project. Where appropriate, a "non-applicable" option can be selected. The equation will automatically be adjusted so results are not skewed up or down.

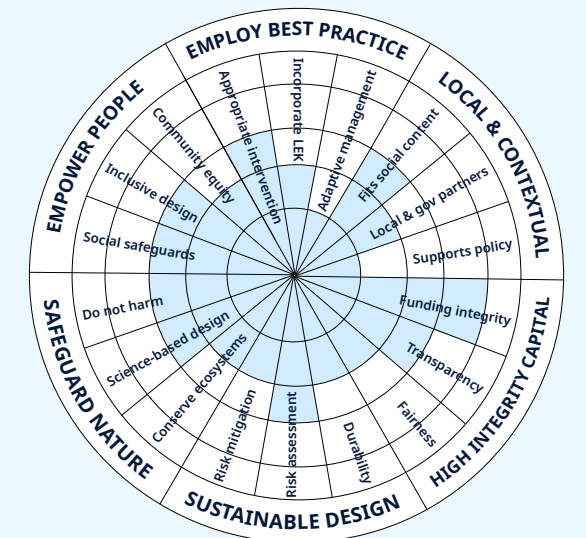
To produce the visual output, simply click on "Update recovery Wheel", and the Wheel will update within a few seconds. The quantity of the wedge that is colored in for each section and category indicates how closely the project meets the High-Quality Blue Carbon Principles and Guidance for that area. The more area colored, the more closely the project aligns with the principles. This visualization helps indicate overall project quality as well as any areas for improvement.

We recommend using the Progress Wheel as often as is helpful throughout a project to understand what is going well and where improvement is needed. Each assessment is expected to take less than an hour to complete. When starting a new project, it is recommended that a project assess its progress **at least** three times. Specifically:

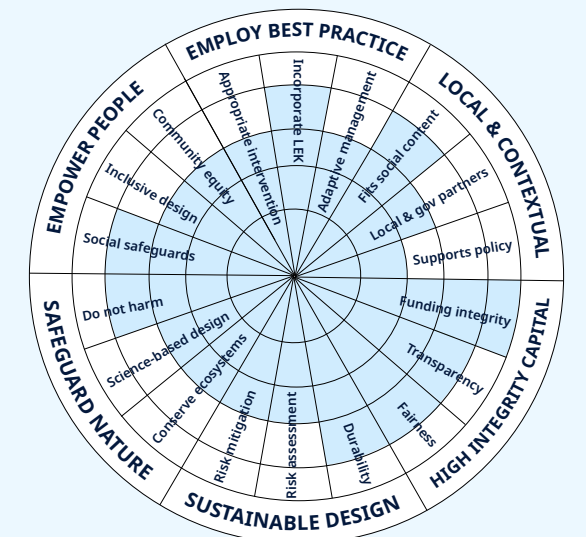
1. At the start of the project - Use the Progress Wheel to demonstrate the anticipated baseline starting point (Year 0).
2. Time point 1 - Select a point in time when project activities should be well underway and use the results to adaptively manage (Year 2 or 3).
3. Time point 2 - Select a point in time when a project should be self-sustaining and use the results to adaptively manage as needed (Year 5 or 6).



Wheel 1



Wheel 2



Wheel 3

Figure 3 (right): Wheel 1 shows a fictional project in year 1, with funding secured but all other interventions in planning or incomplete stages. Wheel 2 shows the project in the "present", with clear progress in all areas. Wheel 3 shows the predicted project progress for year 3.

However, if the project is already in progress the recommended times to use the Wheel include, but are not limited to:

1. Use the Progress Wheel to retroactively demonstrate the baseline starting point for the project in all areas (Year 0).
2. Conduct an assessment of how the project aligns with the principles in the present day.
3. Conduct a final assessment based on how the project is predicted to have progressed 3 years from now.

In addition, the Progress Wheel can be used to demonstrate how additional support for key activities can improve specific areas of impact. For example, when applying for funding it can be useful to produce

two future predictions, one based on how the project can be expected to perform based on current resources, and a second showing how performance in key areas could be improved following successful funding. There are spaces on the evaluation form marked “supporting evidence” where projects can add links to online documentation or media, for example the registry entry, project documents and monitoring reports for crediting projects.

Using this tool doesn't replace the need for conventional reporting. However, by generating an easily understandable visualization based on a common framework, this creates an accessible one-page summary which can be quickly understood by the reader and is broadly comparable across blue carbon ecosystems and project types.



Seagrass in Vanga Bay © Tony Wild/Anthony Ochieng Onyango/ACES

I.I.II Interpreting results

It is important to recognize that project development is a continual process, and the progress of projects is subject to constant change. Low scoring criteria identify areas where progress is at an early stage, not yet begun, or which have not performed as expected and require adaptive management interventions.

The numeric scores on the Progress Wheel can be interpreted as follows:

1	Progress in this area is minimal, represents a starting baseline, or has not yet begun. In a mature project, this may indicate cause for concern or identify additional funding/capacity building needs.
2	Progress in this area is at a basic stage. This may either be representative of an early-stage project progressing as expected, or an older project requiring updating or support to meet modern best practice criteria.
3	Progress in this area is in line with accepted best practice and is satisfactory across all criteria. This is representative of a high-quality project.
4	Progress in this area meets or exceeds current definitions of best practice and is representative of a very high-quality project.
5	This level of achievement is aspirational and represents an unusually high-quality project.

Remember that there is no such thing as a perfect project, as all projects will have areas in need of improvement. Projects which have majority scores of 3-4 in their current or projected performance are likely to be high-quality, investible and with low likelihood of reputational risk. Results will always be somewhat contextual. For example, some projects will be resource-limited and will need to prioritize different actions. The key point to consider and understand is whether underperforming projects are causing harm to people or nature, and if so what actions can be taken to improve performance and progress going forward.

I.I.III Navigating this guide

The main content of this guide has been organized using the High-Quality Blue Carbon Principles & Guidance as a framework, and will now explore each in turn. Chapter and section headings are consistent across both documents and are mapped to corresponding sections of the Progress Wheel.



1.0 Safeguard nature



Mangroves and needlefish off Mansuar Island © Conservation International

1.0 Safeguard nature 17

1.1 Conserve our planet’s remaining intact ecosystems 19

1.2 Design projects in accordance with science-based ecological protocols21

1.3 Do no harm23

 1.3.1 Using alien or invasive species23

 1.3.2 Leakage24

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It is often assumed that every instance of conserving and restoring blue carbon ecosystems will only generate positive outcomes for ecosystem services and biodiversity.

However, this is not always the case. Blue carbon projects face various constraints that can significantly impact their design and delivery. These constraints include government regulations, local rights and capacity, funding timelines, donor/investor expectations and potential market shifts. These constraints can influence a project's ability to include well-designed safeguards, potentially leading to direct or indirect harmful consequences. Unforeseen or unavoidable negative impacts to people and the environment has led to real and perceived risks associated with nature-based solutions and nature derived carbon market finance. This Principle focuses on environmental safeguards related to high-quality blue carbon project implementation, while subsequent sections will address social issues.

 Gazi Mangroves © Anthony Ochieng Onyango/ACES

1.1 Conserve our planet's remaining intact ecosystems

While ecosystem restoration plays a crucial role in environmental recovery, it often falls short of fully replicating the complexity and richness of undisturbed habitats. It is also the case that blue carbon ecosystems have such a high density of carbon per area that can be released when degraded or destroyed, that conserving an intact area has a much higher carbon mitigation benefit than restoration. A conservation approach recognizes that prevention is often more effective than cure regarding ecosystem health. Many communities understand there are tangible benefits to conserving blue carbon ecosystems and ensuring they are sustainably managed. Simultaneously, they may be reliant on extractive or destructive activities for income or resources. The challenge lies in accessing long term funding to pay for improved management and monitoring activities, or to provide alternative resources and livelihood choices, enabling conservation to take place.

Projects leverage both local support and local knowledge to conserve intact blue carbon ecosystems.

High-quality projects consider not just including degraded areas or restoration sites within project boundaries, but also incorporating conservation of areas which are in a good condition, even when they may not be eligible for producing credits. Integrating conservation and restoration efforts creates a more comprehensive strategy for addressing environmental challenges, maximizing biodiversity protection and enhancing ecosystem services. By balancing these complementary approaches, stakeholders can achieve more robust and sustainable outcomes for both nature and human well-being.

High-quality conservation projects adopt a data-driven approach to goal-setting and monitoring, based on baseline assessments and local knowledge. For example, the [IUCN Red List of Ecosystems](#) and the [IUCN Red List of Threatened Species](#) can be used to inform priority biodiversity goals. Local Ecological Knowledge (LEK) (section 3.2) can also identify local biodiversity gain or loss trends and help identify species of local, cultural or subsistence value.

Effective conservation is grounded in local support. Advocating for the ecosystems we aim to preserve is a core part of any conservation activity, with the

central message that healthy blue carbon ecosystems provide more tangible benefits than degraded or cleared sites. Schools and outreach programs offer an important opportunity to encourage participation and understanding of the project and its goals. Welcoming visitors to the project site, if feasible, can be a powerful outreach service.

High-quality blue carbon projects will have carried out the following actions:

- Conduct outreach activities that link conservation to the provision of ecosystem services, which provide tangible benefits and reflect local ecological knowledge.
- Raise awareness of the importance of blue carbon ecosystems with diverse stakeholders such as local authorities, fishers and communities.
- Attempt to fully conserve the biodiversity and integrity of intact ecosystems based on rigorous baseline data.
- Identify species which are a conservation priority.
- Integrate specific, measurable, ambitious, realistic and time-bound biodiversity targets into project goals.
- Implement comprehensive biodiversity monitoring programs.
- Ensure data transparency and increase scientific knowledge by sharing data publicly.



1.2 Design projects in accordance with science-based ecological protocols

Early blue carbon ecosystem management and restoration projects attempted to apply terrestrial forestry methods to the more complex and dynamic intertidal area, often with no or limited long-term project success. For example, common mangrove restoration activities that utilize monoculture plantations, if they survive, may result in increased carbon capture and storage but fail to support biodiversity. Instead, local areas of the same ecosystem in a healthy or pristine state can be used as reference sites to determine suitable project goals and the science-based methods to achieve them.

Remote imagery also allows ecologists to identify potential upstream influences on the project site and build them into risk assessment, monitoring plans and overall project design. Historic trends in ecosystem extent gain and loss can be connected to years of

drought or severe weather events, construction of infrastructure or changes in land use, or hydrology and sediment changes. This data can be interpreted to predict which interventions have the greatest chance of long-term success. Combining participatory mapping exercises, which draw on local knowledge of site history, with satellite imagery and ecological data collection should be used to inform the selection of appropriate interventions.

Designing projects in accordance with accepted science-based approaches is reliant on projects being able to assign sufficient time, resources and expertise to collecting both ecological and social data to make informed, evidence-based decisions. Skipping the evaluation of physical and social site conditions carries a high risk of low-quality project delivery, or complete failure, and should be factored into funding decisions.

© IUCN/MFF



Community-Based Ecological Mangrove Restoration training, Lamu, Kenya © Dom Wodehouse, Mangrove Action Project

High-quality assessment criteria:

- Project design is based on one or more protocols widely accepted as best practice and aligned with project context.
- Work with project participants and stakeholders to develop implementation plans and incorporate their feedback.
- Submit project design to a third party / expert review and/or public consultation.
- Project design goals and methods are firmly informed by all of the following:
 - Reference sites.
 - Historic site conditions.
 - Local knowledge (including Traditional Ecological Knowledge) and inclusive (including participatory) design.
 - Locally relevant peer reviewed scientific evidence.
- Consider hydrological, substrate, salinity and sediment requirements.
- Use appropriate species for restoration, as well as natural transition processes.
- Project team has received training in best practice project design and implementation.
- Project plans aim to support recovery or maintenance of a biodiverse ecosystem.
- Use of remote sensing to:
 - Observe and interpret local trends in ecosystem extent and land use change.
 - Identify potential upstream influences affecting project site.
 - Support selection of appropriate intervention protocols.

1.3 Do no harm

Under the principle of “Safeguard Nature” the goal is to ensure that blue carbon projects, at the very least, do not cause additional harm to the environment and in the best instances improve it.

Blue carbon ecosystems are intrinsically interconnected to both each other and to other terrestrial and marine nearshore ecosystems. Water flow around the project site, such as currents, inflow and outflow, and the risk of inflicting unforeseen consequences of project implementation on downstream areas needs to be assessed and documented before any physical work can begin. Conducting Environmental Impact Assessments (EIAs) prior to restoration or conservation activities is one way to identify possible harm. While EIAs are mandatory for many coastal or marine development projects, nature-based projects often assume positive environmental impacts and may be excluded.

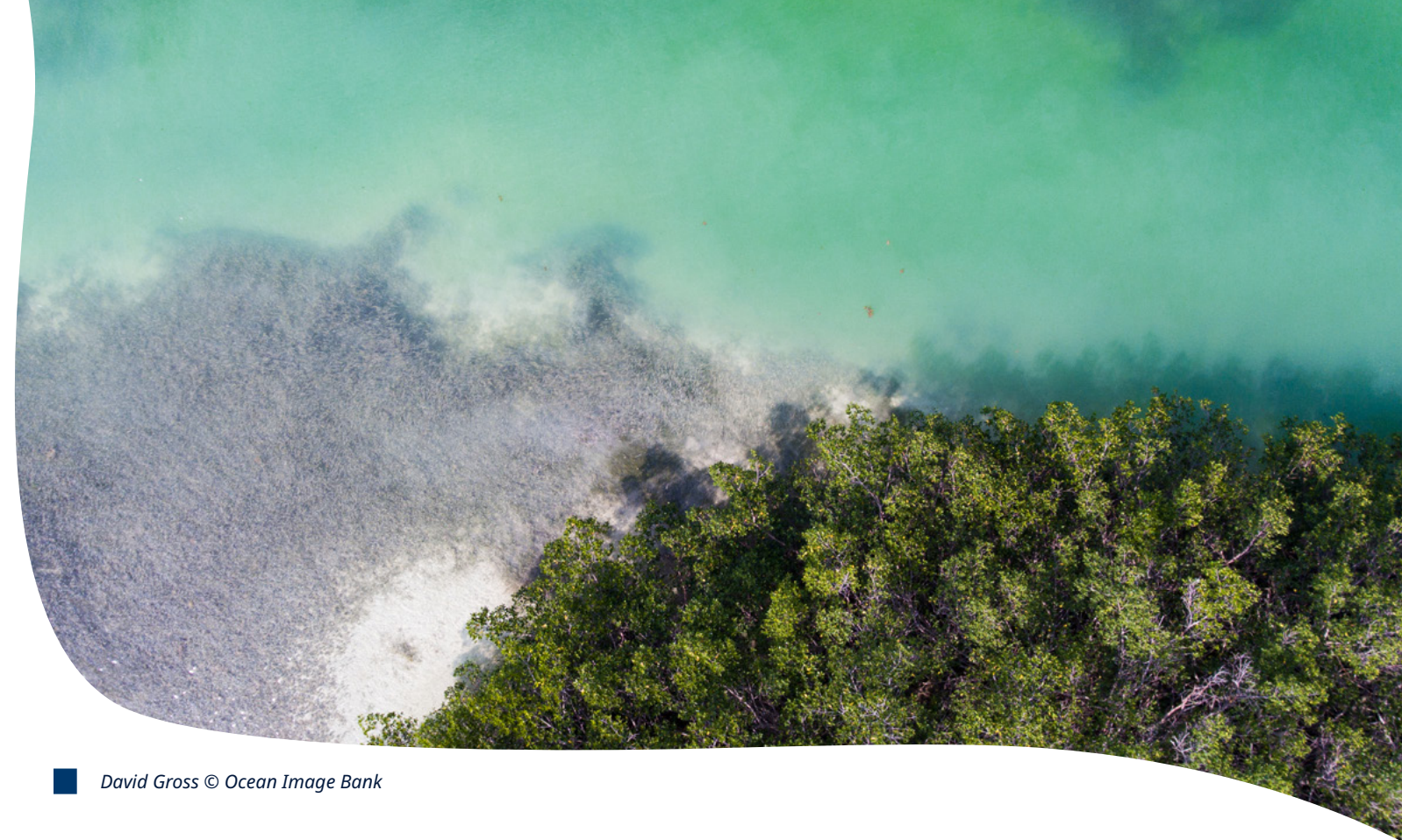
High-quality mangrove restoration is not planting mangroves on mudflats where mangroves never existed before, using non-native species, and/or single species mangrove plantations.

Therefore, working in blue carbon ecosystems requires attention to be paid to monitoring and mitigating impacts on both neighboring and downstream areas.

When evaluating or planning for high-quality blue carbon projects there are well-established activities that lead to harming nature and should be avoided. Inclusion of the activities listed below will prevent a project from being considered high-quality, no matter how well they do in the other sections and criteria. Some of the most common and most damaging issues are described below.

1.3.1 Using alien or invasive species

The risks associated with introducing non-native species, such as invasive behavior and displacement of native species, contradict the principles of high-quality blue carbon projects and high-value carbon credits. However, the use of non-native species for livelihoods or alternative resource provision can be acceptable in certain cases. A clear example is planting non-native casuarina trees on degraded land in Kenya in order to serve as an alternative community wood source. This reduces damage to nearby mangrove areas and is therefore a valid use of non-native species. However, in this case it is essential that such projects clearly communicate the use of non-native species and do not claim it as a restored or conserved area. Introducing non-native fauna for pest control, alternative livelihood opportunities, or as a food source should be approached with extreme caution. For instance, the introduction of an African tilapia fishery as an alternative income stream. Whilst these are commonly farmed in blue



David Gross © Ocean Image Bank

carbon ecosystems in Asia, they are aggressive and can drive native species to extinction. Therefore, such introductions must be carefully justified and monitored.

Additional examples of project activities that may deliver less than ideal results or cause harm include:

- Afforestation or conversion of an extant functioning ecosystem.
- Alteration of site hydrology affecting neighboring areas.
- Large-scale dredging or addition of sediments.
- Use of fertilizers, pesticides or chemical treatments in aquaculture.
- Creating roads or increasing accessibility to protected areas.
- High-intensity tourism or recreational use.

1.3.2 Leakage

There is a risk that human activities which cause loss or degradation, such as unsustainable cutting for timber or charcoal, may be displaced from the project site rather than reduced or halted. This can result in intensified use of other locations, or new loss or degradation “leaking” into previously unharmed sites. High-quality crediting standards require that projects apply an approved methodology to assess the risk of leakage. For non-crediting projects, or crediting projects using standards which do not include assessment or monitoring of leakage, it is entirely feasible to increase project quality by choosing to independently apply an additional assessment of leakage using a methodology from a different standard.

Best practice projects of all types will monitor nearby ecosystems to identify if any activity displacement is occurring. They may also revise alternative resource provision or livelihood plans accordingly. Note that this kind of adaptive management should include engagement and negotiation with affected parties ahead of any solution and projects may need to raise additional funds to do so effectively. Integrating community members into the design and decision-making process around alternative resource or livelihood provision can increase community uptake and mitigate risk of activity displacement. However, assessments of leakage should be renewed at multiple intervals throughout the project lifecycle.

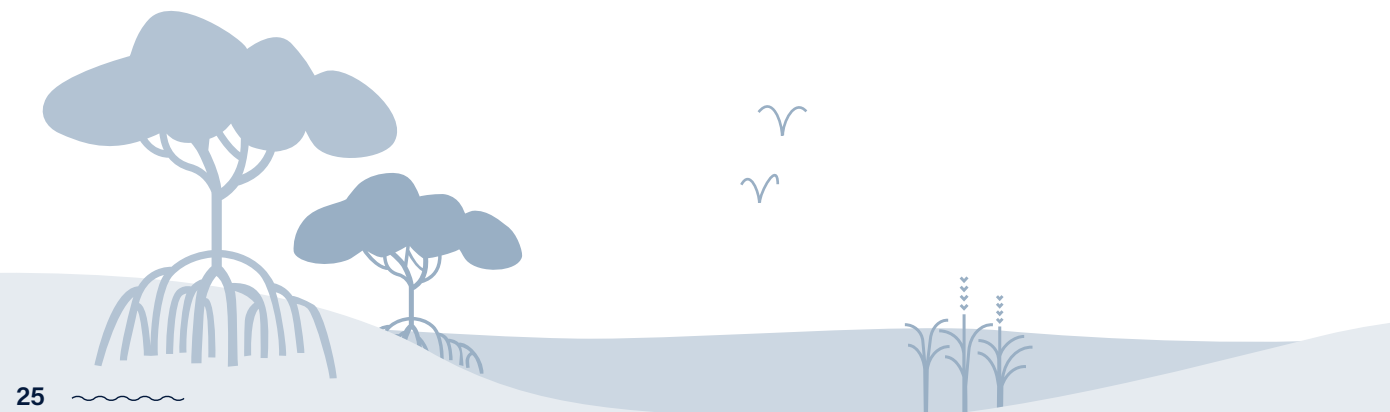
Addressing activity displacement or leakage requires engagement and negotiation with affected parties, and projects may need to raise additional funds to do so effectively.

High-quality assessment criteria:

- Design activities that efficiently avoid loss of biodiversity.
- Minimizes habitat loss or conversion.
- Prohibits invasive or non-native species from being introduced.
- Avoids reduced water quality, increased erosion or harmful sedimentation levels.
- Does not increase net emissions.
- Any adjacent or downstream areas which may be affected by project implementation have been identified during planning.
- Project implementation is designed to mitigate negative impacts on neighboring and downstream ecosystems.
- Where possible, improved management of neighboring areas or ecosystems are integrated into project plans and budget.
- Project monitors neighboring areas for leakage / activity displacement.

Resources: Safeguard Nature

International Principles and Standards for the Practice of Ecological Restoration (second edition)
Seagrass Restoration Handbook
Saltmarsh Restoration Handbook
Best Practice Guidelines for Mangrove Restoration - includes resources applicable to all blue carbon ecosystems
Seagrass Watch field resources library
Mangrove restoration tracker tool
Blue Forests Yayasan Hutan Biru knowledge hub - includes Ecological Mangrove Rehabilitation - A field guide for practitioners
DEFRA Saltmarsh Management Manual
Kingdom of Cambodia Mangrove Biodiversity Survey Report
The Global Biodiversity Standard: Manual for assessment and best practices
Rapid assessment protocol for terrestrial vertebrates
Good practices for the collection of biodiversity baseline data
Effectiveness of community-based mangrove management for coastal protection: A case study from Central Java, Indonesia
Ecological engineering for successful management and restoration of mangrove forests
Video series: How to effectively restore mangroves
Global Mangrove Watch - Data visualisation program including adjacent saltmarsh and coral ecosystems
Restoration, creation and management of salt marshes and tidal flats - A collation of evidence-based guidance



2.0 Empower people



Lilian in the forest © Anthony Ochieng Onyango/ACES

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Most blue carbon projects take place where people live and work. Blue carbon practitioners must implement social safeguards to protect and enhance community member rights, knowledge, leadership and where relevant, foster equitable access to markets for ecosystem services.

Conservation should never be carried out at the expense of people's safety, needs or rights.

In urban populations, blue carbon practitioners must negotiate layers of overlapping permissions and effectively socialize the project with diverse commercial, industrial, community and government stakeholders. In more rural areas, clearly defined processes may not exist to establish/recognize ownership or management rights for blue carbon ecosystems. In any case, there may be no formal safeguards or grievance pathways for residents, users, rightsholders or other stakeholders to object to conservation or restoration activities that may directly affect them.

Differing roles and responsibilities often determine how people interact with blue carbon ecosystems and how they perceive their usefulness or value. Gender-specific roles may mean that knowledge of the ecosystem's dynamics, and awareness of trends in the abundance of natural resources, biodiversity, food or commercial species, is unequally shared. For example, in many areas women are the primary users of mangroves and

seagrass, however in other places it is common for multiple groups, such as men, women, youth, etc., to actively harvest and use blue carbon ecosystems.

