MANUAL FOR

DEVELOPING NATURE-BASED CARBON PROJECTS IN EASTERN AFRICA

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CLIMATE FOCUS

Eastern Africa Alliance On Carbon Markets And Climate Finance

VCMI Voluntary Carbon Markets Integrity Initiative

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The views expressed in this manual are those of the authors and do not necessarily reflect those of every affiliated organisation.

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Section 1

Introduction

1.1. Why are nature-based carbon projects important for Eastern Africa?

Eastern African countries possess significant untapped potential for nature-based solutions (NbS) that contribute meaningfully to climate change mitigation, adaptation, and sustainable development.[1] NbS are actions to protect, sustainably manage, and restore ecosystems and their benefits for humans and nature. Some estimates suggest that NbS could provide up to 30% of the global mitigation needed by 2050 to stay on track with the 1.5 °C climate target.[2] From forest conservation and agroforestry to grassland restoration and beyond,[3] NbS activities in Eastern African countries not only sequester carbon but also support biodiversity, improve livelihoods, and build climate resilience in the region.

Carbon markets are an important mechanism to finance NbS activities. They provide financial incentives by allowing developers of activities that reduce or remove greenhouse gas (GHG) emissions to generate carbon credits, which can be commercialised to finance these activities. Carbon markets help bridge the financial viability gap for NbS by creating a new revenue stream for landowners, farmers, or conservation practitioners, making it possible to implement mitigation activities that might otherwise be too costly.

1.2. What is the purpose of this manual?

Despite nature's importance, much of the potential for NbS in Eastern Africa remains untapped. Accessing carbon finance for NbS requires significant capacities and expertise to develop carbon projects and commercialise carbon credits. Significant potential for NbS in Eastern Africa is untapped. Many prospective project developers in the region are uncertain about how to get started with NbS activities, how to ensure their projects meet the technical and procedural requirements of high-quality carbon standards, how to navigate regulatory frameworks or how to access the market for NbS carbon credits.

This manual was created to help project developers in overcoming such barriers. The purpose of this manual is to support entities interested in developing nature-based carbon projects in member states of the Eastern Africa Alliance on Carbon Markets and Climate Finance (EAA). The EAA member states are Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda and Sudan. The manual was developed by Climate Focus and EAA with support from the Voluntary Carbon Markets Integrity Initiative (VCMI). It clarifies the carbon project development process and provides practical guidance for designing and implementing NbS carbon projects, with a focus on project types that are most relevant in EAA member countries, such as forest conservation, agroforestry, and grassland regeneration. The manual also provides guidance on commercialising carbon credits, negotiating contractual terms and navigating regulatory frameworks.

Ultimately, this manual aims to support greater participation in high-integrity carbon markets in EAA member countries and contribute to scaling up NbS activities that align with national climate goals and benefit communities while unlocking finance for sustainable, resilient development across the region.

1.3. How to use this manual

The manual is relevant to a wide range of stakeholders. Whether you are the owner of land that could be the basis for a carbon project, a farmer interested in using carbon credits to support sustainable practices, or an investor interested in supporting the development of a project in exchange for receiving credits, this manual is intended to help its users engage more effectively with NbS and carbon markets.

SECTION	DESCRIPTION
1. INTRODUCTION	Provides background on the rationale behind this manual, its purpose, and how to use it.
2. CARBON MARKET FUNDAMENTALS	Introduces key concepts in carbon markets, explains what NbS projects are, outlines common project types, and provides a regional snapshot of carbon market activities in East African countries.
3. DEVELOPING HIGH-INTEGRITY NBS PROJECTS	Explains what it means to develop high-integrity NbS projects and provides a high-level step-by-step overview of the carbon project development cycle from start (assessing project feasibility) to finish (credit issuance).
4. METHODOLOGICAL GUIDANCE FOR NBS PROJECTS	Provides detailed technical guidance for NbS project development, highlighting key considerations relevant to carrying out the seven steps of project development presented in Section 3. These include considerations for baseline selection, demonstrating additionality, leakage, permanence, and safeguards.
5. COMMERCIALISING NBS CARBON CREDITS	Explores how NbS carbon credits can be transacted via common commercialisation approaches, including spot market sales, forward sales, pre-purchase agreements, and carbon streaming, provides guidance on structuring contractual arrangements.
6. BENEFIT-SHARING IN NBS PROJECTS	Guides project developers in designing their benefit sharing mechanisms, including the benefit-sharing principles, regulatory expectations, design steps, and recommendations to ensure fair and equitable distribution of benefits among stakeholders.
7. NAVIGATING CARBON MARKET LEGAL FRAMEWORKS	Covers how project developers can assess the implications of regulatory frameworks on their projects, with examples of legal and regulatory landscape in Eastern African countries.
ANNEX	Includes lists of regional initiatives/associations, relevant NbS methodologies, and fees and levies charged by Eastern African countries.

Section 2

Carbon market fundamentals

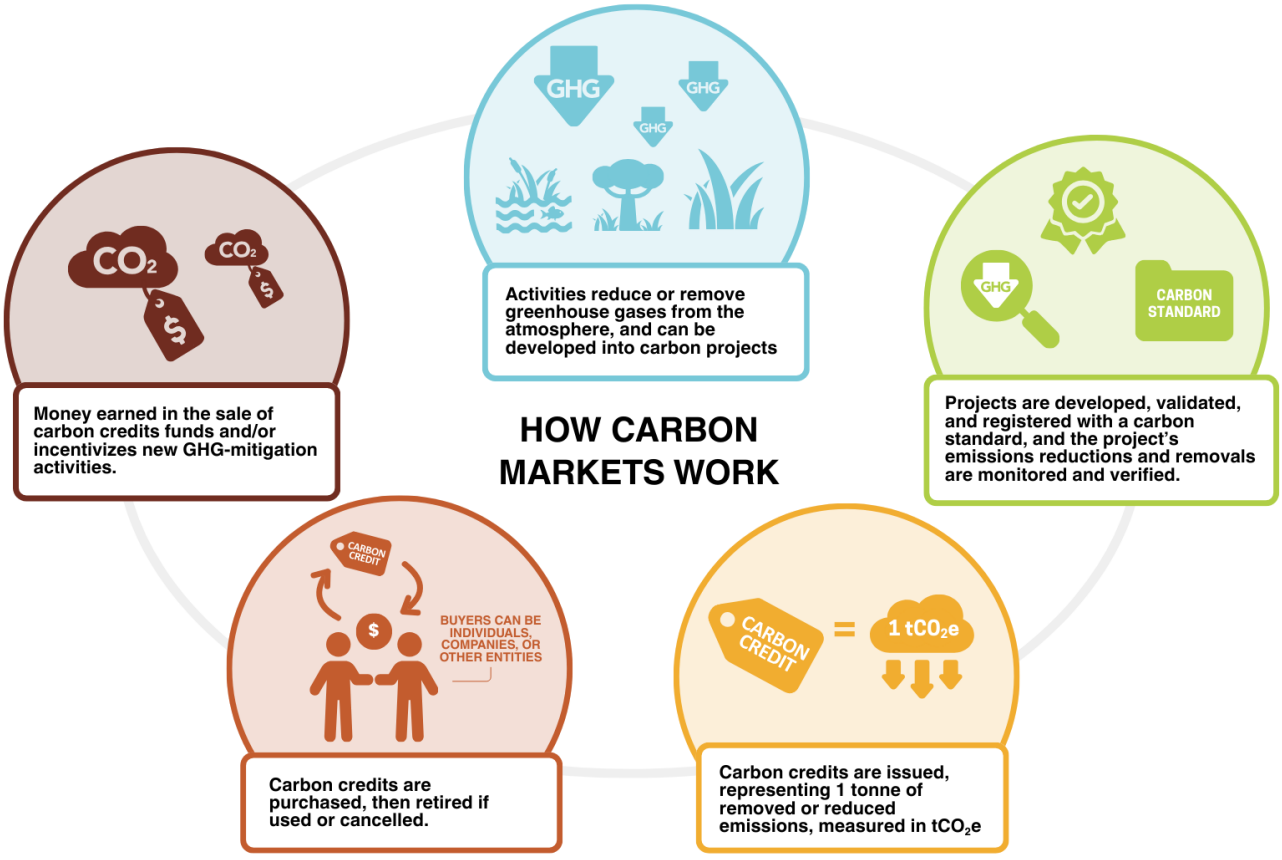
2.1. What are carbon markets and how can they support climate action?

Activities that reduce or remove GHG emissions from the atmosphere are essential to meeting climate goals. GHG-reducing activities include renewable energy generation, introduction of clean cookstoves, methane capture, novel technologies like direct air capture, and NbS – the focus of this manual. These activities often require significant funding. One way to mobilise that funding is through carbon markets.

Carbon markets are transactional systems that enable state and non-state actors to finance mitigation activities by generating and transferring carbon credits. **Carbon credits** are tradeable units that each represent one tonne of GHG emissions (measured in tCO_2e) that has been reduced or removed from the atmosphere. The demand for carbon credits comes from **buyers** who **purchase credits** to – for example – fulfil regulatory obligations, meet voluntary climate commitments, or contribute to climate action for another reason (see Section 2.4 for more on where the demand for carbon credits come from). Credits are then **cancelled or retired,** which means they are permanently taken out of circulation so they cannot be resold or reused.

Figure 1 provides a high-level illustration of how carbon markets function. While the real-world system involves a much broader range of actors and more complex processes, this simplified diagram offers a basic overview of how carbon credits are generated and transacted to support climate action.

Figure 1. High-level overview of how carbon markets function



2.2. How do carbon projects generate carbon credits?

Carbon projects generate carbon credits through the design and implementation of activities that reduce or remove GHG emissions. The key carbon market participants are summarised in this section.

Carbon projects and project developers

A **carbon project** is an activity[a] that measurably and verifiably reduces or removes GHG emissions. To fund an activity that mitigates emissions via carbon markets, a **project developer** (such as a company, NGO, government agency, or community organisation) designs and implements a carbon project with the goal of generating carbon credits that are transacted in carbon markets. Project developers often work closely with local communities, landowners, government agencies, and other partners to develop carbon projects.

Investors

To cover the upfront costs of project development, project developers may seek funding from **investors**, including private companies, financial institutions, NGOs, or governments. Investors may deploy direct equity investments, offer debt finance, or de-risk carbon market investments through guarantees or structured products that blend commercial and concessional forms of funding. In return, investors may receive a portion of the carbon credits or future revenue from their sale.

Carbon standards

Before being able to generate credits, projects must be certified by a **carbon standard** or carbon crediting mechanism (hereafter collectively referred to as "carbon standards"). A carbon standard is a set of rules and requirements that govern how carbon projects are designed, developed and validated, how emissions reductions or removals are quantified, monitored and verified, and how carbon credits are issued. Carbon standards ensure that carbon credits that they issue represent emission reductions or removals that are real, measurable, additional, and permanent.

Standards' requirements typically include:

- Developing a project that follows an approved **methodology**;
- **Reporting** and **monitoring** of emissions reductions and removals by the project developer at specified time intervals;
- Validation of project design and verification of emissions reductions and removals by independent auditors.

Sometimes there are additional requirements that projects need to fulfil. For example, a project developer seeking to register a project under the Paris Agreement Crediting Mechanism (PACM) must get approval from the country hosting the project prior to registration.

[a] This Manual uses the term "project" to refer to individual carbon projects as well as programs or groups of activities.

There are different types of carbon standards. Some are independent crediting mechanisms managed by non-governmental organisations (such as Verra's Verified Carbon Standard (VCS), the Gold Standard, Plan Vivo and ART-TREES) and others are established under the Paris Agreement (PACM) and its predecessor the Clean Development Mechanism. This manual generally focuses on the methodologies and requirements set out by independent crediting mechanisms.

Standards provide **methodologies** for how to design and implement a project that reduces or removes GHG emissions. There are different methodologies for different types of projects. A methodology is a detailed technical document under a given standard that outlines how to quantify GHG emission reductions or removals for a specific type of project activity (e.g., afforestation, avoided deforestation, improved grassland management). It includes guidance on baseline setting, additionality demonstration, emissions calculations, monitoring requirements, and data collection procedures. Methodologies are crucial for ensuring consistency and scientific rigor in carbon accounting.

One requirement is that projects and credits are tracked in a **registry.** A carbon registry is an official system or platform that records and tracks the lifecycle of carbon projects and the issuance, transfer, and retirement of carbon credits. It ensures transparency, prevents double counting, and maintains a clear record of ownership. Registries are usually operated by the carbon standard bodies or authorised third parties (e.g., Verra Registry, Gold Standard Registry, PACM registry), although countries may also establish national registries to track carbon projects in the country.

Carbon standards **certify** that carbon projects meet all their requirements and follow their methodologies. To be certified, a project developer needs to complete and submit various documents including a project design document and monitoring report, and a project must be validated by a third-party auditor. Once a carbon project is certified by a carbon standard, a project developer will monitor the implementation of the project and report the generated GHG emissions reductions or removals, which are verified by a third-party auditor. The standard body then issues credits from the project in its registry, where they can then be transferred once transacted. A credit is **retired** when a buyer uses the credit to offset emissions or claim other contributions to climate change mitigation, and then the credit can no longer be traded.

2.3. What are nature-based carbon projects?

Nature-based carbon projects generate carbon credits by enhancing, conserving, or restoring the ability of ecosystems to reduce or remove GHG emissions. There are many types of NbS that can be developed as carbon projects. Broadly, NbS projects can be divided into two main types of climate change mitigation: activities that remove GHGs from the atmosphere ("emission removals") and activities that reduce the emission of GHGs ("emission reductions"). Emission removal activities include ecosystem restoration, which results in the removal of GHGs as plants grow and sequester carbon dioxide, and improved management of soils or ecosystems to increase the uptake of carbon dioxide and other GHGs. Emission reduction activities include those that prevent the conversion of natural ecosystems into other land uses which results in GHG emissions, and improved management to decrease the loss of stored GHGs into the atmosphere.

Project types especially relevant in EAA member countries

This manual focuses on NbS carbon projects that are particularly relevant in EAA member countries, such as those presented in Table 1. NbS that are relevant in Eastern Africa include removal and reduction activities.

Table 1. Key categories of NbS relevant for EAA member countries

NBS TYPE	DESCRIPTION
AVOIDED FOREST CONVERSION 	These projects generate carbon credits through the conservation of forests that are imminently threatened by deforestation, conversion to a non-forest land use, and/or forest degradation. Carbon credits represent the emissions that are avoided by preventing such deforestation, forest conversion or degradation.[4] One common approach for this are activities aimed at "reducing emissions from deforestation and degradation and the role of conservation, sustainable management, and enhancement of forest stocks" (otherwise known as REDD+). REDD+ is a United Nations-backed framework that aims to incentivize developing countries to reduce emissions from and increase carbon sequestration by forests. Some carbon standards (such as Verra VCS, Plan Vivo and ART-TREES) have methodologies for REDD+, which allow such project types to be implemented under them. REDD+ activities can be developed as individual projects aiming at mitigation in a specific location with limited geographical scale (projects), or as part of jurisdictional REDD+ programs, which are implemented on a larger scale (national or subnational). This manual focusses of individual projects as opposed to jurisdictional programs. Blue carbon projects that generate carbon credits through the conservation of mangroves are included in this category. Carbon credits from these projects represent the emissions reductions resulting from the conservation of mangrove ecosystems.[5]
AVOIDED GRASSLAND CONVERSION 	These projects generate carbon credits through the conservation of natural grasslands that are imminently threatened by conversion to a different land use (e.g., croplands or managed pastures). Carbon credits represent the emissions that are reduced by preventing the release of carbon stored in the soil that would result from land use conversion.[6]
IMPROVED FOREST MANAGEMENT 	These projects generate carbon credits by incorporating or introducing management techniques that improve a managed forest's capacity to remove carbon from the atmosphere or decrease its emissions. Carbon credits represent the reduced emissions or increased carbon removals that result from implementing such improved management practices.[7]
IMPROVED GRAZING MANAGEMENT 	These projects generate carbon credits by controlling the density, timing, and intensity of grazing in a way that maximises carbon sequestration in the soil. Carbon credits represent the increased carbon removals that come from implementing these grazing practices.[8]
AFFORESTATION, REFORESTATION, REGENERATION (ARR)	These projects generate carbon credits by removing carbon from the atmosphere through planting trees in areas that have not been forested for a long time (afforestation), replanting trees in areas more recently deforested (reforestation), and/or restoring areas that have been degraded (regeneration). Carbon credits represent the carbon emissions that are removed by the planted trees and/or vegetation in restored areas.[9]

NBS TYPE	DESCRIPTION
	ARR projects include the following (among others): • *Agroforestry projects* that generate carbon credits through combining agriculture and forestry practices, which enhances the ability of trees and soil to remove carbon from the atmosphere. Carbon credits represent the emissions captured in the trees and soil as a result of implementing these practices.[10] • *Blue carbon* projects that generate carbon credits through the restoration of mangroves, tidal salt marshes, and seagrass meadows. Carbon credits represent the emissions captured by these ecosystems as a result of implementing the restoration project.[11]

Box 1. A note about biochar carbon projects

Biochar is an emerging carbon project type. Biochar is a substance that results from heating biomass such as forestry and agricultural residues, wood chips, leaves, and straw at high temperatures in the absence of oxygen. This process concentrates and stabilises the carbon contained within the biomass in the biochar. The resulting end product can be used for a range of purposes, including as an input to building materials and as an addition in agricultural soils. Carbon credits resulting from biochar projects represent the emissions that are avoided by stabilising carbon in the biochar and later stored in building materials or soil through the application of biochar.[12,13]

Biochar projects represent a hybrid project type, including both technology and nature. Carbon standards generally do not consider biochar to strictly represent a NbS, although some biochar activities – such as the application of biochar to soils to enhance agriculture – do relate to nature-based interventions. Biochar project types are still emerging and there are few biochar methodologies available. This manual does not include biochar methodologies due to its hybrid and emerging nature.

2.4. What are different types of carbon markets?

The international demand for carbon credits comes from multiple types of carbon markets: voluntary carbon market (VCM) and compliance carbon markets. In the VCM, public and private entities purchase carbon credits to achieve voluntary mitigation goals. In compliance markets, entities purchase credits to meet regulatory requirements such as emissions caps or carbon tax obligations. There are domestic compliance markets defined by national or subnational governments as well as an international compliance mechanism for the aviation sector, known as Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

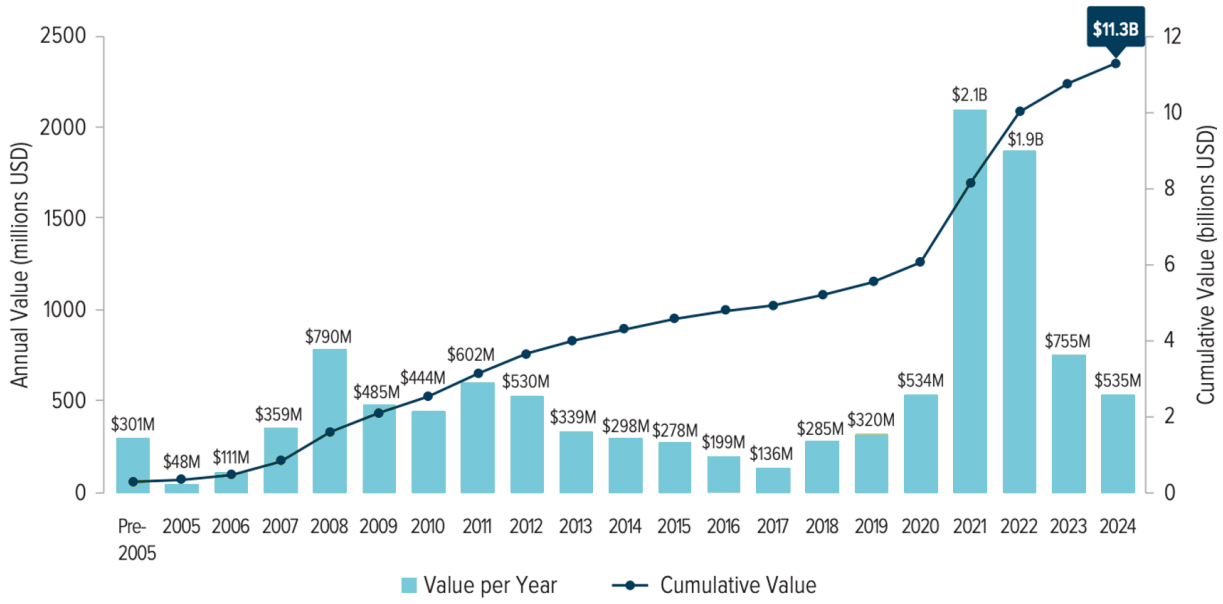
Additionally, Article 6 of the Paris Agreement establishes a framework for international cooperation in climate action under which state and non-state can generate and transact mitigation outcomes for

voluntary or compliance purposes. This section and section 2.5 describe the different types of carbon markets in more detail.

Voluntary carbon market

The VCM is driven by companies and organisations that voluntarily purchase carbon credits to meet their sustainability commitments such as corporate net-zero targets. Large corporate buyers dominate the VCM landscape, with companies like Shell, Engie, Microsoft, and various airlines among the most active purchasers.[14] The total market value for VCM rose rapidly from 2018 through 2021, with a market capitalisation of about USD 2 billion in 2021 and 2022 (Figure 2). The market has since 2022 declined, which has been attributed to, among others, the public scrutiny of projects due to integrity issues.

Figure 2. Voluntary carbon market size by value of traded carbon credits through 2024 (Source: Forest Trends' Ecosystem Marketplace, 2025.[15])



Despite the recent decline, the VCM has the potential to leverage large volumes of finance for climate change mitigation as the market moves towards greater transparency and integrity (see Section 3 for more on developing high-integrity carbon projects). Projections show that the increased number of companies setting ambitious climate commitments could raise the value of the global carbon market to at least USD 7 billion, and as much as USD 35 billion, by 2030.[16]

The VCM still represents the largest and most accessible route to market for NbS carbon projects as companies continue to source carbon credits largely to meet voluntary climate commitments. The demand from compliance markets is limited, as most compliance systems, including CORSIA and national schemes, have limitations on the types and volumes of credits that can be used to meet compliance obligations. For example, CORSIA allows the use of carbon credits issued by approved carbon standards and the credits must be authorised by host countries (see below). National compliance mechanisms often allow the use of domestically generated carbon credits and only a limited volume and type of international credits can be used. An example is Singapore, which allows entities to use international credits for only up to five percent of their annual tax liability. Article 6.2 transactions (further explained in section 2.5) are

limited by the cooperative approaches designed by countries and criteria that countries establish. Existing Article 6.2 cooperations also show a preference for non-NbS credits, with Singapore and the Republic of Korea being the only countries that have shown interest in acquiring NbS credits under Article 6.2 transactions. These limitations mean that NbS carbon credits currently are more easily transactable in the voluntary segment of the market.

Furthermore, large corporate buyers voluntarily participating in the VCM value NbS credits because they typically are generated by projects that not only deliver climate benefits but also measurable social and environmental co-benefits. These buyers often prefer credits from projects that align with their sustainability narratives and can provide compelling stories about biodiversity conservation, community development, and ecosystem restoration. Pricing in the VCM varies significantly based on project type, quality attributes, and co-benefits. High-quality nature-based projects with strong co-benefits and verified permanence measures can command premiums over current average prices that range from USD 10 to 20 per tCO_2e.[17] In particular, prices of carbon removal NbS credits from activities like Afforestation, Reforestation & Revegetation (ARR), Improved Forest Management (IFM), or blue carbon may transact at the higher end of the price range (between USD 30 to USD 50 per ton, or even higher).[18]

National compliance markets

National compliance markets are markets in which entities trade and retire emissions permits (often referred to as allowances) or eligible carbon credits to meet predetermined regulatory compliance targets. A growing number of countries are introducing emissions or carbon tax obligations and allow liable entities to (in part) use carbon credits to meet these regulatory obligations. Participating entities are companies that are subject to a government's rules on emissions caps or carbon taxes.

Currently, the majority of jurisdictions that allow for such allow the use of carbon credits generated from domestic carbon projects. There are also several markets that extend eligibility to international carbon credits, such as Singapore, Switzerland, and the Republic of Korea (see Box 2). International carbon credits can be used under strict conditions (for example, they must be generated from specific sectors and using approved methodologies).

Box 2. Use of international credits for domestic compliance

Singapore has a carbon tax and allows carbon tax-liable entities to use international carbon credits to offset up to five percent of their tax liability. The carbon credits must comply with Article 6 of the Paris Agreement, must be authorised under Article 6.2 (see section 2.5) and meet the eligibility criteria set out by the Singaporean government.[19]

Switzerland has placed an obligation on importers of fossil motor fuels to compensate a portion of their emissions.[20] Eligible international carbon credits may be used to meet part of the compensation obligation, which are currently carbon credits generated and authorised as per Article 6.2 Paris Agreement. Based on this, the Klik Foundation has been procuring ITMOs on behalf of the Swiss Petroleum Association to fulfil the legal obligation.

The Republic of Korea has a national emissions trading system (ETS) and allows entities with obligations to use carbon credits to meet up to five percent of their obligations with carbon credits. Entities can, however, only use Korea Credit Unit (KCU) to offset compliance obligations. There is a

system for converting carbon credits (including international carbon credits) to KCUs that can be traded in the national trading platform and used to offset compliance obligations.

Compliance market for the aviation sector

The International Civil Aviation Organization (ICAO) established the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which requires airlines to compensate for their GHG emissions above a baseline (85% of their emissions in 2019). This requirement creates growing demand for eligible carbon credits. CORSIA currently covers airlines in 129 countries that are voluntarily participating in the first phase of CORSIA (2024 – 2026). Participation will be mandatory from 2027 onwards for states that do not meet the exemption criteria.[21] Among the EAA member states, Kenya, Rwanda, and Uganda are voluntarily participating in the first phase.[22] While all EAA member states are exempt from the mandatory phase, airlines may continue to voluntarily participate in future years.[23]

Only CORSIA Eligible Emissions Units (CEEU) can be used by airlines under the scheme. CEEUs are carbon credits that meet the eligibility criteria set by ICAO, which – among other conditions – includes being issued under carbon standards approved by ICAO. The Gold Standard, Verra's Verified Carbon Standard (VCS), and the Global Carbon Council (GCC) are among the six standards approved to issue CORSIA-eligible units for the first phase. Plan Vivo, a relevant standard in the NbS space, is not yet approved to issue CORSIA-eligible units.

Accessing the CORSIA market requires the carbon credits to be authorised and correspondingly adjusted by the host country under Article 6.2 of the Paris Agreement (Article 6 is covered in greater detail below). Additionally, project developers are required to have a liability management mechanism (e.g., obtain political risk insurance) to protect against the risk that a host country revokes its Article 6 authorisation or fails to apply the corresponding adjustment.