The responsibility lies with developers of high-quality projects to assess what legal obligations they have to local users and rightsholders, carry out their own stakeholder mapping (section 4.2) and put in place their own processes to safeguard the rights and livelihoods of communities and other stakeholders affected by changes in how the ecosystem is managed. To do this effectively, interdisciplinary teams with a balance of social and ecological expertise are required. Plus, funders need to be conscious of the time and resource investment needed for adequate consultation and/or consent for the project.

Integral to the definition of high-quality projects is that conservation should never be carried out at the expense of people's safety, needs or rights. While using crediting mechanisms in blue carbon systems is relatively new, there is a long history of coastal MPA management and terrestrial REDD+ projects from which to draw lessons and best practices.



2.1 Social safeguards

2.1.1 Ensure that Free, Prior and Informed Consent (FPIC) is established

Free, Prior and Informed Consent (FPIC) is an essential activity and the first step in any high-quality blue carbon project. FPIC provides fundamental rights to Indigenous People and Local Communities (IPs&LCs) by securing consent at all project stages. FPIC aims to empower communities and create long-lasting, sustainable projects that integrate local needs, practices and values. All projects in areas owned, inhabited or which provide essential goods or services are expected to follow the FPIC process. Some countries also have a legal requirement for basic FPIC processes to be completed.

Before initiating the project, IPs&LCs must consent to engage with the project. Consent must be *free* from intimidation, threats, force or bribes. Proper FPIC procedures also require that the project consults communities through culturally appropriate means and respects the rights of community members to make informed decisions about the project prior to implementing activities. This necessitates that community members have access to all information about the project activities, benefits and risks in the appropriate formats and languages (written, in-person, video etc.) to make an *informed* decision. Communities may decide to *withhold consent* or *revoke* it at any project stage.

For projects which originate within or are led by rural communities or Indigenous groups, with external partners playing a supporting role supplying technical expertise or facilitating market access, the FPIC



Maintirano fisherman in front of mangroves © WWF

process may be more organic, but project activities and governance structures still need to be clearly documented and agreed to, with the role of each partner clearly defined. Local groups may also need to conduct an FPIC process to confirm and document consent and support of affected minority groups or other stakeholders within their own communities.

FPIC can only really be realized if or when communities have the access to the information and skills needed to effectively negotiate. High-quality projects recognize if parties have unequal capacity to negotiate, make sure third-party mediation or legal advice is available where needed, and proceed at a rate that IPs&LCs are comfortable with.

The United Nations Food and Agriculture Organization (FAO) offers the following steps and best practices that should be documented and recorded:

1. Identify the needs, concerns and perspectives of Indigenous communities, including appropriate representatives and leaders.
2. Utilize participatory stakeholder mapping to record demographic and geographic information.
3. Collaborate with representatives and leaders to develop plans to communicate information about the project transparently and effectively to stakeholders.
4. Communicate how the project will support the needs of IPLCs and document consent for the project's plans and activities.
5. Create feedback and grievance mechanisms that are accessible to all community members in a culturally appropriate format.
6. Continuously monitor and evaluate the project through participatory processes.
7. Document lessons learned, share and disseminate information about the project.

Source: FAO (2014)

High-quality blue carbon projects uphold FPIC by following the appropriate local, cultural and political contexts in a decision-making process. This is determined by communities, including making changes to the project design and activities as necessary to meet community needs. Clear records of the process are also kept, including any objections raised and solutions reached, and consent is given in writing with all parties having access to the resulting documents in appropriate languages.

High-quality assessment criteria:

- The project conducted a full and inclusive consultation and FPIC process in accordance with UN FAO guidelines.
- FPIC processes are updated at any necessary intervals throughout the project lifetime.
- Project meets or exceeds any minimum legal requirements.
- All participants had access to all required information, including opposing or alternative viewpoints, in order to make an informed decision.
- All participants have the skills to be able to effectively negotiate, or access to neutral third party support if needed.
- A written record of the FPIC process was kept and all parties have copies in appropriate languages, freely available to stakeholders.
- Consent was given in writing to a mutually developed project proposal.



Local people are a critical source of ecological information © Ana Grillo

2.1.2 Ensure inclusive participation

High-quality projects grant all community members the right to participate in the project regardless of gender (section 2.2.2), sexuality, ethnicity, wealth, age, religion, education, location or other identifying factors. However, inclusive participation also respects cultural and religious beliefs, avoids causing or exacerbating conflict, and needs to operate safely within the local social and cultural context.

Participating in community meetings or project activities can cost time which individuals may normally spend working, earning, or taking care of families and household tasks. To enable wider participation across different social groups within a community, some individuals may need to be compensated for lost income, meals, or childcare, and be provided with transport to the activity location. Project managers will also need to consider how to ensure accessibility for older people, disabled people, young people, and linguistic minorities. Project communications and group activities also need to be designed to accommodate different levels of education and literacy.

While projects should identify effective and socially feasible ways to ensure the voices of all stakeholders are heard and included, care must be taken where some communities may discriminate against certain individuals or groups (for example, members of ethnic minorities) thus discouraging them from participating in the project. In turn, the project may not integrate their needs or issues, perpetuating an existing cycle of discrimination. Breaking this cycle requires engaging, consulting and including all excluded or discriminated groups and individuals wherever practical and safe to do so. For example, projects may address these concerns by providing anonymous feedback options or safe spaces for individuals to openly discuss their concerns without fear of retaliation. When challenged by investor or funder due diligence, projects should be able to describe local cultural dynamics and any challenges or risks which may impose limitations on inclusivity.

Inclusive participation takes considerable time, capacity and effort to achieve, and requires projects to employ social scientists or dedicated team members to act in community liaison roles.

Ensuring equitable participation and leadership requires time spent in and among the community, building relationships and connections with diverse individuals, groups and leaders, but it may ultimately result in a deeper understanding of who faces discrimination, by whom, why and in what ways. Experience demonstrates that achieving broad and highly participatory community engagement in project design and implementation, including people of different genders and ages etc., delivers more sustainable and long-lasting results.

Due to their multi-decadal implementation and monitoring periods, carbon crediting projects require working in close collaboration with communities across several generations. This may present novel opportunities to address systemic inequalities over longer than usual timescales.

Some national guidelines, and carbon standards such as Plan Vivo's PV Climate, require projects to transparently design, monitor and report on the community engagement process. Other standards may apply labels to indicate credits produced by projects which have achieved additional certifications, such as the Climate, Community, and Biodiversity Certification (CCB) or ABACUS labels administered by Verra, or the independent W+ label.

Verra's CCB certification is separate from its carbon crediting standard and can be used as a standalone method to assess whether a blue carbon project is delivering tangible climate, community, and biodiversity benefits.

A deep understanding of the social matrix and community perspectives will inform how the project can engage, build capacity and create an inclusive environment for everyone.

High-quality blue carbon projects will have designed an inclusive approach that recognizes and engages key stakeholder groups, keeps clear records of community interactions and are transparent in their conduct.

High-quality assessment criteria:

- The project has a clear understanding and is sensitive to local social and cultural norms and prioritizes participant and staff safety.
- Project has identified different groups within the community, including minority groups, and takes appropriate action to facilitate their participation in community meetings and project activities.
- Ensure that local and traditional ecological knowledge from the Indigenous Peoples and local communities is at the center of projects through a collaborative approach.
- Project employs interdisciplinary teams including members skilled in relevant social engagement and safeguarding processes.
- Social engagement processes are clearly documented, including records of attendance at meetings and activities, and are regularly reviewed and adapted to ensure inclusive and safe participation.
- Social engagement processes are designed, monitored and reported on in accordance with published best practice, or certified by a social standard such as Verra CCB or PV Climate.

2.1.3 Ensure feedback, accountability and grievance mechanisms are available to all rightsholders and stakeholders

High-quality projects develop feedback and grievance mechanisms for communities and resource users to submit concerns and receive timely, transparent and equitable responses. These mechanisms ensure that projects adapt and evolve to the changing needs and circumstances of the community and are accountable for their impact on IPs&LCs and stakeholders.

Grievances must receive a response followed by concrete actions to mitigate or compensate for the damage, regardless of the type or magnitude of harm. If no response or solution is apparent as a result of engagement then the system may cease to be used and be rendered ineffective. Responses may include apologies, restitution, financial or non-financial compensation, halting activities, or other mutually agreed-upon solutions. Projects also need to ensure that the existence of the feedback and grievance mechanisms, and how to access them, is effectively communicated to all project participants and any other potentially affected people.

A feedback and grievance mechanism should enable project participants and other stakeholders to easily communicate with project governance, and to safely submit any complaints or concerns. Projects need to provide multiple accessible contact options suitable for the local context, including anonymous contact routes. There should be a clear written procedure for processing a grievance, underpinned by a code of conduct or set of principles and clearly defined roles and responsibilities.

© Joeri Borst, Wetlands International



High-quality blue carbon projects will have designed an inclusive approach that recognizes and engages key stakeholder groups, keeps clear records of community interactions and are transparent in their conduct.

High-quality projects are those which provide a mix of different routes to safely provide feedback. This includes ensuring all participants have easily accessible ways to be heard, and making sure participants are aware these feedback routes are available.

Communities are not static, so the project must evolve and adapt with them...

The structured framework of the grievance mechanism prevents serious concerns from escalating into disputes and human rights abuses. Communities are not static, so the project must evolve and adapt with them while remaining accountable to the communities for their actions.

In 2001, the United Nations Human Rights Council introduced The Guiding Principles on Business and Human Rights (UNGPs), which offers a framework for addressing human rights issues within organizations, including mangrove restoration projects. The UNGPs outlines that grievance mechanisms should be legitimate, independent, predictable, equitable, transparent, non-judicial, adaptive and aligned with human rights.

- Legitimacy and Independence:** Mechanisms should respect human rights, remain unbiased and avoid conflicts of interest by using independent representatives and allocating adequate funds and resources to run the mechanism.
- Accessibility and Equitability:** Stakeholders should have free access to information about the mechanism in a clear, understandable and locally relevant format.
- Predictability and Equitability:** The mechanism should have clear steps, timelines and processes in place that also provide updates on the grievance process. This should also be tracked and recorded.
- Non-Judicial and Adaptive:** The grievance mechanism should attempt to resolve issues outside of legal proceedings but allow stakeholders the option to pursue legal action. Mechanisms should learn from experiences and cases to improve and evolve over time.
- Human Rights Complaints:** Mechanisms must align with international human rights standards and prevent retaliation or harm to individuals or groups making a grievance.



CBEMR Training in the Rufiji Delta, Tanzania © Dom Wodehouse, Mangrove Action Project

High-quality assessment criteria:

- The existence of a feedback and grievance mechanism, how it works, and how to use it are clearly communicated to all parties participating in or potentially impacted by project activities.
- The grievance mechanism includes multiple communication pathways which are safely accessible or equitable for all stakeholders.
- The mechanism has clear steps and processes in place, is actioned in a timely and impartial manner, and results in a tangible outcome.
- There is a clear third-party appeals process for any contested decisions, followed by the option to access legal action if necessary.
- Feedback and grievance mechanisms are reviewed and updated periodically to ensure they remain effective and aligned with international human rights standards.
- Full records are kept.

2.2 Inclusive project design

2.2.1 Respect traditional land use practices and legal rights to land, resources and carbon

Respecting traditional land use practices, resource management and legal rights to land, carbon and other resources is crucial for all blue carbon projects. Project developers must conduct stakeholder mapping exercises to identify the landowners, users, community leaders and resources within the project area. While seeking permission to operate from the government is paramount, project developers must first consult with local communities and stakeholders on



GPS Training

ownership or management rights, and take care to avoid misunderstanding or potential conflict between user groups. Community leadership may not always adhere to formal structures, titles or legally recognized entities. External partners working with communities may need to recognize and respect traditional informal leadership practices and integrate them within project governance, in line with local cultural and gender norms.

Land tenure varies widely in mangroves and is often unclear or complex. Developers should establish clear legal and governance mechanisms within the project. For crediting projects, this includes clarity over the owners of carbon rights to ensure all stakeholders understand who has the right to transact carbon or other ecosystem services. This could include obtaining written clarification of traditional de facto ownership and usage rights or establishing legally recognized community associations or co-operatives, such as forestry or fishers groups, for the purpose of securing community rights and project tenure.

While rotating or temporary closure of some degraded sites may be necessary to enable recovery, local stakeholders' complete and permanent exclusion from project sites should be avoided. Instead, project developers need to invest time in determining which activities are sustainable and which are incompatible with conservation or restoration goals. Traditional uses of blue carbon ecosystems should be observed to see if they actively degrade the project site or inhibit recovery, and whether damaging activities can be effectively managed or modified to mitigate degradation. Management solutions and the provision of alternative resources should be developed in partnership with

affected user groups and community leaders, to ensure interventions are desirable and practical and to preserve any practices of cultural significance.

For projects where drivers of ecosystem degradation include activities such as over-extraction of resources, the provision of alternative resources or livelihoods is a commonly accepted solution. High-quality projects work with affected users to offer a choice of desirable alternative activities which are risk assessed and economically viable. Enabling users to switch to activities which no longer damage the project area but still provide resources or livelihood benefits in turn enables the ecosystem to recover successfully. Critically, alternative

livelihood activities will need to compete with the opportunity cost of the unsustainable activities and be closely monitored to ensure there is no displacement of household income or access to basic resources.

High-quality projects are those which listen to the needs and ambitions of different community user groups when establishing the most appropriate interventions. They also keep clear records of solutions offered, rejected, or accepted, and co-design appropriate alternatives aligned with stakeholders' chosen livelihoods and traditional practices.

High-quality assessment criteria:

- Project implementation includes recognition of community ownership or management rights.
- Traditional owners and/or users are integrated into project governance.
- The project supports the registration of legally recognized community governance or resource management entities.
- If the project produces credits, who has the right to own and sell ecosystem services is clearly established and communicated with all stakeholders.
- At other times, access to the restoration/conservation site is open to local communities/stakeholders, but may remain closed to others.
- There is a sustainable management policy in place that permits non-damaging or low impact use of the site, preserving traditional practice where possible.
- Alternative livelihoods activities are chosen and co-designed with the affected user groups.
- Alternative livelihoods or other compensatory measures are risk assessed and economically viable.
- Records are kept of all alternative livelihoods consultations and there is a transparent reporting process.
- Project is able to articulate and justify choices of alternative livelihoods or other compensatory measures.
- The management plan was co-developed with community and user groups, and users receive the relevant information and capacity building to participate.
- Any restrictions to site access are necessary, time-bound and agreed upon with stakeholders.



Harvesting from the mangroves in Demak, Central Java, Building with Nature Indonesia initiative
 © Wetlands International, Nanang Sujana

2.2.2 Ensure locally relevant gender integration

Project developers should conduct a gender assessment or analysis during the project design/scoping phase to elucidate the specific social and cultural context and gender norms in local communities. This includes an in-depth understanding of their needs, vulnerabilities, knowledge, capacity and agency within society. This greater understanding of gendered power dynamics allows blue carbon projects to set gender goals and/or design gender action plans to **reach, benefit, empower or transform** targeted stakeholder groups and monitor risks to community cohesion or other potential impacts.

A highly participatory process coupled with a thorough gender assessment/analysis allows projects to design gender plans that are culturally respectful and realistic within local social constraints. For example, in some cultures women, or individuals from other marginalized groups, may hold leadership positions and actively

participate in public discourse. In contrast, the same behavior may be considered inappropriate in other places.

At a minimum, high-quality blue carbon projects take active steps (through gender assessment/analysis, plans, associated gender-sensitive indicators and risk management systems) to ensure blue carbon projects do not risk harm to participants or exacerbate pre-existing social conditions.

Building a locally appropriate gender-balanced project team is an excellent first step to making all community members feel more comfortable when participating in the project and sharing their knowledge and ideas. Alternative actions such as joining in with the daily activities and routines that are typically assigned to women in the community, for example assisting with cooking or collecting food, can create a safe and informal space for engagement. These gender-inclusive approaches can effectively support the project in reaching a wider group of stakeholders. However, they should be considered and adopted in direct consultation and collaboration with local leaders and representatives.

High-quality projects are a welcoming, inclusive and non-coercive environment for people to participate. By working carefully within local social and cultural norms, they ensure participant safety, bolster community engagement and create a sustainable project and environment.

High-quality assessment criteria:

- Have conducted a gender assessment/analysis to understand the complex social and cultural gender norms of the local community, prior to conducting any social engagement.
- Prioritize the safety of women, female-presenting and gender non-conforming people, are sensitive to local gender norms, and do not force participation.
- Develop gender goals and/or plans that include targeted gender-sensitive indicators appropriate to local context and are actively working toward them.
- Risk assessments are carried out prior to community engagement, the safety of project staff and community members is monitored, and plans are adapted as needed.
- Deliberate steps are taken to foster inclusive community consultation and broad participation with special consideration for marginalized groups, such as women and gender non-conforming people.
- Where possible, the project employs a gender-balanced team that includes both men and women in senior roles.
- Meeting attendance records include the number of participants of different genders.

Trond Larsen Trip to Liberia © Conservation International



2.3 Community equity

2.3.1 Empower local communities to define equitable benefit sharing

Benefit sharing is a system that distributes project benefits such as project income, ecosystem services, livelihoods and biodiversity among participating communities and stakeholders.

Not all blue carbon projects will generate income that can be dispersed among stakeholders or invested in community needs. However, they should still be able to articulate how project activities produce tangible benefits in other forms, which could include but are not limited to, coastal resilience, storm protection, increased revenues from tourism or fishing and the preservation of natural or cultural heritage.

Climate mitigation and biodiversity benefits may be of primary interest to external partners or funders, but intangible to local communities. Project managers need to be able to explicitly link stakeholder benefits to project activities, for example increases in fish catches due to implementing seasonal fishery closures over seagrass beds. High-quality projects recognize that paid labor or jobs created by implementing the project are not a substitute for community benefit sharing, but rather part of a package that includes outcomes that benefit the whole community.

The impact of the loss or recovery and changes in the management of blue carbon ecosystems may be disproportionately distributed across different user groups. Attention will need to be paid to ensure benefit-sharing schemes and alternative livelihoods effectively compensate those most affected. In all cases, they

must consider the varying responsibilities, roles and vulnerabilities of individuals and groups participating in the project.

Community and Indigenous participants should have a prominent role in defining whether project benefits and associated sharing mechanisms are fair, equitable and meet their needs. Additionally, the project has a responsibility to define social and economic baselines against which to measure the positive or negative effects of project delivery and demonstrate that the promised benefits are delivered.

Negotiations between external partners and IPs&LCs have a real risk of power imbalance, with external partners often having access to skilled team members and legal support which may not be accessible to local stakeholders. Access to technical assistance can be a challenge for community-led projects which may be vulnerable to “cowboy” developers who capture an outsized share of funding or carbon credit income, in return for overseeing project design and delivery. High-quality projects ensure that all parties have access to neutral advice, including legal advice where necessary.

Negotiations should be clearly documented with records available to all parties, and may in some instances be observed by third parties acting as safeguards to ensure the process is carried out in line with best practice. This includes ensuring decision making and benefits are not captured by only the high-ranking officials or elites in the community.

High-quality projects can present clear evidence which documents the consultation process, including how community representatives had an active and meaningful role in defining equitable benefit sharing on their own terms.

High-quality assessment criteria:

- Indigenous people and local communities have a clear understanding of project benefits and impacts and are able to define that the benefits they receive are fair and equitable.
- Any power imbalances in defining benefit sharing are mitigated via provision of access to third party oversight, and/or qualified neutral advice, including legal advice where necessary.
- Ensure the stakeholder decision-making process is equitable and participants have the right to withhold consent.
- Negotiations are clearly documented with records available to all parties in appropriate languages.

Community and Indigenous participants should have a prominent role in defining whether project benefits and associated sharing mechanisms are fair, equitable and meet their needs.

Building the capacity of aquaculture farmers with innovative sustainable practices through Coastal Field Schools © Boskalis





Mikoko Pamoja community monitoring © Anthony Ochieng Onyango/ACES

2.3.2 Empowering local communities with the means to participate and lead

Community-led blue carbon projects are increasing as more funders prioritize projects with strong local leadership. Partnerships between IPs&LCs and conservation or project development organizations can facilitate access to funding, expertise, and training, enabling communities to have more choice over how they manage or develop their natural resources.

Lessons learned from early blue carbon crediting projects highlight the importance of creating local capacity to

participate in carbon estimation processes, including collecting samples, storing them, sending them to lab, and understanding the results.

Good partners recognize that working with IPs&LCs to define project goals and inclusive decision-making processes represents an opportunity to increase local leadership capacity. This introduces IPs&LCs to the concepts of nature finance and market mechanisms and strengthens connections to potential partners such as local government, universities or other research institutions. Project participants may be interested in additional training in leadership, organizational

High-quality projects facilitate participation by providing appropriate compensation or supplementary services.

capacities, finance, ecological science, administration, legal aspects of cooperatives or local associations, or other relevant skills.

Participating in project design, implementation or training courses may represent time spent away from employment, subsistence activities or familial responsibilities. High-quality projects facilitate participation by providing appropriate compensation for the time cost, or may provide supplementary services such as child minding, transport, or meals.

Project goals can include multi-year programs for training with the goal of recruiting community members into diverse roles within the project team, including management roles. Care should be taken to ensure traditional community leadership roles remain relevant and integrated into project management structures and are not made redundant. International organizations partnered with IPs&LCs should also ensure local colleagues and community members are included in opportunities to speak or participate in regional or national meetings and international forums, and are provided with appropriate financial support.

Highest-quality projects offer interested individuals or group training in one or more areas. This might include financial literacy, sustainable resource management, ecological restoration and scientific protocols for measuring, monitoring and reporting. In doing so, these projects are training the next generation of trainers, ensuring knowledge is embedded and retained in communities, and building in-country capacity to develop projects at scale.

High-quality assessment criteria:

- Project goals include training and recruiting community members into diverse roles within the project team, including management roles.
- The project facilitates participation in training activities by providing appropriate compensation, transport, childcare, or other supporting measures.
- The project offers interested individuals or groups training in one or more areas such as financial literacy, sustainable resource management, ecological restoration and scientific measurements, monitoring and reporting, as chosen by stakeholders.
- Traditional community leadership roles remain relevant and integrated into project management structure.
- Local leaders and team members are included and financially supported to participate in regional or national meetings and international forums.
- Training is given by a qualified or recognised training provider and the project provides documentation or references to support trained individuals in accessing work.

2.4 Case Study: Vanga Blue Forest, Kenya

Vanga Blue Forest

Authors: Hamad Juma Tsunusi, Amber Baker & Mark Huxham



Location: Kenya, Kwale County, Lungalunga Sub-county, Vanga, Jimbo and Kiwegu villages, Vanga Bay. The project is in the transboundary conservation area between Southern Kenya and Northern Tanzania.

The Vanga Blue Forest (VBF) project generates climate, community and biodiversity benefits under the Plan Vivo carbon standard ([PV Climate](#)). The key aim of the project is to sustain the flow of mangrove goods and services by halting further deforestation and degradation. This loss is mainly caused by overexploitation of mangroves by the local communities to meet their household requirements for wood and energy. VBF also seeks to contribute to improving community livelihood.

Vanga Blue Forest © Anthony Ochieng Onyango/ACES

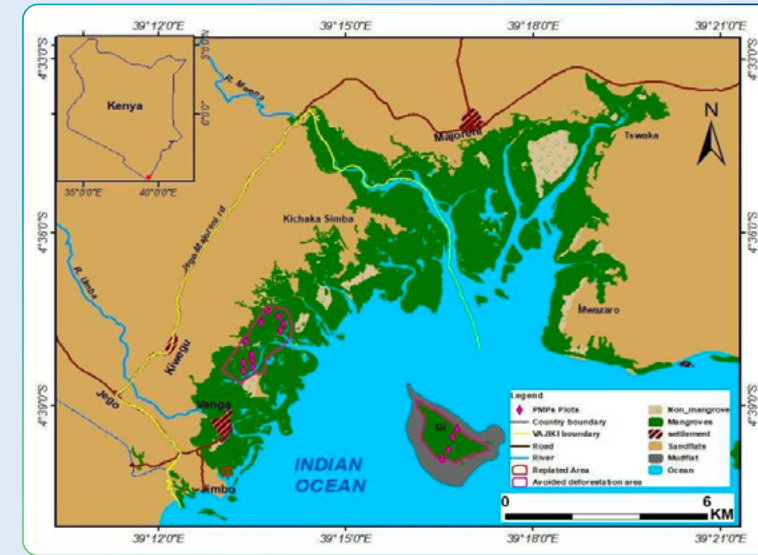


Figure 4: Map of Vanga mangrove ecosystem showing the project areas in red.

VBF is the sister project of Mikoko Pamoja. Both projects enable long term community development funded from the sale of carbon credits.

Specific objectives of the project are:

1. To restore degraded mangroves in the Vanga project area through education, awareness creation and community participation.
2. To prevent continued emissions from the deforestation and degradation of mangroves in Vanga in a way that can be measured, reported and verified.
3. To conserve a high-quality mangrove forest from encroachment and degradation, for conservation, carbon enhancement and scientific purposes.
4. To promote long-term socio-economic development of the local communities through income generation from mangrove forest resources, including sales of carbon credits.
5. To enhance community capacity on joint mangrove management.

Traditional land use practices and legal rights

Under Kenyan law, mangrove forests belong to the government, but local communities can assume tenureship rights to forest products, including carbon. To do this they need to work through a Community Forest Association (CFA). VBF and partners, including the Association for Coastal Ecosystem Services (ACES), established a local CFA and with the initiation of VBF as a legally recognized Community Based Organization (CBO) operating under this CFA. VBF and partners (inc. KMFRI and ACES) now plan to include seagrass conservation in our activities and are working with the local Beach Management Units to ensure local tenureship and management rights in the seagrass meadows.

Providing equitable access to global finance and markets

VBF was founded in 2019 following the requests of local people. Vanga lies 30 km from Mikoko Pamoja, the world's first community-led blue carbon project. Having visited Mikoko Pamoja, community leaders from Vanga saw the potential for their own area, and asked for help from ACES and the Kenya Marine and Fisheries Research Institute (KMFRI). They had a long history of voluntary mangrove conservation, including planting and protecting the natural forest.

The project partners KMFRI and ACES worked to secure money to help establish the project and were able to align VBF credit sales and management with the processes already established under Mikoko Pamoja.

The project belongs to the VBF community-based organisation, who collaborate with Scottish charity ACES as advisory partner. The project is community-led, with a project coordinator managing the day-to-day activities on the ground, supported by ACES. The project is governed by a committee of local people/stakeholders.

Key stakeholders are described below (Vanga Blue Forest PDD, 2021);

Key functions	Organization
Project coordination	Association for Coastal Ecosystem Services (ACES) Scottish Charity (nonprofit organization)
Project technical operations	Kenya Marine and Fisheries Research Institute (KMFRI)
Project implementation	Vanga Blue Forest (VBF) community organization through VAJIKI CFA User groups: Jimbo Environmental Group, Magugu mariculture group, Mwambiweje Women Group, Vumilia Nguvu Kazi Group

Project documentation (including the Project Design Document and the Annual report) can be found on the Vanga Blue Forest project page, available here: www.planvivo.org/vanga, www.aces-org.co.uk/our-projects/vanga-blue-forest/.

Accountability and grievance mechanisms

VBF has multiple ways of giving feedback. This includes the use of the suggestion box outside the VBF office, or expressing views, feedback or complaints through the VBF coordinator, the CFA and the VBF chairperson.

Any grievances are always addressed by the VBF Committee members in the first instance. If no resolution is reached, the village heads are involved according to established practice, this follows the procedures outlined in the VBF constitution through the village barazas. To the right is the summary of the VBF grievance mechanism.

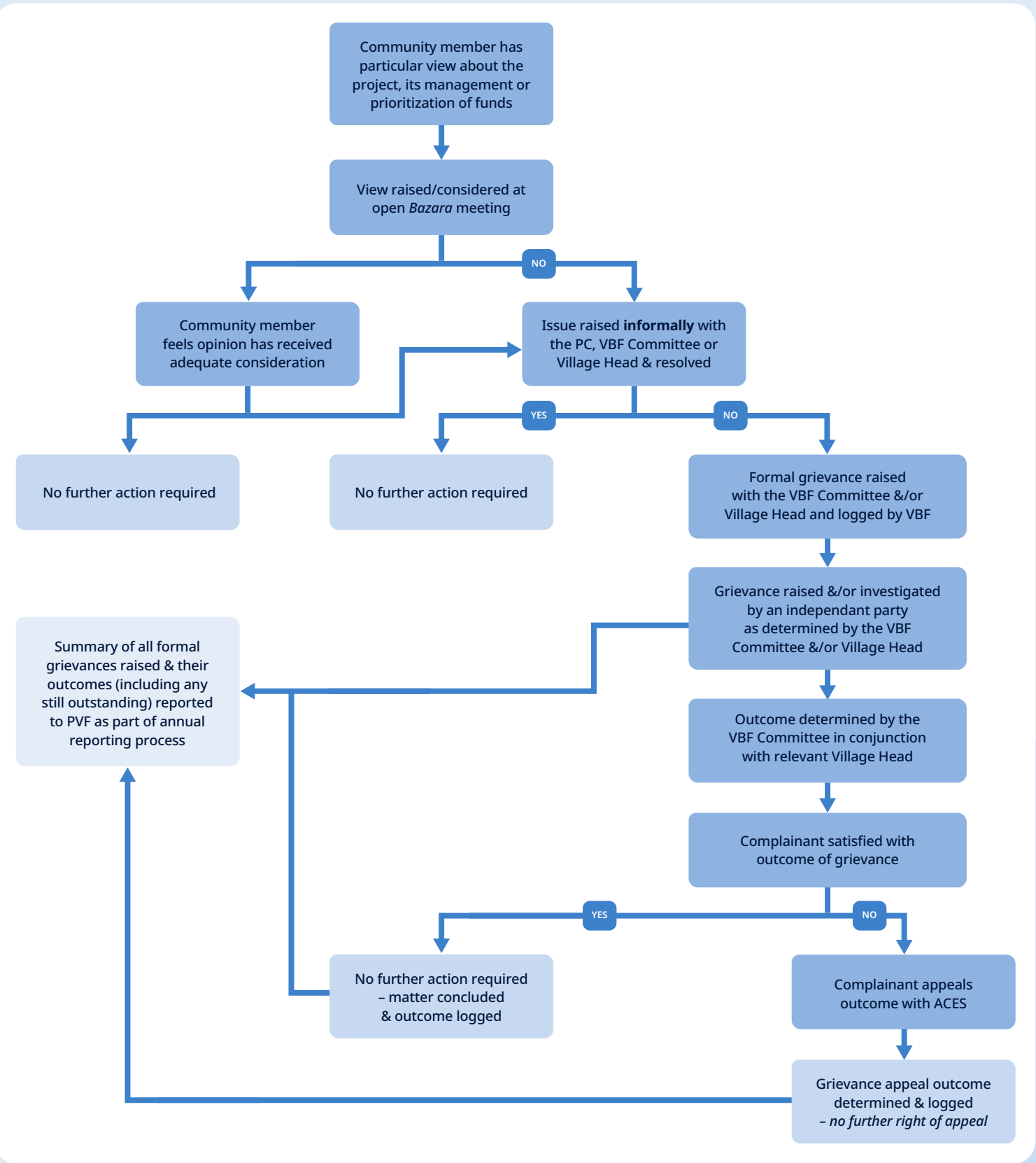


Figure 5: VBF Grievance process

Locally relevant gender integration

VBF prioritizes gender equality and representation throughout its activities, including by:

1. Giving women leadership positions. For instance, the Treasurer of the project committee is a woman and has the right to decide on what amount of funds, when and how it should be spent. The Assistant Secretary is also a woman.
2. In each of the sub-committee groups, specifically the conflict resolution, project governance and finance sub-committees, there must be women involved.
3. Gender equality features in all VBF plans and projects. Where a team of four VBF members are needed, then there must be two women and two men.



Seagrass monitoring in Vanga Bay © Anthony Ochieng Onyango/ACES

Women are represented within the VBF committee and are involved in decision-making. Compared to men, women would generally have low representation in decision-making processes in Vanga. This attribute is common across Kenya, with men tending to predominate in leadership positions. There are, however, positive changes in the project area where women are assuming leadership roles. A participatory approach has been used whereby the community (including women and youth) were involved in every step of the project design and planning. The project works to promote the role of women in leadership to meet the two-thirds gender rule enshrined in the national constitution (2010). There is constant consideration to gender equality in project activities (by ensuring equal participation and making sure everyone is involved). There has been a noticeable increase in participation from women and they are always encouraged to be involved and contribute to the project activities.



Seagrass monitoring in Vanga Bay © Anthony Ochieng Onyango/ACES

Community defined benefit sharing

VBF project, supports multiple communities by distributing income derived from carbon credits. On average, 36% of the monetary benefits go to local work teams and enforcement personnel to protect the project, while another 26% flows to community projects. The participating communities collectively decide on how to disperse carbon credit income through a multi-step process.

First, each community meets to discuss potential community development projects and community needs they wish to fund.

Second, a Project Committee meets to discuss the suggested community development projects. The communities then meet again to go over the Committee's responses and vote on which project they would like to fund.

Once the community makes a collective decision on where to distribute the funds, they identify which groups or individuals will receive payments to complete the project. However, individuals must deliver the promised result or they may receive some or none of the promised monetary amount. As such, the benefit-sharing system of the VBF allows communities to collectively identify their needs and employ the appropriate checks and balances to ensure that individuals deliver the project to benefit the entire community.

Resources: Empower people

FAO guidance for Free Prior and Informed Consent
Forest Carbon Partnership Facility Guidance Note on Benefit Sharing for ER Programs
Getting it right: a Guide to Improve Inclusion in Multi-stakeholder Forums
Plan Vivo Participatory Toolkit
Biodiversa Stakeholder Engagement Handbook
Human Rights Guide for Working with Indigenous Peoples and Local Communities
Indigenous Negotiations guide
Rawls in the Mangrove: Perceptions of Justice in Nature-based Solutions Projects
Governance Principles for Community-centered Conservation in the Post-2020 Global Biodiversity Framework
Alternative Livelihoods
Flora and Fauna Lessons learned on Benefit Sharing in REDD+
Conservation International webpage with links to multiple resources in several languages, plus case studies of gender in conservation planning
Tools of Engagement - A long and comprehensive toolkit for engaging people in conservation
Gender Analysis Toolkit for Coastal Management Practitioners
Pacific handbook for gender equity and social inclusion
USAID LandLinks Tools and Guides repository A suite of tools to guide practitioners in addressing land tenure issues
Field Guide to Adaptive Collaborative Management and Improving Women's Participation
IUCN Gender Analysis Guide

Ramsar Guidance on Mainstreaming Gender
The Nature Conservancy Guidance for Integrating Gender Equity in Conservation
W+ Standard: Incentivizing finance for women's empowerment
Gender integration and intersectionality in food systems research for development: A guidance note
UN-SWAP System-Wide Action Plan on Gender Equality and Women's Empowerment
Reach-Benefit-Empower-Transform (RBET) Framework for understanding whether and to which extent agricultural development projects contribute to women's empowerment
Guidelines for applying Free, Prior and Informed Consent
Development of Blue Carbon Projects: A Guide for Communities
The World Bank's Environmental and Social Safeguards
Participatory Appraisal for Potential Community-based Mangrove Management in East Africa
Naturebase Human Rights Screening Tool
Community Project Development Guide
Community Seagrass Guide



3.0 Employ the best information, interventions and carbon accounting practices



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This principle highlights the need for reliable information to inform blue carbon project design and management decisions. Projects have the greatest potential for success when decisions are backed by scientific data, including local ecological knowledge, and follow appropriate carbon accounting practices.

High-quality projects will combine local ecological and historical knowledge with site-specific satellite imaging, remote sensing datasets and peer-reviewed science. This allows them to assess the drivers of loss and restoration potential and design well-informed interventions and budgets.

Drivers of ecosystem loss and degradation are often rooted in societal or economic necessity.

■ Anne Wanjiru digging © Anthony Ochieng Onyango/ACES



Monkey
© Lammert Hilarides, Wetlands International

3.1 Use the most appropriate interventions and the best available scientific knowledge, including Indigenous, traditional and local knowledge

3.1.1 Appropriate interventions to maintain or improve the health of the ecosystem

Successful blue carbon projects rely on identifying and mitigating the causes of degradation, restoring ecosystem services that were lost and protecting the results of that work into the future. Science-based ecological protocols for physical interventions can effectively reduce loss and restore lost blue carbon ecosystems (section 1.2). However, drivers of ecosystem loss and degradation are often rooted in societal or economic necessity and thus high-quality projects incorporate both social and economic information into their design.

Satellite data is increasingly used to understand how project sites have changed over time. Trends in land use change include both gains and losses in blue carbon ecosystem extent and identifying how converted areas are used. This data can be applied to modelling “business as usual” (BAU) scenarios for projects aimed at halting or decreasing erosion, ecosystem loss, or producing carbon credits, in addition to identifying priority areas within the site where restoration or conservation may either provide the greatest benefit or be most urgently needed.

Selecting appropriate interventions involves investigating both the project site and any upstream influences that could impact project success.

Participatory mapping can be used to integrate local ecological and historical knowledge with satellite images.

Projects might require a suite of interventions that include ecological and social considerations, are in line with national policies and targets (section 4.3) and are supported by local governance.

Participatory mapping can be used to integrate local ecological and historical knowledge with satellite images and maps to further understand how and why the project site has changed over time, and to mark areas which are prioritized by community stakeholders for restoration, conservation, or other uses. Activities like this can be a step towards actively co-designing solutions and identifying where alternative livelihoods may be required to reduce human pressure on blue carbon ecosystems.

While satellite imagery and global remote sensing datasets provide a first tier of site data, technology such as drone surveys employing video, lidar, or hyperspectral imagery can create detailed site level datasets, including canopy cover, distribution of tree species, and above ground biomass. It should be noted however that not all projects will have access to the equipment or expertise to deploy drone mounted equipment for site mapping or monitoring, and this does not prevent a project from being regarded as high-quality.

Project managers need to consider the balance between using remote observations and more traditional surveying and monitoring approaches. These can both ground-truth remote observation data and ensure that, where appropriate, community members continue to have opportunities to meaningfully participate in project data collection.

High-quality assessment criteria:

- Local historical and ecological knowledge is integrated into site survey data and remote observations to understand what drives changes in ecosystem extent.
- Project interventions are designed to address social and physical drivers of change.
- Project plans are co-designed with project participants and team ecologists, supported by GIS expertise where applicable.
- Strike a balance between remote sensing and hands-on data collection and monitoring to ensure local partners can participate.
- Project uses the best available data, and takes care to ground-truth remote observation data.



Ambilobe
© WWF

3.1.2 Demonstrate additionality using clear evidence and reasoning

Additionality is defined as any change in the state of an ecosystem that occurs as a direct result of project implementation and is *in addition* to any changes that would have occurred without the project taking place. The challenge in measuring additionality lies in proving the counterfactual.

For many non-crediting projects with area-based targets, establishing cause and effect can be enough. The project implements an intervention and a number of hectares, which previously had no or minimal trends towards recovery, are restored. Calculating the exact mass of vegetation or square meters of healthy ecosystem per hectare compared to the project baseline is not necessary to prove additionality. High-quality projects may choose to strengthen their impact reporting by applying a published additionality methodology or by using reference sites with a similar starting condition as a comparative benchmark.

For projects reporting climate mitigation impacts or producing and selling carbon credits, proving additionality is much more technically challenging.

Here, projects need to not just show that a change in the healthy ecosystem area occurred, they must also measure the change in the annual rate of carbon sequestration or emission as a direct result of that change. Carbon crediting projects also need to prove that the project would not have been financially viable without carbon revenue.

Given the expense and time required to develop a blue carbon project, they will inherently have a need for multiple funding streams. Historically these projects were funded on a piecemeal basis with little to no long-term funding to support project monitoring, maintenance and community stewardship. The role of carbon finance for blue carbon projects is to fill this gap and be an *additional* long-term driver for project implementation.

High-quality assessment criteria:

- Project able to clearly demonstrate additionality to existing management strategies (environmental, social, economic, governance etc.).
- Carbon crediting projects apply a published additionality methodology.





© Conservation International

3.1.3 Ensure transparent and accurate greenhouse gas accounting and monitoring by using a scientifically sound methodology or protocol

Blue carbon crediting projects need to adhere to a reputable standard and methodology.

Best practice is to approximate carbon benefits using IPCC default values or locally relevant peer reviewed data to create initial project models, and then invest in further site-specific sampling to create more robust carbon accounting once feasibility and funding are confirmed.

Compliance markets will have clear criteria for accepted credit types and issuing entities. Some countries (for example the United Kingdom) have proposed the establishment of national approved lists of voluntary standards or methodologies, which have undergone review by a government-appointed scientific body.

Blue carbon crediting projects need to adhere to a reputable standard and methodology.

In the last few years, the number of new greenhouse gas (GHG) crediting programs and standards entering the voluntary carbon market (VCM) has grown significantly. The quality and rigor of these programs vary, and projects should be pragmatic in their selection, seeking expert third-party review of new standards and methodologies prior to proceeding.

For the international voluntary carbon market, organizations such as the [International Carbon Reduction and Offset Alliance \(ICROA\)](#) and the [Integrity Council for Voluntary Carbon Markets \(ICVCM\)](#) assess and endorse quality GHG crediting programs to provide valuable guidance for projects when selecting a standard.

Projects that include mitigation outcomes in donor reports that are not used as offsets by any party should also apply basic additionality criteria, only include outcomes directly attributable to project interventions and clearly qualify the quality and source of data used in their GHG reporting.

In all cases, carbon baseline data, BAU scenarios and calculated emissions reductions should be laid out in project documentation in a clear and replicable way and freely accessible online. For example, from a credit registry or project website. This can safeguard the project

against accusations of bad practice, enable easy investor or buyer due diligence, insulate against greenwashing accusations and provide a useful reference for future projects.

The informal sale of carbon benefits, whether marketed as credits, carbon packages, emissions units or by any other name, via private websites and without any accessible documentation, accreditation, third party verification or lifecycle tracking in a reputable registry, is never compatible with high-quality.

High-quality blue carbon projects should wherever possible deliberately select a GHG crediting program and/or methodology endorsed by [ICROA](#) or the [ICVCM](#), or a national government body responsible for carbon trading regulation, or reviewed by a competent independent authority.

High-quality assessment criteria:

- Uses in-situ data to produce models for all claimed carbon pools OR peer reviewed data with an appropriate buffer to accommodate environmental variation.
- Non-crediting projects reporting climate mitigation outcomes use an accounting methodology such as AM-AR0014 or VM0033.
- Carbon crediting projects select a GHG program & standard which has been reviewed and approved by either: A national government body responsible for carbon trading regulation and/or ICROA, or the ICVCM.
- Project technical documents including baseline data and emissions reductions calculations are easily discoverable and accessible online.

3.1.4 Establish accurate carbon baselines through evidence-based assessments

Blue carbon projects aiming to produce credits will need to provide accurate baselines and be able to model and track improvement over the baseline for the project's lifetime.

The intensity of data required is dependent on the function of the adopted methodology. Highly technical methodologies will yield the maximum volume of carbon credits, but have a correspondingly high burden of proof. Other methodologies are focused on enabling access to carbon financing and so have deliberately lower technical demands, but will issue a substantially lower volume of credits in order to compensate for the less granular data used. This approach is particularly well suited to smaller, community-oriented projects which prioritize sustainable income over profit. Both approaches can be of high-quality and projects should feel free to select which aligns best with their goals, capacity and budget.



Aerial view of mangrove forest in Gambia © Mariusz Prusaczyk

Accurately calculating GHG baselines in blue carbon ecosystems is widely assumed to be prohibitively complicated and, if including soil organic carbon stocks, can be expensive. It's not uncommon for technical carbon stock assessments or carbon crediting methodologies to refer to the necessary data points required, but without providing standard operating protocols for data collection. The Coastal Blue Carbon Handbook contains instructions for a lot of those procedures and is an invaluable resource. The physical collection of most data can be carried out using reasonably simple and portable equipment or in some cases, smartphone apps.

It should be noted that while the accurate measurement of any carbon pools included in crediting calculations is required, the inclusion of soil organic carbon is not mandatory. However, given that in blue carbon ecosystems 60-90% of the carbon value is in the soil, not including this may drastically underestimate the overall climate benefits. The Vida Manglar mangrove carbon crediting project in Colombia (section 6.4) was the first blue carbon conservation project to fully account for the soil organic carbon pool.

Above-ground carbon stocks in mangrove forests can also be readily estimated and monitored using satellite or drone imagery. Once above-ground biomass is known, allometric equations use species-specific ratios of aboveground biomass (AGB) to belowground biomass (BGB) to create estimates of below-ground carbon stocks.

It is not yet possible to accurately predict site level soil organic carbon stock via remote sensing. That is because no reliable relationships between biomass, ecological and environmental factors have yet been identified, and except for limited experimental sites, there is not yet sufficient data to create or train AI or machine learning models².

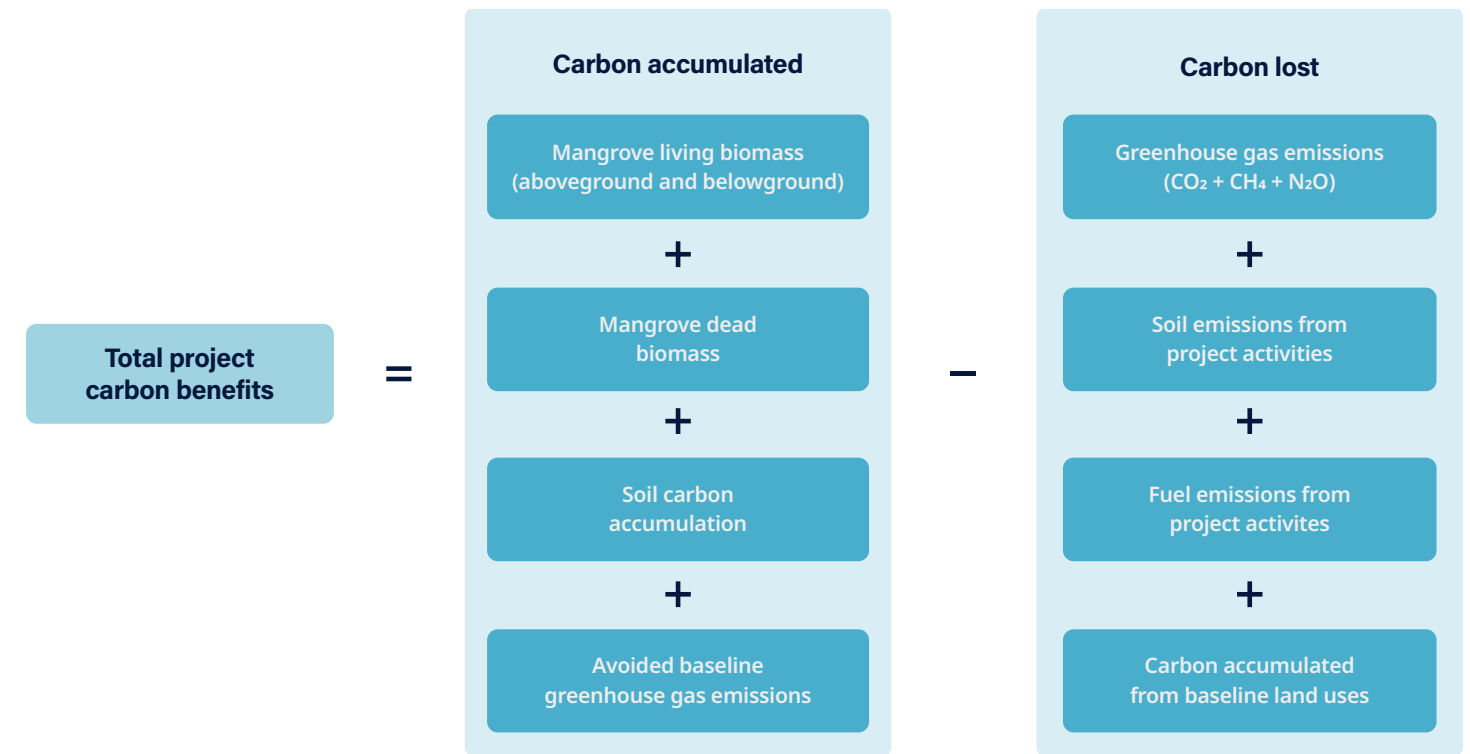


Figure 6: Project mitigation outcome calculations are specific to each carbon credit methodology, including the sum of parameters in carbon accumulated minus the parameters of carbon added to the atmosphere.