The CORSIA market is nascent, and there is currently an insufficient supply of eligible credits. One of the reasons for the undersupply is that countries are not being ready to authorise, as most countries are still establishing their Article 6 regulatory frameworks and setting up their authorisation criteria.[b] As of January 2025, only one NbS programme – the REDD+ Guyana programme certified by the Architecture for REDD+ Transactions (ART/TREES) – has generated and transacted CEEUs for CORSIA Phase 1.[24] Nevertheless, CORSIA offers several advantages for NbS projects, including relatively stable pricing driven (currently in the region of USD 20 per tonne[25]) and the potential for long-term offtake agreements with airlines. The Guyana jurisdictional programme, for example, sold its credits at over USD 21 per tonne in January 2025.[26] Estimates project that CEEU demand could reach 144 $MtCO_2e$ during the scheme's first phase, with prices expected to range between USD 25 and USD 36 by 2027.[27]

[b] An analysis by Sylvera found that out of 4,000+ projects that meet ICAO's eligibility criteria, only about 1,500 are in countries that are moderately ready to issue Article 6 Authorisation.

2.5. Article 6 of the Paris Agreement

Article 6 of the Paris Agreement facilitates international cooperation between countries in implementing their Nationally Determined Contributions (NDCs) while enhancing their ambition and promoting sustainable development goals. It enables state and non-state actors that generate emission reductions and removals to drive finance towards the Paris mitigation goals. Under Article 6, three cooperation approaches are established, two of which are market-based: the Article 6.2 cooperative approaches and Article 6.4 mechanism (otherwise known as PACM).

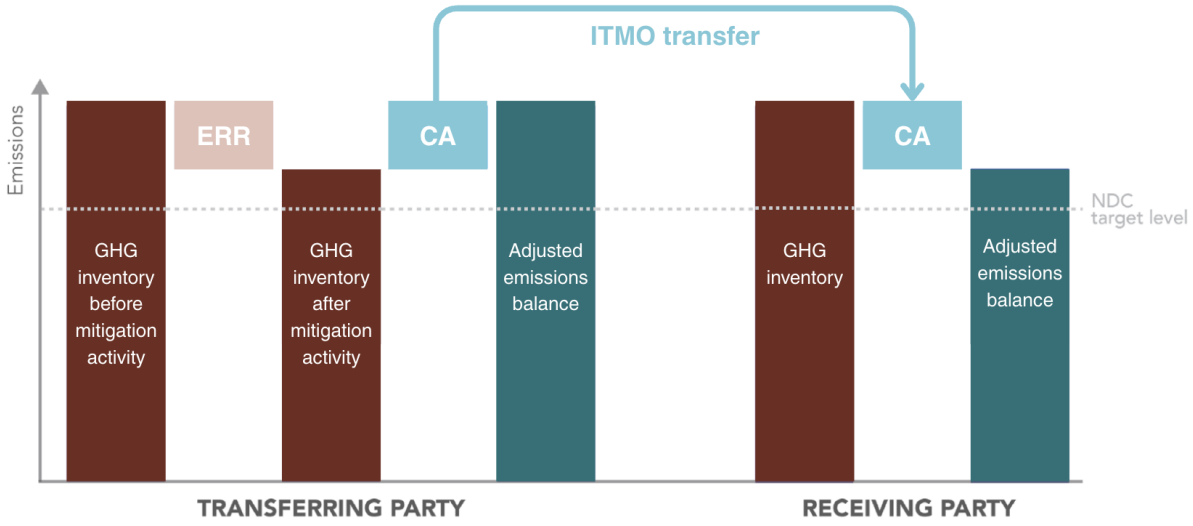
Article 6.2 Paris Agreement

Article 6.2. provides flexibility for countries to design unilateral, bilateral or multilateral cooperative approaches to facilitate the international transfer of mitigation outcomes as “Internationally Transferred Mitigation Outcomes" (ITMOs). A country where a mitigation outcome occurs (a “host country”) can design transaction and cooperation structures (together with other countries, private sector buyers, or unilaterally) that best meet their specific needs as well as determine the types of mitigation activities eligible to generate ITMOs and the methodologies to be used.

State and non-state actors can implement mitigation activities and generate carbon credits (known as mitigation outcomes under Art. 6.2) under cooperative approaches designed by countries. Mitigation outcomes generated by projects developed under Article 6.2 cooperation may be authorised by a host country, and authorised mitigation outcomes (known as ITMOs) may be used for the NDC of another country or for other international mitigation purposes, such as CORSIA and voluntary purposes.

Where a host country authorises ITMOs, it must apply **corresponding adjustment** (Figure 3). Corresponding adjustment is an accounting mechanism under the Paris Agreement that ensures there is no double counting of emissions reductions or removals under the Paris Agreement. When a corresponding adjustment is applied, the host country foregoes the right to count underlying emissions reductions or removals towards its NDC while the receiving country counts the adjustment towards its NDC achievements. Even where the ITMOs are not used towards the NDC of another country (e.g., if used for CORSIA compliance or voluntary corporate commitments), emission reductions or removals backed by corresponding adjustments cannot be counted by the host country towards its NDC achievement. For this reason, host countries are selective on the types of projects from which they can authorise ITMOs, and they typically establish eligibility criteria for authorisation (see further explanation in Chapter 7).

Figure 3. Applying a corresponding adjustment increases the total emissions balance of the transferring party and decreases the emissions balance of the receiving party



It is, however, important to note that not all emission reductions or removals generated in the context of Article 6.2 cooperative approaches (or PACM as described below) will have to be transferred as ITMOs. In other words, mitigation outcomes or emission reductions or removals that are authorised as ITMOs must be transferred with corresponding adjustments, but other mitigation outcomes and emission reductions or removals do not. Host countries are at liberty to decide the cases, conditions, and use for authorising ITMOs.

Article 6.4 Paris Agreement

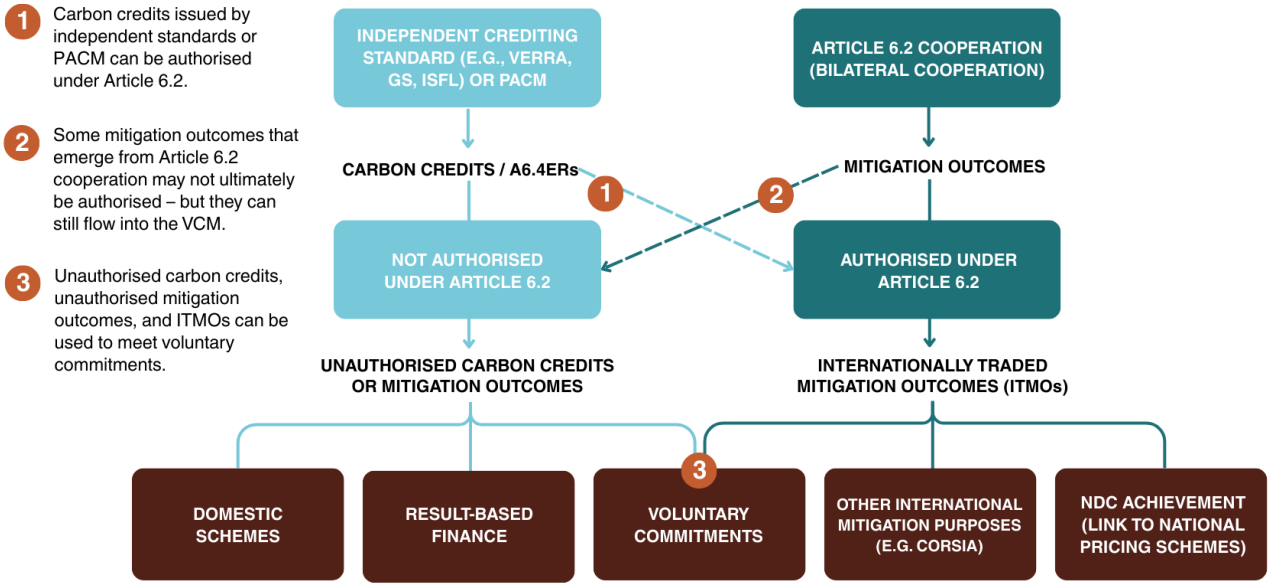
Article 6.4 creates a centralised mechanism overseen by the United Nations Framework Convention on Climate Change (UNFCCC), known as the Paris Agreement Crediting Mechanism (PACM). It requires the application of methodologies and rules approved by the Article 6.4 Supervisory Body (SBM), which governs the mechanism. Under Article 6.4, mitigation activities are approved by a host country, registered with the PACM registry, and implemented according to methodologies approved by the Supervisory Body. State and non-state actors can develop projects under the PACM, but the non-state actors must be authorised, and the projects must be approved by the host country before registration with PACM. Mitigation outcome units (known as Article 6.4 Emissions Reductions units or A6.4ERs), are then issued by the PACM registry.

Host-countries may authorise A6.4ERs, in which case they can be internationally transferred for use toward the NDC of another country or other purposes. Where a host country authorises A6.4ERs, the authorisation process and requirements will be in accordance with Article 6.2 described above. Therefore, where A6.4 ERs are authorised, the host country must apply corresponding adjustment and cannot count the underlying emissions reductions and removals in its NDC. Non-authorised A6.4 ER units, known as Mitigation Contribution Units (MCUS), can be counted towards a country's NDC achievement.

Article 6 and other carbon markets

Article 6 market mechanisms interact with the voluntary and compliance markets. Some countries, like Singapore (as described in Box 2), allow only Article 6 authorised carbon credits to be used for compliance purposes. Carbon credits issued by independent crediting standards can also be authorised under Article 6.2, in which case they become ITMOs that can be used for various purposes, such as NDC of another country or for voluntary purposes (Figure 4). Additionally, independent methodologies can apply for approval/eligibility under PACM. A6.4ERs issued under the PACM or mitigation outcomes issued and authorised under Article 6.2 can be purchased to be used for voluntary purposes.

Figure 4. The interlinkages between the VCM and Article 6



How can non-state actors be involved in Article 6?

While Article 6 provides a framework for countries to cooperate in climate change goals, it allows for participation of non-state actors. However, non-state actors, such as private project developers, can engage in Article 6.2 or 6.4 if they are authorised by a host country. Authorised non-state actors can develop Article 6.4 projects under the PACM or implement projects that generate mitigation outcomes to be transferred as ITMOs under Article 6.2 cooperative approach.

Under Article 6.2, there are various transaction arrangements through which authorised non-state actors can be involved (Figure 5). An authorised non-state actor can develop a carbon project under a bilateral signed between countries and through which ITMOs can be transferred. Considering that different entities can engage in Article 6.2 transactions, there are different transaction arrangements that can exist under Article 6.2 and under which non-state actors can be involved. These include:

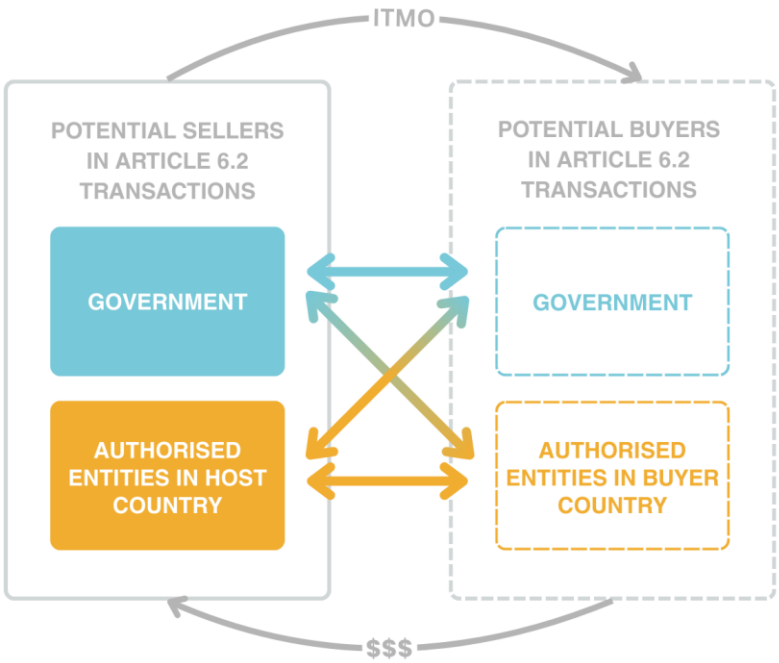
1. Sovereign-to-sovereign or government-to-government transactions, where the host country and an acquiring country enter into a bilateral agreement as well as the commercial transaction for the sale and purchase of ITMOs.

2. **An authorised entity as the seller to a sovereign buyer**, where a host country enters into a bilateral agreement with an acquiring country, but the commercial ITMO transaction is between an authorised entity (e.g. private project developer) in a host country and a government entity as a buyer.

3. **Authorised entities as both the seller and buyer**, in which a host country and an acquiring country signs a bilateral agreement, but the commercial ITMO transactions are signed by authorised entities in a host and acquiring countries (e.g. a private project developer in a host country and a private sector buyer in an acquiring country).

It is important to note that a bilateral or multilateral agreement is not mandatory for Article 6 transactions, although the practice has been that countries prefer to sign bilateral agreement prior to any Article 6 projects or transactions are implemented in a country. These bilateral agreements provide a framework for the two countries to engage and set out the principles applicable to projects that will generate ITMOs to be transacted under the agreement. They may also define the obligations of countries related to Article 6, such as the obligation to issue authorisation, apply corresponding adjustment and report to UNFCCC as well as the sectors and approved methodologies for implementing projects. The advantage of having bilateral agreements in place is that it provides an assurance to market participates that the governments will issue authorisation if their mitigation activities meet legal requirements, and that the government will perform its Paris Agreement obligations as related to corresponding adjustments and reporting.

Figure 5. Types of Transactions under Article 6.2



It is important to note that participation in Article 6 transactions is voluntary for both non-state actors and countries. Host countries have the right to determine the criteria and rules on how state and non-state actors will engage in Article 6. Furthermore, project developers can continue to operate carbon projects and carbon credits can continue to be traded voluntarily in the VCM without Article 6 approval or authorisation. Carbon credits that are traded in the VCM, and are not traded as ITMOs, do not necessarily have to be authorised.

Government-to-government transactions

In these transactions, the host government and a buyer government may sign a bilateral agreement that sets out the Article 6 related obligations. Subsequently, the two governments also sign a commercial contract for sale of ITMOs. This means that the host country is the one responsible for coordinating the implementation of mitigation activities, ensuring that mitigation outcomes are generated and is the one that transfers the ITMOs to the buyer. While the host country is the one that enters the commercial transaction, owns the mitigation outcomes, and is responsible for delivering ITMOs, it may engage non-state actors (e.g., private project developers) in implementing mitigation activities. For example, the government may establish a national programme that allows non-state project developers to implement mitigation activities and then distributes carbon payments to project developers based on the performance of the specific projects.

Authorised non-state actor to a government buyer transaction

In this transaction type, a host country and an acquiring country may enter into a bilateral agreement, setting out the Article 6 related obligations. Subsequently, a commercial contract for the sale and purchase of ITMOs is signed by an authorised non-state actor (e.g., a non-state project developer) in a host country as a seller with a government entity as a buyer. The authorised non-state actor is directly responsible for the implementation of the project, the generation of mitigation outcomes and delivery of ITMOs. The authorised non-state actor is also responsible for obtaining ITMO authorisation from the host country. In this case, the authorised entity receives payments directly from the buyer.

For example, the bilateral agreements that Sweden signed with countries like Ghana (2024) and Kenya (2025), indicate that both state and non-state sellers can engage in transactions under the bilateral agreements. Under these agreements, the Swedish Energy Agency has entered into agreements with non-state actors to supply ITMOs.[c]

Authorised non-state actors as buyers and sellers

This transaction type involves non-state actors as sellers and buyers. Like the transaction type described above, the host and acquiring country enters into bilateral agreement that defines the states' Article 6 related obligations. Subsequently, a commercial contract for sale of ITMOs is signed by a non-state buyer and a non-state seller (e.g., a project developer). The authorised project developer is responsible for developing the mitigation activity, generating mitigation outcome, obtaining host country authorisation and delivery of ITMOs. Payments are also made directly to the non-state actor.

For example, this model used by Switzerland and the host countries that it has entered into bilateral agreements with (e.g. Ghana, Peru, Morrocco, Thailand, Kenya). Switzerland signs bilateral agreements with host countries to facilitate the Art. 6 transactions. Klik Foundation has been authorised by Switzerland to obtain ITMOs. Klik Foundation typically enters into commercial contracts with non-state actors who develop Article 6 projects and supply ITMO to Klik.

Another example of an acquiring country using authorised non-state actors to buy and sell ITMOs is Singapore. Singapore has signed several implementation agreements. The ITMOs transferred under these agreements could be used for Singapore's NDC achievement and private sector voluntary use.

[c] For example, see here.

Singapore's main model has been for the private sector to purchase ITMOs for use to meet carbon tax liability. More recently, Singapore has also been considering purchasing ITMOs directly (government as a buyer). The government sent out a call for proposals to buy ITMOs and plans to launch a second call later in 2025.[28]

2.6. How is the carbon market evolving?

The global carbon market has undergone a significant transformation in recent years, with demand trends, pricing dynamics, and buyer preferences being impacted by both developments in voluntary and compliance markets, as well as the new markets introduced under Article 6 of the Paris Agreement. The market observed rapid growth in the period 2019 – 2021, reaching peak valuation in 2021 (by some measures).[29] While carbon prices have corrected since, demand for carbon credits (as defined through the retirement volumes of carbon credits) has been stable over the past several years, with annual retirement volumes averaging around 180 million since 2021. While recent estimates based on reported over-the-counter transactions point to a market size of USD 0.5 billion,[30] this value excludes primary investments in carbon projects. These are estimated to range between USD 15 billion and USD 20 billion annually.[31] A considerable share of these primary investment flows targets NbS activities (i.e., through debt or equity investments, or carbon streaming deals), with companies securing access to nature-based credits (and removals in particular) to facilitate achievement of future climate commitments.[32]

With a growing number of companies positioning themselves for future voluntary or compliance needs, around two-thirds of the future market value is expected to be represented by carbon removal projects – up from less than 10% in 2024.[33] In addition, international demand triggered by CORSIA (where demand is projected to reach between 500 $MtCO_2e$ and 1,300 $MtCO_2e$ during Phase II (2027 – 2035)), combined with growing Article 6.2 bilateral cooperation, is expected to drive demand for high-integrity credits. This presents opportunities for NbS projects in developing regions, including the EAA.

The market increasingly values removal credits and high-quality projects

One noteworthy trend in the context of NbS projects is that carbon removal credits command a significant price premium over reduction credits in today's carbon market. This reflects a fundamental shift in buyer preferences toward permanent nature- or tech-based carbon storage solutions that has been intensifying in recent years.[34] Corporate buyers are willing to pay premium pricing for carbon credits from NbS carbon removal projects (e.g., ARR, IFM, soil carbon) and removal technologies (e.g., Direct Air Capture, Bioenergy with Carbon Capture and Storage) as these carbon credits have an explicit role to play in corporate net-zero targets as defined by leading target setting initiatives (including the Science Based Targets initiative (SBTi)). This growing demand for carbon removals has been supporting price development in the space: while the overall market value of the VCM fell by 29% in 2024,[35] prices for credits from NbS removal categories like ARR rose over the past year.[36]

Beyond the clear "use case" of carbon removal credits in corporate net-zero reporting, another leading trend is the quest for "high-quality" carbon credits that credibly deliver the climate benefit they claim. This search for quality has been triggered by concerns around the additionality and GHG quantification approaches adopted by some carbon projects, and subsequent over-crediting. Recent market data shows that "high-quality" projects are being recognised by buyers, who are willing to offer premium

pricing. According to one carbon credit ratings agency, every one-point improvement in a project's overall integrity score results in an 8% increase in the spot price of its credits.[37] Carbon credits from rated NbS projects command on average a 20% price increase for each ratings notch (e.g. 'BBB' and 'A' or 'C' and 'B') on its rating scale.[38] It should be noted that these price ranges are currently based on relatively small sample sizes, and larger trading volumes will need to validate how strong the price premium is that buyers are willing to pay for quality projects.

Carbon prices vary greatly between voluntary and compliance markets

Current pricing trends reveal significant differences across market segments. Average prices in the VCM stood at USD 6.40 per tCO_2e in 2024, based on reported over-the-counter data.[39] While these levels are double that of the average pricing observed in 2020, the discrepancy in pricing is large and driven by various project characteristics. As mentioned above, one leading driver impacting pricing in the voluntary market is climate integrity of issued carbon credits, with the ICVCM's labelling process and the work carried out by carbon credit ratings agencies affecting willingness to pay for credits. As part of this trend, voluntary buyers have also been offering premium pricing for more recent vintages (i.e., carbon credits generated in recent years), a growing share of which is being issued against recent, improved methodologies. Exchange-traded prices for NbS removals have shown particular resilience, increasing over the past year and transacting around USD 15 per tonne.[40] NbS carbon credits transacted over-the-counter (through intermediaries) often attracted further price premia over these exchange-traded contracts.

On the compliance side, the eligibility criteria of domestic carbon schemes and international compliance schemes have been the guiding determinant of carbon credits. Pricing in these markets is primarily impacted by carbon tax levels or allowance prices traded in ETSs, incentivising obligated entities to source eligible credits at a discount to these regulated prices. Some compliance buyers – like those covered by Singapore's carbon tax – are subsequently pricing carbon at a considerable premium over the average prices currently observed in the voluntary market. Singapore earlier this year conducted a tender process to procure eligible credits from NbS activities, with the tender attracting prices ranging from USD 18 to over USD 40 per tonne.[41] These prices are expected to further increase as the level of the domestic carbon tax will rise in the future. Credits eligible under CORSIA's Phase 1 also attracted buyer interest, with IATA's procurement events realising transactions for eligible credits at fixed-price offerings of USD 21.70 per tonne.[42]

Pricing of carbon credits is also being affected by their eligibility for use in NDC accounting. For example, Switzerland reported paying an average price of over USD 30 per tonne for its portfolio of Article 6.2 credits to be delivered between 2022 and 2030.[43] The valuation in Article 6 markets is being driven by both the opportunity cost of host country corresponding adjustments, as well as marginal abatement costs of buyer countries. NbS projects located in countries with established Article 6.2 frameworks like Kenya and Rwanda are thus favourably positioned to access sovereign buyers through the growing number of bilateral agreements, opening up new routes to markets and diversifying commercialisation opportunities.

Buyers shift from spot markets to long-term commitments

Buyer procurement strategies are increasingly shifting toward longer-term commitments. These are helpful as they both help manage future delivery risk, as well as secure long-term price stability for compliance purposes and voluntary corporate goals. This dynamic is also beneficial for project developers, as it allows projects to secure financing earlier, thereby overcoming the access to upfront finance gaps typically faced by developers in the space and reducing long-term revenue uncertainty compared to selling credits on the spot market. This trend supports the development of higher-quality, scalable NbS projects that require substantial upfront investment and multi-year development timelines.

Combined, these trends collectively point to a maturing carbon market that rewards climate integrity and carbon credits that are eligible across various market segments. For NbS project developers, this means projects have to ensure long-term carbon removal in their project design, follow best-in-class approaches in quantifying carbon removals or avoided emissions (e.g., through the adoption of methodologies approved under the ICVCM's Core Carbon Principles – see Section 2.8), and follow standards and methodologies that open up routes to both compliance and voluntary markets.

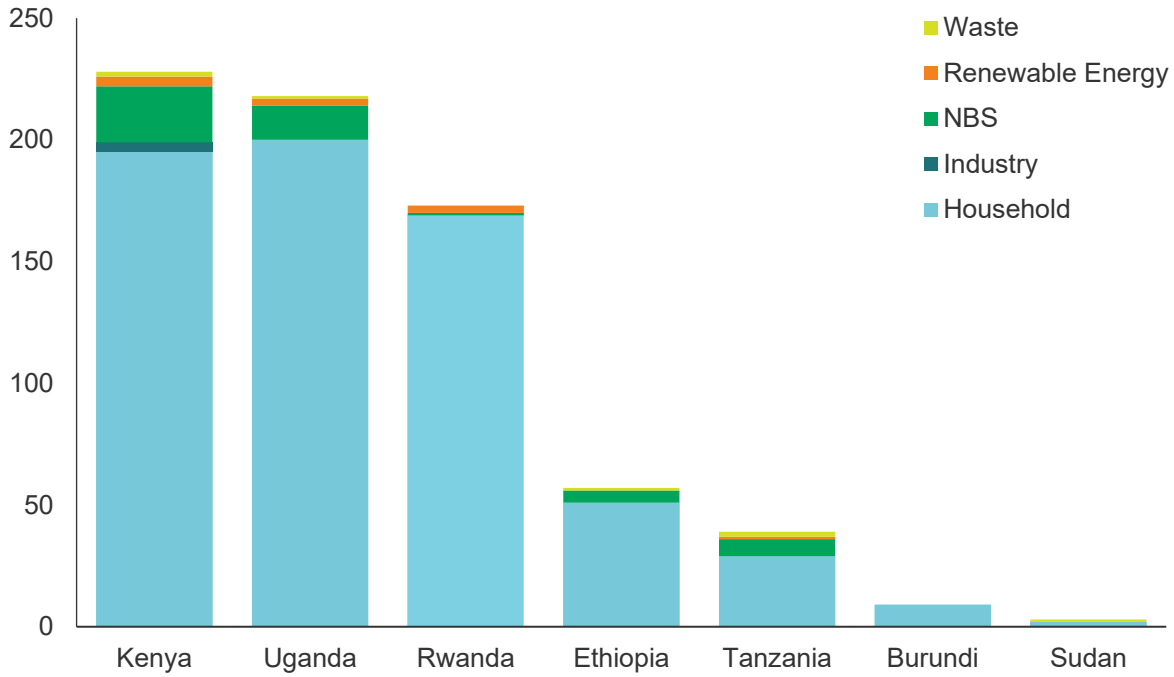
2.7. What is the status of carbon markets in EAA member countries?

Carbon projects across EAA member countries

As of June 2025, EAA member countries host over 700 carbon projects registered with international carbon standards (Figure 6). Kenya, Uganda, and Rwanda are the EAA member countries with the highest number of registered carbon projects. Kenya hosts the highest number of projects: 228. Uganda ranks second with 218 registered projects, and Rwanda ranks third with 173 registered projects.[d] In all the three countries, household-related activities (such as improved cookstoves and clean water projects) are the most common project type, and NbS is the second most common type. Ethiopia, Tanzania, Sudan, and Burundi have significantly fewer registered carbon projects.[44]

[d] It is important to note that these totals include projects that are part of programmes of activities, which is an approach that groups projects. Clean cooking projects are more likely to be part of programmes, while NbS projects are more likely to be standalone projects.