Source: Beeston, M., Cameron, C., Hagger, V., Howard, J., Lovelock, C., Sippo, J., Tonneijk, F., van Bijsterveldt, C. and van Eijk, P. (Editors) 2023. Best practice guidelines for mangrove restoration.

High-quality assessment criteria:

- High-quality projects can demonstrate capacity, whether internal or through partners, to be able to assess carbon baseline stocks and monitor the net project mitigation outcomes, including changes in carbon stocks and any significant fluxes in GHG emissions over time.
- Sufficient information is included in publicly available project documents so others can easily and comprehensively understand how the baseline was created, the accounting approaches followed, the emissions factors and activity data included and the justifications for any omissions.

² International Space Science Institute: Coastal Blue Carbon from Space. ISSI Forum | 14-17 May 2024, Bern Switzerland.

3.1.5 Weigh the tradeoffs between actual and anticipated credit types

Ex-ante credit sales, or forward sales, refer to credits that have not yet been issued but are expected to be produced based on estimates of carbon reductions or removal that will occur in the future. Ex-post credit sales refer to credits that have been verified and issued by a GHG crediting program. They represent emissions removals or reductions that have already taken place.

The time from the beginning of a blue carbon project to the first issuance of credits is usually several years, which can be a significant barrier for projects that lack up-front financing. Instead, some validated projects sell ex-ante credits to fund upfront project costs. However, ex-ante credits have a higher risk as they are not yet verified and represent predicted outcomes only. They should not be counted towards emissions reduction targets until the issuing body has verified them. For example, PV Climate issues tradeable “future credit” tokens which projects can sell in place of ex-ante credits and tracks them in the project registry. Purchasers are not able to retire credits labeled “future” until verification and issuance have taken place.

Ex-ante credit sales are typically made at a high discount or low retail price, reflecting the risk taken on by the buyer. As credit prices rise, the difference between the price per ex-ante credit and the average selling price for an ex-post credit several years later could be substantial.

High-quality projects that sell ex-ante credits take care to limit the volume offered, in order to minimize the risk of non-delivery and ensure project beneficiaries receive a fair return.

Projects where the full lifetime volume of credits are traded in advance of project implementation are considered high risk and incompatible with high-quality projects. In all cases, risks should be transparently shared with the buyer.

High-quality assessment criteria:

- Any ex-ante credit sales are limited to a portion of predicted credits to minimize risk of non-delivery and ensure project beneficiaries receive a fair return.
- Ex-ante credit sales are clearly labelled as such, tracked, and are not able to be retired prior to verification and issuance.

© Dom Wodehouse, Mangrove Action Project



Shawlet and Kuto conducting a Mapping exercise © Elizabeth Wamba/Wetlands International

3.2 Incorporating local ecological knowledge

High-quality projects uphold and champion the inherent rights of Indigenous People, their land and their culture. Local Ecological Knowledge (LEK) represents knowledge of native vegetation and ecosystem function passed down over generations. It provides critical information on how to best sustainably manage and conserve blue carbon ecosystems. Striking a balance between traditional use of blue carbon ecosystems and conservation or improved management outcomes can be challenging, but high-quality projects incorporate LEK as a fundamental source of data and use it to connect project goals with local traditional and cultural values. For example, local knowledge of ecosystem

health, biodiversity and productivity can be integrated with data from reference sites to define the criteria for successful restoration or conservation goals.

In communities with strong cultural or spiritual ties to blue carbon ecosystems, external partners will need to work closely with community members and knowledge holders to understand and preserve the social, historical and traditional importance of blue carbon ecosystems. Ownership should remain with the knowledge holders, who specify how/if/when the project can share or publish LEK and how the benefits derived will be dispersed.

High-quality assessment criteria:

- The project is respectful of, and incorporates LEK into project intervention plans.
- Recognize that LEK is the intellectual property of IPs&LCs and as such they have the right to decide if and how it is shared.
- Equitably distribute benefits derived from LEK.
- The project collaborates with knowledge holders to understand and preserve the social, historical and traditional importance of blue carbon ecosystems.



© Lorenzo Mittiga, Ocean Image Bank

3.3 Employ adaptive management protocols

Adaptive management is a flexible approach to project planning that prepares for potential changes and risks, adjusts strategies based on ongoing performance monitoring and uses pre-planned protocols to handle unexpected challenges. Adaptive management helps projects stay effective by being prepared and responsive to change.

High-quality projects that employ adaptive management can benefit from increased resilience and greater investor confidence. This is achieved by producing iterative design documents that demonstrate the project's consideration of various outcomes and its ability to respond and adapt.

Iterative design is a staged approach to project design that integrates adaptive management practices, with an agile review and decision-making process at the end of each stage. This method doesn't alter the project's goals during implementation, instead it focuses on learning from the implementation experience to choose the most promising path toward

achieving those goals. By integrating continuous improvement based on current information from a robust monitoring and evaluation framework, iterative design is especially useful for large or complex projects or those testing new intervention types.

Adaptive management protocols for risk mitigation involve identifying potential risks or stressors in advance and having clear plans and resources ready to monitor, respond to and mitigate any impacts promptly.

Without a clear plan, responding to unforeseen and harmful events can result in a poorer response, costing the project more time and resources and ultimately making the ecosystem less resilient to future stressors. Project sites may face acute or chronic stressors that vary in timescale and intensity. Acute stressors include sudden, intense impacts like extreme weather events, while chronic stressors involve prolonged effects such as warmer temperatures or changes in rainfall patterns. Identifying whether project performance will be significantly affected by chronic stressors can be challenging before project initiation, with effects only becoming apparent through repeated site monitoring. Adaptive management planning acknowledges the potential for chronic stressors and sets conditions for action before effects become severe.

3.3.1 Key Components of adaptive management in high-quality blue carbon projects

- **Clear Adaptive Management Strategies:** The project employs adaptive management strategies for the entire project area, integrating continual improvement through a robust monitoring and evaluation framework.
- **Social Adaptive Management:** The project has formal processes to solicit feedback and engage communities, accessible to all stakeholders, and addresses concerns through regular community engagement programs.
- **Response to Underperformance and External Stressors:** The project has clear strategies to respond to underperformance of physical implementation methods and impacts of external stressors based on risk assessments.
- **Documentation and Accessibility:** The project maintains written records stored in accessible online format and shares learnings and experiences in appropriate written or video formats.
- **Monitoring and Feedback:** Adaptive management is supported by a formal monitoring process which solicits feedback from communities and other stakeholders, identifies activity displacement and assesses the effectiveness of ecological elements of the project.

By employing these strategies, high-quality blue carbon projects can enhance their resilience and maintain investor confidence, ensuring they are well-prepared to adapt to changing conditions and unforeseen challenges.

High-quality assessment criteria:

- The project uses iterative design to adaptively manage underperformance of physical project implementation methods.
- The project employs clear adaptive management strategies to respond to impacts of external stressors, based on risk assessment and monitoring.
- The project has clear social adaptive management strategies supported by a formal monitoring process which solicits feedback from communities and other stakeholders.
- The strategy integrates continual improvement by having a robust monitoring, evaluation and learning framework.
- The project has written records / annual reports which are stored in an accessible online format and freely shares learnings and experiences.

3.4 Case study: Jiquilisco, El Salvador

Mangrove Restoration in the Bay of Jiquilisco, El Salvador: A Collaborative Conservation Success Story

Authors: Laura Michie & Dominic Wodehouse, [Mangrove Action Project](#)

Use the most appropriate interventions and the best available scientific knowledge, including Indigenous, traditional and local knowledge:

The Community-based Ecological Mangrove Restoration (CBEMR) initiative in the Bay of Jiquilisco, El Salvador, demonstrates the transformative impact of training in restoration best practices. It also showcases a remarkable collaboration between local communities, government agencies and NGOs on a national scale.

In July 2011, after previous failed attempts to restore mangroves in the Bay of Jiquilisco, a national forum on mangrove restoration was organized by Asociación Mangle (AM), Fondo de Inversión Ambiental de El

Salvador, EcoViva (FIAES) and Mangrove Action Project (MAP). This drew attention to the environmental challenges faced by the mangrove forests of the Bay of Jiquilisco and the surrounding areas.

Appropriate interventions to maintain or improve the health of the ecosystem:

Following the forum, a four-day CBEMR workshop was conducted which targeted local communities, Wetland Rangers, environmental organizations and government officials. The training introduced participants to the science-based “best practices” approach promoted by MAP, equipping them with skills and knowledge in

mangrove restoration.

The success of the 2011 workshop led to significant developments in mangrove restoration in El Salvador. El Salvador’s Ministry of Environment and Natural Resources (MARN) recognized the importance of a science-based ecological approach and engaged with AM to lead mangrove restoration efforts in the country. Consequently, AM, EcoViva and their local partners initiated the restoration of the mangrove ecosystem in El Llorón. This contributed to tangible conservation outcomes by prioritizing the restoration of ideal hydrological conditions to support mangrove regeneration, instead of exclusively depending on tree planting.

These efforts have propelled ecological restoration to the forefront of El Salvador’s national mangrove conservation strategy. Plus, FIAES, the largest environmental fund in El Salvador, identified CBEMR as the primary method for its mangrove restoration work.

To evaluate the progress of the mangrove restoration work, MAP conducted a follow-up visit to El Salvador in February 2023. The findings reveal that over 1,000 individuals in the country have received training in the scientific and ecological aspects of CBEMR and are actively applying these methods to restore mangroves. Over 70 km of channels have been excavated, and without the need to plant any trees, hundreds of hectares of mangrove forest have been restored. Authorities at MARN have now incorporated the principles of CBEMR into the national policy for best practices in mangrove restoration.

Incorporating local ecological knowledge:

Many elements inform MAP’s training. Our training approach is comprehensive and collaborative. Before each session, we conduct thorough groundwork,

collaborating with local NGOs to understand the local ecological knowledge of the mangrove ecosystem and incorporate local experience and previous restoration efforts. We encourage inclusivity by gathering diverse perspectives from various stakeholders, predominantly local communities, alongside representatives from the Forest/Environment Department and NGOs.

This allows us to address the underlying causes of mangrove loss and lack of natural regeneration by engaging with communities to understand local challenges. Rather than immediately focusing on planting trees, we prioritize collaborative research to develop site-specific solutions, encompassing both biophysical and social aspects.

Through explaining the biology and ecology of these systems, the communities learn the ‘why’, which builds on their own local ecological knowledge. Importantly, by building and leaving capacity within the community, rather than imposing external solutions, we ensure sustainability beyond the duration of our projects. This enables communities to not only restore their own sites but also maintain the health of existing mangroves and extend their restoration efforts to other areas. The sense of ownership cultivated through this process ensures that communities continue to protect and nurture their forests long after MAP’s direct involvement has ended, ensuring the longevity and effectiveness of conservation efforts.

Arguably the Jiquilisco Bay Project was successful because MAP’s workshop built on participants’ local knowledge and in this case crystallized the need for greatly improved hydrology. The CBEMR method empowered local communities to take the lead in the restoration efforts. It was the local people who identified practical solutions to their unique environmental challenges and implemented

Mangrove restoration © Leo Thom, Mangrove Action Project



them successfully.

Resources: Employ the best information, interventions and carbon accounting practices

Blue Carbon Manual
Verra Climate, Community & Biodiversity Standard – Can be applied to almost any blue carbon project
ICROA Endorsed Standards
Integrity Council for Voluntary Carbon Markets – Core Carbon Principles
Verra – Verified Carbon Standard – Tools and methodologies developed for the Verra Verified Carbon Standard, including methods for demonstrating additionality
Plan Vivo – PV Climate Standard V5.0 – Tools and methodologies developed for PV Climate, which accredits several blue carbon projects
Gold Standard: Nature Activities Hub, Blue Carbon and Freshwater Wetlands
Impact of seagrass loss and subsequent revegetation on carbon sequestration and stocks
A socio-ecological survey in Inhambane Bay mangrove ecosystems: Biodiversity, livelihoods, and conservation
Mangrove Restoration Under Shifted Baselines and Future Uncertainty
Protocols for the Measurement, Monitoring and Reporting of Structure, Biomass and Carbon Stocks in Mangrove Forests
The Wetlands Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 4
The Science and Policy of the Verified Carbon Standard Methodology for Tidal Wetland and Seagrass Restoration
Precision of Mangrove Sediment Blue Carbon Estimates and the Role of Coring and Data Analysis Methods
Including Local Ecological Knowledge (LEK) in Mangrove Conservation & Restoration. A Best-Practice Guide for Practitioners and Researchers

CIFOR field guide to Adaptive Collaborative Management
Indicators of Coastal Wetlands Restoration Success: A Systematic Review
WWF Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) Methodology
An Introduction to Adaptive Management for Threatened and Endangered Species
USAID library of adaptive management resources
Adaptive Management Framework: A results-Based Approach to managing Puget Sound recovery
Landscape GHG Accounting Guidance
CariCAS Partners Practical Field and Laboratory Guide
Mangrove Science Earth Engine Apps
Scientific Best Practice Guides for Land-based Carbon Projects: Blue Carbon

4.0 Operate locally and contextually



Community groups constructing permeable structures to trap sediment in Demak, Indonesia © Nanang Sujana

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There is no single “one size fits all” solution for designing and implementing activities in blue carbon ecosystems. For project activities to be replicated in new locations, they must be adapted or redesigned entirely to fit their unique local ecological and social context.

Fully understanding the social context, even for projects with local teams or a long history of working in the area, requires time spent on stakeholder mapping and identifying potential areas of support or conflict.

This principle recognizes that sustainable projects are strengthened by collaboration rather than competition with local partners and takes a structured approach to understand and engage with the people and organizations around them.

Sustainable projects are strengthened by collaboration rather than competition with local partners...

© Srikanth Manneperi, Ocean Image Bank



Protected mangroves from above, Colombia
© Mariana Rivera-Uribe, Mangrove Photography Awards 2021

4.1 Design projects according to the local social and ecological context

Recognition that drivers of ecosystem change are often rooted in societal or economic necessity has resulted in wider adoption of social solutions to ecological problems. While science-based ecological protocols can be effective at restoring ecosystem health (section 1), high-quality project designs incorporate socio-economic information to identify and mitigate drivers of change.

The local social context includes local customs and practices, gender dynamics, resource use, management, policy, the governance structure and power-structures.

When discussing community buy-in, engagement and benefits, we tend to think of coastal villages in less economically developed landscapes rather than busy harbors in heavily modified and industrialized locations.

Community stakeholders in urban locations may consist primarily of recreational users. Commercial and industrial users can have a dominant presence and blue carbon projects may find themselves in the position of needing to negotiate with parties with conflicting interests, and simultaneously with local governance to secure planning permissions.

Projects which generate revenue in these settings need to evaluate if benefit sharing is required in their particular socio-economic context. Specifically, whether project implementation has a tangible negative impact on any single user group, and if so, does that user group need compensation to address that impact.

High-quality projects in developed and urban locations will have identified the full diversity of stakeholder or user groups, provide a consistent and transparent flow of information, can easily receive feedback and will be monitoring changes in the social context via participation in local forums and targeted engagement.

In contrast, rural coastal communities may be reliant on blue carbon ecosystems for resources and interact with them as part of their daily lives. However, the tendency to regard small populations as somewhat homogenous and aligned in their needs can lead to highly misleading conclusions. Projects will need to carry out effective and safe socio-economic data collection, including conducting

baseline resource assessments (household income, access to water and fuel, access to education and healthcare) and design project interventions appropriate to the social and financial needs of community members and local stakeholders. The effects of any social or economic interventions require regular and structured monitoring and reporting, with clear adaptive management strategies in place to ensure no negative outcomes are realized (section 3.3).

Funders also need to ensure their desired outcomes align with the local social and ecological context. For example, external partners may exert pressure to meet targets such as planting 100,000 mangrove trees,

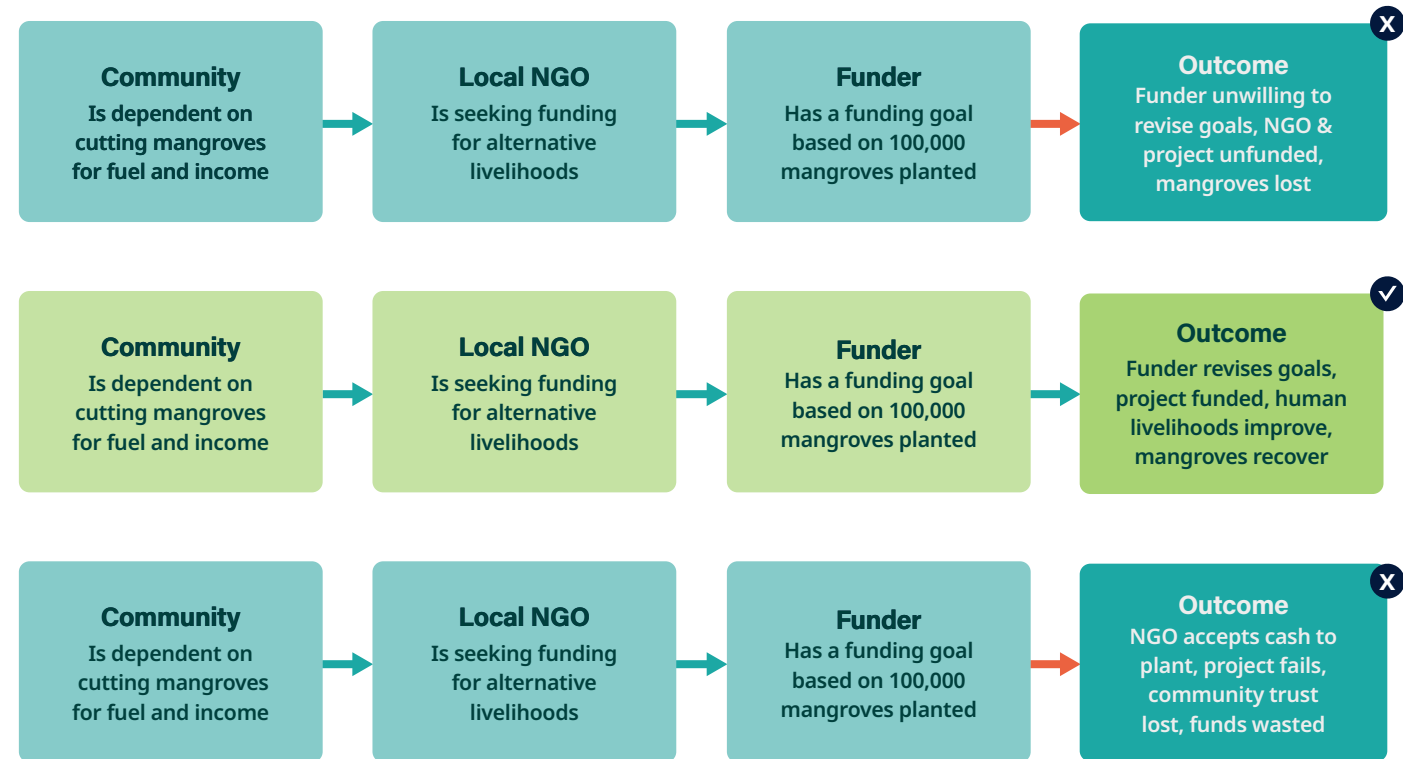


Figure 7: Observed positive and negative outcomes from mismatches between funder goals and project funding needs. Funding goals based on number of trees planted are rarely applicable to ecosystem restoration goals.

Source: Beeston, M., Cameron, C., Hagger, V., Howard, J., Lovelock, C., Sippo, J., Tonneijk, F., van Bijsterveldt, C. and van Eijk, P. (Editors) 2023. Best practice guidelines for mangrove restoration.



Mangroves in Mindanao, Philippines © Alexpunker

Imposing external goals onto projects can undermine effective implementation and project success.

causing projects to prioritize meeting the funder's specified target rather than designing in line with social and ecological conditions. Ignoring site-specific data may result in project failure, as some communities may continue to use the mangrove for livelihoods, or the ecological conditions are not right for planting.

Imposing external goals onto projects can undermine effective implementation and project success. The local socio-economic and ecological context must inform the overall design and governance of the project for long-term success.

High-quality assessment criteria:

- Project includes the budget and team capacity to assess local social and economic context and/or interpret existing research.
- Socio-economic data collection is carried out in line with best practice and including relevant social safeguards.
- Methods used to collect social and/or economic data are transparently shared.
- Socio-economic data is published (if appropriate) or included in project reporting.
- The project is designed considering local social and economic realities based on reliable data.
- Project is able to identify all stakeholders impacted by project implementation and justify where compensation is, or is not, appropriate.
- Project maintains clear and effective communication with stakeholder and user groups.
- Project monitoring plans include ensuring project implementation remains in line with cultural and social values and norms, and ensures no negative outcomes are realized.

4.2 Establish a diverse network of local partners to ensure project success and longevity

A project is only as good as its support from local communities and stakeholders.

High-quality blue carbon projects take the time to map and engage with all stakeholders and to understand where there is potential support or opposition to the project. Stakeholder mapping should include community leaders, influential individuals, resource users, vulnerable groups, local institutions such as universities, plus community organizations and NGOs active around the project area.

Take the time to map and engage with all stakeholders and to understand where there is potential support or opposition to the project



By the mangroves © Anthony Ochieng Onyango/ACES

A simple influence/interest matrix is sufficient to understand the social risks to the project and establish a baseline on which to base social engagement and communications strategies.

Many projects are implemented by multiple partners with different areas of expertise and experience. Projects should seek to incorporate existing local capacity where possible. For example, it's not uncommon for universities to work with projects with aligned data and research goals, while local NGOs with experience implementing nature-based projects in the area can be invaluable partners.

Blue carbon ecosystems are often managed by more than one government agency with overlapping jurisdictions, such as forestry, natural resource

management, climate change, fisheries or marine management agencies. In many cases, the project will have governance issues to resolve.

A similar mapping process can be followed with local institutions and national government bodies, identifying each management agency, their jurisdiction, how to secure the necessary permissions required to proceed with the project, and where project implementation may align with local goals and create opportunities for strategic partnerships.

High-quality projects will aim to integrate with the local social context and build strong local partnerships, including the support of local and regional government agencies.

High-quality assessment criteria:

- The project carried out rigorous stakeholder mapping.
- Project ensured all stakeholder and user groups were at a minimum contacted, made aware of project plans, and have opportunities to engage.
- Project forms local partnerships and incorporates local experiences and capacity where possible.
- The project has effectively engaged or partnered with local or jurisdictional government entities relevant to the management and/or restoration of blue carbon ecosystems.
- Projects funded by market mechanisms have effectively engaged with relevant government entities to ensure rights to transact ecosystem services such as carbon or biodiversity.
- The project shares learnings with relevant government entities and other organizations.

4.3 Advance policies to promote high-quality blue carbon project development

Blue carbon projects frequently face an absence of policies and national frameworks for implementing nature-based solutions, particularly around land tenure or management rights for blue carbon ecosystems. It may be the first time that a particular project type has been proposed in that country or jurisdiction. This necessitates project time spent mapping policies or legislation which can support or inhibit implementation and financing, identifying policy gaps which create uncertainty (and therefore risk), and building any necessary local or national government relationships to resolve barriers to implementation.

High-quality blue carbon projects can therefore act as a catalyst to drive the necessary political, social and economic support for subsequent projects. Pilot projects act as a proof of concept and can hold a particularly important role in driving the development of

High-quality projects take a leading role in science to policy dialogues.

policies which define national standards for best practice. For example, FPIC is not a mandatory legal requirement in many countries. Project developers may choose to advocate for the clear and comprehensive inclusion of

FPIC to prevent land grabbing, human rights abuses or other harmful practices that may stem from bad actors capitalizing on carbon credits.

An increasing number of countries are designing or implementing national plans to monitor, manage, or restore blue carbon ecosystems, however local capacity to effectively realize national targets may be lacking. High-quality projects can also serve a role here in promoting successful restoration or management interventions and inclusive development processes which can be replicated at scale.

In many countries, governments are only now beginning to develop carbon market policies, which creates an opportune moment for crediting projects to engage with and support the policymaking process. Collaborating with other blue carbon or nature-based projects, academic institutions, local non-governmental

organizations and civil society to collect data for policymakers and the public ensures they have access to reliable and scientifically robust information to inform decision-making. High-quality projects take a leading role in science to policy dialogues, ensuring that decision-makers understand the local context and scientific processes of coastal ecosystems.

Alternatively, poorly designed or exploitative projects can disincentivize policy decisions to support blue carbon trading, in some cases policymakers have paused all project development or placed a moratorium on blue carbon credit trading until protective legislation is in place.

Projects may find support on policy matters from local and international forums and working groups such as the [Global Mangrove Alliance](#) or [Blue Carbon Initiative](#).

High-quality assessment criteria:

- The project is engaged with local and/or national government representatives to ensure there are supporting policies and legal frameworks for project operation and replication.
- The project advocates for community and stakeholder rights in addition to project needs.
- Project has served as an effective pilot or example of best practice which informs policy decisions.
- Project participates in local policy forums, consultations or working groups and shares learnings with other blue carbon or NbS projects.
- Actively provides feedback and information to parties involved in local and/or national policy engagement concerning blue carbon ecosystems.
- Participates in international forums (eg GMA) or shares learnings with academics or working groups which produce policy articles related to blue carbon ecosystems.

Jitambue bee keeping group member at Mchinga, Tanzania
 © Elizabeth Wamba, Wetlands International East Africa



4.3.1 Account for the local implications of international policies

Conserving and restoring blue carbon ecosystems supports meeting the commitments of many Multilateral Environmental Agreements (MEAs), such as the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), the Ramsar Convention on Wetlands of International Importance (Ramsar) and the Sustainable Development Goals (SDGs).

While MEAs differ in their scope and complexity, signatory nations often define national targets which overlap and contain synergistic goals. Countries may also design national policies to achieve MEA goals that influence coastal zones and impact the operation of blue carbon projects, especially those aiming to produce carbon credits.

National MEA targets present an opportunity to advocate for updated policies affecting blue carbon ecosystems, including land tenure and user rights, governance and conservation or restoration goals, clarifying legal frameworks and potentially facilitating implementation of projects that proactively contribute towards national targets.

High-quality projects can clearly demonstrate how project goals and activities align with national and international policy targets and MEA commitments.

High-quality projects may generate support by voluntarily reporting on their contributions to national commitments. Reporting will depend on the project's scope, activities and local context. For example, mangrove restoration projects can utilize reporting frameworks such as the System of Environmental Economic Accounts (SEEA) to report to the Convention on Biological Diversity. Projects that decide to use these frameworks should first align project indicators with the framework to ensure ease of use. Blue carbon projects may also frame project goals in language which demonstrates alignment with blue carbon climate mitigation or adaptation targets in the country's Nationally Determined Contribution (NDC) submission to the Paris Agreement.

Developers of climate mitigation or carbon crediting projects should also understand local implications of national governments which opt to participate in Article 6 carbon trading. Article 6 may include ecosystem-based carbon credits, and whether developers may sell credits



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on the Voluntary Carbon Market (VCM). Countries will decide if they will allow VCM credits and whether those credits must apply a Corresponding Adjustment (CA) to account for which country will count the credit towards their emissions reductions. Investors need to understand the risk that future national level policies might have on credits availability and be willing to work with the project in a fair way should the situation change. The community and project should not be held liable if they under deliver due to changes in policy.

Note that mangrove carbon stocks may already be included in National Greenhouse Gas Inventories (NGHGs), depending if mangroves are included in national definitions of forests. If mangrove blue carbon is included in a national inventory it is critical for crediting projects to be aware of any restrictions on international trade or application of CAs. Additionally, regulations will usually differ for both seagrasses and tidal salt marshes.

High-quality crediting projects will be able to provide financiers with detailed information on whether the project secured approval to trade carbon internationally and whether they must apply CAs.



Mangrove forest, Caravelas, Brazil
© Conservation International

High-quality assessment criteria:

- Project articulates how it aligns with national commitments to international policy targets for example, climate mitigation or biodiversity plans outlined in NDCs, NBSAPs and related national policies or action plans.
- Project is able to quantify how it contributes to achieving multiple relevant targets.
- Project actively shares data with the relevant national implementing agencies or government entity.
- Carbon crediting projects can articulate how they plan to align with changing national policies (i.e. Article 6).

4.4 Case study: Seagrass restoration in Virginia

Under the Sea: Virginia's Blue Carbon Seagrass Project

Authors: Chelsea Bowers and Stefanie Simpson

Operating locally and contextually

The Volgenau Virginia Coast Reserve (VCCR) Seagrass Restoration Project is possible due to over 50-years of land protection, public and private partnerships and concerted eelgrass restoration research efforts in Virginia's coastal bays.

Historically, Virginia's seaside bays were covered in vast meadows of eelgrass beds. However, from 1930-1932 a slime mold disease swept across the eelgrass meadows, resulting in 99% loss. While the water quality remained pristine, the isolation of the location was not conducive to eelgrass meadow re-establishment. In the decades since, and particularly in the past 50 years, conservation efforts have protected the water quality, while long-term research and strong partnerships have provided the enabling conditions for the largest, most successful seagrass restoration effort in the world and now, the first registered seagrass blue carbon project.



Figure 8: Map of Virginia mangrove ecosystem showing the project areas in red.

Designing according to the local social and ecological context

Community and stakeholder engagement is an ongoing process that started well before the blue carbon project in 2011 with the creation of a special area management plan process to share information and gather feedback on project activities. Since then, engagement has included multiple approaches with the intention of keeping the local community informed and engaged.

The VCR community engagement program, managed by The Nature Conservancy (TNC), includes a combination of educational outreach and consultation efforts and materials. Consultation efforts include a quarterly meeting of the VCR Community Advisory Group, which is designed to represent the interests of local stakeholders. This is made up of representatives of local Eastern Shore community institutions (aquaculture, education, real estate, religious, agriculture etc.) who represent a diversity of age, race and geographic location groups. These meetings are used to communicate updates about the project including the results of project implementation and monitoring, relevant changes to risks, costs and benefits for the local community, and the validation/verification process, including the Validation/Verification Body (VVB) site visit.

Stakeholder feedback has been integral to the design of the project. For example, stakeholders in the aquaculture community expressed concern for eelgrass restoration that could compete with the available leasing of bottomlands. As a result of this process, the project includes buffer areas around shellfish or aquaculture lease areas where no new restoration will take place.

In the event that local stakeholders have grievances that arise during project implementation or during the project lifetime, stakeholders can access TNC's VCR staff in-person at the TNC office or via phone or email

contact. When a grievance is received, the Project Lead will acknowledge receipt of the grievance and assess the appropriate internal or external resources to amicably address the grievance directly.

Establishing a diverse network of local partners

Many enabling conditions provided the opportunity for this project, including:

- The Nature Conservancy's legacy of land conservation sustained and improved water quality conditions for eelgrass restoration success on the Eastern Shore of Virginia.
- Longstanding partnerships between The Nature Conservancy, the Virginia Institute of Marine Science, University of Virginia and the Commonwealth of Virginia have supported eelgrass restoration efforts, a proven restoration approach, long-term data on carbon sequestration and identified project scalability.
- Well-established community engagement on the Eastern Shore of Virginia.

The Virginia Coast Reserve seagrass project is the first registered seagrass blue carbon crediting project.



Eelgrass © Daniel White

The VCR Seagrass Restoration Project is a collaboration among:

- The Nature Conservancy (TNC), which oversees stakeholder engagement, volunteer coordination and carbon project management.
- Virginia Institute of Marine Science (VIMS), which pioneered the restoration methodology and provides project monitoring support.
- University of Virginia (UVA), which co-authored the VM0033 methodology, and conducts long-term research on carbon sequestration and stocks that is the foundation for the carbon accounting data and scaling opportunities.
- Virginia Department of Environmental Quality (VA DEQ), which manages state ownership and rules around carbon credits.

- Commonwealth of Virginia, which owns the seafloor bottom where restoration occurs.
- TerraCarbon, LLC, providing technical support for project development and approval.

A cooperative agreement between the Virginia Marine Resources Division, VA DEQ and TNC provides the governance structure for the project over the next 30 years, with potential for renewal. The project uses a grouped approach, as project activity occurs across 66,452 hectares of Virginia's Eastern Shore.

Regular meetings of the VCR Blue Carbon Advisory Group, an inter-agency team, which is composed of members from VA DEQ, VIMS, UVA and TNC provides a process for ongoing consultation and mechanism for communicating project results and potential negative impacts to these stakeholders.

Advancing policies to support blue carbon project development

Milestones for this project included updates to state legislation for carbon projects. The project was listed on Verra's registry with a project start date of October 2015 for a 20-year crediting period. It is currently in validation and verification for the first round of credits to be certified, anticipated late 2024 or early 2025.

Key milestones for this project include:

- **February 2019:** Completion of Feasibility Study
- **July 2020:** Passing of Virginia legislation that authorized VA DEQ to participate in the voluntary carbon market
- **September 2021:** Cooperative agreement signed to formalize partnership to support carbon project
- **March 2022:** Project listed on Verra's registry
- **May 2022:** Public comment period for project

- **July 2022:** Beginning of project validation and verification
- **Late 2024 or early 2025:** Anticipated approval and credit issuance.

Registering this seagrass restoration project on the voluntary carbon market provides a transparent process for measuring the climate mitigation value and access to carbon offset buyers. Once finalized, carbon revenues will support monitoring and research for the project, which can include additional scientific study to inform future restoration efforts. The project will pave the way for future seagrass restoration and blue carbon projects across the globe, aiming to increase the pace and scale of this critical work.

The project is supported by a diverse network of local and national partners.

Eelgrass © Jay Fleming



Resources: Operate locally and contextually

A guide to the Restoration Opportunities Assessment Methodology (ROAM)
Enhancing the integration of governance in forest landscape restoration opportunities assessments
The 4 Returns Framework for Landscape Restoration
Land tenure considerations are key to successful mangrove restoration
Better restoration policies are needed to conserve mangrove ecosystems
The SWAMP Toolbox – A suite of resources for coastal wetland project development for mitigation or other outcomes.
CASE STUDY: Community Based Ecological Mangrove Rehabilitation (CBEMR) in Indonesia
IUCN Legal Frameworks for Mangrove Governance
ODI 2014 Resource hub for policy engagement
Stakeholder Analysis in Environmental and Conservation Planning
OXFAM Influencing for Impact Guide
WWF Stakeholder Analysis Tool
Core Values, Ethics, Spectrum – The Three Pillars of Public Participation
Enablers and Challenges When Engaging Local Communities for Urban Biodiversity Conservation in Australian Cities
USAID LandLinks Tools and Guides repository
Blue Carbon Initiative Policy Working Group
Blue Carbon and Nationally Determined Contributions: Second Edition
Better Restoration Policies are Needed to Conserve Mangrove Ecosystems
UNDP Institutional and Context Analysis
Publication: Tools for Institutional, Political and Social Analysis of Policy Reform: A Sourcebook for Development Practitioners

The International Policy Framework for Blue Carbon Ecosystems
Power tools: for policy influence in natural resource management
Scaling up wetland conservation, wise use and restoration to achieve the Sustainable Development Goals
Incentives and disincentives of mangrove conservation on local livelihoods in the Rufiji Delta, Tanzania
Local perceptions of changes in mangrove ecosystem services and their implications for livelihoods and management in the Rufiji Delta, Tanzania
Ecosystem Restoration through Managing Socio-Ecological Production Landscapes and Seascapes (SEPLS)
Carbon Market Regulations Tracker
Guide to Valuing Coastal Wetlands

5.0 Mobilize high-integrity capital



© Matt Curnock, Ocean Image Bank

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Achieving the best outcomes for people, nature and climate requires applying ethical and high-integrity guidelines to financing projects.

This includes how funds are spent, how purchased credits are used and how agreements are negotiated and communicated transparently. Blue carbon credits are in high demand without the supply to match. This can lead to potentially high blue carbon credit prices which creates a lot of competition. While this could benefit communities and project developers it can also drive bad actors. Investors and buyers are uniquely positioned to raise the quality bar for the overall blue carbon marketplace and must be held accountable for the quality components within their control in the same way that project developers are.

So far, this Practitioners Guide has focused on what makes a high-quality blue carbon project. However, high-quality projects are the product of developers and their investors/credit purchasers. This chapter will explore the importance of six criteria in determining the quality of funding used in blue carbon crediting projects.

Multi-stakeholder collaboration in Demak, Central Java
© Yus Rusila Noor, Wetlands International



5.1 Funding integrity

5.1.1 Set science-based targets and follow a mitigation hierarchy

When selecting funding sources for blue carbon projects, it is vital to ensure that the funding source aligns with the project's values and goals. For instance, funding from a fossil fuel company without a credible decarbonization plan may be inappropriate. Such companies might finance blue carbon projects while expanding oil and gas extraction, which undermines environmental objectives and poses reputational risks.

A common argument against carbon credits is that they allow polluters to buy credits to reach a carbon neutrality claim, without doing anything to reduce their annual "business as usual" emissions. To limit climate change and reach the 1.5-degree target, carbon credits must complement emissions reductions by compensating for the remaining emissions a company cannot reduce on its own. High-quality investors and buyers should



Hoatzin
(*Opisthocomus hoazin*), Lake Chalalan © Conservation International

be able to show meaningful action towards reducing their emissions in line with science-based targets. Some international organizations, such as [The Science Based Targets Initiative](#) (SBTi), or the [Voluntary Carbon Markets Integrity Initiative](#) (VCMI) provide corporate guidance on setting targets and reducing emissions in accordance with high-quality principles. Setting science-based targets requires companies to 1) conduct a full audit of their annual emissions, 2) develop a greenhouse gas inventory, and 3) set near and long-term reduction targets for their entire operations.

Companies that are actively executing efforts to reduce emissions, and are interested in buying credits to offset the GHG emissions they cannot currently reduce, should then prioritize the retirement of credits. Ideally, credits should be sold to buyers who immediately account for and retire them. This is particularly important for buyers with emission reduction plans, net-zero commitments or climate-positive goals. Buyers who immediately retire credits demonstrate a genuine commitment to reducing their carbon footprint and contribute to the overall effectiveness of the project.

Conversely, credits sold to brokers or buyers without a clear emission reduction plan may not yield the desired environmental benefits. Brokers often hold credits for speculative purposes in the hopes of selling the credits for a greater profit later, and buyers without a plan may not actively work to reduce their emissions.

Investors and buyers are uniquely positioned to raise the quality bar for the overall blue carbon marketplace...



Mangroves © Conservation International

High-quality project developers who need to use brokers to provide access to the market or to certain customer bases should take care to select high-integrity brokers who apply similar buyer criteria. Leading ethical brokers should build processes to ensure transparent benefit sharing with project developers and communities in the event that any market fluctuations result in higher earnings on the resale of credits.

Crediting projects have complete control over setting investor/buyer criteria. That means that projects can justify walking away from buyers and investors who do not prioritize progress against their science-based targets, seek to hold on to or forward sell credits rather than retire them, who may have unresolved issues with communities negatively affected by their business activities, or who may have unmet social responsibilities within their supply chain. Instead, projects have freedom to prioritize sales to corporate buyers who demonstrate a principled approach to credit use.

High-quality assessment criteria:

- Credits are primarily being sold for immediate retirement.
- Buyers have a 1.5° C aligned science-based target which is monitored and publicly disclosed, following an established emissions reductions framework.
- As far as can be reasonably established, buyers meet social responsibility and human rights criteria set by the project.
- Brokers apply similar guardrails to customer selection.

5.1.2 Risk mitigation

To mitigate the risks associated with improper climate claims, high-quality blue carbon projects must ensure that funders do not make unsubstantiated or misleading claims about the project’s climate or social impacts. Projects should place constraints on how funders are permitted to report on project outcomes, ensuring that claims are accurate and do not exaggerate the project’s benefits. For example, stating “we funded a project which sequestered 10,000 tons of carbon and helps reduce our carbon footprint” may be misleading. However, “our funding supported a project which delivered 10,000 tons of carbon removals, helping the host country achieve their climate goals” is accurate. By setting clear guidelines for reporting, projects can prevent the misuse of climate claims and maintain transparency and credibility.

Double counting is a significant risk in blue carbon projects, where multiple funders or entities might claim the same climate benefits. To mitigate this risk, projects must ensure that climate mitigation benefits and carbon credits are tracked and verified through recognized greenhouse gas programs. Projects should also maintain transparent and publicly accessible records of credit issuance and ensure that all stakeholders can easily understand how carbon models and social baselines were created and monitored.

High-quality projects communicate openly with funders and other stakeholders to prevent the duplication of claims and ensure that climate and social benefits are accurately attributed. By doing so, projects can maintain the integrity of their climate claims and prevent the erosion of trust in the carbon market.

High-quality assessment criteria:

- The project places restrictions on claim language and provides funders or investors with guidance on how to represent project outcomes accurately.
- Systems are in place to prevent double counting.
- Where possible, the project prioritizes investors/buyers who publicly support best practices in climate and/or biodiversity mitigation and adaptation projects.



5.2 Financial transparency

Financial transparency enables project participants to understand whether benefit sharing is fair and equitable.

High-integrity capital relies on transparency for both the project and the buyer/investor. Financial transparency is essential for ensuring all stakeholders understand the project's financial situation. Projects should produce written annual budgets and financial reports that are easily accessible and understandable for all stakeholders. This transparency promotes trust and cooperation among project partners, allowing them to track the project's financial performance and make informed decisions. High-quality projects ensure that financial reports are well-detailed and openly displayed at meetings, and transparent financial reports are publicly accessible to all stakeholders.

In contrast, projects that do not produce written annual budgets and financial reports or that restrict access to these reports may lead to mistrust among stakeholders and hinder the project's ability to secure funding or attract buyers. Moreover, restricted access to financial

reports can create power imbalances, where some stakeholders have more information than others, potentially leading to unfair decision-making processes.

Sometimes, transparency is not legally allowed, as with non-disclosure agreements. Non-disclosure agreements (NDAs) imposed by funders need to be carefully worded to allow for the effective dissemination of printed information to community and local partners,



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with the awareness that this sharing is necessary and presents a route by which NDAs may be involuntarily broken. Projects should also push back against secrecy

surrounding project financing where they can, and request that funders justify why non-disclosure is necessary.



El Salvador Mangrove Action Project © Leo Thom, Mangrove Action Project

High-quality assessment criteria:

- The project produces written annual budgets and financial reports, which are provided to all stakeholders for their input and are accompanied by easy-to-understand summaries, video explainers, verbal updates or other forms of communication in the native language.
- NDAs are restricted to necessary confidential information only, to enable the easy sharing of financial information such as credit sale prices.
- The project produces technical, social, and financial reports for external readers, which are open access and easily discoverable.

5.3 Design agreements and contracts to promote fair and transparent pricing and compensation

5.3.1 Costs and revenue sharing

The revenue generated by blue carbon projects should cover core costs, including any agreed-upon financial benefits or compensation, with any profits shared equitably among all relevant stakeholders. This promotes cooperation and long-term commitment to the project.

While it's widely understood that project design requires ecological expertise, projects also need to be able to recruit social scientists or team members with local cultural knowledge to deliver high-quality projects aligned with the local social context and which deliver measurable socioeconomic benefits. Project funders need to consider that the true cost of implementing a project is not limited to the cost of physical restoration activities. It also includes the cost of time and human resources spent engaging and working with communities, monitoring social and economic impacts and, critically, the cost of delivering livelihoods and community benefits.

High-quality projects ensure that communities/ stakeholders receive long-term tangible and equitable benefits, with full participation in deciding the terms and support from legally recognized benefit-sharing agreements.

In projects where revenue is not shared equitably, local communities may not receive the benefits they deserve, leading to social and economic disparities. Moreover, if profits are not shared equitably, stakeholders may lose interest in the project or resentment and mistrust among community members may grow, compromising the project's long-term viability.

High-quality assessment criteria:

- The project generates enough revenue to cover core costs and meet financial obligations to communities or other stakeholders.
- There is the additional potential for profits to support project expansion, improved social outcomes, scientific research, long term sustainability or provide investor returns.

5.3.2 Credit price

The price of credits is a critical factor in determining the financial viability of blue carbon projects. The ideal scenario is when the project secures sufficient grant or other finance to cover costs up to credit issuance and can retail all credits ex-post at full market price. This scenario is unlikely, instead most projects secure early-stage finance by offering investors a reduced price on credit purchases. Usually, the discount is fixed for an agreed time or volume.

Some leading investors have identified the potential to develop mechanisms where the investment price of credits is set to reflect changing market conditions, such as floating prices or escalation clauses. This ensures that if the market price for carbon goes up dramatically, as predicted, project stakeholders can take full advantage of the market increase. For example, if a buyer locks in a competitive market price at \$10/tonne in year one, but then the market price increases to \$25/tonne in year five, and the buyer is still only paying \$10/tonne, the result could be the exploitation of local communities that may have been unaware of market trends.

Fixed prices or up-front payments for the total predicted emissions reductions can also lead to financial instability if market conditions change. For instance, fixed prices may not account for changes in project costs, inflation, or market conditions over time. While pre-sale agreements or ex-ante credit sales may be a useful way to secure early-stage income, the volume of credits offered at a discount should be carefully decided and ideally limited to a minority portion of the expected total issuance.

Projects which accept up-front payment for total lifetime emissions reductions risk failure if operating costs increase.

High-quality projects may negotiate that the price per tonne be discounted for an agreed-upon time or volume, reflecting the risk taken by early-stage buyers. However, they retain sufficient undiscounted credits to hedge against rising operational costs, and ensure that at the end of the discount period the project can renegotiate the price per tonne or seek an alternative buyer.

Ex-ante credit buyers must recognize the potential risks of investing in a nature-based solution project when designing deals. They should not, however, use the risk of non-delivery to justify designing poor value deals that exploit projects and vulnerable communities.

High-quality assessment criteria:

- Credit prices might be fixed or discounted for a limited time or volume, but project is not locked into a lifetime fixed sale price.
- Sufficient undiscounted credits are retained to balance the risk of rising operational costs.
- Investor price is set to account for, and reflect, changing market conditions (e.g. floating prices, escalation clauses etc.).
- The project has not agreed to one single up-front payment for the total predicted emissions reductions.



5.3.3 Benefit sharing agreements

Open, formal, written, long-term benefit-sharing agreements are essential for ensuring that all stakeholders have a say in defining equitable terms. This promotes fairness and cooperation among project partners, as all parties are involved in decision-making. Agreements may outline expectations around carbon pricing, repayment plans, who is responsible for delivering carbon benefits, who holds the risk if the project underperforms and any other stipulations that either party requires.