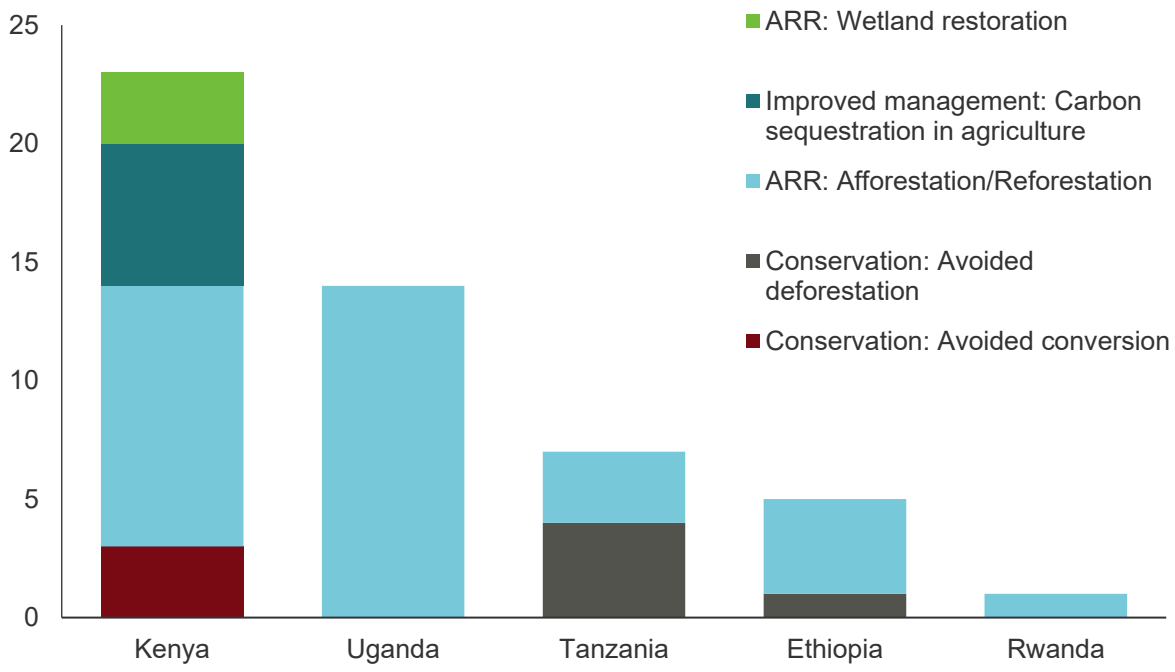
Figure 6. Carbon projects per category in EAA member countries as of June 2025, including both NbS and non-NbS projects (based on Climate Focus' VCM Dashboard data)



NbS project types across EAA member countries

Figure 7 shows the distribution and scale of NbS carbon projects across EAA member countries. The majority of registered NbS projects are afforestation and reforestation (most of which come from Uganda and Kenya), followed by carbon sequestration in agriculture (despite being exclusively registered in Kenya), followed by avoided deforestation projects (only registered in Tanzania and Ethiopia). Other NbS project types registered in these countries – though on a smaller scale – are wetland restoration and avoided forest conversion. No NbS projects have been registered in Sudan and Burundi.[45]

Figure 7. NbS carbon projects per category in EAA member countries as of June 2025 (based on Climate Focus' VCM Dashboard data)



Untapped project development opportunities in the region

Despite this activity, several reports show that there is still significant untapped potential for carbon projects in the East African region. In 2021, Africa generated only 2% of its carbon credit generation potential and accounted for only 16% of the global market.[46,47] The African Carbon Market Initiative (ACMI) outlined the region's potential, projecting that carbon markets in Africa could:[48]

- **Increase carbon credits retirements** in Africa 19-fold, reaching 300 $MtCO_2e$ per year by 2030 and up to 1.5-2.5 $GtCO_2e$ by 2050.
- **Support 30 million jobs** by 2030 and more than 100 million jobs by 2050.
- **Mobilise finance** up to USD 6 billion by 2030 and more than USD 100 billion per year by 2050.

However, realising this potential depends on several factors, including a clear and conducive regulatory landscape, efforts by different actors to improve the integrity of carbon markets and the developments in the global carbon markets, particularly demand and supply (see Section 2.6).

The NbS potential is different across each of the EAA member countries. Some studies have highlighted the potential for soil-related conservation activities in Burundi and Sudan, improved forest management activities in Ethiopia, afforestation and reforestation projects in Kenya, and improved livestock management in Uganda.[49] Other studies point to carbon sequestration from agriculture in Ethiopia, Kenya, and Sudan, forest conservation in Rwanda and Tanzania, and improved forest management in Uganda, as

the activities with most cost-effective mitigation potential. Ultimately, project developers must consider country-specific potential when choosing the location and type of project to develop.[e]

2.8. What are high-integrity carbon projects, and why are they important?

Overview

By design, the carbon market enables tonne-for-tonne compensation, where one tonne of emissions can be balanced by one tonne of verified reductions or removals elsewhere. For this to hold, carbon projects must be of **high integrity,** meaning that they generate carbon credits that deliver the emission reductions or removals they claim. Market participants must trust that the carbon credits they are sourcing represent real emission reductions or removals. If credits do not truly represent one tonne of reduced or removed emissions, this undermines the market's purpose.

While there is no single, universally agreed definition of carbon credit integrity, at minimum, integrity for carbon projects means that the climatic, environmental and social benefits that projects deliver are real, transparent, and aligned with safeguards against harm. In high-integrity projects, emissions reductions and removals are represented by carbon credits that are issued by reputable carbon crediting programmes. These carbon credits should be issued based on robust quantification of emission reductions and removals, be verifiable and validated, really contribute to climate change mitigation, not have occurred without the project, align with national and global climate change goals, and not be double counted. High-integrity projects also robustly apply environmental and social safeguards to avoid or manage potential adverse impacts and verifiably deliver positive benefits for sustainable development, biodiversity, and human well-being. Furthermore, transactions of carbon credits must be transparent with the benefits fairly distributed to stakeholders (see Section 6 for more on benefit sharing).

Why is integrity important?

This section provides a foundation for understanding integrity in carbon projects. For methodological guidance for developing high-integrity projects, see Section 4, and for an explanation of fair benefit sharing, see Section 6.

The integrity of carbon credits, especially those generated from NbS projects, has come under a lot of public scrutiny in recent years. Media reports and academic studies reported that a large share of projects registered with international carbon standards have overstated their mitigation impacts. Concerns that projects and carbon credits lack integrity drives down prices and reduces investment. Several examples of NbS integrity risks to illustrate some common criticisms are presented in Box 3. Projects that overstate their carbon benefits and ignore local community impact will ultimately fail to deliver long-term ecological benefits.

[e] Further information about NbS potential can be found in the Study on Carbon Market Opportunities and Technologies for Seven Eastern Africa Countries published by the EAA in November 2023. The study evaluates 37 activities and technologies using nine different criteria: accessibility, MRV, co-benefits, innovation, mitigation potential, proven, national priority, carbon finance, and cost.

Ensuring environmental integrity of carbon credits and integrity of underlying projects is key for the reputation of a project and for obtaining favourable prices in the market. Projects can avoid problems and ensure high integrity by aligning with the frameworks described above and following the guidance presented in subsequent sections of this manual.

Box 3. Common examples of NbS integrity risks

Avoided conversion projects lack additionality: there is not sufficient evidence that a forest or other ecosystem was facing imminent threats of conversion or degradation, and therefore the emissions the project claims to have avoided would not have occurred.

Non-permanence in restoration projects: a restored ecosystem is damaged by a disaster like a flood or a fire, resulting in removed emissions being released back into the atmosphere, and the project does not adequately account for this disruption.

Activity-shifting leakage: a project prevents or changes land use activities, but activities that cause emissions simply move outside of the project zone rather than being halted or changed.

Inflated emissions baselines: a project over-estimates the volume of emissions associated with the activities that it will halt, change, or offset, which results in overall less mitigation than the project reports.

Local stakeholders are not adequately consulted: a project is developed without appropriate consultation with local communities or other local stakeholders. As a result, communities experience negative impacts such as loss of livelihoods or land rights, stakeholders do not receive appropriate benefits, and/or local stakeholders decline to participate in project activities. This can all lead to decreasing or undermining emission reductions and removals.

In recent years, participants in and observers of carbon markets have demanded stronger oversight to ensure that credits are credible and are used to drive real climate change mitigation. In response, international integrity initiatives, such as the Integrity Council for the Voluntary Carbon Market (ICVCM) and the Voluntary Carbon Market Integrity Initiative (VCMI) have defined criteria and guidance to drive high-integrity carbon market activities. They provide guidance and oversight to carbon project developers, investors and buyers, and governments by assessing carbon crediting programmes and methodologies, recommending safeguards and arrangements to mitigate risks and promote benefits, and evaluating or guiding the use of carbon credits. Both organisations aim to ensure that carbon markets support progress towards the 1.5°C target for global warming set in the Paris Agreement.

ICVCM's Core Carbon Principles (CCPs)

The ICVCM developed the Core Carbon Principles (CCPs)[50] and an accompanying Assessment Framework to set out clear standards for quality in the voluntary carbon market. The CCPs set out fundamental, science-based principles for what high-integrity programmes and methodologies look like. To ensure integrity, projects should check that the standards they follow are CCP Approved. The ten CCPs, as presented by ICVCM, are listed in Table 4.

ICVCM uses the CCPs and an accompanying assessment framework to evaluate carbon-crediting programs (i.e., carbon standards) and categories of carbon credits.[51] Based on the assessment, carbon-crediting programs and crediting methodologies that meet the CCPs can be CCP-Approved, and issue CCP-labelled credits. As of August 2025, seven carbon standards[f] and 28 methodologies are CCP-Approved. ICVCM's Assessment Status webpage provides the latest updates of approved programs, credit types, and methodologies. This Manual will note which methodologies included are CCP-approved or not. In some cases, projects may not be able to use a CCP-approved methodology because methodologies may not be available for all project types. However, a project developer can still aim to align with the CCPs in the interim.

Table 2. ICVCM's ten CCPs

ICVCM CCPS BY CATEGORY
GOVERNANCE
1. **Effective governance:** The carbon-crediting program shall have effective program governance to ensure transparency, accountability, continuous improvement and the overall quality of carbon credits.
2. **Tracking:** The carbon-crediting program shall operate or make use of a registry to uniquely identify, record and track mitigation activities and carbon credits issued to ensure credits can be identified securely and unambiguously.
3. **Transparency:** The carbon-crediting program shall provide comprehensive and transparent information on all credited mitigation activities. The information shall be publicly available in electronic format and shall be accessible to non-specialized audiences, to enable scrutiny of mitigation activities.
4. **Robust independent third-party validation and verification:** The carbon-crediting program shall have program-level requirements for robust independent third-party validation and verification of mitigation activities.
EMISSIONS IMPACT
5. **Additionality:** The GHG emission reductions or removals from the mitigation activity shall be additional, i.e., they would not have occurred in the absence of the incentive created by carbon credit revenues.
6. **Permanence:** The GHG emission reductions or removals from the mitigation activity shall be permanent or, where there is a risk of reversal, there shall be measures in place to address those risks and compensate reversals.
7. **Robust quantification of ERRs:** The GHG emission reductions or removals from the mitigation activity shall be robustly quantified, based on conservative approaches, completeness and scientific methods.
8. **No double-counting:** The GHG emission reductions or removals from the mitigation activity shall not be double counted, i.e., they shall only be counted once towards achieving mitigation targets or goals. Double counting covers double issuance, double claiming, and double use.
SUSTAINABLE DEVELOPMENT
9. **Sustainable development benefits and safeguards:** The carbon-crediting program shall have clear guidance, tools and compliance procedures to ensure mitigation activities conform with or go beyond widely established industry best practices on social and environmental safeguards while delivering positive sustainable development impacts.

[f] Those standards are: ACR, Architecture for REDD+ Transactions (ART) The REDD+ Environmental Excellence Standard (TREES), Climate Action Reserve (CAR), Gold Standard, Isometric, and Verified Carbon Standard (VCS), Equitable Earth (ERS).

10. **Contribution toward net zero transition:** The mitigation activity shall avoid locking-in levels of GHG emissions, technologies or carbon-intensive practices that are incompatible with the objective of achieving net zero GHG emissions by mid-century.

Verra's ABACUS

Verra created the ABACUS label[52] for carbon credits from exceptionally high-integrity ecosystem restoration and reforestation projects. Labelled credits come from projects that exceed the requirements of Verra's methodology for Afforestation, Reforestation, and Revegetation – which itself is a CCP-approved methodology that is applicable in East Africa (see the Annex for details on this and other methodologies).

Projects seeking this label must go beyond the methodology requirements by:

- **Demonstrating dynamic additionality** through real-time comparisons with control areas,
- **Ensuring full transparency** by publishing data and annual disturbance reports,
- **Promoting permanence** by restoring diverse, appropriate ecosystems with ongoing carbon stock management, and
- **Avoiding displacing food production** by maintaining or enhancing agricultural output within and around the project area.

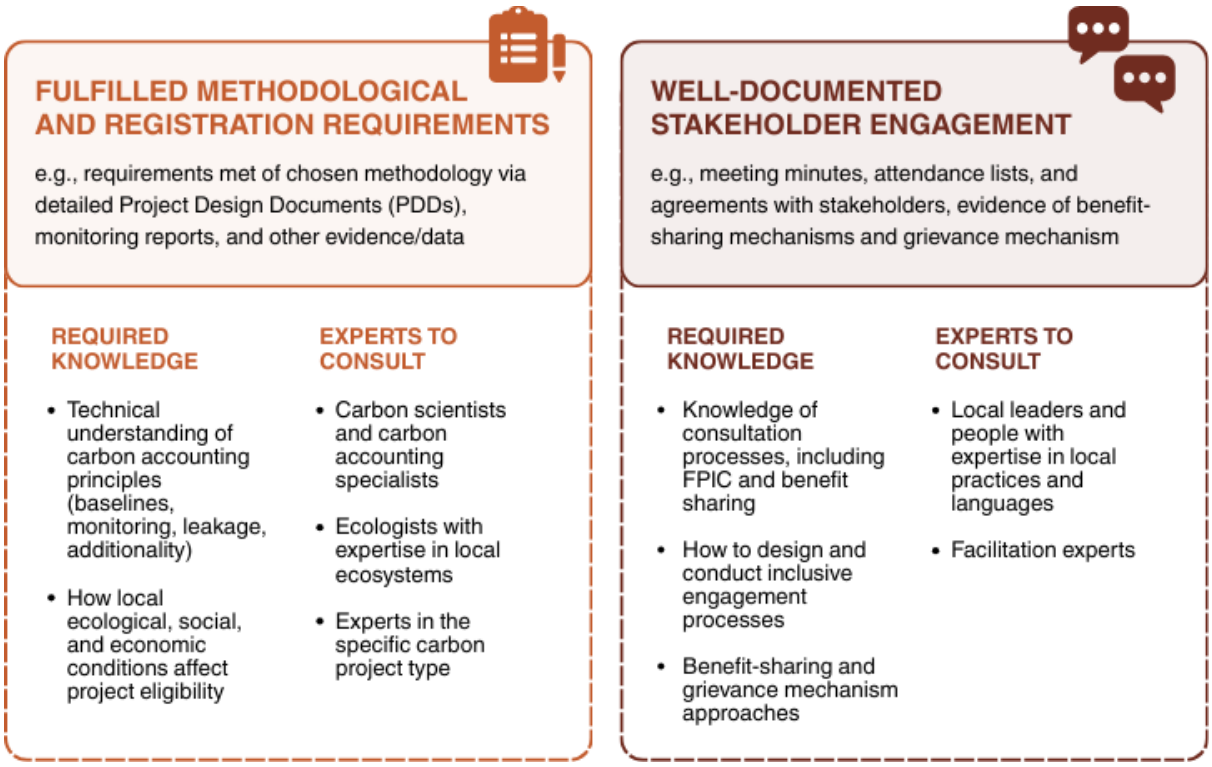
Section 3

Developing high-integrity NbS carbon projects

3.1. What technical assets and knowledge are needed to develop NbS projects?

Successfully developing a carbon project requires a combination of technical assets and specialised knowledge. A project developer will need ensure that they either possess all of these within their team or work with external advisors. Necessary assets and knowledge as well as the kinds of experts a project developer may consider including on its team are summarised in Figure 8, which may be used as a checklist when contemplating project development.

Figure 8. Summary of technical assets and related specialised knowledge needed for NbS project development



SPATIAL DATA

e.g., satellite imagery of land cover, cartographic maps, GIS polygons of the project area, maps created by local stakeholders about land use

REQUIRED KNOWLEDGE

- How to use GIS and spatial data platforms
- How to interpret and analyse spatial data for carbon project purposes

EXPERTS TO CONSULT

- GIS analysts and remote sensing specialists
- Local officials responsible for land mapping data
- Community leaders

INFORMATION ABOUT HISTORIC AND CURRENT LAND USES

e.g., records of agricultural activities, logging or timber concession records, traditional land-use practices

REQUIRED KNOWLEDGE

- How to interpret the information's impacts on carbon stocks, land rights, and the ability to implement the project

EXPERTS TO CONSULT

- Local officials and community leaders
- Landowners who have knowledge of the area
- Historians, ecologists, anthropologists who have worked there

LEGAL RECORDS AND DOCUMENTATION

e.g., documentation related to land rights and land use, and understanding of other relevant regulations, like Article 6

REQUIRED KNOWLEDGE

- Understanding national and local laws governing land use, forestry, and carbon ownership
- How these regulations and practices will impact project development

EXPERTS TO CONSULT

- Lawyers
- Local officials
- Community leaders

CLEAR PROJECT BUDGET

e.g., accurate estimates of all project costs (such as tree planting, community engagement, monitoring, verification, and beyond) and estimates of expected carbon credit revenues

REQUIRED KNOWLEDGE

- How to prepare cost estimates for each major project activity
- Understanding of carbon market dynamics (prices, buyers, demand)
- How to build financial models for different scenarios

EXPERTS TO CONSULT

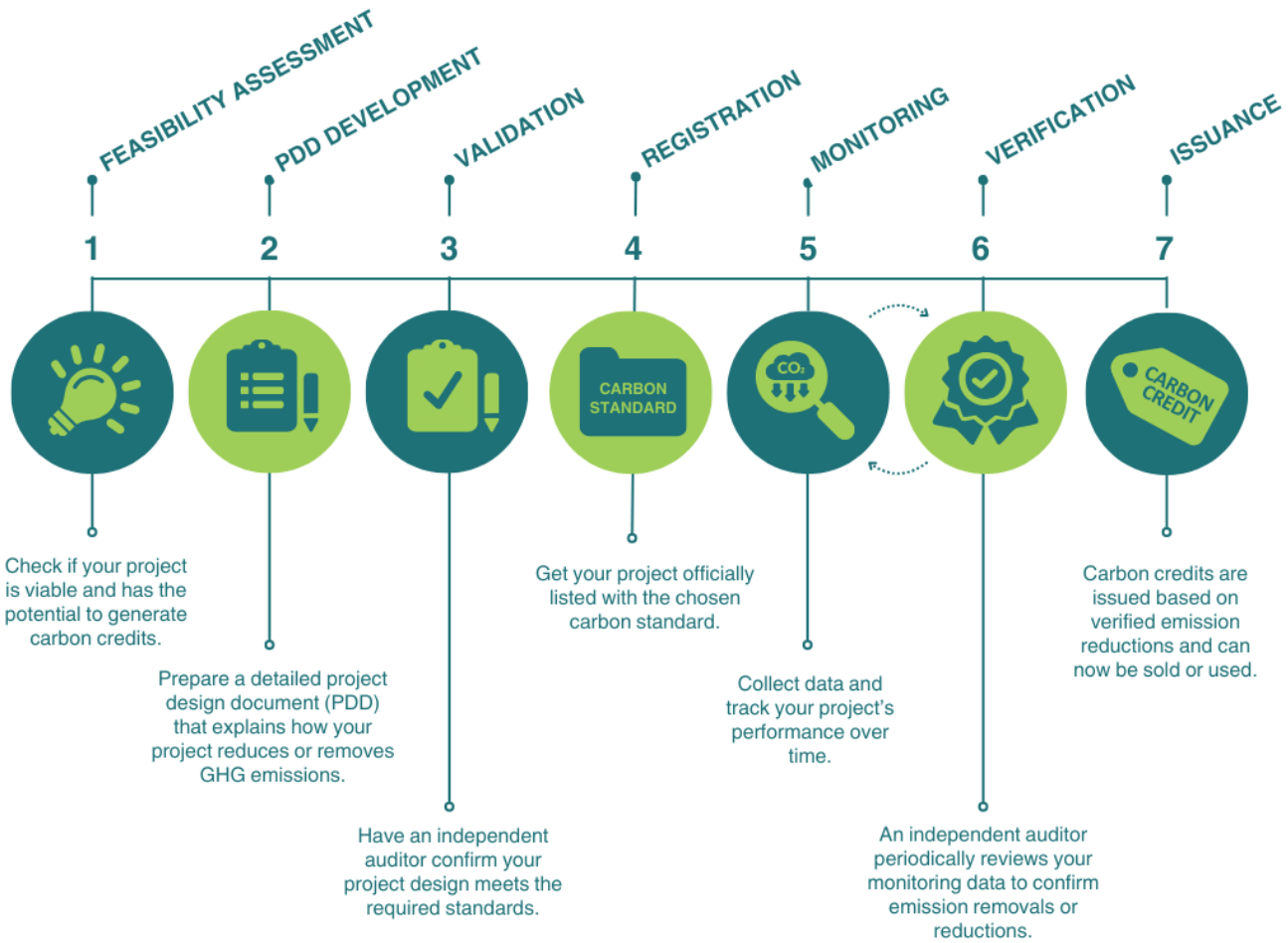
- Financial analysts or accountants
- Local officials who can provide information on local costs, permits, and fees
- Experts familiar with pricing trends and demand

3.2. Overview of steps in carbon project development

This section outlines the key steps in carbon project development – from the initial feasibility assessment to the issuance of carbon credits. To ensure buy-in and prevent future conflict, project proponents should ensure transparent stakeholder engagement and participation throughout the process.

The following sections provide an overview of typical timelines and costs for each project stage. However, costs and timelines depend on various aspects, including the type of project, the selected standard and carbon accounting methodology, and the degree of outsourcing tasks to service providers or external experts. The cost ranges presented below should be used as high-level estimates to inform budget and resource planning. Steps 1 through 4 present one-time costs, while steps 5 through 7 present ongoing costs.

Figure 9. Overview of the steps of carbon project development



3.3. Feasibility assessment (Step 1)

Overview

A feasibility assessment is a preliminary analysis conducted to evaluate a carbon project's basic viability and potential before committing significant time and resources to a project. It serves as an early decision-making tool to determine whether the project idea merits further development and investment.

A feasibility assessment identifies major risks or constraints – such as legal barriers, lack of community consent, weak data availability, or technical ineligibility under known methodologies – that could prevent the project from successfully being developed and implemented long term.

Table 3. Overview of a feasibility assessment

IN BRIEF	A feasibility assessment determines whether a project is technically, socially, and financially viable, based on the requirements of a carbon standard.
ESTIMATED TIME	2-6 months
ESTIMATED COSTS	USD 50,000 to USD 150,000

Conducting a feasibility assessment

The feasibility assessment should inform decisions about proceeding to the next stages of the project design and development, including the potential to generate high-quality and high-integrity carbon credits, significant risks, resource needs, financing needs, and stakeholder support. The following aspects should be covered in the feasibility assessment report at a minimum:

Table 4. Minimum components of a feasibility assessment report

SECTION	DESCRIPTION
PROPOSED PROJECT TYPE AND PROJECT ACTIVITIES	State the type of project (e.g., ARR, IFM, REDD+, ALM, blue carbon) and describe the project activities. For instance, the feasibility assessment report for an ARR project should explain the afforestation strategy – ANR, active restoration, commercial reforestation, agroforestry, or a combination of multiple strategies. For each activity, as much detail as possible on the operational side should be provided. Even though it is not necessary to have all the details sorted out at this stage, more information will ease decision-making for the project proponent and potential investors.

SECTION	DESCRIPTION
POTENTIAL CARBON METHODOLOGY AND STANDARD	Identify a methodology and standard that is applicable to the project. The following are some of the aspects to consider when choosing the standard and methodology: • Identify the methodologies available for the type of project and activities that will be implemented (See Annex 8.2) • Check the project alignment and compliance with methodologies' eligibility criteria. For instance, some methodologies have requirements on project duration, project area geographic location, land cover history, or project size (See Annex 8.2) • Identify recent or planned updates or changes to the methodologies • Review integrity criteria or major criticisms of the methodologies
PROJECT PROPONENT	Present the organisation that is proposing the project, and any other entities involved in the project development.
CREDITING PERIOD	Define the length of time the project will generate carbon credits. This period should be in line with a methodology or standard of choice. Some standards may require permanence of carbon stocks to be monitored for an extended time, beyond the length of the crediting period (e.g., VCS requires a minimum of 40 years for monitoring permanence).
PROJECT AREA	State the geographic boundaries of the area that the project and approximate area will intervene. This includes defining whether the project will be focused on a single geographic area or if it will be a grouped project. At this stage, grouped projects should have at least a first project area instance (PAI) to report and describe, and a list of criteria that new areas would need to meet to join the project (e.g., geographic region, ecosystem type, current land cover, landowner type). Land tenure arrangements and potential land use conflicts should also be identified. For instance, it should clarify if the area is affected by any type of legal reserve or consideration that limits activities that can be executed therein. Evaluate also how the project area's geophysical, climatic, and environmental conditions could facilitate or complicate the implementation of the project activities
LEGAL AND REGULATORY VIABILITY	Demonstrate that the project has a solid legal foundation and complies with applicable laws: • Verify land tenure and carbon rights – showing that the project developer or partners have legal access to the land and the right to generate and claim carbon credits. • Describe the national legal framework governing land use, forestry, biodiversity, and climate change, and how the project aligns with relevant policies, such as Nationally Determined Contributions (NDCs) or REDD+ strategies • Identify permits or authorisations required to implement the project and note their current status. • Outline any agreements with stakeholders, such as benefit-sharing arrangements or memorandums of understanding, and flag any legal risks like unresolved land disputes or unclear carbon rights. • Assess dispute resolution mechanisms and regulatory risks.
RELEVANT STAKEHOLDERS MAPPING AND ENGAGEMENT	Identify local communities, landowners, government entities, and implementing partners that will need to be involved throughout the project development. This mapping of roles helps to design the community involvement strategies and to identify potential issues related to benefit sharing, responsibilities, and project risks

SECTION	DESCRIPTION
	from the social perspective. Although not mandatory, include any information on stakeholder engagement that has already been carried out.
ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) CONSIDERATIONS	Identify the potential positive and negative impacts of the project beyond its climate mitigation impacts. This should include assessing impacts on ecosystem services, conservation or protected areas, biodiversity, local communities and landowners, local socio-economic conditions, and existing land rights. Projects may conduct an environmental and social impact assessment (ESIA). Projects should always conduct consultations with local residents who will be impacted by the project. If a project will impact Indigenous or traditional communities, the project may be required to follow a Free, Prior, and Informed Consent (FPIC) process.
PRELIMINARY TECHNICAL ASSESSMENT	The level of information for this section varies greatly. However, it is recommended to provide some preliminary analysis on the baseline scenario analysis, additionality claims, sources of leakage, risks to permanence, a coarse estimation of carbon credit volumes that can be generated through the project activities, and a draft of the monitoring plan.
FINANCIAL VIABILITY	A financial assessment, including carbon revenues under different carbon price scenarios and implementation costs, including any expenses related to consultations and social development, to determine under which conditions the project would remain financially viable. This financial analysis will also inform the additionality claims.