For a contract to be equitable, the project developer and investor must both agree upon contractual obligations and terms without power imbalance. This may require securing additional legal advice for the project, either starting at the beginning of the negotiation process or before signing the contract. For full transparency and to adhere to the tenets of FPIC, the investor must provide a drafted agreement in relevant languages that are appropriate for the local context and provide ample time for the project and community members to reflect on the contract's terms.

If the project beneficiaries deem the terms unacceptable, they reserve the right to refuse the proposal without retaliation.

Fair and transparent agreements require that project developers understand the challenges and needs of coastal communities and co-design contracts with community participation. This includes integrating community-benefit-sharing arrangements and confirming the percentage of project income allocated to the community, and how that is delivered and managed. Some carbon standards mandate a set percentage, such as PV Climate, which requires that 60% of project income goes to the community.

High-quality assessment criteria:

- Long term benefit sharing mechanisms are in place and all stakeholders and stakeholder groups are equally empowered in defining equitable terms and benefit sharing agreements with the support of neutral legal advice.



Persian Gulf, Iran © Saeed Hadipoorsalestani, TNC Photo Contest

Resources: Mobilize high-integrity capital

Voluntary Carbon Markets Initiative
The Ocean Finance Handbook
IUCN Blue Natural Capital Knowledge Centre
Taskforce for Scaling Voluntary Carbon Markets
International Emissions Trading Association (IETA)
Common Success Factors for Bankable Nature-based Solutions
Forest Carbon Partnership Facility: Guidance Note on Benefit Sharing
Taskforce on Nature-related Financial Disclosures
Benefit Sharing at Scale: Good Practices for Results-Based Land Use Programs
Capitalizing on the global financial interest in blue carbon
The Trust Code
Beyond Beneficiaries: Fairer Carbon Market Frameworks
Climate Policy Initiative
Blue Forest Finance Guide
4 Returns Framework: Courses on Business Approaches to Landscape Restoration
Earth Security: The Business Case for Mangroves in Indonesia

6.0 Design for sustainability



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This principle addresses the need for sustainable blue carbon project designs which are inclusive of how these initiatives will last into the future. This includes financing, threat abatement, community stewardship and climate change.

Any effort to conserve and restore nature comes with risks pertaining to sustainability beyond the project lifetime. Risks related to changes in political priorities, long-term financing of interventions, changes in societal needs and climate change all pose concerns. Mitigation measures should be put in place to address risk of reversal and ensure durability for the longest time scale possible. Some options include social and livelihood improvements to reduce pressures on the ecosystem resources, creating local ownership in blue carbon projects, creating an enabling policy environment and designing solutions that address biophysical and socio-economic root causes of loss and degradation.

 Gazi Mangroves © Anthony Ochieng Onyango/ACES

The intention of carbon finance is to provide the means to transition to alternative livelihoods, and this should be included from the start of the project.

Implementation of restoration does not automatically mean restoration is successful, and it is suggested that it takes at least five years to assess the success of a restoration project. Large scale trends in socio-political dynamics and human activities (such as increased migration of people to the coast) can also impact the success of a project. Additional biodiversity loss or species movement might deliver cumulative or accelerated negative impacts. While these forces are outside the immediate control of the project, they should be accounted for and addressed in adaptive management plans (section 3.3).

By considering these factors and implementing adaptive management plans, sustainable blue carbon projects can achieve long-term success and resilience in the face of evolving environmental and socio-political challenges.

6.1 Project durability

The long-term durability of a blue carbon project hinges on the sustainability of economic activities that avoid large-scale alterations or degradation to the natural environment and integrate community needs.

In the context of carbon crediting projects, durability, also known as permanence, refers to carbon stored for 100 years or more. The monitoring and management requirements of carbon crediting programs are designed to ensure project durability through the 20+ year crediting period and beyond, while the ICVCM requires project longevity of minimum 40 years. However there are likely to be risks associated with the ending of carbon crediting income and associated community benefits and incentives. The challenge for crediting projects is to establish alternative livelihoods which effectively remove the need for stakeholders to re-engage in activities which degrade the project site once credit income ceases, or to be able to transition to other income streams to maintain project incentives.

For projects which are limited to shorter 3-5 year funding periods, designing an effective and durable livelihoods transition can be an even greater challenge. Site monitoring and maintenance often also ceases at the end of the funding period, unless a follow-on grant can be secured, or the project is able to meet the additionality requirements to pivot to credit income. Five years is barely time to establish if restoration work is successful, so ideally projects should be maintaining and monitoring sites for ten years or more.

Many projects support livelihoods directly tied to restoration activities. While this provides short term economic benefits to local communities, it does not



 © IUCN/MFF

link community members' livelihoods and well-being to the long-term health of the ecosystem. Instead, it creates a dependency on the funding flow for the restoration activities.

The strongest projects are those which invest in diverse long term sustainable livelihoods that are linked to a healthy ecosystem such as agroforestry, sustainable non-destructive fishing, ecotourism, or development of non-extractive resource uses such as honey and soap production. Capacity building activities can also be designed to support the sustainable livelihoods beyond the expected funding period, including targeted train-the-trainer programs and local recruitment (section 2.3.2), insulating the project against the shock of funding or crediting income ending.



Measuring the growth of a newly planted mangrove
© Conservation International



Circumference measuring of mangrove trees
© Conservation International

High-quality projects will plan beyond the initial funding period and invest in dedicated staff or consultant time to not only manage the current project finances, but to actively explore additional long-term sustainable finance options. Active participation in national or

international networks such as the [Global Mangrove Alliance](#), [Mediterranean Posidonia Network](#) or [Seagrass-Watch](#) can increase exposure and access to funding opportunities.

High-quality assessment criteria:

- The project has clear long term monitoring and maintenance plans for 10+ years, can show how they are being implemented, and trains and employs long term staff, recruiting locally wherever possible.
- Project capacity building has ensured that local communities have the skills and knowledge to maintain project outcomes beyond the project end date, including transition planning to reduce financial shocks and prepare stakeholders.
- Project partners have access to a network of funder/investor options and/or participate in national or international forums (e.g. GMA and national restoration plans) which increase funding likelihood.
- Project has clear financial plans including spending on dedicated human resources to establish multiple income streams and secure continued access to grants or other revenue sufficient to maintain the site and stakeholder benefits once the initial grant period ends.

6.2 Risk assessments

High-quality blue carbon projects benefit from the early identification and monitoring of risks to durability that are linked to cohesive adaptive management and risk response plans.

Projects should select sites with minimal risks to durability and ongoing project success. Regardless, projects must implement ongoing risk assessment measures on social, political, environmental and financial variables that may pose future risks. Comprehensive measures should be in place to minimize the impacts of future events, especially climate change that may pose a significant risk of reversal.

Examples of risks to assess include climate, human, policy and financial risks.

Climate risks

Climate change risks include a broad range of environmental and ecological impacts that harm, stress or threaten the ecosystem. Some of the large-scale risks include increasingly frequent extreme weather events

such as hurricanes, flooding and storms that physically damage the project area. Similarly, sea level rise and coastal erosion may decrease the project area and threaten the durability of the carbon. Biological threats including invasive species and diseases can compound physical impacts, stress the ecosystem and make it less resilient to additional risks.

Projects should first take proactive steps to identify and evaluate potential climate change-related risks. Datasets for sea level rise, water temperatures and historic precipitation or extreme weather records are usually freely available online and are highly useful in assessing risks to durability. A proactive approach requires evaluating the likelihood and severity of each risk occurring and including corresponding strategies to respond to such events in project adaptive management plans (section 3.3.2).

Ambilobe © WWF



High-quality projects integrate social, political, environmental and financial risk assessments into project plans.

Human risks

Human risks largely stem from activities that can compromise the overall integrity and health of the ecosystem. Overharvesting and intense use of blue carbon ecosystems, whether for subsistence or commercial use, reduce the ecosystem's resilience. External actors may also deforest or convert blue carbon habitat for commercial purposes such as aquaculture, agriculture or coastal development overlapping project sites. Projects need to be sure that ownership or management rights to their sites are secured against external decision makers. Coastal tourism can also cause physical damage to sensitive habitats through over exposure to human use, infrastructure development, pollution or additional stressors.

Conflicts between investors and local communities can be a significant risk in blue carbon projects, particularly if the project's goals and values are not aligned with the community's. Projects should establish clear governance structures and decision-making processes, ensuring community members have a voice in project decisions and can hold project developers and investors accountable for their commitments.

Restoring and conserving blue carbon ecosystems involves inherent risk that efforts to remove the drivers of loss will fail, and loss or damage to the site will resume. To the greatest extent possible, projects should model threats to durability over time to establish a timeline of greatest risks and the corresponding uncertainty.

Policy risks

Policy risks can profoundly impact the viability and feasibility of projects. Policy changes at the local or national level can impact how a project operates, such as changes to land tenure or ownership regimes, planning permission for private development or public infrastructure projects that cause harm to the environment. In some instances, policy changes may place a permanent or temporary moratorium on carbon credit sales that make crediting projects financially unsustainable, and therefore unable to continue conserving and restoring the ecosystem.

At the onset of the project, developers should conduct a thorough policy analysis to identify any conflicting policies or potential developments that may negatively impact the project. This includes incorporating lessons learned from other projects that experienced policy shocks to inform their adaptive management planning accordingly.



© Soham Bhattacharyya, Ocean Image Bank

Financial risk assessments should include risks experienced by participating IPs & LCs, including the opportunity cost of project vs benefits received.

Financial risks

Demonstrating a robust financial risk assessment builds investor confidence that the project has a viable long-term financial strategy and will not fold due to short-term interruptions in funding. Monitoring changes in currency values can be critical for projects which receive international funding, while dramatic increases in inflation or interest rates can undermine implementation budgets.

Financial risk assessments should include risks experienced by participating IPs&LCs, including the opportunity cost of project vs benefits received, changes in household income, changes in market value of any goods or ecosystem services produced by alternative livelihood activities. For example, a local apiculture initiative could experience price decrease due to market volatility or oversupply. Developers should identify these

risks early and integrate contingency plans into their adaptive management strategies.

Fluctuations in market prices and demand also pose risks to crediting projects. Strategies for the project to mitigate and adapt include diversifying revenue, creating flexible budgets and setting aside a portion of finances in a reserve fund.

Creating contingency plans and worst-case scenarios that integrate budgeting requirements make projects more resilient, while ensuring durability.

High-quality blue carbon projects produce comprehensive assessments for climate change, human, financial and policy-related risks using an open and transparent process inclusive of stakeholders and community members. Results are transparently shared with all project participants and used to inform monitoring and adaptive management plans.



High-quality assessment criteria:

- The project conducted a comprehensive climate change risk assessment.
- Where possible, the project has full and comprehensive measures in place to mitigate and adapt to potential effects of climate change.
- Effects of climate change on the project site are monitored, for example, sea level rise, heat stress, changing rainfall and severe weather.
- The project conducts regular and comprehensive human risk assessments, including external actors, and results inform project design, monitoring, and adaptive management strategies.
- The project conducts regular and comprehensive policy risk assessments, including tenure, governance, and access to markets. Results inform project design, monitoring, and adaptive management strategies.
- The project conducts comprehensive financial risk assessments, incorporated outcomes into design of project finances and funding/income streams and updates assessments regularly.
- Crediting projects include assessment of the risk of reversal associated with loss of income at the end of the crediting period, carried out at least five years in advance.
- Includes financial risks to IPs&LCs from project implementation.

6.3 Establish measures to mitigate risk of reversal

In blue carbon projects, unmitigated risks can swiftly compromise a project's financial viability and climate impact, leaving investors and developers reeling. To mitigate this danger, projects must allocate risks to participating parties based on mutual agreement, carefully considering factors such as influence over risks, potential returns and the ability to absorb underperformance.

High-quality projects take a proactive approach, ensuring that stakeholders allocate foreseen risks fairly. This not only promotes cooperation and risk management but also prevents the concentration of risk among certain stakeholders, which can lead to project failure. Other threats, like climate change, pose a significant risk to the durability of these projects. Investors and developers must openly discuss this threat and develop agreements that consider potential risks, describe how they may evolve over time and clearly allocate the potential risks and rewards. Some investors opt for insurance or guarantees to protect themselves against project underperformance related to these kinds of risks.

For carbon crediting projects, carbon standards often require projects to set aside a percentage of credits into a buffer pool, where they cannot be sold, to count towards any future carbon reversals. The number of credits allocated to the buffer pool depends on whether the project implements sufficient mitigation plans to address the risk of reversal.

All projects, regardless of their objectives, should integrate mitigation strategies into their adaptive management planning to reduce risks. Strategies can include:

- **Risk Plan** – Any points where there could be issues that slow down the entire project are identified, and steps are outlined to overcome those risks. Doing this before risks manifest allows the project team to respond to issues as quickly and efficiently as possible.
- **Monitoring, Evaluation, Accountability and Learning (MEAL) Plan** – Decide on the indicators of success that need to be tracked, who will do that, the methods that will be used and the frequency that the indicators are assessed.
- **Responsible, Accountable, Consulted, Informed (RACI) Chart** – This chart provides clear guidance on roles and responsibilities amongst the team, describing who makes decisions and how to keep everyone informed.
- **Resource and Budget Plan** – This plan describes what expertise, materials, equipment etc. are needed at what point in the project lifetime, how resources will be managed and the budget for the resources. In some cases, funding may be coming from multiple sources so it can be useful to decide early what expenses are charged to which funding source and if there are any restrictions on how funds can be spent.



The point at which there is greatest risk of reversal is most likely to be the end of the project funding period. Whether that is after a 3 year grant or a 40 year crediting project, for previous site users not to resume economic activities which degrade the site and reverse project outcomes, they must be better off as a result of the project having happened, happy to continue with alternative activities which preserve the target ecosystem, and possess the skills to do so. The project site, whether seabed, intertidal or supratidal marsh, will need to have clearly established and legally recognized tenure and governance which grants the community freedom to continue sustainable management as they see fit.

High-quality projects which have adhered to principles of safeguarding nature, empowering people, using the best information, and designing an equitable, sustainable and durable project which fits the local context will have the best chance of creating satisfied participants who continue to maintain or expand on the project into the future.



Common Greenshanks in flight in the Rufiji Delta
© Menno de Boer, Wetlands International

High-quality assessment criteria:

- Risk management and mitigation is allocated to appropriate project partners and supported by a RACI chart and MEAL plan.
- Resource and budget plans are informed by risk assessments to ensure there are sufficient resources available to implement adaptive management responses if needed.
- Ensure that the project continues to provide tangible benefits to stakeholders and they choose to maintain it.
- Ensure stakeholders have successfully transitioned away from any damaging activities and are unlikely to resume them.
- Policy or governance changes achieved during project implementation provide longer term protection.

6.4 Case study: Vida Manglar

Vida Manglar Blue Carbon Project

Author: Maria-Claudia Diazgranados

Design for sustainability

Vida Manglar ("Mangrove Life" in Spanish) is the first Blue Carbon program in the world which takes into account the carbon stored not only in plants, but also monitors and fully accounts for carbon in the soil. Certified with the Verified Carbon Standard (VCS) and Climate, Community and Biodiversity (CCB) and approved by Verra.

Vida Manglar is the first Verra blue carbon crediting project to fully quantify and include soil organic carbon.



© Conservation International

The project began on May 15th 2015, and is expected to last for 30 years. A reduction of **939,296 tCO₂e** is expected through the implementation of activities related to four strategic lines framed in the Management Plan (PIM) of Cispatá:

- Strengthening governance
- Alternative productive projects
- Recovery and rehabilitation of mangrove areas
- Monitoring.

Developing and implementing a blue carbon crediting program requires much more than only measuring carbon stocks and sequestration rates over time. Vida Manglar has an extensive list of activities, within the strategic lines, which combine to make sure there are direct benefits for climate, community and biodiversity, with all of them directly related to the Management Plan of the protected area.

Project durability

Conservation efforts are only effective if people have sustainable and viable economic alternatives to reduce the pressure on the natural ecosystem. Three main themes were selected as key components of Vida Manglar: ecotourism activities led by local associations (birdwatching and crocodile release program), bee products such as honey and wax and improvement of agriculture and local orchards for personal consumption. For the period 2019-2022, three local associations have signed onto voluntary agreements to develop and implement their business models.

It is fundamental to reduce threats to the forest by offering economic alternatives to resource users and creating agreements with landowners to reduce their direct impact. Local governance is strengthened by

ensuring communities have adequate capacity to administer funds and successfully participate in decision making processes to ensure the long-term sustainability of the project.

Most of the project revenues (92%) are invested in Cispatá PA's conservation management plan to protect the mangroves, avoid their degradation and directly and indirectly support the livelihoods of the population who live in or near the project site.

Risk assessments

Risk analysis considered:

- Information on estimates of the costs necessary for the implementation of all activities to be included into the project.
- Information on credits or subsidies applied for, or intended to be applied for, in order to obtain financing for the activities (if applicable).
- Information on management plans for the prevention of forest fires, damage from extreme weather events, or geological or geomorphological phenomena.
- Information on existing regional or local land-use plans or management plans.
- Information from sea level rise studies or projections based on IPCC models.

Both fauna and flora in the area are subject to several monitoring programs. Three flagship species are constantly studied to ensure their population is stable or increasing: manatees, otters, and crocodiles. In terms of the forest composition, fixed plots are monitored on a frequent basis not only to understand the carbon stock and its fluxes, but also the health condition of the forest, the integrity of the ecosystem and the interaction between mangrove/non-mangrove tree species.



© Conservation International

Mitigate risks of reversal

One unique characteristic of this project is the existence of a rotating forest management scheme that allows local communities to use mangrove wood based on annual permits granted by the regional environmental authority.

In exchange for making specific commitments that limit the amount of wood they extract from the mangrove forest, plus active participation in monitoring activities, community members receive other benefits including wages for keeping channels open (avoiding high salinity in the mangroves) and opportunities for capacity building activities and other economic alternatives.

This is more effective at keeping the mangroves in a healthy condition than prohibition, which can result in illegal and damaging activities. The Cispatá Bay is the only area in Colombia with this sustainable-use model.

Community associations are also part of monitoring campaigns and capacity building programs led by the core stakeholders of the program: CVS, INVEMAR and Omacha Foundation. Carbon credit revenues help fund training and supplies for local communities' conservation and restoration activities.

The Gulf of Morrosquillo holds a huge biodiversity including birds, reptiles and mammals.

Thanks to community efforts, hunters became crocodile custodians, resulting in the rehabilitation and release of nearly 10,000 crocodiles in the Cispatá Bay over the last 18 years. Today, local communities use the species for ecotourism activities only. Blue carbon credits revenues support a wild crocodile monitoring plan to keep track of the health of the population.

Resources: Design for sustainability

Manual for Climate Change Vulnerability Assessment of Coastal and Marine Protected Areas
Region Manual for Mangrove Monitoring in the Pacific Islands Region SPREP Library/IRC
The Climate Change Resilience and Adaptation Planning Tool
Assessing the Effectiveness of Marine Nature-based Solutions with Climate Risk Assessments
Using Ecosystem Risk Assessment Science for Ecosystem Restoration
Multiple impact pathways of the 2015–2016 El Niño in coastal Kenya. <i>Ambio</i>.
Indicators of Coastal Wetlands Restoration Success: A Systematic Review
A Framework for Risk Analysis in Ecological Restoration Projects
NOAA Marine Protected Area Climate Vulnerability Assessment Guide
Global Intertidal Change
Keys to successful blue carbon projects: Lessons learned from global case studies
Non-Timber Forest Product Livelihood-Focused Interventions in Support of Mangrove Restoration: A Call to Action
The Livelihood Assessment Toolkit
Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS)
NASA IPCC AR6 Sea Level Projection Tool
Earth Security: Insurance Underwriting with Nature



Eelgrass © Matt Kane

Appendices



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Insights: Capacity building opportunities

Common challenges and opportunities for capacity building within projects

Challenge	Examples	Opportunities
Technical expertise	<ul style="list-style-type: none"> Limited mangrove specific expertise (team and years) Project design inconsistent with regional best practices Scale of project impact not well defined Planting approach: planting prioritized over assisted natural regeneration opportunities, low species diversity 	<ul style="list-style-type: none"> → Support training opportunities on science and social best practices for project proponents (e.g., Mangrove Action Project training) → Connect projects with country specific GMA chapters for additional proposal development support, technical training opportunities; opportunity to identify synergies between smaller projects with complementary interventions → Account for time and resource intensive community engagement activities in early stage project investments
Project logic	<ul style="list-style-type: none"> Planned interventions do not address key sources of degradation and ongoing threats to ecosystem general benefit claims not quantified or supported by detailed activities 	
Proposal quality	<ul style="list-style-type: none"> Inconsistent detail, quality and completeness throughout submission Promising submission/org highlights suggest that submission does not reflect high-quality of project 	
Sustainable livelihoods	<ul style="list-style-type: none"> Livelihood claims not quantified or supported by detailed interventions Livelihood interventions not connected to long term health of ecosystem 	
Community engagement	<ul style="list-style-type: none"> FPIC and grievance mechanism either missing or lacking detail community only engaged in implementation activities (e.g., planting) as opposed to a decision-making role 	

Insights into high-quality locally-led mangrove projects

In 2023 Salesforce issued a request for proposals with the goal of funding a selection of high-quality blue carbon projects. They took the innovative approach of exploring which parts of project descriptions aligned with the High-Quality Blue Carbon Principles as they reviewed shortlisted proposals.

The following insights were shared following an RFP by Salesforce in 2023. Read more here: [4 Steps to jumpstart your mangrove investment journey](#)



Gazi mangroves © Anthony Ochieng Onyango/ACES

Some of the highlights are shared below (anonymized).

Project specific insights and high-quality principles in action:

Project example 1

Project Benefits

Livelihoods/Resilience

- 1,800 long-term livelihood opportunities (i.e., regenerative tourism, ecotourism, honey production, handicrafts) for economically vulnerable communities.
- Establishment of an innovative agroforestry system that assigns integral plots to neighboring communities and establishes alliances for strengthening the value chain for sustainable products and services.

Biodiversity

- The area is home to 183 bird species, and is the largest area of mangrove forest in the region, composed of coastal lagoons, swamps and marshes, and a Biosphere Reserve.

Climate

- An estimated 550,000 tCO₂e will be removed & avoided in a 30 year period.

High-Quality Principles in action

Empower people

- The local community is developing Community management plans and Plots Integral Plans (PIP), with over 50% participants being women, which will result in long term income and improved food security.

Operate locally & contextually

- The project will improve governance of ecosystem by supporting stronger enforcement of existing federal protections while increasing community led protections.
- Strong network of local partners.

Safeguard nature

- Diverse selection of native mangroves will be planted at low density (625 tree/ ha) to optimize for natural regeneration.
- Species zonation accounts for sea level rise to improve ecosystem resilience.
- Hydrological restoration and conservation of 6K hectares.

Employ best information

- Project design and restoration approach utilize local scientific expertise and regional research.

Project example 2

Project Benefits

Livelihoods/Resilience

- 9,800 sustainable livelihood opportunities across two communities. Capacity building related to mangrove crab and seaweed harvesting, sustainable fishing (alternative gear and techniques), crafts, and community-based ecotourism).

Biodiversity

- Project takes place in the coral triangle, the world's epicenter for marine and coastal biodiversity.

- Seascape conservation approach protects mangroves, seagrasses and coral reefs.

Climate

- Preservation of the world's most diverse and carbon rich mangrove ecosystems, with an average of more than 250 tons of irrecoverable carbon per hectare and as much as 450 tons in some areas.

High-Quality Principles in action

Empower people

- Project empowers communities as they design, implement and manage Locally Managed Marine Areas (LMMAs).

Operate locally & contextually

- Sites selected because they are the most biodiverse, carbon dense, wave rich areas that also have a legal framework for community conservation. Project supports improved enforcement of existing national regulations to prevent ecosystem threats related to land conversion.

Safeguard nature

- Protection of 20+ mangrove species and adjacent ocean ecosystem safeguards biodiversity and seascape resilience.