3.4. Developing a project design document (Step 2)

Overview

Once the project proponent has decided to pursue the proposed project, they will need to develop the project design document (PDD). The PDD is a foundational document required for project validation and registration, which presents comprehensive information about the project. It provides a complete description of the project's goals, context, technical design, baseline scenario, estimated emission reductions or removals, environmental and social safeguards, and monitoring plan.

As the PDD is a crucial document that provides a view of the project for the validator, standard, potential buyers, and the public, it is important that it is developed in a comprehensive but easily digestible format. Project developers are also encouraged to use the PDD development process as an opportunity to plan the project in detail, rather than viewing it merely as paperwork required for project registration.

Table 5. Overview of developing a PDD

IN BRIEF	A project design document (PDD) is a detailed document required by standards to register the project. It outlines the project's activities, baseline scenario, carbon accounting approach, and expected environmental and social impacts.

ESTIMATED TIME	9-18 months
ESTIMATED COSTS	USD 250,000 to USD 500,000[53]

Developing a PDD

First, confirm the standard and methodology. The PDD needs to be developed in accordance with rules and requirements defined in the selected methodology and standard. The process of selecting a standard and a methodology starts in the feasibility assessment stage and the key aspects to consider are described in that step.

At this stage, the developer will have already selected a methodology (and included it in the feasibility assessment). However, if necessary, it is still possible to switch the methodology. It is important to note that making this switch will involve transaction costs, as requirements per methodology differ and any sections of the PDD already developed will need to be adapted to the new methodology.

The PDD provides more detailed information than the feasibility study. This includes details about the data and information needed to show that the project is generating emission reductions or removals, a monitoring plan for how data will be collected and measured, and evidence that the project is complying with requirements like safeguards, benefit sharing, and stakeholder consultations.

The next page presents a checklist of the main elements that standards typically require project developers include in their PDD, organised by sections that often structure PDDs. Each standard has PDD templates that project developers must follow. This checklist does not replace those templates, but it will help project developers know if they generally have the necessary information. Sections 4 and 6 of this manual provide further explanation about methodological elements on this checklist.

Important tips

- *Start early and document everything:* Collect data and engage stakeholders early in the process, and keep records of consultations, data sources, and assumptions. Many of these records will be needed to demonstrate compliance with standard and methodology requirements.
- *Be consistent:* Ensure figures, names, and maps match throughout the document.
- *Be concise:* A PDD needs to be complete and meet requirements, but it does not have to contain excessive narrative. Use concise descriptions and take advantage of tables and graphics to present information.
- *Engage locally:* Local partners bring essential context and credibility.

PDD checklist

PROJECT OVERVIEW

- ☐ Project title
- ☐ Project description
- ☐ Project developers(s)
- ☐ Project location (country, region, coordinates)
- ☐ Start date and crediting period
- ☐ Type of NbS project (e.g., REDD+, ARR, IFM, blue carbon)
- ☐ Project goals (climate, biodiversity, community, economic)

ELIGIBILITY AND METHODOLOGY

- ☐ Selected standard and methodology
- ☐ Demonstration of applicability for the methodology
- ☐ Description of the project scenario
- ☐ Ex-ante[9] GHG benefits from the project
- ☐ Description and justification of the baseline scenario
- ☐ Explanation of additionality
- ☐ Identification of leakage risks and measures to reduce or compensate for leakage
- ☐ Identification of risks to carbon permanence and measures to ensure permanence (e.g., permanence buffer)

LEGAL DOCUMENTATION

- ☐ Evidence of compliance with relevant national, subnational, and local laws
- ☐ Evidence of land title and proof of ownership of carbon assets to be generated
- ☐ Appropriate contracts and agreements with local stakeholders

DATA AND MONITORING

- ☐ Specific indicators (carbon and non-carbon) that will be monitored throughout the project to measure project outcomes
- ☐ Data sources, tools (e.g., field plots, remote sensing)
- ☐ Monitoring plan that establishes what data will be collected, how data will be collected and analysed and at what frequency
- ☐ Monitoring protocol that provides specific guidance for collecting data and carrying out the monitoring plan

ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) DOCUMENTATION

- ☐ Evidence of compliance with social and environmental safeguards
- ☐ Plans for and evidence of consultation with local stakeholders, including evidence of FPIC if applicable
- ☐ Anticipated Sustainable Development Benefits and/or contributions to SDGs
- ☐ Anticipated positive or negative impacts on biodiversity and other elements of the ecosystem
- ☐ Anticipated livelihood improvements for local stakeholders
- ☐ Approach to gender and social inclusion
- ☐ Benefit sharing plans
- ☐ Description of grievance redress mechanism

FINANCIAL INFORMATION (OPTIONAL/CONFIDENTIAL)

- ☐ High-level financial feasibility
- ☐ Sources of funding
- ☐ Potential carbon revenues

[9] In carbon projects, *ex-ante* estimates are predictions made before the project outcomes are fully realized, based on models, assumptions, and expected conditions. They are essentially best estimates of how many emission reductions or removals (ERRs) a project is likely to generate in the future, before actual measurements (ex-post verification) occur.

3.5. Validation (Step 3)

Overview

Validation is a critical step in the registration process. This independent audit is required by standards to confirm that a project meets all applicable requirements.

During this step, a third-party auditor, often referred to as a Validation and Verification Body (VVB), reviews the project documentation and conducts a site visit to check compliance with requirements. Standards typically maintain a list of approved VVBs from which the project proponent can choose and hire to conduct validation.[54,55,56]

Table 6. Overview of the validation step

IN BRIEF	An independent review by a standard-accredited Validation and Verification Body (VVB) to confirm that the project design meets the requirements of the selected carbon standard.
ESTIMATED TIME	3-12 months
ESTIMATED COSTS	*Listing fee:* USD 1,000 to USD 5,000[57] *VVB:* USD 40,000 to USD 60,000[58]

How the validation process works

The validation process is interactive and iterative. The VVB will typically start with a desktop review of the PDD and supporting documentation (e.g., land tenure documents, baseline data, stakeholder consultation records). Any issues raised (see Table 7) need to be addressed by the project proponent to the validator's satisfaction. Most standards will require a site visit by the VVB to verify conditions on the ground and meet with community members. The site visit might be replaced with other methods if logistics and security do not allow, however most often a site visit will take place and needs to be organised by the project proponent.

Issues, inconsistencies, and gaps may be raised by the VVB as clarification requests (CRs), corrective action requests (CARs), and forward action requests (FARs). Depending on the issue, the project proponent will need to provide additional explanations or supporting evidence, resolve the finding to achieve compliance, or note the request for future project implementation and monitoring. The project proponent must respond to all CRs and CARs. This may involve modifying the PDD, submitting new data, refining assumptions, or providing more detailed records. This exchange may take several rounds until all issues are resolve to the VVBs satisfaction. See Table 7 for more information about addressing CRs, CARs, and FARs.

Some standards require that projects undergo a public consultation process in advance of validation. Validators are required to consider public comments submitted and any responses by the project proponent during the validation process. In this process, any members of the public – including those

directly involved in or impacted by the project as well as other interested parties or observers – can submit comments on any aspect of a project in the process of being validated. The project developer must consider the results of the consultations and incorporate them into the PDD.

The outcome of the validation process

The outcome of the validation process is a validation report issued by the VVB, which the project proponent can use to request registration of the project by the selected standard. This report contains:

- **Summary** information about the project
- **The scope** of the validation report and a description of the validation process
- **Findings and clarifications**, including a list of issues raised during the validation process and how the project proponent resolved them
- **Conclusion and validation statements**, indicating whether the VVB finds the project complies with the standard and recommends it for registration

Important tips

- *Select a relevant VVB:* When selecting a VVB, the project developer should consider the VVB's experience in the region and with NbS project type, language capability, and costs.
- *Get a head start:* Given the recent growth in carbon markets, there has been a shortage of VVBs, and it is recommended to engage a VVB as soon as possible. Many developers establish relationships with VVBs early in project development to ensure a smooth validation process and VVB availability.

Table 7. Description of the type of requests used by VVBs in their validation and verification process and the required actions by project developers

ISSUE TYPE	DESCRIPTION	REQUIRED ACTION
CLARIFICATION REQUESTS (CRS)	• Request for additional information or explanation when documentation is unclear or incomplete • Do not indicate non-compliance with standard requirements, but just the need for more information • Most frequent type of request during validation/verification	Provide additional explanations or supporting evidence
CORRECTIVE ACTION REQUESTS (CARS)	• Identify non-conformities or non-compliance with standard requirements • Require actual corrections to documentation, methodology, or project design • Can be raised for both major and minor non-conformities	Must be resolved before validation/verification can be completed

ISSUE TYPE	DESCRIPTION	REQUIRED ACTION
FORWARD ACTION REQUESTS (FARS)	• Identify issues that need to be addressed in future monitoring periods or verification cycles • Do not prevent current validation/verification completion • Often relate to monitoring plan improvements or data collection enhancements • Help ensure better compliance in subsequent periods	Receive and potentially address the recommendation for future project implementation and monitoring

3.6. Registration (Step 4)

Overview

In this step, the project proponent submits the successful validation report (from Step 3) and final project documents (initially developed in Step 2) to the carbon standard for registration. Standards and registries have online platforms for documentation submission (e.g., Verra Project Hub). The standard's secretariat or technical team may conduct a final review to ensure completeness and consistency. In depth project reviews by standards have become standard procedure in recent years.

Table 8. Overview of registration

IN BRIEF	Formal approval of a carbon project by the standard body (e.g., Verra, Gold Standard, Plan Vivo) after successful validation. It confirms that the project is eligible to generate carbon credits and is officially listed in the registry under the chosen methodology.
ESTIMATED TIME	1-3 months
ESTIMATED COSTS	USD 2,500 to USD 4,000[59,60]

What happens after successful registration?

If accepted, the project is assigned a unique identification number and listed in the standard's public registry (Box 4). Usually, the PDD and validation reports are made publicly available through the standard's registry. Most standards require the payment of a registration fee, which varies depending on the project size, standard, and credit volume. The project becomes eligible to start issuing carbon credits after validation (Step 6, section 3.8).

Box 4. Refresher on carbon registries

A carbon registry is a digital platform or database that records and tracks carbon credits. Its main goal is to ensure transparency, integrity, and accountability in carbon markets. The following are a registry's main functions:

- **Maintain and provide public access** to project records and documentation (e.g., PDD, and validation, verification and monitoring reports)
- **Generate and assign unique serial numbers** to verified emission reductions or removals
- **Allow credit holders to transfer, retire credits** (to use emissions) **or cancel them voluntarily** (e.g., for non-offsetting purposes like corporate claims).
- **Maintain a record of each credit's lifecycle**: issuance, transfer, retirement, and cancellation.
- **Track ownership and movement** of credits between accounts.

3.7. Monitoring (Step 5)

Overview

The monitoring process aims to quantify the volume of emission reduction and removals and other parameters in each monitoring period. The first monitoring period is typically in the first 3 years of the project, and monitoring then takes place at regular intervals (e.g., every 3 years) throughout the life of the project.

Table 9. Overview of monitoring process

IN BRIEF	Process of collecting and recording data on the project's performance, including GHG reductions/removals and co-benefits, according to the monitoring plan in the PDD.
ESTIMATED TIME	Usually a continuous process, with a minimum reporting frequency of once per year after the project start date. Developing a monitoring report can take 2-4 months.
ESTIMATED COSTS	USD 50,000 to USD 200,000[61,62,63]

Monitoring involves systematic data collection, analysis, and documentation related to the project implementation and performance. Monitoring should be done according to a monitoring plan established in the PDD. Ideally, the plan should include a monitoring protocol that provides clear, practical guidance for people collecting and analysing data. The monitoring protocol can enable local stakeholders to carry out aspects of project monitoring. The results of the monitoring process are presented in a monitoring report. Monitoring reports are independently verified by a VVB and once accepted by the standard, provide the basis for issuance of carbon credits (see Steps 6 and 7).

Grouped projects can add new project areas instances during the monitoring and verification process. To add new instances, a project needs to indicate new project areas and their compliance with eligibility criteria defined in the PDD. This information if verified alongside other project information.

Carrying out the monitoring process

First, refer to the project's monitoring plan. The monitoring process follows a monitoring plan, which is documented in the PDD (as listed in the PDD structure and contents). The monitoring plan is approved as part of the validation and registration process. Monitoring activities are carried out according to the approved plan and accompanying protocol and can begin as early as the project start date.

Second, carry out the monitoring activities. Depending on the project and methodological requirements, monitoring activities may involve field measurements, remote sensing and GIS data analysis, leakage tracking, evaluation of non-carbon benefits (e.g., biodiversity, environmental, or social impacts), and review of safeguards benefit sharing, and grievance mechanisms implementation.

Third, systematically record this data. The project developer must ensure that all data collected is appropriately recorded, stored, and saved with back-ups. This applies to raw data, metadata (i.e., who collected the data, when, and how), calculation spreadsheets, software output, and quality assurance procedures. The project developer should ensure that staff receive sufficient training and adhere to Standard Operating Procedures (SOP) to ensure accuracy and consistency in the data collection, analysis, and storage. A monitoring protocol that provides practical guidance for staff or local stakeholders can help to ensure that data is collected, stored, and analysed correctly.

Fourth, produce the monitoring report and repeat the process at regular intervals. The frequency of the monitoring depends on the standard and methodology. Most methodologies and standards require submission of a verified monitoring report at least every 4-6 years. The following information generally needs to be included in monitoring reports:

- Activities conducted during the monitoring period
- Data collected and analysed
- Estimated GHG emissions reductions or removals
- Updates to the baseline or project scenarios and assumptions
- Updates to the leakage estimates and assumptions for permanence
- Any issues encountered during the project implementation and the corrective actions

Important tips

Partnering with local institutions, training communities to participate in monitoring, and using technology (e.g., mobile data collection, open-source satellite imagery) can strengthen monitoring systems and reduce costs. Establishing a clear monitoring protocol facilitates bringing on local partners.

3.8. Verification (Step 6)

Overview

In this step, a VVB audits performance of the project as reported in the periodic monitoring report. The goal is for the VVB to assess whether the project activities were carried out as planned and whether the reported ERR are accurate and verifiable. Verification is required before a project proponent can request issuance of carbon credits.

Table 10. Overview of verification

IN BRIEF	A periodic audit by a VVB to assess whether the monitored results are accurate, credible, and compliant with the methodology and standard. This step is required for carbon credits issuance.
ESTIMATED TIME	Every 2-5 years after the project start date. The process can take 2-4 months per cycle.
ESTIMATED COSTS	USD 100,000 to USD 300,000[64]

How the verification process works

As with validation, the project will need to contract a VVB from the standard's approved VVB list. In some cases, the project may be able to use the same VVB for both validation and verification, and in other cases the standard may require using different VVBs.

The following are some of the activities the VVB will carry out during the verification process:

- Desk review of the monitoring report
- Review the methodology for collecting monitoring data, including field measurements and remote sensing imagery, and check compliance with the monitoring methodology

- Visit to the project site
- Interview project staff and other stakeholders
- Review the application of the permanence buffer, leakage discounts, and any updates to the baseline conditions and emissions

Important tips

For the first issuance of credits, validation of the PDD and verification of the first monitoring report may be conducted simultaneously. This often happens in cases where projects have been engaged in climate change mitigation activities before seeking project registration.

3.9. Issuance (Step 7)

Overview

Issuance is the formal process through which the carbon standard recognises the project's climate benefits and converts them into tradable carbon credits. These credits are issued by recording a unique serial number for each credit in the standard's registry.

Before issuance, the project must have completed the monitoring process (Step 5) and verification process (Step 6) and have submitted a verification report to the carbon standard. The carbon standard reviews the documentation to confirm that the project complies all applicable requirements.

Most standards have a credit issuance fee, often based on the number of credits to be issued.

Table 11. Overview of issuance

IN BRIEF	Upon successful verification, the corresponding standard issues carbon credits to the project, which can then be sold or retired in the carbon market.
ESTIMATED TIME	Credits can be issued for each verification cycle (i.e., every 2-5 years). The process can take 1-2 months.
ESTIMATED COSTS	USD 0.002 to USD 0.40[50,65] per credit

What happens after issuance?

Once issued, credits can finally be transferred or retired on behalf of buyers or investors. Credits are considered retired by or on behalf of a buyer when they have been used (e.g., to make a compensation claim). Once retired, a credit can no longer be transferred and it is recorded as "used" in the registry. Before credit issuance, a portion of the credits generated by the project is directed to the project permanence buffer pool.

Early crediting or retroactive accounting (i.e., issuing credits for emissions reductions or carbon removals that happened before registration) may be allowed by some standards if properly justified and demonstrated. For this purpose, monitoring must have been carried out since the project start date (i.e., the entire period for which credits are being claimed).

3.10. Summary of costs

Table 12. Summary of estimated costs across all steps

PROJECT DEVELOPMENT STEP	ESTIMATED COSTS
STEP 1: FEASIBILITY ASSESSMENT	USD 50,000 to USD 150,000
STEP 2: PROJECT DESIGN DOCUMENT DEVELOPMENT	USD 250,000 to USD 500,000[66]
STEP 3: VALIDATION	*Listing fee:* USD 1,000 to USD 5,000[67] *VVB:* USD 40,000 to USD 60,000[68]
STEP 4: REGISTRATION	USD 2,500 to USD 4,000[69,70]
STEP 5: MONITORING	USD 50,000 to USD 200,000[71,72,73]
STEP 6: VERIFICATION	USD 100,000 to USD 300,000[74]
STEP 7: ISSUANCE	USD 0.002 to USD 0.40[50,75] per credit

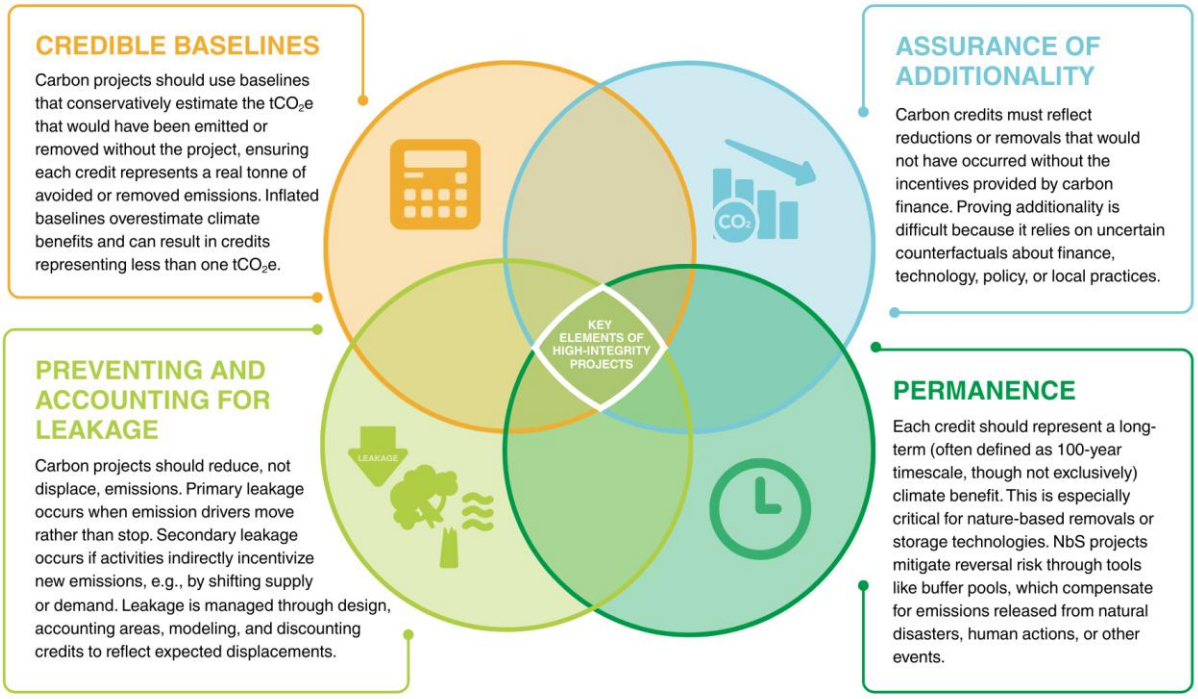
Section 4

Methodological guidance for developing NbS projects

4.1. Overview of methodological guidance

Section 3 outlined the basic steps for developing a carbon project, providing a high-level roadmap from concept to credit issuance. This section highlights essential elements for successfully carrying out the seven project development steps presented in the previous section. These elements are baseline selection, accounting for leakage, ensuring permanence, demonstrating additionality, quantifying emission reductions and removals in different NbS project types, and implementing environmental and social safeguards

Figure 10. Methodological guidance for high-integrity carbon projects



4.2. How to establish baselines and demonstrate additionality

Establishing a baseline scenario

The baseline scenario is a counterfactual scenario that estimates – as accurately as possible – what *would have happened* in the *absence* of the project intervention. The baseline establishes how many emissions would have occurred without the project. The emission reductions or removals generated by the project are determined by measuring how many fewer emissions occurred or how much GHGs were removed relative to the baseline. Carbon projects are required to quantify and justify the most likely baseline scenario. This quantified baseline becomes the reference point for calculating the net emission reductions

or removals achieved by a project (i.e., beyond any emission reductions or removals that would have occurred in its absence).

Establishing a baseline is essential because it provides the comparison for estimating the project's impact: without a baseline, there is no way to determine the quantity of emissions that are reduced or removed. The accuracy of the baseline emission estimates directly impacts project credibility and the integrity of generated carbon credits (Baseline emissions are explained in Section 4.3).

Most methodologies – including the AR-TOOL02[76h] used by many methodologies –identify and demonstrate the most likely baseline scenario by analysing alternative scenarios. Projects are generally required to analyse three types of alternative scenarios (Table 13). The scenario identified as most likely is used as the project baseline.

Table 13. Types of alternative scenarios to consider using as a baseline

ALTERNATIVE SCENARIO	DESCRIPTION
STATUS QUO CONTINUATION	• **Scenario:** The current land use practices will continue unchanged. For example: as-is cattle grazing, as-is forest management, or as-is agricultural practices – which may be unsustainable – will continue. • **Considerations:** Generally easier to justify since it reflects documented historical patterns.
PROJECT IMPLEMENTATION WITHOUT CARBON FINANCE	• **Scenario:** The same proposed project activities are implemented – but are funded through alternative mechanisms (*not carbon finance*). • **Considerations:** Requires demonstrating that the project lacks financial viability without carbon revenues. Must show that carbon finance is the critical enabling factor.
OTHER ALTERNATIVE LAND USE SCENARIOS	• **Scenario:** Conversion to different land uses (forest to agriculture, grazing to crops), or development or intensification of current uses. These can also be described as opportunity cost alternatives (i.e., foregone economic benefit of choosing conservation/restoration instead of converting or intensifying land use). • **Considerations:** Scenarios involving significant land use changes demand stronger evidence, including economic analysis, regulatory assessment, and demonstration of underlying drivers.

The following three approaches are often used (and required by methodologies) to analyse the alternative scenarios in Table 13 and identify the most likely one:

1. **Barrier analysis:** project developers conduct a barrier analysis to identify obstacles that would prevent implementation of the alternative scenarios. Scenarios with fewer barriers are more likely to represent what would have occurred in absence of the project. This involves systematically evaluating investment barriers (capital constraints, financing availability), institutional barriers (regulations, permitting requirements), technological barriers (technical capacity, infrastructure limitations), and ecological barriers (resource availability, environmental constraints) for each

[h] The CDM "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" (AR-AM-Tool-02, version 1.0) provides a standardized, stepwise framework to identify a project's baseline scenario and simultaneously assess additionality for afforestation and reforestation activities under CDM (https://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-02-v1.pdf/history_view)

potential baseline scenario. Barrier analysis for baseline setting is required by most methodologies and for most project types.

2. Investment or financial analysis: project developers conduct an investment or financial analysis to determine which alternative scenario would be most economically attractive and therefore most likely to be implemented without the carbon project. This analysis compares financial metrics (e.g., net present value, internal rate of return, payback periods) for the different scenarios to identify which option rational investors would choose based on economic returns alone. The analysis considers realistic financing conditions, market prices, and investment criteria relevant to the sector and region. Financial or investment analysis for baseline setting is required by most methodologies and for most project types.

3. Common practice analysis: project developers conduct a common practice analysis is to identify what scenarios are typically implemented in similar circumstances within the relevant geographic and sectoral context. This analysis surveys existing market practices and adoption patterns to identify the most commonly chosen alternatives when facing comparable conditions. The common practice analysis for baseline setting is most often used by IFM methodologies.

Demonstrating additionality

Additionality is a principle that aims to ensure that the project activities would not have happened without the financial incentive provided by carbon credits. Testing additionality is critical to determine if the GHG emission reductions or removals generated by a project are above and beyond what would have occurred in the absence of the project and may, therefore, be issued as carbon credits.

The following are common requirements for demonstrating additionality:

- Regulatory surplus: The project activity must not already be required by law. If required by law, the project needs to prove the law to be chronically unenforced.
- Financial additionality: The project activity must not be the most financially attractive of the viable land use scenarios without revenue from the carbon project.
- Barrier analysis: A project may choose to apply a barrier analysis, demonstrating that the project faces significant barriers that prevent it from being implemented in the absence of carbon finance (e.g., investment, institutional, technological, ecological, and other barriers).
- Common practice analysis: The project activity must not be commonly implemented in the region without support from carbon finance.
- Performance-based approaches: The project must demonstrate that its technology or practice performs well beyond a defined benchmark (performance threshold). To use this approach, projects must be able to identify a suitable indicator of performance and to find robust and representative data to measure and compare this indicator.
- Analysis of lock-in risk: The project must prove it will not cause long-term dependence on unsustainable, high-emission practices, even if beneficial in the short term. This requirement is unique to Article 6.4.[77]

Baselines and additionality considerations by project type

Table 14 describes specific challenges and aspects to consider for selecting a baseline and demonstrating additionality in each type of project.

Table 14. Considerations regarding baselines and additionality by project type

ARR (INCLUDING AGROFORESTRY)	
BASELINE CONSIDERATIONS	• **As a safeguard to prevent perverse incentives that drive ecosystem degradation**, the project developer typically needs to demonstrate that the project area has not been deforested or degraded in the recent past (typically 10+ years but varies among methodologies). Under some standards and methodologies, this is an eligibility criterion for ARR. However, it is still important to demonstrate that without the project activities, the area would stay deforested, as it has historically been. • **If the land has been abandoned in recent years** (e.g., not actively managed for agriculture or grazing), the PD will need to demonstrate that natural regeneration would not be possible or would occur at a slow rate in the absence of human intervention. • **For agroforestry and regenerative agriculture**, current crop yields and management practices are also part of the baseline scenario (e.g., continuation of conventional agriculture without tree integration). This requires additional supporting information on historic farming practices or common farming practices in the region. • **In coastal wetland restoration projects**, the baseline typically assumes continued degradation or conversion of wetlands due to pressures such as agriculture, aquaculture, and urban development. This scenario is supported by historical patterns of wetland loss and an analysis of ongoing threats. • **Seagrass restoration** projects typically establish a baseline of ongoing degradation due to declining water quality, physical disturbances (e.g., boating or dredging), and coastal development. A key aspect of the baseline analysis is understanding the natural recovery rates of seagrass ecosystems and the factors that may limit regeneration without active intervention.
DEMONSTRATING ADDITIONALITY	• **Restoration and afforestation are mandated by law in certain areas in some countries** (e.g., river margins). Therefore, it is important to either demonstrate chronic lack of enforcement of such laws or exclude areas that are mandated to be afforested by law from the project. • **Additionality is relatively easy to demonstrate in restoration projects that lack non-carbon revenues and public incentives**. In turn, it can be challenging to demonstrate for commercial ARR or agroforestry projects, due to availability of non-carbon revenues that may be sufficiently attractive. Therefore, it is important that commercial forestry and agroforestry projects are able to show insufficient return on investment from timber or agricultural products alone, and/or to prove a lack of alternative funding sources for restoration activities. Moreover, the high upfront costs, long payback periods, and limited access to capital are other financial barriers that can be shown to demonstrate additionality. • **Non-financial barriers may also be used to demonstrate that the ARR activity would not happen in the absence of carbon finance**. This may include lack of knowledge and experience with ARR, significant soil

	degradation that prevents natural regeneration, lack of equipment or planting materials, market conditions and practices, lack of skilled labour force, and many other ecological and socioeconomic conditions that can be demonstrated through documentation. • **In the specific case of agroforestry**, it is important and common to demonstrate that most farmers would not incorporate trees into their cropping systems without an economic incentive. This is a barrier related to traditional production practices and scepticism towards new methods. Additionally, there can also be a lack of required knowledge and expertise in agroforestry. In coastal restoration, barriers to natural regeneration include coastal erosion and unsustainable and unregulated use of public resources. • **In seagrass restoration,** degradation causes that prevent natural regeneration include poor water quality, boat traffic, and coastal construction. Similarly, seagrass restoration is a challenging task that requires specialised equipment, expertise and logistics, which are not typically available without dedicated funding. • **Both mangrove and seagrass restoration** require a long-term commitment to maintenance and monitoring, which requires sustainable finance.
CONSERVATION (INCLUDING AVOIDED GRASSLAND CONVERSION AND AVOIDED FOREST CONVERSION)	

BASELINE CONSIDERATIONS	• **For avoided forest conversion projects**, the baseline scenario demonstration requires spatial analysis of deforestation patterns and threats that show ongoing deforestation within or close to the project area or presence of other threats such as those resulting from economic drivers, infrastructure development, or regulatory changes. Projects need to use this information to derive their project-level baseline.
	• **Similarly, for avoided grassland conversion**, the PD should demonstrate the baseline scenario through:
	  ○ Historical conversion rates in similar areas
	  ○ Economic incentives for conversion (e.g., commodity prices, land values)
	  ○ Regulatory environment and conversion permissions
	These management practices must be backed up by published or project-specific data and models, historic grazing plans, or local statistics of grazing areas and fire history.
	• **In mangrove conservation projects**, the baseline is generally characterised by the continued loss of mangrove forests driven by economic activities such as shrimp farming, palm oil plantations, or coastal infrastructure expansion. Demonstrating this scenario involves identifying the economic drivers behind land conversion, evaluating the effectiveness of existing regulatory enforcement, and considering local communities' dependence on mangrove resources for livelihoods.

DEMONSTRATING ADDITIONALITY	• **In avoided conversion projects, demonstrating additionality involves building a compelling case** that, in the absence of the carbon project, the land would likely be converted to another use with significant carbon emissions, and that the project is essential to preventing this outcome. There are three key aspects that support the additionality claim:
	  ○ **Evidence of imminent threats** from historic and recent deforestation rates in nearby areas and land use trends. This should include a regulatory assessment that shows that legal protection is weak, enforcement is limited, and/or there are legal gaps that would allow deforestation to continue.
	  ○ **An economic analysis** shows that converting the land is more financially attractive to landowners than maintaining the forest.
	  ○ **A market analysis** that shows how grassland conversion is appealing due to crop prices, land value, or government incentives.

IMPROVED MANAGEMENT (INCLUDING IFM AND IMPROVED AGRICULTURAL LAND MANAGEMENT)	
BASELINE CONSIDERATIONS	• **In developing a baseline scenario for Improved Forest Management (IFM) projects**, the starting point is typically the continuation of existing forest management practices. This includes maintaining the current harvest schedules, rotation lengths, silvicultural techniques, species composition, and forest stocking levels. The baseline may be based on either legally required management standards or common practice within the region, depending on the methodology used. Demonstrating the baseline scenario involves documenting these practices through historical records and verifying that they represent the most likely scenario in the absence of the carbon project. In projects attempting to change logging practices in forests that are legally exploitable but where no logging has taken place before the project start date, the baseline setting relies on legally required management standards and/or common practice within the region. • **For Improved Agricultural Land Management (IALM) projects**, the baseline scenario is generally defined as the continuation of conventional agricultural practices. This includes existing tillage systems, fertilisation regimes, water management and irrigation, grazing practices, crop rotations, and current levels of soil carbon and management intensity. The baseline assessment also involves evaluating the economic and practical barriers to adopting improved practices without carbon incentives. The type of information typically required to support the baseline scenario includes signed attestation from the farmer or landowner, historical management records (e.g., management logs, receipts, invoices, farm equipment and machines) and plans (e.g., management plan, recommendation documents from an agronomist), and local or regional statistics of agricultural practices (e.g., from agricultural census data).
DEMONSTRATING ADDITIONALITY	• **Improved management projects** should demonstrate that there are significant barriers to implementing more optimal practices from a carbon perspective, and that these barriers can be overcome with carbon incentives. The following are some useful aspects to include in additionality analysis of improved management projects: ○ **A regulatory assessment** showing that the proposed improved management goes beyond legal requirements and common practice.

	○ **A management practice analysis** that shows how traditional practices comply with legal requirements but do not maximise carbon stocks. These practices tend to favour short-economic returns rather than long-term sustainability. ○ **An economic analysis** that demonstrates that improved practices would lead to reduced financial returns for landowners, farmers or forest managers without carbon revenue. ○ **An adoption barrier assessment** where technical, cultural and logistical reasons for not adopting improved management practices are identified (e.g., lack of knowledge or infrastructure, yield uncertainty, unfamiliar techniques). • Evidence for these assessments may include agricultural census or other governmental data, peer-review articles, other independent research data or reports, and expert statements as a last resource.

4.3. Leakage

Leakage is when the project displaces activities that generate emissions to outside of the project area instead of halting or reducing emission-generating activities.

There are three main types of leakage:

- **Activity-shifting leakage:** Baseline agents shift their pre-project or baseline activities (e.g., deforestation in the case of AUD or cattle grazing in the case of ARR project), and corresponding emissions, outside the project area. For this type of leakage, methodologies typically require identification of the baseline agent or type of agent and require monitoring of areas that activities may be displaced to (e.g., leakage belts around an AUD project, other properties of a company managing an IFM or ALM project).
- **Market leakage:** If the project reduces the supply of a commodity (e.g., timber, livestock, agriculture), market forces may compensate elsewhere, potentially causing equivalent emissions. For this type of leakage, methodologies typically require an estimation of the magnitude of supply reduction to determine a market leakage factor, as direct monitoring is almost impossible.
- **Ecological leakage:** Occurs when project activities cause ecosystem degradation elsewhere (e.g., when restoration affects hydrology and negatively affects downstream ecosystems). Ecological leakage involves biophysical processes (e.g., water displacement, species migration, soil nutrient changes) that can result in biodiversity loss, habitat shifts, or carbon emissions outside the project boundary.

Table 15 shows the main aspects on estimating leakage for each project type that you will need to pay special attention to and propose mitigation activities for.

Table 15. Leakage considerations and mitigation activities for different project types.

PROJECT TYPE	LEAKAGE CONSIDERATIONS	MITIGATION ACTIVITIES
ARR	Activity displacement and market leakage are important in restoration and reforestation projects that happen in areas that used to be croplands or grazing lands. It is less important when the activities happen in abandoned areas or in agroforestry systems. Blue carbon projects can result in coastal development, fishing, and aquaculture shifting to adjacent areas. Ecological leakage can occur if the project affects the water table depth or flooding frequency in other areas.	• Identify and prioritise degraded or abandoned lands with no active use. • Incorporate agroforestry or silvopastoral systems to maintain productive use or increase productive use in other areas. • Support alternative livelihoods or intensification strategies outside the project area to reduce pressure. • Monitor landowners' activities or use agreements where landowner commit to not displacing their activities to other areas. • Provide alternative livelihoods to local communities to reduce pressure. • Advocate for legal protections and zoning regulations that restrict development in adjacent areas. • Use hydrologic models to estimate water displacement from project activities.
CONSERVATION	Loggers or developers may shift their activities to nearby non-project lands. Blue carbon projects can result in coastal development, fishing, and aquaculture shifting to adjacent areas.	• Engage in landscape-level planning and coordinate with nearby landowners and government to address regional drivers of land use change. • Support alternative livelihoods or intensification strategies outside the project area to reduce pressure. • Monitor landowners' activities or use agreements where landowner commit to not displacing their activities to other areas. • Monitor surrounding areas for displacement and implement buffer zones if needed. • Provide alternative livelihoods to local communities to reduce pressure. • Advocate for legal protections and zoning regulations that restrict development in adjacent areas.
IMPROVED MANAGEMENT	Market leakage is critical in IFM projects that reduce or completely stop harvesting timber. The timber supply deficit is likely to be compensated by increase in harvesting outside the project area. On the other hand, in IFM projects that increase	• Design productive IFM practices that maintain or increase timber supply. • Establish long-term management plans and contracts to lock in improved practices.

	productivity, market leakage is unlikely as no timber supply needs to be made up elsewhere.

All standards and methodologies provide guidelines on how to estimate leakage risk and leakage discount. The following are some of the most common approaches and tools:

- VCS VMD0054 Module for Estimating Leakage from ARR Activities: Applies to ARR projects seeking registration under the VCS)
- Plan Vivo Leakage estimation tool (PU004): Applies to agriculture, forestry, and other land use (AFOLU) projects seeking registration under the Plan Vivo standard
- VMD0011 Estimation of emissions from market-effects (LK-ME), v1.2: Applies to REDD+ projects

Some methodologies use their own procedure to estimate leakage without using an external tool (e.g., VM0032, VM0042, VM0048, and GS Sustainable Management of Mangroves). In VM0033, the applicability conditions are supposed to guarantee that leakage other than ecological leakage does not occur, and can, therefore, be deemed zero. However, ecological leakage must be carefully assessed according to the methodology's guidelines. See the Annex for more details about each methodology.

4.4. Permanence

Permanence (or durability) refers to the ability of the project to maintain the claimed reductions and removals long-term. The *non-permanence risk* refers to the likelihood that carbon storage will be reversed, for example through deforestation or ecosystem degradation at a later point in time, releasing the carbon back to the atmosphere and therefore diminishing, or nullifying, the mitigation benefits achieved by the project.

There is no universally accepted threshold that defines what constitutes a *permanent* carbon storage. However, for forest carbon projects, permanence usually means that carbon is stored for a defined period of time that extends throughout and beyond the project crediting period. Verra, for example, assesses permanence over 100 years from the project start date.

All standards require projects to analyse and mitigate non-permanence risk. For example, for AFOLU carbon projects, Verra requires the following risk factors to be analysed using its Non-Permanence Risk Tool:[i]

- Internal risks: project design (e.g., planted species), project management (e.g., team experience level), financial viability (e.g., payback period), opportunity costs (e.g., positive community impacts), project longevity (e.g., duration of legally binding agreements).

[i] See, for example, the VCS AFOLU Non-Permanence Risk Tool.

- External risks: land tenure (e.g., agreements over land ownership and resource access, risk of land expropriation), stakeholder engagement e.g., consultation of external stakeholder that use land on the project area), political risk (e.g., governance score of the country).
- Natural risk: forest fire, pest and diseases, extreme weather, sea-level rise.

While standards are innovating approaches to address non-permanence risk, a common approach is to require projects to withhold a certain percentage of emission reductions and removals achieved in a reserve, also referred to as a non-permanence buffer, that serves as an insurance against future reversals. The percentage of credits that projects need to contribute to the buffer pool is either fixed or determined through a non-permanence risk assessment.

Most standards and methodologies have developed their own risk assessment approaches or tools. Below are some of the most common tools for risk assessment tools allowed or provided by carbon standards:

- VCS Permanence Risk Tool (VCS AFOLU Risk Tool, v4.0): VCS uses a detailed, standardised assessment for all AFOLU. The tools divides risks into the three main types mentioned before (i.e., internal, external, and natural) and provides a score to each component. According to this score, it calculates the proportion of credits to be allocated to the non-permanence buffer pool. This proportion can range from 10-60%, depending on the risk level.
- Gold Standard has two relevant risk assessment tools: 1) the "Guidelines: Risks & Capacities for Agriculture & Forestry" and 2) the "Guidelines: Risks & Capacities for Blue Carbon & Freshwater Wetlands Activities." Both tools provide a structured framework for assessing performance risks associated with potential non-delivery or reversal of emission reductions and removals. They employ a risk scoring methodology that evaluates risk categories like natural disturbances, political, project management, financial, market, and other risks. The main difference is that the first document focuses on agricultural and forestry systems, and the second specifically targets freshwater wetlands and blue carbon ecosystems like mangroves.
- Plan Vivo uses a different approach, where 10% of carbon benefits are withheld to mitigate the risk of underperformance and 20% are allocated to the risk buffer, for all projects. These values are used to calculate future and reported and verified Plan Vivo certificates (PVCs).

Table 16 shows the main risks to permanence by project type that you will need to pay special attention to and propose mitigation activities for.

Table 16. Risks and mitigation activities associated with the different project types.

PROJECT TYPE	MAIN RISKS	MITIGATION ACTIVITIES
ALL PROJECT TYPES	• Reversal of practices and/or landowners leaving the programme before the end of the crediting period, especially in grouped projects	• Long-term land tenure and conservation agreements • Extensive stakeholder engagement and capacity building among landowners or farmers • Alignment with national policies • Improve communities' governance

	• Illegal logging, deforestation, or land use change	
ARR	• Tree mortality related to natural events such as wildfires, pests, and droughts • Coastal erosion, sea-level rise, and hydrological disruptions (in mangrove and seagrass restoration projects)	• Firebreaks, fire early warning systems, and community fire brigades. • Integrated pest management strategies • Selection of drought-tolerant species, irrigation systems, and soil moisture retention techniques • Diversified and sustained funding mechanisms • Integrate the project into national coastal management plans and protect areas through zoning • Reconnect tidal flows, remove barriers, or restore natural water movement • Stabilise shorelines with NbS solutions like sediment trapping structure • Track erosion and deposition rates
CONSERVATION	• Political or economic pressures to convert the land • Ecosystem degradation from natural events such as wildfires and droughts	• Formalise land rights • Provide alternative livelihoods by supporting community-based economic initiatives (e.g., ecotourism, agroforestry) • Improve communities' governance • Firebreaks, fire early warning systems, and community fire brigades. • Monitoring of drought and widespread mortality events
IMPROVED MANAGEMENT	• Market shifts that affect management decisions	• Monitoring and adaptive management of practices • Align practices with national or regional sustainable land-use policies

4.5. How to quantify emission reductions and removals

Quantification of emission reductions and removals refers to the process of estimating how many GHG emissions have been reduced or removed from the atmosphere due to the carbon project. This quantification should be thorough and transparently documented to ensure that the emission reductions or removals—and corresponding carbon credits—are scientifically sound, credible, and verifiable.

Emission reduction and removal quantification depends on the following:

- **The baseline:** As explained in section 4.2, the baseline is the GHG emissions that would have occurred in the absence of the project.

- **Project emissions and removals**: Estimated GHG emissions and removals that will result from project implementation. Project emissions and removals are estimated ex-ante[j] and documented in the PDD. Monitoring is required to estimate actual amount of emission reductions or removals that result during the project implementation.
- **Carbon pools and GHG emission sources:** Both the baseline and project emissions estimates should account for all relevant carbon pools and any significant sources of GHG emissions in the project area. Methodologies typically define mandatory and optional carbon pools for the baseline and project scenario, as well as the volume of emissions from those pools that would require a project to include them (called significance thresholds). Carbon pools and emission sources in the project area may include:
    - Aboveground biomass
    - Belowground biomass
    - Deadwood and litter
    - Soil organic carbon
    - Non-CO_2 gases such as methane or nitrous oxide
    - CO_2 emissions from fossil fuel combustion (e.g., fuel use)
- **Leakage deduction** (see Section 4.3)
- **Uncertainty deduction:** a deduction from the estimated number of emission reductions or removals generated by a project. This deduction is applied to emission reductions or removals when measurement or modelling uncertainties exceed thresholds prescribed by a methodology and is used to ensure the number of credits generated is conservative. These deductions account for potential errors in estimating variables like biomass, soil carbon, or activity data, and are typically calculated using statistical methods defined in the applied methodology or standard.
- **Net emission reductions or removals**: the net volume of emission reductions or removals achieved by a project is calculated as the difference between the emissions reductions or removals generated by the project and emissions in the baseline scenario, with discounts for leakage emissions and uncertainty deductions.
- **Non-permanence buffer pool and withholding:** A portion of the carbon credits generated by the project are allocated to the non-permanence buffer pool for any reversals (see section 4.4).

[j] In carbon projects, ex-ante estimates are predictions made before the project outcomes are fully realized, based on models, assumptions, and expected conditions. They are essentially best estimates of how many emission reductions or removals (ERRs) a project is likely to generate in the future, before actual measurements (ex-post verification) occur.

■ The following 3 sections explain how to quantify emission reductions and removals for different types of NbS projects.

4.6. Quantifying emission reductions and removals from ARR projects

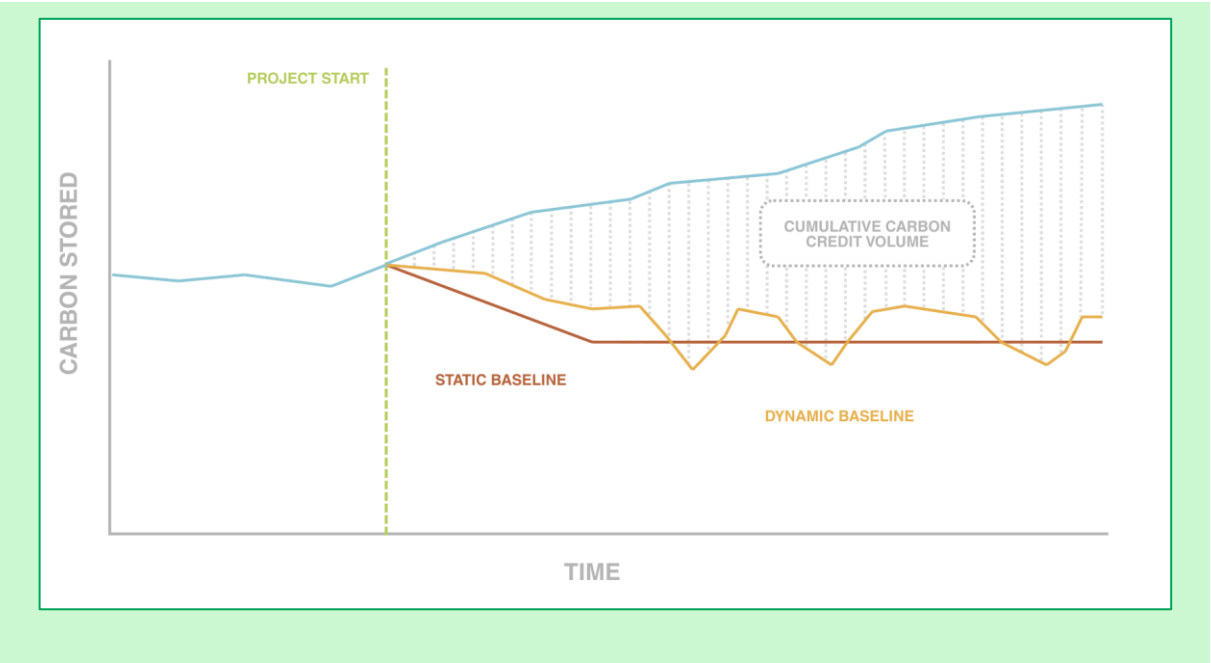
Emission reductions and removals in ARR projects – including agroforestry – result mostly from biomass accumulation and increased soil carbon accumulation from vegetation growth. The most important carbon pools are aboveground and belowground biomass, and soil organic carbon. Other carbon pools such as dead organic matter usually represent a less significant share of total carbon stocks and are often not accounted for as the measurements cost can be prohibitive.

Baseline emissions and removals from ARR projects can be estimated either from static or dynamic baselines:

- In static baselines, estimates typically represent carbon stocks in pre-existing vegetation and soils:
    - *Residual Biomass:* Includes any sparse vegetation or remaining woody biomass prior to project implementation. Above-ground and below-ground biomass may be present on the site, especially in partially degraded or fallow areas. These estimates can be based on field measurements or land cover maps of the project area that can be used to estimate average biomass in the corresponding land cover type.
    - *Soil Organic Carbon (SOC):* SOC is measured through soil sampling at multiple depths (commonly 0–30 cm, but sometimes deeper). It can also be estimated using default value of carbon accumulation in the baseline scenario land cover type (e.g., pasturelands or croplands).
- Estimates from dynamic baselines (see Box 5), are based on carbon stocks in the control plots that are periodically monitored for carbon stocks or stocking indexes. If carbon stocks in control plots increase during the project, the removals achieved by a project are discounted by carbon removals in control plots. Field data measurements are the most common type of measurement, but high-resolution remote sensing data is starting to be accepted.

Box 5. Dynamic baselines explained

A dynamic baseline is a baseline that evolves over time, reflecting real-world changes such as policy shifts, economic trends, or land-use patterns. Using a dynamic baseline ensures that the baseline remains realistic and relevant over the project's lifetime. It also makes it easier to avoid inflated baselines when using project-specific historical or current (static) data.



Estimation of ex-ante emission reduction and removal for ARR projects

In ex-ante estimates (i.e., estimates made before any results are directly measured) of ARR projects, emission reductions and removals are quantified by modelling expected tree growth in the project area. These models use information about species growth rates adjusted to local conditions (e.g., soil type, climate) and management practices. Table 17 presents key pieces of information needed to model tree growth and the corresponding biomass accumulation.

Table 17. Key information needed to model tree growth and the corresponding biomass accumulation

SITE CONDITIONS	SPECIES-SPECIFIC PROPERTIES	MANAGEMENT ASPECTS
• Soil texture, depth, fertility, and drainage • Temperature, precipitation and growing season length (if applicable) • Topography	• Growth rates, including variation through the project lifetime • Survival rates • Wood density • Carbon content • Root-to-shoot ratio	• Planting density • Thinning schedules and rotation length (if applicable) • Silvicultural treatments •

Most of the above information and soil organic carbon accumulation is collected from peer-reviewed publications. However, local growth data is often scarce, and information needs to be retrieved from studies from similar regions and ecosystems. As a last resort, default Tier 1 values from the IPCC reports can be used. It is recommended to use conservative parameters and values to avoid overestimating emission reductions and removals. If any local studies or measurements from similar projects in the region are available, this would represent the most accurate way to estimate emission reductions and removals. It is worth noting that ex-ante estimates are only used to provide an estimate of potential emissions reductions and removals but are irrelevant for determining eventual issuance volumes.

In ARR projects that involve timber extraction for commercial purposes, projects need to account for the biomass being removed. A common way to do this is by applying the long-term average concept. Instead of crediting the total emissions reduced or removed each year, the project is credited based on the average carbon stock expected to be maintained over the project lifetime. This approach considers the gradual biomass accumulation from forest growth, but also periodic carbon losses from timber extraction.

Ex-post (monitoring) estimates of ARR projects

The most common way of estimating actual project emission reductions and removals is from field measurements. These measurements come from a census or inventory for areas with lower planting density, or from permanent sample plots for areas with higher planting density. Tree growth measurements include tree survival, diameter, and height data. These data are converted to biomass and carbon using allometric equations. Soil organic carbon is also measured through soil sampling of soil bulk density (g/cm^3) and soil organic carbon content (%), usually up to 30 centimetres, sometimes to 1 metre (e.g., in the case of mangrove or seagrass restoration projects).

Remote sensing technologies are increasingly used to estimate tree cover and biomass in the project area. However, only high-resolution satellite imagery, LiDAR data, or drone-based imagery is helpful for this purpose. An example of case where remote sensing data may be used, is for ARR projects developed under the VCS methodology VM0047 v1.1. This methodology allows for the use of remote sensing data (e.g., aerial imagery, satellite data, LiDAR) to derive parameters such as stocking index, biomass, canopy cover, and tree count, as long as they are validated/calibrated with ground truthing (i.e., field measurements). Using the field data, uncertainty needs to be quantified and kept within an acceptable threshold. The monitoring process needs to be consistent over time, and a clear explanation documented in the PDD and monitoring reports.

To guarantee quality assurance and control, it is important to keep track of the following:

- Standardised protocols for field measurements, and data handling and reporting
- Training and certification of staff in field measurements protocols and techniques
- Sample handling, including collection, storage, and chain of custody

In mangrove and seagrass restoration projects, baseline, ex-ante, and ex-post emissions are quantified similarly to those in ARR projects. However, here are some key aspects to keep in mind for these projects:

- For baseline emissions, you can provide an assessment of the potential of mangroves to regenerate without an intervention, considering mangrove specific factors like propagule availability, coastal erosion, hydrological connectivity, water pollution, and seed dispersal.
- For field measurements that can inform baseline, ex-ante, and required for ex-post ERR quantification:
    - Measure carbon up to 1 meter depth as a large portion of the carbon stocks in these ecosystems is located in these deeper soil layers.
    - Aerial root systems (pneumatophores) contribute significantly to mangrove biomass and should be measured and accounted for.