- Project provides education on climate change to support community members and government as they design resource management regulations and actions to strengthen adaptation.

- Innovative conservation of 3,000 ha mangroves and 25,000 ha of coastal forest.

Employ best information

- Indigenous and local knowledge provides key insights into ecosystem processes, changes and threats, and culturally appropriate solutions.
- Conservation approach builds on success of 17 other Surf Protected Areas implemented in the region in the past 2.5 yrs. Established LMMA's share best practices with new sites.

Project example 3

Project Benefits

Livelihoods/Resilience

- Coastal protection of 6,200 people and food security for the 17% of the population who rely on the local mangrove ecosystem for food.

Biodiversity

- Innovative scientific approach addresses the threats facing coral reefs, mangroves, other

coastal and nearshore ecosystems, as well as the diversity of life found there.

Climate

- Safeguarding ecosystem services, including carbon sequestration, by reversing loss of 21-36% of the mangroves lost due to hurricane damage.

High-Quality Principles in action

Empower people

- Promote resilient communities that have a buffer from storm surge and waves and promote fisheries and tourism.

Operate locally & contextually

- Momentum-building for the recently launched Global Mangrove Alliance chapter, providing a common framework to improve efficient use of resources in restoration and a comprehensive approach to education, awareness, and the public-private partnerships to guard against coastal development.
- Extensive social science data set informs interventions that account for human relationships and dependencies on the ecosystem.

Safeguard nature

- Hydrological restoration and increased genetic diversity across project area will improve the ecosystem's climate resilience and ability to withstand future storm events.
- Acceleration of ecosystem recovery to enable mangroves to keep up with sea level rise again.

Employ best information

- Project utilizes 10 years of data from before and after hurricane damage for a robust baseline.
- Advanced monitoring technology such as drones, high resolution multi-spectral imaging, and image processing software used to track the survival, growth and productivity of individual plants at scale in a rapid and cost-effective way.

Project example 4

Project Benefits

Livelihoods/Resilience

- 140 sustainable jobs via ecopreneurship capacity building for income based on briquettes, mangrove honey, seaweed farming, and ecotourism.

Biodiversity

- Project area includes a river estuary, providing excellent protection of marine biodiversity. This

estuary provides breeding, nursery grounds to 1000s of fish including mud skippers and migratory species.

Climate

- An estimated 1,000 tCO2e removed & avoided each year.

High-Quality Principles in action

Empower people

- Indigenous coastal communities will serve as the guardians of this ecosystem and managers of the Locally Managed and Protected Mangrove Forest (LMPMF).
- Advocacy to increase awareness of mangroves' importance and continued engagement of youth and coastal communities in restoration efforts.

Operate locally & contextually

- Coastal Zone Management Plan designates salt mining areas to prevent future threats of this salt industry to the mangrove ecosystem.
- Existing law will form legal foundation for LMPMF.

Safeguard nature

- Assisted natural regeneration is prioritized in project design; some targeted planting will be paired with social interventions to kickstart and maintain ecosystem recovery.
- LMPMF will prevent ongoing threats to the mangrove ecosystems including direct harvesting of trees, fishing baits extractions and salt brine construction.

Employ best information

- Local knowledge of ecosystem dynamics and history informed the boundary of the LMPMF as well as species selection and zonation.
- Project follows guidelines on mangrove restoration in the region.

Project example 5

Project Benefits

Livelihoods/Resilience

- 70% of the local population relies on extractive activities for income. Project supports diversification of livelihoods through ecotourism, sustainable fisheries, & eco-friendly mangrove practices such as honey production

Biodiversity

- The mangroves are located at a biological hot-spot renowned for its unparalleled biodiversity.

Climate

- This project is part of our Ridge to Reef initiative that aims to mitigate the impacts of climate change at scale by increasing connectivity and building more resilient landscapes for people and nature.

High-Quality Principles in action

Empower people

- Local communities receive training in monitoring mangrove health, biodiversity, water quality, & carbon sequestration to ensure the long-term success of the project. The project also collaborates with the local school on an immersive youth education program.

Operate locally & contextually

- Project is aligned with National Wetland Policy and the Ramsar Convention on Wetlands, and will support the implementation of the 2023 National Strategy on Blue Carbon.

Safeguard nature

- These reforestation efforts are part of a larger Ridge to Reef initiative that is rebuilding connectivity from sea-level to mountain top, building resilience for humans and nature.

Employ best information

- Project design is science driven and the monitoring protocol used is based on the system of indicators proposed by the National Mangrove Monitoring Program, so data generated contributes to the national matrix of mangrove monitoring efforts.

Project example 6

Project Benefits

Livelihoods/Resilience

- Project aims to create ongoing economic benefits for 8,526 people in 6 coastal villages. Fishers will be trained in better harvesting techniques, post-catch handling, local storage & preservation.

Biodiversity

- Coral reefs, seagrass beds and fisheries are expected to benefit from project activities. The

project includes spawning and nursery grounds for many fish and crustaceans.

Climate

- Reversing mangrove loss, and restoring the carbon sink in a highly vulnerable ecosystem which has experienced the most rapid rates of mangrove deforestation nationwide.

High-Quality Principles in action

Empower people

- Project will establish and/or strengthen village forest management groups to govern and manage mangrove forests and fisheries sustainably and support them to secure management rights over their forests and fisheries.
- Community groups (including women's associations, community based savings groups, youth groups) will lead on mangrove reforestation, monitoring, patrols and surveillance.

Operate locally & contextually

- Project aligns with National Climate Change Policy & Adaptation Programme which aims to improve livelihoods of rural communities,

ensure sustainable management of marine and coastal resources, and improve information, education and communication on climate change.

Safeguard nature

- The project will support fishers to use data to limit overfishing and rebuild stocks, i.e. prohibiting destructive fishing gear or establishing temporary NTZs.

Employ best information

- Conducted research with partners to identify pilot and scale sustainable alternatives for community charcoal needs.

Project example 7

Project Benefits

Livelihoods/Resilience

- Restoration helps protect villages against sand displacement & coastal erosion; increased mangrove area benefits community livelihoods including those derived from fishing activities (shrimp and crabs), beekeeping and ecotourism.
- Mangroves in these areas contribute significantly to the local and national economy, providing over 50% of the national shrimp production and 36% of the national crab production every year and supporting the livelihoods of approximately 14,000 households.

Biodiversity

- Ecosystem restoration will bring benefits to area fisheries (shrimp and crabs) & shorebirds.

Climate

- Topographic and hydrological rehabilitation create favorable conditions for restoring mangrove ecosystems, improves tree density in restored sites, and contributes to climate mitigation.

High-Quality Principles in action

Empower people

- Local communities play a lead role in identifying restoration sites and setting restoration objectives, developing and implementing restoration process, and project data collection and analysis.
- Restoration sites are located within community-managed areas; the National Government awarded community-based organizations management rights over the mangroves.

- Project will support the enforcement of local laws and community agreements already in place to zone and manage cattle grazing areas.

Safeguard nature

- Climate-smart restoration approaches address enabling conditions related to topography, hydrology, and sediment supply.

Employ best information

Operate locally & contextually

- Project interventions are supported by the seascape 2021-2025 action plan which addresses key threats to mangrove ecosystem (climate change, sedimentation, illegal logging for charcoal and timber). Other ongoing projects support awareness-raising, patrolling, & enforced local by-laws to minimize extractive activities.

- Project interventions are informed by hydrological and topographic analysis of restoration area.
- Community informed project's detailed understanding of current and future land uses via participatory mapping process.

Practical approaches consistent with high quality:

Linking interventions to cause of degradation

- Community woodlot established to provide nearby fuel source and reduce pressure on mangroves.
- Restoration of hydrological flows previously interrupted by storms, roads or other developments.
- Advocacy and education prioritized to promote community ownership of project area and discourage extractive uses of mangrove ecosystem.

- Capacity building for the production of briquettes as a new source of income and alternative fuel source, reducing extractive threat to mangroves.
- Support for fishers as they transition to use of non-destructive fishing techniques and equipment and realize the benefit healthy mangroves have on fish stocks.

Understanding the *why* behind planting

- Hydrological interventions prioritized early in project to support assisted natural regeneration (ANR); planting only pursued in areas where ANR is not possible.
- Planting density is based on observed density of naturally occurring, adjacent ecosystems.

Innovative approaches to adaptive management and climate resilience

- Species selection and plant sourcing designed to enhance genetic diversity and overall resilience of ecosystem.
- Locally-adapted seedlings used to optimize survivability.
- Buffer zone of halophytic grasses used to bolster shore stability in highly flooded region.
- Restoration pilot plots studied to inform project area selection, optimal restoration technique(s) and maintenance activities.

Connecting livelihoods to long term health of ecosystem

- Reconversion of invasive or illegal crops inside project area to agroforestry. Integral agroforestry plots are assigned to adjacent, economically vulnerable communities.

Index of in-text hyperlinks used in this document

I Introduction to the High-Quality Blue Carbon Principles & Guidance

- High-Quality Blue Carbon Principles & Guidance - https://oceanriskalliance.org/wp-content/uploads/High-Quality-Blue-Carbon-PG_FINAL_11.9.2022.pdf
- Ocean Panel Blue Carbon Handbook - <https://oceanpanel.org/publication/blue-carbon/>
- Roadmap for High Integrity Marine Natural Capital Markets in the UK. - https://assets.ctfassets.net/nv65su7t80y5/3x88HLIKgEWRuEmk6tsil8/8464c382301e2636711e945ccb8ffb2c/High-Integrity_Marine_Natural_Capital_Markets_Roadmap.pdf
- The Best practice guidelines for mangrove restoration - <https://www.mangrovealliance.org/best-practice-guidelines-for-mangrove-restoration/>
- Global Mangrove Alliance (GMA) - <https://www.mangrovealliance.org/>
- Global Mangrove Watch platform - <https://www.globalmangrovetwatch.org/>
- The State of the World's Mangroves - <http://www.mangrovealliance.org/mangrove-forests/>
- High-Quality Blue Carbon Principles and Guidance as the foundation for its own set of Guiding Principles - <https://www.mangrovealliance.org/wp-content/uploads/2023/04/Mangrove-Breakthrough-Guiding-Principles.pdf>

I.I Introducing the Progress Wheel tool

- The “Progress Wheel” is an application of the Society for Ecological Restoration “Recovery Wheel” - <https://www.ser.org/page/Standards-Tools>
- Mangrove restoration tracking - <https://www.frontiersin.org/articles/10.3389/fmars.2020.600220/full>
- Social benefits monitoring - <https://www.ser.org/page/Standards-Tools>

1.1 Conserve our planet's remaining intact ecosystems

- IUCN Red List of Ecosystems - <https://www.iucn.org/resources/conservation-tool/iucn-red-list-ecosystems>
- IUCN Red List of Threatened Species - <https://www.iucnredlist.org/>

2.2.2 Ensure locally relevant gender integration

- gender action plans to reach, benefit, empower or transform - <https://gender.cgiar.org/tools-methods-manuals/reach-benefit-empower-transform-rbet-framework>

2.4 Case Study: Vanga Blue Forest, Kenya

- Plan Vivo carbon standard (PV Climate) - <https://www.planvivo.org/pv-climate-about>

3.1.3 Ensure transparent and accurate greenhouse gas accounting and monitoring by using a scientifically sound methodology or protocol

- International Carbon Reduction and Offset Alliance (ICROA) - <https://icroa.org/>
- Integrity Council for Voluntary Carbon Markets (ICVCM) - <https://icroa.org/>

4.3.1 Account for the local implications of international policies

- United Nations Framework Convention on Climate Change (UNFCCC) - <https://unfccc.int/>
- Convention on Biological Diversity (CBD) - <https://www.cbd.int/>
- Ramsar Convention on Wetlands of International Importance (Ramsar) - <https://www.ramsar.org/>
- Sustainable Development Goals (SDGs) - <https://sdgs.un.org/goals>
- System of Environmental Economic Accounts (SEEA) - <https://seea.un.org/>
- Nationally Determined Contribution (NDC) - <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs>

5.1.1 Set science-based targets and follow a mitigation hierarchy

- The Science Based Targets Initiative (SBTi) - <https://sciencebasedtargets.org/>
- Voluntary Carbon Markets Integrity Initiative (VCMI) - <https://vcmintegrity.org/>

6.1 Project durability

- Global Mangrove Alliance - <https://www.mangrovealliance.org/>
- Mediterranean Posidonia Network - <https://medposidonianetwork.com/>
- Seagrass-Watch - <https://www.seagrasswatch.org/>

Collated 'High-quality assessment criteria' by section

1.0 Safeguard nature

High-quality blue carbon projects will have carried out the following actions:

- Conduct outreach activities that link conservation to the provision of ecosystem services, which provide tangible benefits and reflect local ecological knowledge.
- Raise awareness of the importance of blue carbon ecosystems with diverse stakeholders such as local authorities, fishers and communities.
- Attempt to fully conserve the biodiversity and integrity of intact ecosystems based on rigorous baseline data.
- Identify species which are a conservation priority.
- Integrate specific, measurable, ambitious, realistic and time-bound biodiversity targets into project goals.
- Implement comprehensive biodiversity monitoring programs.
- Ensure data transparency and increase scientific knowledge by sharing data publicly.

High-quality assessment criteria:

- Project design is based on one or more protocols widely accepted as best practice and aligned with project context.
- Work with project participants and stakeholders to develop implementation plans and incorporate their feedback.
- Submit project design to a third party / expert review and/or public consultation
- Project design goals and methods are firmly informed by all of the following:
 - Reference sites
 - Historic site conditions
 - Local knowledge and inclusive design
 - Locally relevant peer reviewed scientific evidence.
- Consider hydrological, substrate, salinity and sediment requirements.
- Use appropriate species for restoration, as well as natural transition processes.
- Project plans aim to support recovery or maintenance of a biodiverse ecosystem.
- Use remote sensing to:
 - Observe and interpret local trends in ecosystem extent and land use change
 - Identify potential upstream influences affecting project site
 - Support selection of appropriate intervention protocols.

High-quality assessment criteria:

- Design activities that efficiently avoid loss of biodiversity.
- Minimizes habitat loss or conversion.
- Prohibits invasive or non-native species from being introduced.
- Avoids reduced water quality, increased erosion or harmful sedimentation levels.
- Does not increase net emissions.
- Any adjacent or downstream areas which may be affected by project implementation have been identified during planning. Project implementation is designed to mitigate negative impacts on neighboring and downstream ecosystems.
- Where possible, improved management of neighboring areas or ecosystems are integrated into project plans and budget.
- Project monitors neighboring areas for leakage / activity displacement.

2.0 Empower people

High-quality assessment criteria:

- The project conducted a full and inclusive consultation and FPIC process in accordance with UN FAO guidelines.
- FPIC processes are updated at any necessary intervals throughout the project lifetime.
- Project meets or exceeds any minimum legal requirements.
- All participants had access to all required information, including opposing or alternative viewpoints, in order to make an informed decision.
- All participants have the skills to be able to effectively negotiate, or access to neutral third party support if needed.
- A written record of the FPIC process was kept and all parties have copies in appropriate languages, freely available to stakeholders.
- Consent was given in writing to a mutually agreed project proposal.

High-quality assessment criteria:

- The project has a clear understanding and is sensitive to local social and cultural norms and prioritizes participant and staff safety.
- Project has identified different groups within the community, including minority groups, and takes appropriate action to facilitate their participation in community meetings and project activities.
- Ensure that local and traditional ecological knowledge from the Indigenous Peoples and local communities is at the center of projects through a collaborative approach.
- Project employs interdisciplinary teams including members skilled in relevant social engagement and safeguarding processes.
- Social engagement processes are clearly documented, including records of attendance at meetings and activities, and are regularly reviewed and adapted to ensure inclusive and safe participation.
- Social engagement processes are designed, monitored and reported on in accordance with published best practice, or certified by a social standard such as Verra CCB or PV Climate.

High-quality assessment criteria:

- The existence of a feedback and grievance mechanism, how it works, and how to use it are clearly communicated to all parties participating in or potentially impacted by project activities.
- The grievance mechanism includes multiple communication pathways which are safely accessible or equitable for all stakeholders.
- The mechanism has clear steps and processes in place, is actioned in a timely and impartial manner, and results in a tangible outcome.
- There is a clear third-party appeals process for any contested decisions, followed by the option to access legal action if necessary.
- Feedback and grievance mechanisms are reviewed and updated periodically to ensure they remain effective and aligned with international human rights standards
- Full records are kept.

High-quality assessment criteria:

- Project implementation includes recognition of community ownership or management rights.
- Traditional owners and/or users are integrated into project governance.
- The project supports the registration of legally recognized community governance or resource management entities.
- If the project produces credits, who has the right to own and sell ecosystem services is clearly established and communicated with all stakeholders.
- Any restrictions to site access are necessary, time-bound and agreed upon with stakeholders.
- At other times, access to the restoration/conservation site is open to local communities/ stakeholders, but may remain closed to others.
- There is a sustainable management policy in place that permits non-damaging or low-impact use of the site.
- Alternative livelihoods activities are chosen and co-designed with the affected user groups.
- Alternative livelihoods or other compensatory measures are risk assessed and economically viable.
- Records are kept of all alternative livelihoods consultations and there is a transparent reporting process.
- Project is able to articulate and justify choices of alternative livelihoods or other compensatory measures.

High-quality assessment criteria:

- Have conducted a gender assessment/analysis to understand the complex social and cultural gender norms of the local community, prior to conducting any social engagement.
- Prioritize the safety of women, female-presenting and gender non-conforming people, are sensitive to local gender norms, and do not force participation.
- Develop gender goals and/or plans that include targeted gender-sensitive indicators appropriate to local context.
- Risk assessments are carried out prior to community engagement, the safety of project staff and community members is monitored, and plans are adapted as needed.
- Deliberate steps are taken to foster inclusive community consultation and broad participation with special consideration for marginalized groups, such as women and gender non-conforming people.
- Where possible, the project employs a gender-balanced team that includes women in senior roles.
- Meeting attendance records include the number of participants of different genders.

High-quality assessment criteria:

- Indigenous people and local communities have a clear understanding of project benefits and impacts and are able to define that the benefits they receive are fair and equitable.
- Any power imbalances in defining benefit sharing are mitigated via provision of access to third party oversight, and/or qualified neutral advice, including legal advice where necessary.
- Ensure the stakeholder decision-making process is equitable and participants have the right to withhold consent.
- Negotiations are clearly documented with records available to all parties in appropriate languages.

High-quality assessment criteria:

- Project goals include training and recruiting community members into diverse roles within the project team, including management roles.
- The project facilitates participation in training activities by providing appropriate compensation, transport, or other supporting measures.
- The project offers interested individuals or groups training in one or more areas such as financial literacy, sustainable resource management, ecological restoration and scientific measurements, monitoring and reporting.
- Traditional community leadership roles remain relevant and integrated into project management structure.
- Local leaders and team members are included in opportunities to participate in regional or national meetings and international forums.

3.0 Employ the best information, interventions and carbon accounting practices

High-quality assessment criteria:

- Local historical and ecological knowledge is integrated into site survey data and/or remote observations to understand what drives changes in ecosystem extent.
- Project interventions are designed to address social and physical drivers of change.
- Project plans are co-designed with project participants.
- Strike a balance between remote sensing and hands-on data collection and monitoring to ensure local partners can participate.
- Project uses the best available data, and takes care to ground-truth remote observation data.

High-quality assessment criteria:

- Project able to clearly demonstrate additionality to existing management strategies (environmental, social, economic, governance etc.).
- Carbon crediting projects apply a published additionality methodology.

High-quality assessment criteria:

- Uses in-situ data to produce models for all claimed carbon pools OR peer reviewed data with an appropriate buffer to accommodate environmental variation.
- Non-crediting projects reporting climate mitigation outcomes use an accounting methodology such as AM-AR0014 or VM0033.
- Carbon crediting projects select a GHG program & standard which has been reviewed and approved by either: A national government body responsible for carbon trading regulation and/or ICROA, or the ICVCM.
- Project technical documents including baseline data and emissions reductions calculations are easily discoverable and accessible online.

High-quality assessment criteria:

- High-quality projects can demonstrate capacity, whether internal or through partners, to be able to assess carbon baseline stocks and monitor the net project mitigation outcomes, including changes in carbon stocks and any significant fluxes in GHG emissions over time.
- Sufficient information is included in publicly available project documents so others can easily and comprehensively understand how the baseline was created, the accounting approaches followed, the emissions factors and activity data included and the justifications for any omissions.

High-quality assessment criteria:

- Any ex-ante credit sales are limited to a portion of predicted credits to minimize risk of non-delivery and ensure project beneficiaries receive a fair return.
- Ex-ante credit sales are clearly labelled as such, tracked, and are not able to be retired prior to verification and issuance.

High-quality assessment criteria:

- The project is respectful of, and incorporates LEK into project intervention plans.
- Recognize that LEK is the intellectual property of IPs&LCs and as such they have the right to decide if and how it is shared.
- Equitably distribute benefits derived from LEK.
- The project collaborates with knowledge holders to understand and preserve the social, historical and traditional importance of blue carbon ecosystems.

High-quality assessment criteria:

- The project uses iterative design to adaptively manage underperformance of physical project implementation methods.
- The project employs clear adaptive management strategies to respond to impacts of external stressors, based on risk assessment and monitoring.
- The project has clear social adaptive management strategies supported by a formal monitoring process which solicits feedback from communities and other stakeholders.
- The strategy integrates continual improvement by having a robust monitoring, evaluation and learning framework.
- The project has written records / annual reports which are stored in an accessible online format and freely shares learnings and experiences.

4.0 Operate locally and contextually

High-quality assessment criteria:

- Project includes the budget and team capacity to assess local social and economic context and/or interpret existing research.
- Socio-economic data collection is carried out in line with best practice and including relevant social safeguards.
- Methods used to collect social and/or economic data are transparently shared.
- Socio-economic data is published (if appropriate) or included in project reporting.
- The project is designed considering local social realities based on reliable data.
- Project is able to identify all stakeholders impacted by project implementation and justify where compensation is, or is not, appropriate.
- Project maintains clear and effective communication with stakeholder and user groups.
- Project monitoring plans include ensuring project implementation remains in line with cultural and social values and norms, and ensures no negative outcomes are realized.

High-quality assessment criteria:

- The project carried out rigorous stakeholder mapping.
- Project ensured all stakeholder and user groups were at a minimum contacted, made aware of project plans, and have opportunities to engage.
- Project forms local partnerships and incorporates local experiences and capacity where possible.
- The project has effectively identified local & jurisdictional government entities relevant to the management and/or restoration of blue carbon ecosystems.
- Projects funded by market mechanisms have effectively identified relevant government entities to ensure rights to transact ecosystem services such as carbon or biodiversity.
- The project shares learnings with relevant government entities and other organizations.

High-quality assessment criteria:

- The project is engaged with local and/or national government representatives to ensure there are supporting policies and legal frameworks for project operation and replication.
- The project advocates for community and stakeholder rights in addition to project needs.
- Project has served as an effective pilot or example of best practice which informs policy decisions.
- Project participates in local policy forums, consultations or working groups and shares learnings with other blue carbon or NbS projects.
- Actively provides feedback and information to parties involved in local and/or national policy engagement concerning blue carbon ecosystems.
- Participates in international forums (eg GMA) or shares learnings with academics or working groups which produce policy articles related to blue carbon ecosystems.

High-quality assessment criteria:

- Project articulates how it aligns with national commitments to international policy targets for example, climate mitigation or biodiversity plans outlined in NDCs, NBSAPs and related national policies or action plans.
- Project is able to quantify how it contributes to achieving multiple relevant targets.
- Project actively shares data with the relevant national implementing agencies or government entity.
- Carbon crediting projects can articulate how they plan to align with changing national policies (i.e. Article 6).