- Seagrass biomass is quantified through destructive sampling and plant density measurements that can be extrapolated to the entire project area. Seagrass roots and rhizomes are an important carbon stock and need to be sampled and accounted for.

4.7. Quantifying emission reductions and removals from conservation projects

In avoided conversion carbon projects, including avoided grassland conversion and avoided forest conversion, emission reductions and removals are estimated by quantifying emissions avoided due to protection of natural ecosystems such as forests and grasslands. Therefore, quantification of baseline emissions to be avoided is a key component. This requires the estimation of the areas converted per year and the carbon stock per hectare.

The overall process of this quantification is as follows:

- Land use change modelling to determine the extent and timing of conversion;
- Estimates of carbon stocks in existing vegetation and soils that would be lost through conversion or standardised emission factors to account for emissions from biomass loss and soil disturbance.

In avoided grassland conversion, in addition to quantifying potential and actual land use conversion, project developers must document historical land management practices (e.g., grazing patterns and grazing intensity, fire regimes, and vegetation composition). Baseline estimates of soil organic carbon are essential in this type of project as they represent the largest carbon pool in grasslands. Soil carbon can be measured through soil sampling or a modelling approach. Models must be validated with field measurements to achieve a certain predictive accuracy. If livestock emissions (mainly methane) are to be accounted for using IPCC Tier 2 methods based on animal type, body weight, and cattle numbers.

Baseline emissions in conservation projects have been criticised for relying on inflated deforestation or land conversion scenarios that may not reflect realistic future trends, leading to the overestimation of projects' emissions reductions and the issuance of non-additional carbon credits. Due to this criticism, most standards have recently been updated or developed new methodologies aiming for more accurate and conservative baseline emissions estimates.

Just like for avoided conversion of forests and grasslands, quantifying baseline emissions from avoided conversion of mangroves requires an assessment of historical loss rate and threat modelling. Specific threats like aquaculture, coastal development, and erosion must be accounted for. Estimates of carbon contents will need to be adapted to coastal ecosystems. Biomass quantification is based on field diameter and tree height measurements, and allometric equations for mangrove species. Additionally, because soil carbon stocks are so large in mangrove forests, potential losses from mangrove degradation or deforestation need to be accounted for. For this purpose, you will need to measure sediment carbon content, ideally at 1 meter depth. Using these two pieces of information (i.e., deforestation/degradation threats and carbon stocks), you can estimate the baseline emissions.

Ex-ante estimates of conservation projects

Ex-ante estimates for conservation projects involve comparing the baseline emissions with the expected emissions from the project implementation. Baseline emissions are estimated as mentioned in the previous section, while the project's expected emissions are based on the amount of deforestation the project aims to avoid. For instance, if a project expects to completely stop deforestation and forest degradation within the project area, the estimated emissions reductions would be equivalent to 100% of the estimated baseline emissions throughout the crediting period.

Ex-post (monitoring) estimates of conservation projects

For estimating the actual project's emissions reductions, the project's actual performance is compared against the baseline emissions estimates. The project's actual performance is estimated from actual land conversion (e.g., deforestation) in the project area. If the actual land use conversion observed in the monitoring period is lower than what was estimated for the baseline emissions, conversion was avoided and emissions reduced with the project implementation. Therefore, project avoided emissions are not directly measured but inferred by confirming that the baseline conversion scenario did not occur, and that forest or grassland conditions have been maintained or improved. Therefore, land use monitoring, soil organic measurements, vegetation assessments, and evidence of management continuity are key aspects of the project emissions.

4.8. Quantifying emission reductions and removals from improved management projects

Carbon in improved management projects – including IFM and Improved Agricultural Land Management – is quantified by estimating the impact of enhanced practices against baseline management scenarios. This requires careful documentation of both current and improved management practices.

Baseline emissions and removals

In IFM projects, baseline emissions can be quantified through the following approaches:

- A historical baseline assumes that historical forest management practices would continue unchanged in the absence of the project. Past harvesting records, forest inventories, remote sensing data, and management plans are the main data sources for these estimates.
- A baseline based on legal requirements assumes that forest management complies only with the minimum legal or regulatory requirements (e.g., from forest codes or sustainable quotas). National or subnational forest regulations and legal harvest limits plans are the main data sources for these estimates.
- A common practice approach assumes that forest management in the baseline scenario follows typical practices in similar forests or by similar landowners in the region. Regional forest inventories, national forest statistics, and local expert surveys are the main data sources for these estimates.

- Forest modelling can be used to predict growth and yield under the baseline scenario. Models usually need to be parameterised with site-specific forest inventory data (e.g., species composition, age class distribution) and management practices. These types of estimates require a very specific expertise with these types of models.

Carbon quantification in IFM projects is based on forest inventories. These can inform baseline emissions and ex-ante estimates, if using historical records, and are required by most methodologies for ex-post (monitoring) estimates. In addition to the forest inventories, current management practices (e.g., harvesting schedule, rotation lengths, and silvicultural practices) must be documented. Although there is a lot of interest in using remote sensing data for this purpose, the type of data currently available cannot accurately estimate the slight biomass changes that happen in IFM projects.

Baseline emissions from IFM projects have been criticized in the past due to what has been claimed as overestimated baseline harvesting rates that result in inflated baseline emissions and crediting the project with higher reductions. This criticism can be avoided by using verifiable, historical harvesting data, rather than hypothetical future management scenarios or common practice data.

In ALM projects, ERR quantification is primarily focused on soil organic carbon as the most significant carbon pool, and, in some cases, nitrous oxide and methane emissions depending on the practices adopted. If silvopastoral practices are also implemented, carbon removals from biomass changes also need to be quantified. Biomass carbon quantification is similar to the process described for ARR projects.

For the baseline emission estimates, soil carbon stocks need to be estimated under conventional land management practices. This quantification requires soil sampling and analysis, and documentation of historical practices. These measurements can also be supported by models validated against local field data. For instance, VM0042 allows for two types of quantification methods for SOC, Measure and Model and Measure and Remeasure. Other carbon pools or sources of emissions (e.g., enteric fermentation, manure deposition, nitrogen fertilizers, biomass burning) can also be based on default values.

Ex-ante estimates in improved management projects

Ex-ante estimates for IFM projects are developed by comparing the estimated baseline emissions against the emission reductions and removals resulting from project interventions. The expected reductions and removals from the management practices implemented by the project can be estimated from forest growth models, available research data, and peer-reviewed literature.

Similarly, for ex-ante estimates in ALM projects, the goal is to estimate the expected impact of the planned interventions (e.g., cover cropping, reduced tillage, organic amendments, or improved grazing) on SOC and other GHG emissions. These estimates of carbon accumulation or reduced emissions can be based on available research data, peer-reviewed literature, and soil carbon models calibrated and parameterized with project-specific data.

Ex-post (monitoring) estimates in improved management projects

As mentioned before, ex-post estimates in IFM projects rely largely on field measurements and monitoring to determine the actual emission reductions and removals. Key variables that are measured and monitored in plot-level forest inventories include tree diameter, species, and height. These measurements can be used to calculate total biomass and the stocking index, which are then used to estimate s. These project emissions and removals are then compared against the baseline emissions.

Ex-post emissions estimates in ALM projects involve periodic soil sampling. Although models are acceptable, they still need to be periodically re-calibrated with soil measurements (e.g., at least every five years in VM0048). For methane and nitrous oxide emissions, project measurements are not required, and experimental datasets and peer-reviewed values are allowed for model calibration.

4.9. Environmental and social safeguards

Safeguards are the policies and procedures that are used to identify, avoid, or ameliorate risks or negative results of a carbon project.[78] Environmental safeguards ensure that emissions are accurately measured, pollution avoided, ecosystems and biodiversity are protected, ecosystem services are provided, and that land and natural resources are sustainably used. Social safeguards are aimed at ensuring protection of human rights, labour rights, the rights of Indigenous and local communities or other historically vulnerable people, protecting access to territories or resources, ensuring economic and livelihood needs are met, and the provision of services like education and health. There can also be safeguards related to the function of institutions, avoidance of corruption, and transparency in tracking and communicating information.

Legally mandated safeguards

Safeguards may be legally mandated in a country's regulations. For example, many countries have laws that aim to identify and reduce risks related to investments, concessions of land or resources, and working with local communities. Countries might mandate environmental and social impact assessments (ESIAs) or reporting. Some governments have adopted safeguard regulations related to fair benefit sharing with local communities, ensuring appropriate consultation with Indigenous Peoples, or aligning with national climate and biodiversity commitments. Countries that are participating in international mechanisms like REDD+ may have established requirements under those agreements (e.g., the REDD+ Cancun Safeguards). Carbon projects must follow any such applicable laws.

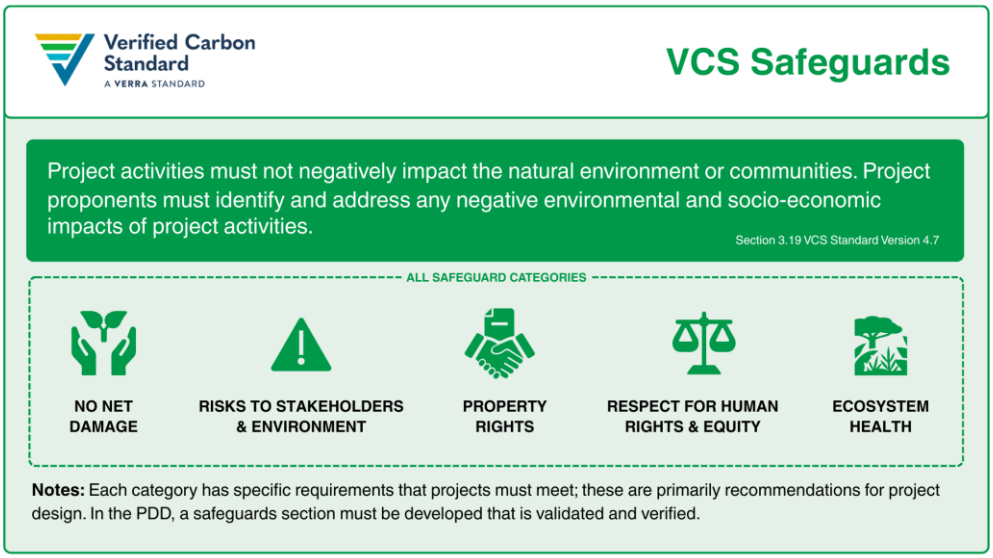
Carbon projects may also need to comply with safeguards that countries have established for compliance with Article 6.4 of the Paris Agreement. Parties participating in Article 6.4 are required to identify, evaluate, avoid, minimize, and mitigate potential risks associated with projects. Article 6.4 introduced the mandatory Sustainable Development Tool (SD Tool), which establishes a framework for risk assessment, easy identification of positive and negative impacts of proposed activities, and monitoring and reporting. The Tool ensures robust social and environmental safeguards are integrated into Article 6.4 activities and consists of three main components: environmental and social safeguards, impact assessment on sustainable development, and validation and verification processes. Parties involved are required to conduct ongoing monitoring of identified risks at least annually and comply with the Tool's objectives for project registration.

Carbon standards' safeguards

Carbon projects are usually subject to safeguard requirements from carbon standards, which are separate from and may go beyond safeguards that are mandated in law. The NbS methodologies that this report focuses on are from Verra's VCS, Gold Standard, and Plan Vivo. The safeguard requirements of these three standards and considerations for projects are summarised here.

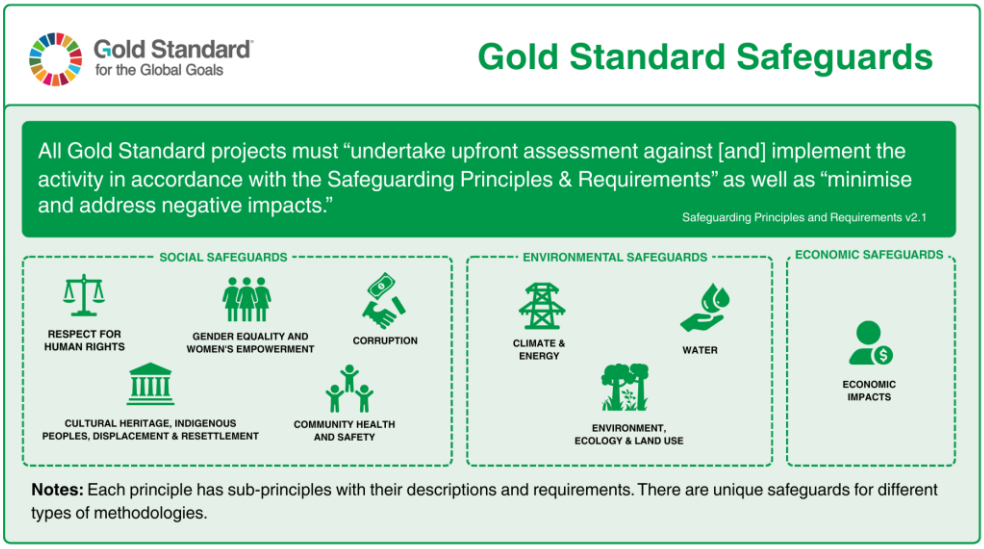
The overarching **VCS Standard** (version 4.7) describes the safeguards with which all VCS projects must comply. Within each of the general categories are specific risks that project developers must assess. If the project developer identifies any risks, they must disclose those risks, develop measures to mitigate the risks, and explain all of this clearly in the project document at validation and each round of verification. For NbS projects, all or nearly all of VCS' safeguards need to be considered and addressed by project developers. This is because NbS projects are very likely to have impacts on people and/or the ecosystems in the places they are developed.

Figure 11. High-level summary of VCS safeguards



Gold Standard's Safeguarding Principles and Requirements (version 2.1) describe the safeguards with which all VCS projects must comply and lays out specific procedures for projects to demonstrate compliance with safeguards (See table 2 and table 3 of the Principles and Requirements document). Gold Standard divides safeguards into the nine areas depicted in Figure 12. As with VCS, project developers must assess whether their project meets all of the specified safeguards and develop and report on measures to minimise or address negative impacts of the project. Gold Standard also requires that project developers report any grievances that are raised about the project related to safeguards. Furthermore, for some of the safeguarding principles, Gold Standard requires that projects obtain the opinions and recommendations of Expert Stakeholders. The requirements for the Sustainable Management of Mangroves, the Gold Standard methodology highlighted in this manual, includes several recommendations to consult experts as part of project development.

Figure 12. High-level summary of Gold Standard safeguards



Plan Vivo similarly requires that projects demonstrate compliance with social and environmental safeguards (Figure 13). Plan Vivo's safeguarding procedures for projects are laid out on its Environmental and Social Safeguards webpage. The first step in Plan Vivo's safeguarding procedure is to review the project concept against the Plan Vivo Exclusion List, found in Annex 1 of Plan Vivo's Environmental and Social Risks Management document. If the project responds "yes" or "TBD" to any items on the exclusion list, the project will or may require changes to its design. The project can then move on to completing the Environmental and Social Screening, which is found in Annex 2 of the same linked document. The screening covers the topics summarised in the Plan Vivo graphic above. It determines the types of safeguard plans required by the project by ranking the likelihood, magnitude, and significance of various social and environmental risks. Based on this screen, project developers are then required to include various safeguard plans in the PDD and validation, monitoring, and verification reports.

Figure 13. High-level summary of Plan Vivo safeguards

CCPs' safeguards

Independent initiatives have also formulated safeguard guidance. For a standard to be approved under the ICVCM's CCPs it must "have clear guidance, tools and compliance procedures to ensure mitigation activities conform with or go beyond widely established industry best practices on social and environmental safeguards." The CCPs' requirements cover: free, prior and informed consent processes with Indigenous and local communities, fair labour rights and working conditions, resource efficiency and pollution prevention, property rights and avoidance of involuntary resettlement, biodiversity conservation, respect for human rights, gender equality, robust benefit sharing, compliance with the REDD+ Cancun Safeguards, and evidence of consistency with the country's Sustainable Development Goals (SDGs).[79]

Who is responsible for enforcing safeguards in projects?

It is important that project developers do not conflate responsibilities for enforcing legally mandated safeguards and the safeguards required by carbon standards. Project developers must ensure that their projects follow all regulatory and independent requirements. Governments are responsible for ensuring that carbon projects comply with safeguards they have established through regulation. Carbon standards, VVBs, and investors are responsible for ensuring that carbon projects comply with the safeguards established by carbon standards. Carbon market actors (e.g., project developers, standards, VVBs, and investors) have the obligation to impose and follow and ensure compliance with safeguards without government intervention.

Section 5

Commercialising NbS carbon credits

5.1. Commercialisation approaches

The financing structure of carbon projects depends directly on how developers choose to commercialise their carbon credits. The timing and method of credit sales determine cash flow patterns, which in turn shape which financing options are available and attractive. Carbon project developers can pursue four primary commercialisation approaches, each with distinct financing implications.[k]

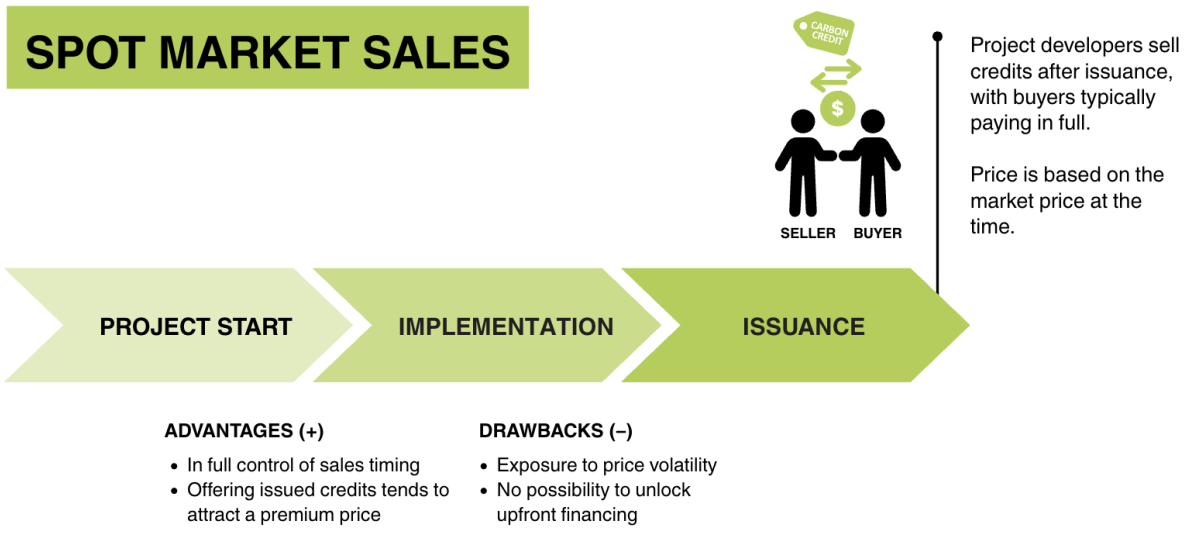
Spot market sales

The first approach involves **spot market sales**, where project developers sell credits after issuance, at prevailing market prices, with the buyer typically paying in full at the time of purchase (Figure 14).

An advantage of spot market sales is that spot credits generally fetch a premium over future deliveries, as there is no delivery risk related to the credits.

A drawback of spot market sales is that they require project developers to have alternative financing sources during the development and operational phases of their projects, which can span several years before the first credits are issued and sold. For NbS projects, this extended financing gap can be particularly problematic, considering their relatively high capital expenditures.

Figure 14. Spot sales process



Forward sales

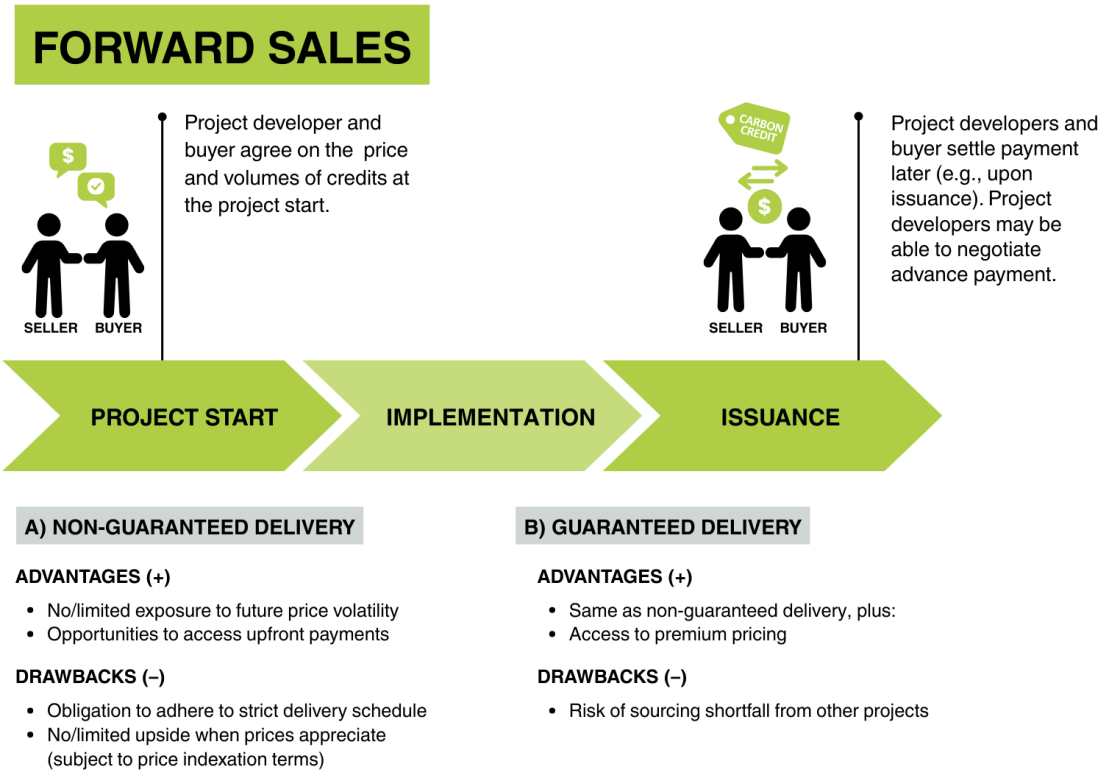
Under a **forward sale,** project developers commit to selling specified volumes of carbon credits upon future issuance at pre-agreed prices (see Figure 15).

[k] This section focuses on commercialisation approaches, but for more on sales *channels,* see Section 5.1 of the World Bank's Carbon Market Guidebook.

An advantage of forward sales is that they provide price certainty and guaranteed offtake for project developers that eliminate the market risk inherent in spot transactions, offering project developers greater revenue predictability for financing and planning purposes.

A drawback of forward sales is that, under these arrangements, buyers typically demand discount on forward prices in exchange for this commitment, with the degree of discount depending on contract terms such as offtake duration, minimum volume guarantees, and delivery performance clauses.

Figure 15. Forward sales process



Pre-purchase agreements

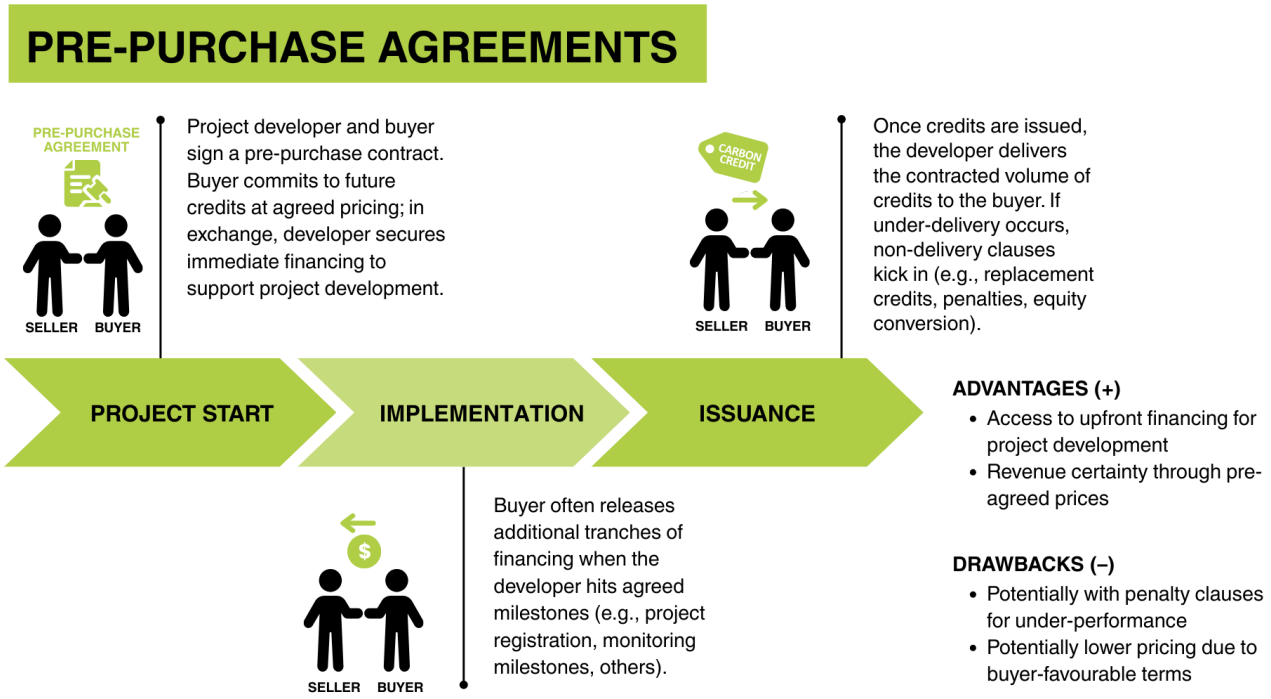
Pre-purchase agreements combine the offtake commitment of forward sales with upfront capital provision, where project developers offer future credit deliveries at pre-agreed prices in exchange for immediate financing to support project development (see Figure 16). Unlike forward sales where payment occurs only upon credit delivery, pre-purchase agreements provide developers with upfront capital, with payments structured in tranches linked to project implementation milestones.

An advantage is that the upfront financing structure makes pre-purchase agreements particularly attractive for capital-intensive NbS projects, as developers can access project development capital without traditional debt financing.

A drawback is that pre-purchase agreements create significant delivery obligations, under which project developers might be obliged to pay investors or make up the difference if too few credits are generated. Pre-purchase agreements often have comprehensive non-delivery clauses that may require developers to

replace non-delivered credits with equivalent volumes from other projects, pay cash penalties based on market prices, or convert shortfalls to equity stakes. These penalties for non-delivery impacts negotiations between developers and buyers: if developers agree to higher penalties, they may be able to negotiate higher prices and better financing terms with buyers; if developers have lower penalties, they may also have lower credit prices or upfront payments from buyers.

Figure 16. Pre-purchase agreements



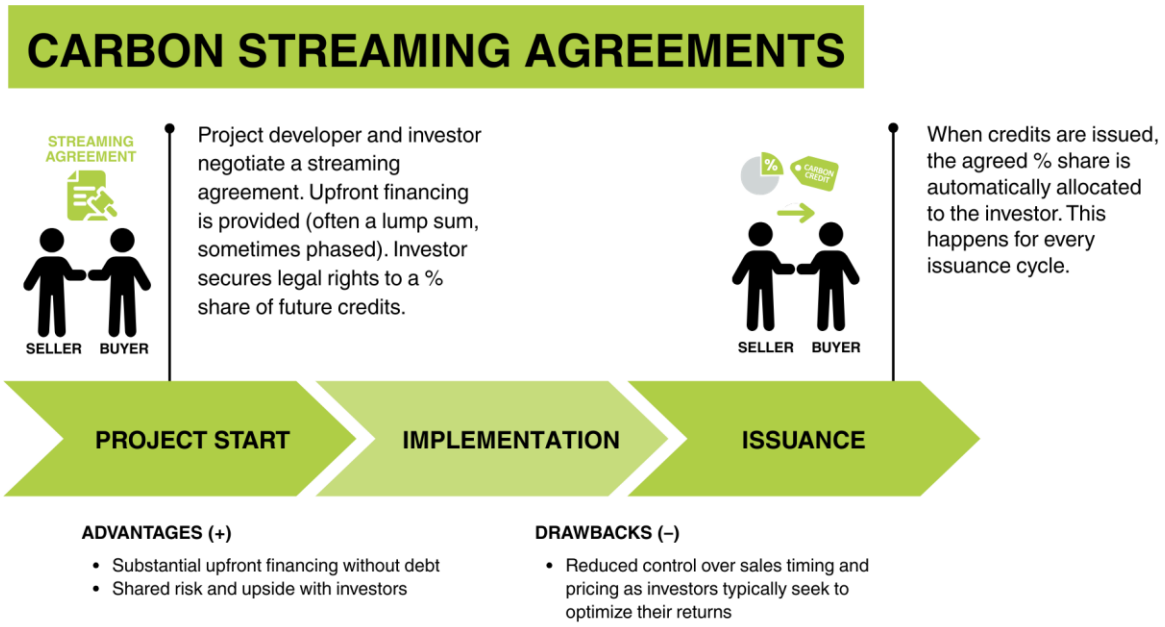
Carbon streaming

Carbon streaming agreements involve project developers offering investors a percentage share of all future carbon credits generated by the project in exchange for upfront capital to fund development and operations (Figure 17). Unlike pre-purchase agreements that fix both volume and price, carbon streaming creates an equity-like partnership where both risks and rewards are shared proportionally between the developer and investor according to the agreed ownership split.

An advantage of this structure is that if projects underperform and generate fewer credits than projected, both parties absorb losses proportionally, while project overperformance benefits both parties through increased credit volumes at effectively lower per-unit costs. Carbon streaming provides several advantages for NbS project developers, including access to substantial upfront financing and the ability to share both performance risks and rewards with experienced investors. The shared risk structure can make carbon streaming particularly attractive for innovative or higher-risk NbS projects where traditional financiers may be hesitant to provide financing.

A drawback is that developers must accept that they have less control over credit sales timing and pricing decisions, as investors typically seek to optimise returns on their proportional stake in the project's credit generation.

Figure 17. Carbon streaming agreements



5.2. Structuring contractual arrangements

The sale, purchase and transfer of carbon credits is done through contractual arrangements, typically known as emissions reductions purchase agreements (ERPAs).[1] An ERPA governs the commercial terms between the buyer and seller and will typically contain a set of rights and obligations of both parties. As noted above, there are different ways to commercialise carbon credits, and depending on the commercialisation path, an ERPA may be **a forward contract** or **a simple offtake agreement**.

A **forward contract** is long-term agreement that is tailor-made for specific projects and context. They are usually individually negotiated based on the specific context with little or no standardisation. Since the risks are shared between the seller and buyer in such transactions, forward contracts will usually contain negotiated forward price that reflect the risk sharing, and in most cases, a discounted price.

Simple off-take agreements (or on-spot contracts) are highly standardized contracts that are concluded and settled immediately. They are usually entered into when carbon credits are already available, which means that the project developer or seller will take all the risks related to project non-performance and market risks. The prices in a spot contract will depend on the reference price or market price at the time of the sale. A forward contract will be entered into for forward sales and prepurchase, while simple offtake agreements are for spot transactions (see section 5.1).

[1] Other terms maybe use used for the contracts for sale of carbon credits. Examples include Emissions Reduction Payment Agreement (ERPA), Certified Emissions Reduction Sale and Purchase Agreement (CERSPA); Mitigation Outcome Purchase Agreement (MOPA).

What are the main commercial terms in an ERPA?

An ERPA will typically contain a range of commercial terms, and, in some cases, a wide set of obligations associated with project implementation. Depending on how the commercial terms are structured, they may place extensive obligations on project developers. Project developers should note that an excessive number of contractual performance and reporting obligation increases the project developer's risk of default and offers an easy way out for buyers (see Table 18). Some of the commercial terms typically addressed in ERPAs are described below.

Contracted carbon credits: An ERPA will define the volume of carbon credits the buyer seeks to purchase throughout the contractual period. The contracted credits could be formulated as a fixed amount (e.g. 50,000 carbon credits during the contract period) or could be linked to generation of carbon credits. The latter approach presents lower contractual risks to the project developer, since they only commit to deliver what is generated (see Table 18). The contracted amount will then be divided into smaller portions to be delivered within a certain period, known as the delivery amount.

Delivery obligation: An ERPA sets out the seller's obligation to deliver carbon credits within a specific timeframe. This includes defining the delivery amounts to be delivered at specific time, the schedule of delivery, including dates, and how the delivery will take place (e.g. by transfer of carbon credits to the buyer's registry account).

A payment obligation: Sets out the conditions upon which the seller will be paid (e.g. on delivery of carbon credits), the timing of the payment (e.g. 30 days after delivery) and the method of payment. In forward contracts, a project developer may be able to negotiate advance payments to be set off against future delivery. Negotiating an advance payment may, however, have implications on the price as it increases the risks for buyers.

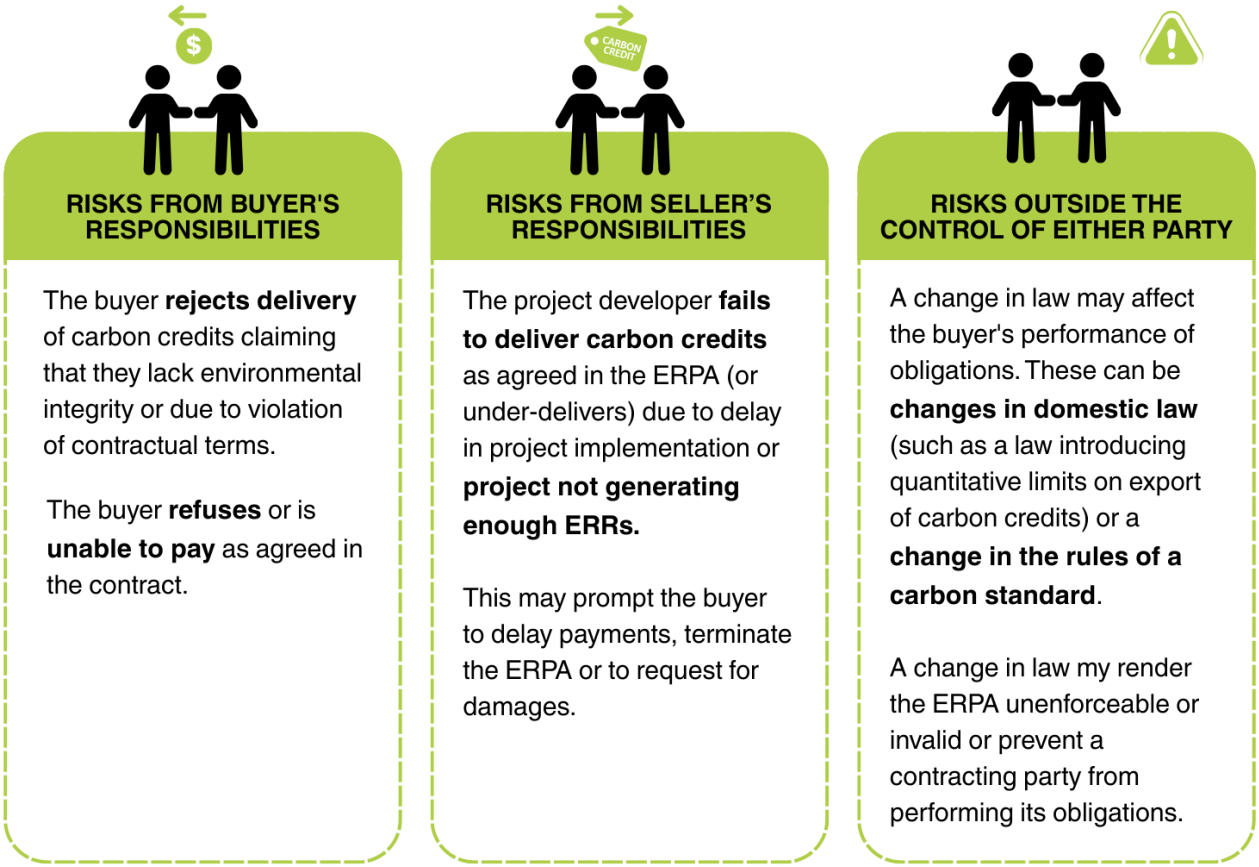
The unit price is the price of one carbon credit. When negotiating a unit price, it is important to ensure that, at minimum, the price takes into account the project costs. In forward contracts, there are different options that can be used to determine the unit price throughout the contractual period. These are:

- Fixed price: In this case, the unit price remains constant for the term of the agreement. This option provides certainty to both parties in terms of the revenues for the project developer and costs for the buyer. However, it does not account for inflation, changes in project costs or market fluctuations
- Indexed price: An indexed price is set using market prices of other units (e.g. spot unit price in a particular mandatory or voluntary markets) as a reference point. This means that the unit price will fluctuate and change depending on the reference market price. While this option accounts for market fluctuations and may lead to higher prices where market prices go up, it may similarly lead to very low prices if prices go down, which may not make commercial sense to the project developer. Consequently, it is advisable for project developers to negotiate a floor price where this price option is used, which guarantees minimum prices. In most cases, buyers will also negotiate a price ceiling, above which they would not be obliged to pay even if the reference prices go up. The price floor and ceiling protect parties from larger movements in prices.
- Escalating price: In this option, prices are fixed but they escalate periodically. For example, parties may agree to review the prices every two years and increase prices taking into account inflation and increased project costs.

How can project developers address contractual risks?

When negotiating ERPAs, project developers/sellers need to consider and address contractual risks. These generally refer to (i) anything that threatens the performance of contractual obligations of the seller, the buyer or both contracting parties, and (ii) any exposure (and potential) liability a contracting party may have as a result of the non-performance or under-performance of a particular contractual obligation. Contractual risks are particularly higher in forward transactions, as they create long-term relationship between the parties. For a seller, contractual risks can arise from the buyer's responsibilities, the seller's responsibilities or issues beyond the control of either party (see examples in Figure 18).

Figure 18. Examples of contractual risks



Contractual risks are an inherent feature of any contractual relationship, and one cannot entirely remove them. Considering that ERPAs create long-term relationships, it is important for seller/project developer to assess its own risk exposure as well as the risks associated with a buyer prior to engaging in contractual negotiations. This risk assessment can help a project developer decide whether they would like to enter a contractual relationship with a potential buyer and how the risks can be mitigated in the contract.

Important tips

- **Conduct due diligence:** It is not only buyers who need to do due diligence. Sellers should also conduct due diligence on the buyer. For instance, check if your buyer is solvent, whether there is a risk that they may become insolvent and if they have a history of carbon transactions.
- **Assess feasibility comprehensively:** Assess the viability of your project and any performance risks. Assess your project costs and ensure that the pricing is sufficient to cover these costs.

As noted above, contractual risks are inherent in any contract, but they can be mitigated through various strategies that minimize, reallocate or share the risks with the buyer. Below are examples of strategies that can be used by a project developer to mitigate contractual risks.

Table 18. Strategies to mitigate contractual risks

STRATEGIES TO MITIGATE CONTRACTUAL RISKS ASSOCIATED WITH THE BUYER'S OBLIGATIONS	
RISK THAT THE BUYER REJECTS DELIVERY	Make sure that you negotiate and include in the contract clear rules on the applicable carbon standard and methodology, baseline and monitoring methodology, and validation and verification rules and criteria. Whenever you permit the Buyer to reject delivery, these rights should be exercised for specific reasons and within a strict timeline. Non-objection within the timeframe should be deemed as approval. Consider including a clause requiring the buyer to accept delivery if seller complies with the conditions set in the contract or not do anything to jeopardise delivery.
THE BUYER REFUSES OR IS UNABLE TO PAY	Where the buyer's creditworthiness is questionable, consider the use of an escrow account. This means that the buyer deposits the payment in advance of delivery of carbon credits in an account held by a third-party and the payment is released to the seller upon delivery. Another option is to consider asking the buyer for a bank guarantee.
STRATEGIES TO MITIGATE CONTRACTUAL RISKS ARISING FROM THE SELLER'S OBLIGATIONS	
THE SELLER FAILS TO DELIVER OR UNDER-DELIVERS	Try to link the contracted volume and delivery to actual generation of emission reductions and removals. This way, the seller will be under an obligation to deliver only what is generated and not a specific amount.
THE PROJECT IS NOT PERFORMING OR CAN NO LONGER BE IMPLEMENTED	Negotiate and commit to use reasonable or best efforts to implement the project as opposed to committing to a specific result. For example, the ERPA can state that "*The Seller agrees to undertake [reasonable] [best] efforts to implement the Project in accordance with the carbon standard agreed by the Parties and documentation attached as Appendix…*"

	It is also advisable to agree on regular reporting in the contract and to raise any potential issues early on.
STRATEGIES TO MITIGATE CONTRACTUAL RISKS ARISING FROM ISSUES BEYOND THE CONTROL OF BOTH PARTIES	
CHANGE OF LAW	Agree to negotiating in good faith to amend the ERPA in case of a change of law event and to termination without liability if parties are unable to agree on amendments.

Section 6

Benefit sharing in NbS carbon projects

6.1. What is benefit sharing and why is it relevant?

In the context of carbon markets, benefit sharing refers to the fair, transparent and equitable distribution of benefits resulting from the commercialisation of carbon credits generated by a project. Benefit sharing mechanisms are designed to provide compensation to local actors for their role in ERR activities, which may include stewardship and active contribution to the implementation of NbS carbon project.

Benefit sharing is a critical component of NbS carbon projects because it incentivizes local actors to engage with and support project activities. In addition, it enhances the legitimacy and long-term viability of carbon projects by delivering real and positive outcomes for all stakeholders involved or affected.[80] It is therefore essential for project developers of NbS projects to design and implement a well-structured benefit sharing mechanism. This will promote local engagement, increase local support and improve the project's long-term sustainability.

Most EAA countries have in place legal requirements for NbS carbon projects to have benefit sharing mechanisms, and in some cases, minimum shares are prescribed (see Section 66.2.2). Similarly, international carbon standards have specific requirements on benefit sharing (see Table 19). Thus, project developers should not only consider the circumstances of the project when designing and implementing a benefit sharing mechanism, but also the mandatory conditions prescribed by national regulatory frameworks and the carbon standard selected by a project developer.

Table 19. Benefit sharing requirements in some international carbon standards

STANDARD	BENEFIT SHARING REQUIREMENTS
VERRA'S VCS	A benefit sharing agreement is mandatory between affected stakeholders and the project proponent when project activities impact on property rights, usage or resources.[81] At minimum, the agreement should: (i) be appropriate to the local context and shared in a culturally appropriate manner; (ii) comply with applicable national regulations, international human rights laws and standards, and customary rights (to the maximum extent possible); and (iii) agreed upon with those with land rights over the project area. In addition, the project proponent must ensure due process and procedural rights through the following measures: (i) conduct stakeholder consultations, including a benefit sharing discussion when relevant; (ii) ensure free, prior and informed consent (FPIC) and disclose minimum information on fair and equitable benefit sharing; (iii) develop a grievance redress mechanism to address disputes; and (iv) establish ongoing communication and inform about the benefit sharing mechanism prior to verification.
GOLD STANDARD	The project developer is required to ensure equitable sharing of benefits with Indigenous Peoples, when the project derives benefits from the utilisation or development of Indigenous Peoples' land, territories or traditional knowledge.[82] When the project includes the use of traditional knowledge, the communities shall be informed of (i) their rights under applicable national and international law; (ii) the scope and nature of the proposed commercial development; and (iii) the potential consequences of the development.
PLAN VIVO	Projects are required to adopt a benefit sharing mechanism where at least 60% of income (after payment of charges and taxes levied by the host country) must directly benefit the landowners or other local stakeholders. The benefit sharing mechanism is required to indicate the allocation, type and distribution measures of benefits, among other details.

Additionally, project proponents are required to ensure that the project financial plan is in accordance with the benefit sharing mechanism. Any deviation from the benefit sharing mechanism must be explained in the annual report.83

6.2. Benefit sharing as a regulatory imperative in Eastern Africa

Most of the EAA members have legal requirements on benefit sharing, including how project benefits should be shared with stakeholders (See Table 20). Some countries (such as Kenya, Tanzania and Ethiopia) prescribe minimum share of benefits or revenues to be distributed to different beneficiaries, while others impose an obligation to share benefits with relevant stakeholders based on general criteria (e.g. equity and fairness). These obligations are additional to fees, levies and taxes analysed in Section 7.3. It is therefore essential that project developers analyse these legal requirements to ensure compliance and to evaluate their financial impact on the project.

Table 20 below outlines the benefit-sharing legal requirements in the EAA countries applicable to NbS projects, along with their respective implications on the project.

Table 20. Benefit sharing requirements in EAA countries

COUNTRY	APPROACH
KENYA	Land-based projects undertaken in community or public land must contribute at least 40 percent of their aggregate earnings less the cost of doing business with the community. Projects developed on private land are not subject to this contribution requirement.[84]
UGANDA	Project proponents must submit a benefit sharing plan to apply for project approval. The plan must demonstrate equity, fairness, engagement and consultation of beneficiaries and other interested groups. No specific percentages are prescribed by the regulation.[85]
TANZANIA	Project proponents and landowners must distribute their revenue in the following manner:[86] *REDD+ projects:* 1) The landowner is entitled to 61% of revenue from the sale of certified emission reductions. 10% out of these resources must be used for community activities at the village level. Note that percentages change when the landowner is under local government authorities. 2) The project proponent is entitled to 31% of the revenue from the sale of certified emission reductions; and 3) the remaining 8% should be paid to the Designated National Authority (DNA). *Non-REDD+ projects:* 92% of the revenue from the sale of certified emission reductions will be negotiated and allocated between the landowner and project proponent. The remaining 8% must be paid to the DNA.

 RWANDA	Carbon projects are required to pay a share of proceeds that is negotiated with relevant authorities (e.g. REMA, Ministry of Environment, among others).[87] Criteria for these negotiations are not yet available.
 ETHIOPIA	Private and community projects developers undertaking carbon projects in State forest under concession are entitled to 80% of the revenue from the sale of carbon assets, while the remaining 20% is allocated to the government (5% federal government and 15% regional government).[88] Community project developers carrying out carbon projects in State forest under participatory forest management agreements are entitled to 80% of the revenue from the sale of carbon assets and other sources of income. The remaining 20% is divided between the federal government (5%) and the regional government (15%).[89]
 BURUNDI	Benefit sharing is not yet governed by any specific law or regulation.
 SUDAN	Benefit sharing is not yet governed by any specific law or regulation.

6.3. Steps in designing benefit sharing mechanisms

The success of NbS projects depends on the existence and implementation of a well-designed benefit sharing mechanism. The design depends on the particular circumstances of the project, as well as the legal requirements in the host country and the carbon standard requirements.

This manual recommends three minimum steps that contribute to design a well-structured benefit sharing mechanism for carbon projects: map relevant stakeholders and identify beneficiaries; determining benefits; and ensuring due process in the development and implementation of the benefit sharing mechanism.

Map relevant stakeholders and identify beneficiaries

Initially, project developers should identify and determine all stakeholders who have a role in the carbon activities. Based on their role, project developers can define the potential beneficiaries. To identify the beneficiaries, project developers may consider the following categories of stakeholders as beneficiaries:

- Stakeholders who are contributing to generation emissions reductions or removals,
- Those with primary rights to emission reductions and removals (see section 7.3)
- Those who own or have historically managed land,
- Those who require to be incentivised to contribute to the mitigation activities;[90] and
- Stakeholders who are – or should be – benefitting from the revenue for a legal, contractual or for equity reasons.

In most cases, the stakeholders in the different categories will be the same. For example, the carbon rights holders will in most cases be landowners and may also be the ones contributing to generation of emission reductions and removals. Those who need to be incentivised may be the same as those generating emission reductions and removals.

While there is no fixed list of beneficiaries in NbS projects, the following stakeholders are often identified as beneficiaries:

- The State (either through a national agency or local authorities) as primary owner of carbon rights in public lands or forest.
- Indigenous Peoples (IPs) and Local Communities (LCs) as primary right owners of community lands or forest. In some cases, IPs and LCs may not be owners but have tenure land rights that entitles them to benefit from land or forest, which may include to benefit from carbon. In other cases, they may not have formal land tenure rights but have historically managed such lands.
- Private landowners as primary owner of carbon rights in private lands or forest.

Determining and allocating benefits

Based on the profile, needs and activities of the beneficiaries identified by a project developer, the nature and form of benefits to be distributed needs to be properly defined. The project developer therefore needs to consider (i) the benefits that are available, including how project costs deliver benefits, (ii) the types of benefits most suitable for the different beneficiaries and (iii) how to allocate benefits among the different beneficiaries. To determine the benefit to be distributed, project developers should define the project's costs based on its design and implementation plan. Once the costs are clear, project developers should define which benefits are most suitable for the project and how to allocate them among the different stakeholders.

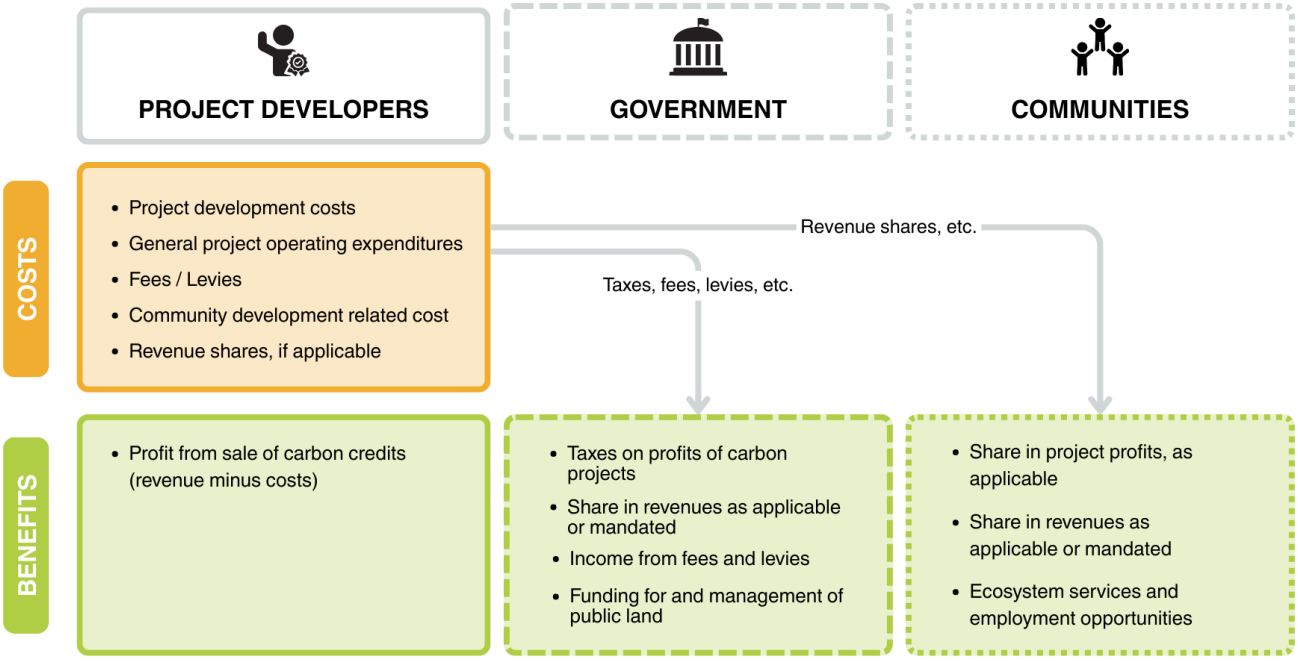
Identifying the available benefits and project costs

In determining the available benefits, consider whether what needs to be shared is project revenues or profits. In most cases, it makes sense to consider project revenue, since some project costs translate to benefits for some beneficiaries. For example, providing services for communities or improvement of livelihood (e.g., training communities on agricultural practices) is a project cost but also a benefit to communities. It is therefore important to identify project costs because this provides certainty about the expenses that must be covered by the proceeds from the sale of credits. It also contributes to understand how project costs translate into benefits, which are often non-monetary, for the beneficiaries (e.g. local employment, service provision and more sustainable livelihoods). Project developers should consider at least the following four categories of costs:

- Project development costs: feasibility studies, legal assessments, PDD preparation, validation, initial capacity building for communities, among others.
- General operational cost (OPEX): carbon activities general expenditure, such as salaries, reforestation cost, management, among others.
- Community related costs: community development, improvement of community governance, provision of services and improvement of livelihoods. Note that these costs translate into and represent benefit for communities.

- **Fees, levies and taxes:** all kind of fees, levies and taxes charged by the State.

Figure 19. Example of costs and benefits in a benefit sharing mechanism



Type of benefits

Depending on the type of beneficiaries, benefits can be monetary and non-monetary:

- **Monetary benefits** are cash payments which could be made through bank transfer or mobile money transfer either to each beneficiary or to a representative of beneficiaries for distribution among its members. Monetary benefits are more appropriate where there is clear land tenure and landowners have capacity to implement activities in their own land.[91] They have the advantage of being easy to administer, are transparently distributed and beneficiaries can use these funds as they see fit. However, there is a risk that the funds could be mismanaged (e.g. in cases of financial illiteracy) and may not ultimately result in long-term benefits.

- **Non-monetary benefits** are in-kind benefits channelled towards services or activities as opposed to cash payments, such as infrastructure (e.g. new or improving medical centres or schools, boreholes, construction of crop storage, etc.), capacity building (e.g., capacity building for specific agricultural practices, artisanal products, etc.) and enabling or providing alternative income sources (e.g. production of honey from forest). Non-monetary benefits are more appropriate where land tenure is unclear or where benefits go to communities (as opposed to individual landowners). They also allow a project developer to support specific activities by and for beneficiaries and to distribute benefits to stakeholders who may not have the necessary means to access cash payments (e.g. bank account or mobile money).