5.0 Mobilize high-integrity capital

High-quality assessment criteria:

- Credits are primarily being sold for immediate retirement.
- Buyers have a 1.5° C aligned science-based target which is monitored and publicly disclosed, following an established emissions reductions framework.
- As far as can be reasonably established, buyers meet social responsibility and human rights criteria set by the project.
- Brokers apply similar guardrails to customer selection.

High-quality assessment criteria:

- The project places restrictions on claim language and provides funders or investors with guidance on how to represent project outcomes accurately.
- Systems are in place to prevent double counting.
- Where possible, the project prioritizes investors/buyers who publicly support best practices in climate and/or biodiversity mitigation and adaptation projects.

High-quality assessment criteria:

- The project produces written annual budgets and financial reports, which are provided to all stakeholders for their input and are accompanied by easy-to-understand summaries, video explainers, verbal updates or other forms of communication in the native language.
- NDAs are restricted to necessary confidential information only, to enable the easy sharing of financial information such as credit sale prices.
- The project produces technical, social, and financial reports for external readers, which are open access and easily discoverable.

High-quality assessment criteria:

- The project generates enough revenue to cover core costs and meet financial obligations to communities or other stakeholders.
- All relevant project partners are aware of and participate in the allocation of resources.

High-quality assessment criteria:

- Credit prices might be fixed or discounted for a limited time or volume, but project is not locked into a lifetime fixed sale price.
- Sufficient undiscounted credits are retained to balance the risk of rising operational costs.
- Investor price is set to account for, and reflect, changing market conditions (e.g. floating prices, escalation clauses etc.).
- The project has not agreed to one single up-front payment for the total predicted emissions reductions.

High-quality assessment criteria:

- Long term benefit-sharing mechanisms are in place and all stakeholders have full participation in defining equitable terms and benefit-sharing agreements with the support of neutral legal advice.

6.0 Design for sustainability

High-quality assessment criteria:

- The project has clear long term monitoring and maintenance plans for 10+ years, and trains and employs long term staff, recruiting locally wherever possible.
- Project capacity building has ensured that local communities have the skills and knowledge to maintain project outcomes beyond the project end date, including transition planning to reduce financial shocks and prepare stakeholders.
- Project partners have access to a network of funder/investor options and/or participate in national or international forums (e.g. GMA and national restoration plans) which increase funding likelihood.
- Project has clear financial plans including spending on dedicated human resources to establish multiple income streams and secure continued access to grants or other revenue sufficient to maintain the site and stakeholder benefits once the initial grant period ends.

Collated resource tables, by section

High-quality assessment criteria:

- The project conducted a comprehensive climate change risk assessment.
- Where possible, the project has full and comprehensive measures in place to mitigate and adapt to potential effects of climate change.
- Effects of climate change on the project site are monitored, for example, sea level rise, heat stress, changing rainfall and severe weather.
- The project conducts regular and comprehensive human risk assessments, including external actors, and results inform project design, monitoring, and adaptive management strategies.
- The project conducts regular and comprehensive policy risk assessments, including tenure, governance, and access to markets. Results inform project design, monitoring, and adaptive management strategies.
- The project conducts comprehensive financial risk assessments, incorporated outcomes into design of project finances and funding/income streams and updates assessments regularly.
- Crediting projects include assessment of the risk of reversal associated with loss of income at the end of the crediting period, carried out at least five years in advance.
- Includes financial risks to IPs&LCs from project implementation.

High-quality assessment criteria:

- Risk management and mitigation is allocated to appropriate project partners and supported by a RACI chart and MEAL plan.
- Resource and budget plans are informed by risk assessments to ensure there are sufficient resources available to implement adaptive management responses if needed.
- Ensure that the project continues to provide tangible benefits to stakeholders and they choose to maintain it.
- Ensure stakeholders have successfully transitioned away from any damaging activities and are unlikely to resume them.
- Policy or governance changes achieved during project implementation provide longer term protection.

Resources: Safeguard Nature

International Principles and Standards for the Practice of Ecological Restoration (second edition)	https://www.ser.org/page/SERStandards
Seagrass Restoration Handbook	https://www.decadeonrestoration.org/publications/seagrass-restoration-handbook
Saltmarsh Restoration Handbook	https://catchmentbasedapproach.org/wp-content/uploads/2021/10/Saltmarsh_Restoration_Handbook_FINAL_20210311.pdf
Best Practice Guidelines for Mangrove Restoration – includes resources applicable to all blue carbon ecosystems	https://www.mangrovealliance.org/best-practice-guidelines-for-mangrove-restoration/
Seagrass Watch field resources library	https://www.seagrasswatch.org/manuals/
Mangrove restoration tracker tool	https://www.mangrovealliance.org/news/new-the-mangrove-restoration-tracker-tool/
Blue Forests Yayasan Hutan Biru knowledge hub – includes Ecological Mangrove Rehabilitation – A field guide for practitioners	https://blue-forests.org/en/knowledge/resources-publications/
DEFRA Saltmarsh Management Manual	https://assets.publishing.service.gov.uk/media/602bf8d8e90e070556671435/Saltmarsh_management_manual_Technical_report.pdf
Kingdom of Cambodia Mangrove Biodiversity Survey Report	https://www.fauna-flora.org/wp-content/uploads/2024/04/Mangrove-Biodiversity-Survey-Report.pdf
The Global Biodiversity Standard: Manual for assessment and best practices	https://cdn.ymaws.com/www.ser.org/resource/resmgr/docs/25.07.2024_TGBS_-_The_Global.pdf
Rapid assessment protocol for terrestrial vertebrates	https://link.springer.com/article/10.1007/s10531-020-02001-w
Good practices for the collection of biodiversity baseline data	http://www.csbi.org.uk/our-work/good-practices-for-the-collection-of-biodiversity-baseline-data/
Effectiveness of community-based mangrove management for coastal protection: A case study from Central Java, Indonesia	https://www.sciencedirect.com/science/article/pii/S0964569123000236
Ecological engineering for successful management and restoration of mangrove forests	https://mangroveactionproject.org/wp-content/uploads/2023/09/Robin-Lewis_2005.pdf
Video series: How to effectively restore mangroves	https://www.wetlands.org/publication/video-series-how-to-effectively-restore-mangroves/
Global Mangrove Watch - Data visualisation program including adjacent saltmarsh and coral ecosystems	https://globalmangrovetwatch.org
Restoration, creation and management of salt marshes and tidal flats – A collation of evidence-based guidance	https://doi.org/10.52201/CGSCOL1/LCNC6109

Resources: Empower people

FAO guidance for Free Prior and Informed Consent	https://www.fao.org/indigenous-peoples/our-pillars/fpic/en/
Forest Carbon Partnership Facility Guidance Note on Benefit Sharing for ER Programs	https://www.forestcarbonpartnership.org/system/files/documents/fcpf_guidance_note_on_benefit_sharing_for_er_programs_2019_0.pdf
Getting it right: a Guide to Improve Inclusion in Multi-stakeholder Forums	https://www.cifor.org/knowledge/publication/7973/ (English / Spanish / French / Bahasa)
Plan Vivo Participatory Toolkit	https://www.planvivo.org/Listing/Category/participatory-toolkit?Take=20
Biodiversa Stakeholder Engagement Handbook	https://www.biodiversa.eu/wp-content/uploads/2022/12/stakeholder-engagement-handbook.pdf
Human Rights Guide for Working with Indigenous Peoples and Local Communities	https://www.tnchumanrightsguide.org/wp-content/uploads/TNC-Full-Guide-01-01.pdf
Indigenous Negotiations guide	https://www.conservation.org/projects/indigenous-negotiations-resource-guide
Rawls in the Mangrove: Perceptions of Justice in Nature-based Solutions Projects	https://doi.org/10.1002/pan3.10498
Governance Principles for Community-centered Conservation in the Post-2020 Global Biodiversity Framework	https://conbio.onlinelibrary.wiley.com/doi/epdf/10.1111/csp2.160
Alternative Livelihoods	https://www.livelihoodscentre.org/-/sustainable-livelihoods-guidance-sheets
Flora and Fauna Lessons learned on Benefit Sharing in REDD+	https://www.fauna-flora.org/wp-content/uploads/2023/05/FFI_2014_Equitable-benefit-sharing.pdf
Conservation International webpage with links to multiple resources in several languages, plus case studies of gender in conservation planning	https://www.conservation.org/priorities/gender-equality
Tools of Engagement – A long and comprehensive toolkit for engaging people in conservation	https://conservationstandards.org/wp-content/uploads/sites/3/2020/10/Audubon-toolkit.pdf
Gender Analysis Toolkit for Coastal Management Practitioners	http://www.mangrovesforthefuture.org/assets/Repository/Documents/Gender-Analysis-Toolkit-for-Coastal-Management-Practitioners.pdf
Pacific handbook for gender equity and social inclusion	https://coastfish.spc.int/en/component/content/article/494-gender-equity-and-social-inclusion-handbook
USAID LandLinks Tools and Guides repository A suite of tools to guide practitioners in addressing land tenure issues	https://www.land-links.org/tools-and-mission-resources/tools-and-guides/

Field Guide to Adaptive Collaborative Management and Improving Women's Participation	https://www.cifor.org/knowledge/publication/5085/
IUCN Gender Analysis Guide	https://portals.iucn.org/union/sites/union/files/doc/iucn-gender-analysis-guidance-web.pdf
Ramsar Guidance on Mainstreaming Gender	https://www.ramsar.org/sites/default/files/guidance_on_mainstreaming_gender_en.pdf
The Nature Conservancy Guidance for Integrating Gender Equity in Conservation	https://www.nature.org/content/dam/tnc/nature/en/documents/English-Version_TNCs-Guidance-for-Integrating-Gender-Equityin-Conservation_2022.pdf
W+ Standard: Incentivizing finance for women's empowerment	https://www.wplus.org
Gender integration and intersectionality in food systems research for development: A guidance note	https://digitalarchive.worldfishcenter.org/bitstream/handle/20.500.12348/5286/c4ca5c32ebb40be3f579997d18ab6f68.pdf?sequence=2&isAllowed=y
UN-SWAP System-Wide Action Plan on Gender Equality and Women's Empowerment	https://gendercoordinationandmainstreaming.unwomen.org/un-swap
Reach-Benefit-Empower-Transform (RBET) Framework for understanding whether and to which extent agricultural development projects contribute to women's empowerment	https://gender.cgiar.org/tools-methods-manuals/reach-benefit-empower-transform-rbet-framework
Guidelines for applying Free, Prior and Informed Consent	https://www.conservation.org/docs/default-source/publication-pdfs/ci_fpic-guidelines-english.pdf
Development of Blue Carbon Projects: A Guide for Communities	https://www.conservation.org/docs/default-source/publication-pdfs/ci_fpic-guidelines-english.pdf
The World Bank's Environmental and Social Safeguards	https://www.cambridge.org/core/services/aop-cambridge-core/content/view/DC427637D6911FCF416F03EC375582AF/S0922156519000293a.pdf/the-world-banks-environmental-and-social-safeguards-and-the-evolution-of-global-order.pdf
Participatory Appraisal for Potential Community-based Mangrove Management in East Africa	https://www.researchgate.net/publication/227227691_Participatory_appraisal_for_potential_community-based_mangrove_management_in_East_Africa#fullTextFileContent
Naturebase Human Rights Screening Tool	https://humanrights.naturebase.org/en
Community Project Development Guide	https://aces-org.co.uk/wp-content/uploads/2023/11/2023Holdfast_Community_Guide.pdf
Community Seagrass Guide	https://aces-org.co.uk/wp-content/uploads/2020/06/Community-Based-Seagrass-Conservation-Manual.pdf

Resources: Employ the best information, interventions and carbon accounting practices

Blue Carbon Manual	https://www.thebluecarboninitiative.org/manual
Verra Climate, Community & Biodiversity Standard Can be applied to almost any blue carbon project	https://verra.org/programs/ccbs/
ICROA Endorsed Standards	https://icroa.org/endorsed-organisations/
Integrity Council for Voluntary Carbon Markets – Core Carbon Principles	https://icvcm.org/core-carbon-principles/
Verra – Verified Carbon Standard Tools and methodologies developed for the Verra Verified Carbon Standard, including methods for demonstrating additionality	https://verra.org/methodologies-main/#vcs-program-methodologies
Plan Vivo – PV Climate Standard V5.0 Tools and methodologies developed for PV Climate, which accredits several blue carbon projects	https://www.planvivo.org/pv-climate-documentation
Gold Standard: Nature Activities Hub, Blue Carbon and Freshwater Wetlands	https://globalgoals.goldstandard.org/nature-activities-hub-expansion-in-blue-carbon-and-freshwater-wetlands/
Impact of seagrass loss and subsequent revegetation on carbon sequestration and stocks	https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2745.12370
A socio-ecological survey in Inhambane Bay mangrove ecosystems: Biodiversity, livelihoods, and conservation	https://www.sciencedirect.com/science/article/pii/S0964569123003381?ref=cra_js_challenge&fr=RR-1
Mangrove Restoration Under Shifted Baselines and Future Uncertainty	https://doi.org/10.3389/fmars.2021.799543
Protocols for the Measurement, Monitoring and Reporting of Structure, Biomass and Carbon Stocks in Mangrove Forests	https://www.cifor.org/publications/pdf_files/WPapers/WP86CIFOR.pdf
The Wetlands Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 4	https://www.ipcc-nggip.iges.or.jp/public/wetlands/pdf/Wetlands_separate_files/WS_Ch4_Coastal_Wetlands.pdf
The Science and Policy of the Verified Carbon Standard Methodology for Tidal Wetland and Seagrass Restoration	https://link.springer.com/article/10.1007/s12237-018-0429-0
Precision of Mangrove Sediment Blue Carbon Estimates and the Role of Coring and Data Analysis Methods	https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.9655
Including Local Ecological Knowledge (LEK) in Mangrove Conservation & Restoration. A Best-Practice Guide for Practitioners and Researchers	https://www.mangrovealliance.org/wp-content/uploads/2024/02/LEK-Guide-Master-Book_Final.pdf

CIFOR field guide to Adaptive Collaborative Management	https://www.cifor.org/knowledge/publication/5085/
Indicators of Coastal Wetlands Restoration Success: A Systematic Review	https://www.frontiersin.org/articles/10.3389/fmars.2020.600220/full
WWF Rapid Assessment and Prioritization of Protected Area Management (RAPPAM) Methodology	https://wwfeu.awsassets.panda.org/downloads/rappam.pdf
An Introduction to Adaptive Management for Threatened and Endangered Species	https://meridian.allenpress.com/jfwm/article/2/2/220/203428/An-Introduction-to-Adaptive-Management-for
USAID library of adaptive management resources	https://biodiversitylinks.org/what-we-do/adaptive-management
Adaptive Management Framework: A results-Based Approach to managing Puget Sound recovery	https://www.psp.wa.gov/science-adaptive-management-framework.php
Landscape GHG Accounting Guidance	https://landscapefinancelab.org/publications/landscape-ghg-accounting-guidance-developing-landscape-scale-carbon-projects
CariCAS Partners Practical Field and Laboratory Guide	https://seagrass.fiu.edu/caricas.htm
Mangrove Science Earth Engine Apps	https://mangrovescience.earthengine.app/
Scientific Best Practice Guides for Land-based Carbon Projects: Blue Carbon	https://nature4climate.org/wp-content/uploads/2024/09/TNC_Blue-carbon-040924.pdf

Resources: Operate locally and contextually

A guide to the Restoration Opportunities Assessment Methodology (ROAM)	https://portals.iucn.org/library/node/44852
Enhancing the integration of governance in forest landscape restoration opportunities assessments	https://portals.iucn.org/library/node/50050
The 4 Returns Framework for Landscape Restoration	https://www.commonland.com/wp-content/uploads/2021/06/4-Returns-for-Landscape-Restoration-June-2021-UN-Decade-on-Ecosystem-Restoration.pdf
Land tenure considerations are key to successful mangrove restoration	https://doi.org/10.1038/s41559-019-0942-y
Better restoration policies are needed to conserve mangrove ecosystems	https://doi.org/10.1038/s41559-019-0861-y
The SWAMP Toolbox A suite of resources for coastal wetland project development for mitigation or other outcomes.	https://www2.cifor.org/swamp-toolbox
CASE STUDY: Community Based Ecological Mangrove Rehabilitation (CBEMR) in Indonesia	https://journals.openedition.org/sapiens/1589
IUCN Legal Frameworks for Mangrove Governance	https://portals.iucn.org/library/node/48361
ODI 2014 Resource hub for policy engagement	https://odi.org/en/publications/roma-a-guide-to-policy-engagement-and-influence/
Stakeholder Analysis in Environmental and Conservation Planning	https://www.amnh.org/content/download/158575/2593966/file/stakeholder-analysis-in-environmental-and-conservation-planning.pdf
OXFAM Influencing for Impact Guide	https://oxfamlibrary.openrepository.com/bitstream/handle/10546/621048/gd-influencing-for-impact-guide-150920-en.pdf;jsessionid=EB9B1176E20BF0B0C83ED05662FCF0F3?sequence=1
WWF Stakeholder Analysis Tool	https://awsassets.panda.org/downloads/1_1_stakeholder_analysis_11_01_05.pdf
Core Values, Ethics, Spectrum – The Three Pillars of Public Participation	https://www.iap2.org/page/pillars
Enablers and Challenges When Engaging Local Communities for Urban Biodiversity Conservation in Australian Cities	https://link.springer.com/article/10.1007/s11625-021-01012-y
USAID LandLinks Tools and Guides repository	https://www.land-links.org/tools-and-missionresources/tools-and-guides/

Blue Carbon Initiative Policy Working Group	https://www.thebluecarboninitiative.org/policy-working-group
Blue Carbon and Nationally Determined Contributions: Second Edition	https://www.thebluecarboninitiative.org/policy-guidance
Better Restoration Policies are Needed to Conserve Mangrove Ecosystems	https://doi.org/10.1038/s41559-019-0861-y
UNDP Institutional and Context Analysis	https://www.undp.org/sites/g/files/zskgke326/files/publications/UNDP_Institutional%20and%20Context%20Analysis.pdf
Publication: Tools for Institutional, Political and Social Analysis of Policy Reform: A Sourcebook for Development Practitioners	https://openknowledge.worldbank.org/entities/publication/9d2139a8-6686-5806-b8b8-2126f71d0588
The International Policy Framework for Blue Carbon Ecosystems	https://portals.iucn.org/library/sites/library/files/documents/2023-022-En.pdf
Power tools: for policy influence in natural resource management	https://policy-powertools.org/index.html
Scaling up wetland conservation, wise use and restoration to achieve the Sustainable Development Goals	https://www.ramsar.org/sites/default/files/documents/library/wetlands_sdgs_e_0.pdf
Incentives and disincentives of mangrove conservation on local livelihoods in the Rufiji Delta, Tanzania	https://www.sciencedirect.com/science/article/pii/S2666719322001339
Local perceptions of changes in mangrove ecosystem services and their implications for livelihoods and management in the Rufiji Delta, Tanzania	https://www.sciencedirect.com/science/article/pii/S0964569122000400
Ecosystem Restoration through Managing Socio-Ecological Production Landscapes and Seascapes (SEPLS)	https://link.springer.com/book/10.1007/978-981-99-1292-6
Carbon Market Regulations Tracker	https://www.goldstandard.org/carbon-market-regulations-tracker
Guide to Valuing Coastal Wetlands	https://www.bluecarbonlab.org/guide-to-valuing-coastal-wetlands/

Resources: Mobilize high-integrity capital

Voluntary Carbon Markets Initiative	https://vcmintegrity.org/vcmi-claims-code-of-practice/
The Ocean Finance Handbook	https://www.weforum.org/friends-of-ocean-action/increasing-finance-for-a-healthy-ocean/
IUCN Blue Natural Capital Knowledge Centre	https://bluenaturalcapital.org/knowledge-centre/
Taskforce for Scaling Voluntary Carbon Markets	https://www.iif.com/tsvcm
International Emissions Trading Association (IETA)	https://www.ieta.org
Common Success Factors for Bankable Nature-based Solutions	https://www.wwf.org.uk/sites/default/files/2022-08/Common-success-factors-for-bankable-NbS-report.pdf
Forest Carbon Partnership Facility: Guidance Note on Benefit Sharing	https://www.forestcarbonpartnership.org/system/files/documents/fcpf_guidance_note_on_benefit_sharing_for_er_programs_2019_0.pdf
Taskforce on Nature-related Financial Disclosures	https://tnfd.global
Benefit Sharing at Scale: Good Practices for Results-Based Land Use Programs	https://documents1.worldbank.org/curated/en/824641572985831195/pdf/Benefit-Sharing-at-Scale-Good-Practices-for-Results-Based-Land-Use-Programs.pdf
Capitalizing on the global financial interest in blue carbon	https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000061
The Trust Code	www.globalcodeofconduct.org
Beyond Beneficiaries: Fairer Carbon Market Frameworks	https://nature4climate.org/natures-solutions/latest-scientific-papers/beyond-beneficiaries/
Climate Policy Initiative	https://www.climatepolicyinitiative.org/
Blue Forest Finance Guide	https://blueventures.org/wp-content/uploads/2022/12/Blue-forest-finance-guide-web.pdf
4 Returns Framework: Courses on Business Approaches to Landscape Restoration	https://4returns.commonland.com/courses/topics/doing-business/?search&mod
Earth Security: The Business Case for Mangroves in Indonesia	https://www.earthsecurity.org/reports/the-business-case-for-mangroves-in-indonesia

Resources: Design for sustainability

Manual for Climate Change Vulnerability Assessment of Coastal and Marine Protected Areas	https://awsassets.panda.org/downloads/va_manual_for_cmpa.pdf
Region Manual for Mangrove Monitoring in the Pacific Islands Region SPREP Library/IRC	https://www.researchgate.net/publication/326332324_Manual_for_Mangrove_Monitoring_in_the_Pacific_Islands_Region_Manual_for_Mangrove_Monitoring_in_the_Pacific_Islands_Region_SPREP_LibraryIRC_Cataloguing-in-Publication_Data_Secretariat_of_the_Pacific_Re
The Climate Change Resilience and Adaptation Planning Tool	https://storymaps.arcgis.com/stories/cdbcb35c435f4de0b6b62e224fe33e47
Assessing the Effectiveness of Marine Nature-based Solutions with Climate Risk Assessments	https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.17296
Using Ecosystem Risk Assessment Science for Ecosystem Restoration	https://portals.iucn.org/library/sites/library/files/documents/2021-042-En.pdf
Multiple impact pathways of the 2015–2016 El Niño in coastal Kenya. <i>Ambio</i> .	https://doi.org/10.1007/s13280-020-01321-z
Indicators of Coastal Wetlands Restoration Success: A Systematic Review	https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2020.600220/full
A Framework for Risk Analysis in Ecological Restoration Projects	https://planning.erd.c.dren.mil/toolbox/library/TWRServer/04-R-02.pdf
NOAA Marine Protected Area Climate Vulnerability Assessment Guide	https://nmsanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/2023-mpa-climate-vulnerability-assessment-guide.pdf
Global Intertidal Change	https://www.globalintertidalchange.org
Keys to successful blue carbon projects: Lessons learned from global case studies	https://www.sciencedirect.com/science/article/pii/S0308597X15003905
Non-Timber Forest Product Livelihood-Focused Interventions in Support of Mangrove Restoration: A Call to Action	https://www.mdpi.com/1999-4907/11/11/1224
The Livelihood Assessment Toolkit	https://www.fao.org/fileadmin/templates/tc/tce/pdf/LAT_Brochure_LoRes.pdf
Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS)	https://unu.edu/sites/default/files/2024-07/Indicators%20of%20Resilience%20in%20SEPLS%202024%20Edition_V2_0.pdf
NASA IPCC AR6 Sea Level Projection Tool	https://sealevel.nasa.gov/data_tools/17
Earth Security: Insurance Underwriting with Nature	https://www.earthsecurity.org/reports/insurance-underwriting-with-nature-how-mangroves-can-transform-the-climate-strategy-of-companies-cities-and-re-insurers



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