Box 6. Examples of benefit sharing

Mikoko Pamoja project: Community-led mangrove conservation and restoration project in Kenya,[92] registered under the Plan Vivo standard. The project has generated benefits for the local communities with the carbon credit sales. These funds are invested to improve quality education by providing school equipment to village schools and repairing school buildings. In addition, these funds have been used for clean water and sanitation projects in two villages leading to the reduction of waterborne diseases.

Kasigau Corridor REDD+ project: The project protects dryland forest and African wildlife.[93] Carbon credit revenues are used to fund education (e.g. renovation of existing schools, construction of new facilities and awarding numerous scholarships), improving healthcare (e.g. renovation of clinics, health laboratories, and after-school education programs), cleaner water (e.g. new or improved infrastructure and water conservation projects), and sustainable economic opportunities (e.g. eco-charcoal production and women's craft initiatives).

Western Kenya Soil Carbon project: The project is developed by the Soil-Carbon Certification Services (SCCS), which is a social enterprise working with small holder farmers in Western Kenya to adopt sustainable agricultural land management (SALM) practices.[94] Carbon credit revenues are used to provide extension services to farmers to adopt SALM practices, improve their livelihoods and to adopt practices for adapting to climate change. Through the project, farmers receive comprehensive training and support on practices that improve their soil health and crop yields.

Mode of disbursement

Depending on the beneficiary and type of benefit, the mode of disbursement will differ. Where monetary benefits are disbursed to individuals, bank transfer or mobile money transfers are the most efficient way to disburse benefits.

Where non-monetary benefits are distributed, there could be different ways. One way could be establishing a community fund where the project transfers funds which are then used to finance community projects. Another way could be for communities to identify activities they would like to be funded, and the project directly funds these activities. Whichever way the activities are funded, it is necessary to involve communities or beneficiaries in the decision on the activities to fund, and where a community fund is set up, how the fund is managed.

Box 7. Examples of mode of disbursement

Chyulu Hills REDD+ Project in Kenya: This project encompasses both state-owned land (Kenya Forest Service and Kenya Wildlife Service) and community land (four Maasai community groups).[95] To oversee the project, the Chyulu Hills Conservation Trust was formed, which acts also as a Project Proponent. The Trustees are nine organisations - the six organisations that own land and three NGOs that work with landowners to support conservation and community programs. Each Trustee appoints a representative to the

governing body of the Trust, and the trust determines, among others, the structure for distribution of benefits. Communities then submit project funding proposals to the Trust.

Ensure due process and procedural rights in a benefit sharing mechanism

Project developers must consider procedural rights and ensure due process when designing and implementing a benefit sharing mechanism. Thus, the project developer must ensure the following minimum aspects:

- **Transparency and effective participation of relevant stakeholders:** A project developer needs to ensure sufficient time and resources for participation of relevant stakeholders in the design and implementation of benefit sharing mechanisms. It is especially important to ensure that landowners as well as IPs, LCs and other marginalized groups are appropriately consulted and informed about the relevant project characteristics and implications. In addition, consent must be obtained through a process that ensures free, prior and informed consent. In some cases, national legislation or regulation impose specific requirements or process for obtaining consent.
- **Establish a clear, accessible, impartial and easy-to-understand grievance and redress mechanism:** Project developers need to set up a system for collecting, managing, addressing, and reporting complaints from beneficiaries and other participating entities of the project. The system should involve a process that is accessible and impartial to beneficiaries, allowing complaints to be timely addressed. The existence of a grievance mechanism should also be communicated to stakeholders. The grievance mechanism does not need to be set up to address benefit sharing only, but benefit sharing issues can be incorporated in the overall grievance mechanism of the project. Carbon standards establish requirements on the grievance and redress mechanism (e.g., Verra[96] and Gold Standard[97]), which must be met by project developers to obtain registration of the project.

6.4. Recommendations for project developers

Project developers may consider the following recommendations when designing and implementing benefit sharing mechanisms:[98]

Important tips

- **Ensure inclusion and participation of all beneficiaries.** Provide clear information and promote transparency from the outset of the project.
- All beneficiaries must have sufficient and easy-to-understand information regarding project income, costs, and benefits to ensure FPIC.
- **Design a benefit sharing agreement with the beneficiaries.** The agreement must establish how to share the benefits from the commercialisation of carbon credits. It should reflect project specific needs, costs, and benefits (i.e. monetary and non-monetary). In addition, this agreement should comply with national legal frameworks.
- **Beneficiaries must have access to the benefit sharing agreement.** The agreements should be dynamic, with previously agreed periods of regular review and consultation that enable adjustments to be made.
- Benefits must be distributed fairly among beneficiaries.
- **Project developers are recommended to obtain written confirmation** from the beneficiaries on the agreed distribution mechanism modality and the bank account to which the payment should be made. For non-monetary benefits, the project developer must keep documentary and audiovisual evidence.
- **Implement a grievance and redress mechanism** that enables complaints to be addressed in a timely and impartial manner.

Section 7

Navigating carbon market legal frameworks

7.1. What are carbon market legal frameworks?

Carbon market legal or regulatory frameworks may define relevant aspects for carbon project development, such as ownership of carbon credits, technical requirements for carbon projects, process to obtain approval to develop a carbon project, how to secure authorisation under the Article 6.2. of the Paris Agreement, benefit sharing obligations and levy or fee structures.

Countries are increasingly adopting or developing carbon market legal frameworks to establish the conditions for implementing carbon projects in their jurisdictions. These legal frameworks impact the viability of carbon projects, as they affect which project types can be developed, the way in which carbon projects are developed, and how carbon credits are treated in a country.

These may affect the volume of carbon credits that can be generated and transacted as well as monetisation of carbon credits and the commercial returns. It is therefore important for project developers to assess the legal frameworks of the countries they are operating in and assess the implications on their projects.

7.2. Overview of legal frameworks in EAA countries

All seven member countries of the EAA have adopted or are in the process of developing carbon market legal frameworks (see Table 21 for overview). The existing legal frameworks tend to regulate the requirements and processes for implementing carbon projects and the national authorities responsible for governing carbon market activities. They also set out requirements relating to benefit sharing, fees and levies. Some of these legal frameworks cover aspects related to Article 6 of the Paris Agreement, albeit to varying degrees.

Table 21. Overview of carbon market legal frameworks relevant for NbS projects in EAA countries

COUNTRY	OVERVIEW CARBON MARKET REGULATORY FRAMEWORKS AND GUIDELINES
KENYA 	*Climate Change (Amendment) Act, 2023.*[99] Pivotal legislation for carbon markets in Kenya (including voluntary markets and Article 6). It provides for the requirements to develop a project, the authorisation of ITMOs and the application of corresponding adjustments, establishes requirements for benefit sharing, and mandates the creation of a national carbon registry. It also grants powers to develop regulations. *Climate Change (Carbon Market) regulations, 2024.*[100] Establishe the process and detailed requirements for carbon project implementation. In addition, it prescribes the fees applicable to different processes and the institutional framework responsible for carbon market-related activities. *Draft Climate Change (Carbon Trading) Regulations, 2025.*[101] Establishe a carbon market exchange for voluntary and compliance markets. ITMO trading is not permitted under the exchange. Provide details on timelines for authorisation process, and outline conditions that the government must consider for international multilateral or bilateral agreements under Article 6. They are yet to be adopted and

	are undergoing public consultation. *Draft Climate Change (Carbon Registry) Regulations, 2025*. Include a detailed list of activities subject to registry, such as approvals, authorisations, first transfer, acquisition, voluntary cancellation, among other. Proposes a digital platform with access to registered users and the general public to enhance transparency. It also establishes the process and requirements for the different operations of the registry. They are yet to be adopted and are undergoing public consultation.
UGANDA 	*The National Climate Change Act, 2021*.[102] Establishes the country's participation in the VCM and Article 6 market and non-market-based mechanisms. Requires project developers to obtain approval to participate and benefit from carbon projects. It also empowers the Ministry in charge of climate change to issue regulations on carbon rights, criteria and procedures for participating in carbon markets, a national carbon registry, fees and levies, and benefit sharing. *The National Climate Change (Climate Change Mechanisms) Regulations, 2025*.[103] Establishes the process of approval for projects, as well as authorisation of domestic and international transfer of emissions reductions units. The regulations also define ownership of emission reduction units, provide guidelines on benefit sharing and prescribe fees for project proponents.
TANZANIA 	*Environmental Management (Amendment) Act, 2025*.[104] Provides legal basis for the National Carbon Monitoring Centre, which is responsible for coordinating carbon trading activities. These activities include registering carbon projects, verifying and certifying carbon credits, managing carbon trade transactions and establishing an MRV system. *Environmental Management (Control and Management of Carbon Trading) Regulations, 2022*.[105] Establish provisions on the requirements for project proponents and carbon projects. It sets out the process for obtaining project approval, benefit sharing obligations and fee structure for carbon activities. *Environmental Management (Control and Management of Carbon Trading) (Amendment) Regulations, 2023*.[106] Establish provisions governing some aspects for ITMOs authorisation, such as competent authority and letter of authorisation template. Eligibility criteria, specific requirements and the process for Article 6 are aspects that still need to be defined. In addition, these regulations adjust and clarify (i) benefit sharing obligations for REDD+ projects and non-REDD+; and (ii) fees and charges structure. *National Carbon Trading Guidelines, 2022*. Explains the requirements for carbon projects, the process for obtaining carbon project approval, and the roles of relevant actors, such as the managing authority and project proponents. Note that these guidelines were issued in 2022, and the country has since adopted amendments to regulations and laws.
RWANDA 	*National Carbon Market Framework, 2023*.[107] Establishes guiding principles for carbon projects development and clear eligibility criteria for activities, including a list of activities eligible for each market (e.g. VCM, Art 6.2 and Article 6.4). Prescribes a share of proceeds for all carbon market activities and states that Article 6.4. activities will contribute to adaptation and overall mitigation purposes. *Rwanda Environment Management Authority (REMA) guidelines and templates.*[108] Establish process for implementing projects and authorisation for Article 6.2. They

	set out the requirements to register the projects in national carbon registry and clarify the share of proceed will be determined through negotiations with authorities.
ETHIOPIA 	*Forest Development, Conservation and Utilization Proclamation, 2018.*[109] Establishes obligations and rights of forest developers, including the right to benefit from carbon generated from forest projects. Defines different types of forest ownership (i.e. private, community, association and State) and sets out general conditions for its development and management. *Forest Development, Protection and Utilization Regulation, 2024.*[110] Provides clarity over carbon rights of forest developers, including the right to transfer rights and benefit from carbon. Prescribes essential requirements for forest projects development, as well as services fees and benefit sharing obligations generated from the sale of carbon assets. Ethiopia is also in the process of developing new legal frameworks, including those governing carbon markets in the forestry sector and those governing Article 6 activities. The drafts are yet to be made public.
BURUNDI 	Burundi is at early stages of developing a carbon market framework.[111]
SUDAN 	Sudan is still developing a climate change policy.[112]

7.3. Assessing implications of carbon market legal frameworks

Overview of regulatory implications

Legal frameworks on carbon markets govern critical aspects for carbon project development and monetisation of carbon credits. They may govern the ownership of emission reductions and removals, prescribe the process for carbon project development, and may contain restrictions to carbon credits transactions (e.g. quantitative limits on export). These provisions will have a direct impact on the generation and the monetisation of carbon credits.

In a similar manner, legal frameworks may prescribe the types of activities eligible to be developed and can be internationally transacted and may also impose technical and/or financial requirements for their development. These conditions will define whether and how a carbon project can be implemented in a country.

It is essential for project developers to assess the host country's legal framework and to consider its specific characteristics. With this assessment, project developers can be aware of the potential impacts and ascertain whether it provides sufficient legal certainty for the development of the project. The legal assessment should be completed prior to project development and should inform the decision on the viability of implementing a project in a specific country.

The main aspects typically addressed in carbon market legal frameworks that a project developer can evaluate include:

- Carbon rights and the ability to transact carbon credits or ITMOs (hereinafter jointly referred to as "carbon credits");
- Requirements for project approvals or no-objection;
- Provisions relevant for implementation of projects under Article 6 Paris Agreement;
- Fees and levies that project developers will have to pay
- Benefit sharing requirements (see Section 6).

The manual analyses relevant issues of each of those aspects in the following subsection and in subsection 6.2. It is, however, important to note that legal frameworks may address more issues that those listed below. Additionally, there are other legal requirements beyond those addressed carbon market frameworks (such as those imposed by forest-related laws, business laws among others). We therefore recommend that a project developer conducts a comprehensive assessment of the host country to holistically understand the implications on projects.

Carbon rights and ability to transact carbon credits

To transact carbon credits generated from a carbon project, a project developer or seller must demonstrate that they have or can obtain ownership of carbon credits and that they are able to transfer legal title to a buyer or their nominee. Carbon standards also require project developers to prove that they have rights to the carbon credits to be generated or will obtain them and to describe how they will obtain the rights. Carbon rights are usually determined based on the national laws of the country hosting the project.

A project developer must first determine who has primary ownership of the emission reductions and removals generated from their projects according to the laws of the host country. If the project developer does not have the primary rights, then they need to determine how they will obtain the rights from primary holders. It is, therefore, important to assess the national legal framework (e.g., carbon market frameworks or forest legislation) to identify whether the country defines carbon rights and the implications for the specific project.

In the AFOLU sector, countries that define carbon rights tend to link it to land ownership or the legitimate control of the activity generating emissions reduction or removals. In the EAA member countries, Uganda and Ethiopia have defined carbon rights in the context of NbS carbon projects. In both countries, carbon rights are based on the ownership of assets generating emission reductions and removals. In Uganda, whoever owns the source of emissions reductions (which is the land or trees) is the owner of generated carbon credits. In Ethiopia, those developing projects on community or private forest can own the carbon credits generated (see Table 22).

Most EAA country members do not have laws expressly defining carbon rights for NbS projects. In the absence of express definition, it is commonly interpreted that carbon rights in NbS activities are based on land ownership or other legitimate land tenure rights that allows to benefit from carbon.

In case the project developer or seller does not have the primary rights to emission reductions or removals, they need to obtain title from the primary owner. A project developer must therefore identify the

primary owner of emission reductions and removals (in most cases the landowner or land tenure holders) and sign the necessary contracts transferring the title to the project developer or seller. The contractual conditions and instrument for transferring carbon rights may vary depending on whether the land is private, state or community owned. For instance, a private agreement is usually sufficient between private parties. Where the land is public or state-owned, carbon rights can be transferred through concessions or management agreements that explicitly pass on carbon rights. In case of community lands, the process to obtain consent can be subject to procedures established in national laws or in the community by-laws. The contractual conditions for transferring carbon rights will usually inform and be part of negotiations for determining the benefit sharing mechanism (see section 6). In most cases, the same contract or instrument transferring carbon rights will also define benefit sharing conditions.

Table 22, below, summarises the legal approach to carbon rights in each of the seven member countries of the East African Alliance for Carbon Markets and Climate Finance.

Table 22. Carbon rights in EAA countries[m]

COUNTRY	APPROACH TO CARBON RIGHTS
KENYA 	Kenya's legal framework does not define carbon rights.
UGANDA 	Ugandan regulation governs the ownership of emissions reductions units.[113] The person who owns (i) the source of emissions reductions or (ii) emissions reduction technology shall be considered the owner of the emissions reductions units. The ownership of emission reduction units must be specified in the benefit-sharing plan, when a person owns the source of the emission reduction units, but not the emission reduction mitigation technology.
TANZANIA 	Tanzania's legal framework does not explicitly define carbon rights.
RWANDA 	Carbon rights are not defined by legal or policy instruments in Rwanda.
ETHIOPIA 	Private and community forest developers have the rights to i) own forest carbon in the forest developed; ii) transfer ownership of carbon rights and assets; iii) benefit from carbon and other ecosystem services generated from the forest on the land they hold.[114] Forest developer is the person who develops, protects and utilizes a forest for various purposes on their land.
BURUNDI 	Carbon rights not defined by any specific law or regulation.
SUDAN 	Carbon rights not governed by any specific law or regulation.

[m] Assessment based on the legal framework as at the time of drafting this Manual

Requirements for project approval

Some countries may require that a project developer obtain an approval or no-objection from the government prior to developing a carbon project or prior to implementation of project activities. In some countries, this may apply to only projects developed under Article 6 of the Paris Agreement, both Article 6.4 and 6.2 activities. In other countries, it may apply to all projects.

This is a common requirement among the EAA member countries. The five EAA countries with legal frameworks for carbon markets require project approval from the competent national authorities prior implementing carbon project activities (see Table 23).

To obtain project approval or no-objection, the carbon project must meet requirements set out in the national legal frameworks, which includes technical, environmental and social conditions. Furthermore, project developers need to submit several forms and documentations (e.g. project idea notes and PDDs) to the national authorities, to facilitate the evaluation of the project and determine its compliance with all host country implementation requirements. A project developer must therefore assess whether an approval is required, the requirements and the process of obtaining one.

Table 23 below summarises the process, conditions and project requirements to be granted with approval to implement a carbon project in EAA countries.

Table 23. Requirements for project approval

COUNTRY	APPROACH
KENYA	Kenya adopted a two-fold process, which requires obtaining: 1) a letter of no objection for the carbon project application and 2) a letter of approval to implement the project.[115] 1) To request a letter of no objection the project needs to meet substantive requirements (e.g., compliance with national laws and regulations, validation by independent auditor, proof of ownership of property or agreements providing title to develop the carbon project, letter of support from the respective county, obtain FPIC for community land-based projects). In addition, project developers need to submit a project concept note (PCN), minutes of the proponents approving the project and payment of fees. 2). To obtain approval, the project developer shall develop and submit a PDD to the Designated National Authority (National Environment Management Authority – NEMA). The project must be developed in accordance with international carbon standards recognized by Kenya and undergo an environmental and impact assessment. Furthermore, the PDD shall be submitted in conjunction with government approvals, stakeholder report, community development agreement for land-based carbon projects on community or public land, validation reports and proof of payment of fees. In addition, projects are required to obtain a letter of support from the county government where the project is being or will be implemented.
UGANDA	Approval process in Uganda entails two steps.[116] First, the project proponent must request for market participation and obtain a letter of no objection. Project

	proponents must submit a project idea note (PIN) specifying the targeted market (i.e., VCM, Article 6.2 or 6.4), proof of registration in Uganda, the geographical location of the project, and personal contact details, among others. With the letter of no objection, project proponents are entitled to conduct feasibility studies. Secondly, project proponents must apply for project approval by submitting a PDD, feasibility study or business plan, benefit sharing plan and letter of recommendation for the lead agency in accordance with the National Climate Change Act and Policy. If all requirements are met, the project proponent will be granted with approval, which allows project implementation.
TANZANIA 	Tanzania has a three-steps approval process. First, the project proponent or managing authority (i.e. owner of the property involved in the carbon project) submit a project idea under the form prescribed in the regulations and pay the application fee, to obtain a letter of approval.[117] Second, the project proponent in collaboration with the managing authority or project partners must submit a project concept note to secure a letter of no objection. The concept note must include relevant project information (e.g. activities, location, proponent, etc), stakeholders involved, potential benefits, sources of finance, estimated costs, letter of consent of the managing authority, proof of payment of project registration fee, among others. Third, the project proponent in collaboration with the managing authority or project partners shall submit a project document. This document needs to meet the requirements of an accepted international standard and be validated by a third independent party. If all conditions are met, the authorities will issue a letter of endorsement for the projects, which allows to implement the project. Carbon projects must be registered in the National Carbon Registry and should meet the following requirements: compliance with policies, laws and regulations; conduct a social and environmental impact assessment, contribute to the NDC, adhere to national priority carbon trading sectors, provide a letter of consent of project partners, involve local communities in project implementation, describe benefit sharing distribution percentage, indicate expected employment creation, among others. In case of REDD+ projects, they need to conduct a safeguard standards assessment.
RWANDA 	Rwanda has a two-step process. First, project developers need to obtain a letter of no-objection for the project idea note (PIN). Second, it is required a letter of approval before implementing the project.[118] For the letter of no-objection, project developers need to fill out the PIN template and apply before REMA. To obtain a letter of approval, the project developer must fill out the Mitigation Activity Design Document (MADD) template, the contribution to Sustainable Development (SD) template and provide other supporting documents, such as agreements, company registration, among others.[119] To register the projects in the national carbon registry, projects need to comply with national policies and laws, contribute to the NDC, adhere to national priority carbon market sectors, proof of ownership or agreements with property owners and relevant entities, indicate expected employment creation, among others.
ETHIOPIA 	Ethiopia has not yet established criteria or process for obtaining approval to develop carbon projects, although it is in the process of developing a framework, which has not yet been made public. However, it imposes requirements on forest projects (which will probably apply to forest carbon projects), such as securing an

	environmental and social impact assessment, a feasibility study, and approved forest management plan. Furthermore, the management plan involves conducting consultations with stakeholders entitled to benefit from the forest.
BURUNDI 	This topic is not yet governed by any specific law or regulation.
SUDAN 	This topic is not yet governed by any specific law or regulation.

Provisions on implementation of Article 6 Paris Agreement

Countries are developing national frameworks on implementation of Article 6, which define the requirements for projects to be implemented either as an Article 6.4 or under Article 6.2 cooperation. In some cases, these frameworks may have implications on independently developed projects that do not require ITMO authorisation. Therefore, a project developer, whether developing an Article 6 or a voluntary, independent project, needs to assess the Article 6 framework of the country to identify what implications it may have on their projects, including whether their projects can be implemented in the country

Four of the EAA countries have adopted legislation or regulations governing Article 6 activities. These legal frameworks include the process and documentation required to obtain ITMO authorisation, project approval as well as the competent authorities involved in this process. In addition, some EAA countries have established general criteria and specific list of activities that are eligible for authorisation under Article 6.2. and approval for Article 6.4 of the Paris Agreement. Thus, project developers interested in seeking authorisation or registering a project under PACM need to assess whether their projects are eligible, whether they meet all the conditions required for such authorisation or approval and the process of obtaining them.

The project developer should also assess how projects intended to trade credits in the VCM are treated under the Article 6 legal framework in the country, and the interactions between VCM and Article 6.2. For instance, some countries may opt not to authorise carbon credits issued by independent carbon standards, and issue authorisation only for carbon credits generated by projects under Article 6 cooperative approaches.

Table 24 below summarises the requirements, eligibility criteria and process to obtain a letter of authorisation in the East African Alliance countries.

Table 24. Article 6 implementation in EAA countries

COUNTRY	APPROACH TO ARTICLE 6 IMPLEMENTATION
KENYA 	Kenya's carbon market regulations state that a "Whitelist" for activities and technologies that are eligible for Article 6.2 cooperative approaches will be established. The Whitelist is still under development, and it is currently not possible to determine whether a project will be eligible. Kenya's legal framework provides for authorisation of ITMOs.[120] The process involves obtaining a letter of no objection and a letter of approval to implement the project, as well as requesting the authorisation to the Designated National Authority (NEMA). The Climate Change (Carbon Market) regulations, 2024 establishes the documentation needed at the different stages, templates and the applicable fees. Draft regulations indicate the timeline for authorities to issue or decline authorisation.[121] Guidance and rules on approval and authorisation for Article 6.4. are yet to be developed
UGANDA 	The international transfer of emissions reductions units is subject to authorisation. This implies that Article 6.2 units shall obtain authorisation prior to transfer.[122] Authorisation for international transfer of ITMOs requires filling a special form and provide evidence of ownership of the emission reduction units, proof of registration of the verified emissions reduction units, amount of emissions reduction units to be transferred, buyer's information, intended use, and payment of corresponding adjustment fee. Guidance and rules on approval and authorisation for Article 6.4. are yet to be developed
TANZANIA 	Project developers must apply for authorisation to the Ministry responsible for the environment. While the regulations establish a template letter of authorisation to be issued by the relevant authority, they have not yet defined project eligibility criteria, specific authorisation requirements or the authorisation process.[123]
RWANDA 	Rwanda has a list of activities that are deemed conditional, unconditional and not covered by the NDC, indicating which of them are eligible for Article 6.2. and 6.4, as well as for the VCM.[124] Rwanda grants authorisation of ITMOs where requested. Projects initially need to obtain a letter of no-objection for the PIN, then a letter of approval to implement the project, which must be monitored by an independent auditor. With the verification report, the project proponent can request for an authorisation letter for ITMOs.[125] Carbon credits issued by an independent carbon standard can be authorised, provided they meet eligibility criteria for authorisation. Process and requirements for Article 6.4. approval are not available yet.
ETHIOPIA 	Current regulation does not provide guidance on eligibility criteria for Article 6 activities and the process and documentation required to grant authorisation

	under Article 6.2. Ethiopia is in the process of developing new legal frameworks which may provide guidance. Those drafts have yet to be made public.
BURUNDI 	This topic is not yet governed by any specific law or regulation.
SUDAN 	This topic is not yet governed by any specific law or regulation.

Fees, levies and taxes

Countries are introducing administrative fees and levies on carbon projects as well taxes on carbon transactions through their regulatory frameworks. The categories of fees and levies commonly introduced by countries are:

- Administrative fees to cover the costs of services provided by government entities in governing and management of carbon projects
- Levies that do not correspond to a service but collected by government for specific objectives (such as to finance adaptation or other socio-economic activities)
- Levies that are used to mitigate the risk of non-achievement of the NDC

All the four EAA countries with carbon market legal frameworks in place have prescribed fees, levies or charges. Some of these fees or levies seek to cover governmental cost related to assess applications or issue different type of permissions (e.g. letter of approval or letter of no objection). In addition, some EAA countries impose a levy for the application of corresponding adjustments for ITMOs.

Each country determines the types of fees, levies or taxes applies to carbon activities. It is therefore common to find significant differences in the way each country regulates these aspects and EAA countries are not the exception. Thus, a project developer needs to assess the fees and other levies in each host country to determine how it will impact the financial viability of the project.

Table 25 below summarises the fees, levies or taxes imposed in the East African Alliance countries.

Table 25. 2 Fees, levies and taxes on EAA countries

COUNTRY	APPROACH TO FEES, LEVIES AND TAXES
KENYA 	Kenya applies several fees to carbon activities.[126] This includes fees to carbon project application and submission of PDDs. Administrative fees apply on approval of PDD, issuance of carbon credits and corresponding adjustment fees. Draft regulations indicate that Kenya is considering imposing fees for national carbon registry use[127] and withhold a percentage of mitigation outcomes to support Kenya's NDC for each authorisation of ITMOs.[128]

UGANDA 	Project proponents are subject to a fee for applying for project approval. In addition, the application of corresponding adjustment is levied with a fee of 10% for each ITMO.[129]
TANZANIA 	Carbon projects are subject to several fees and charges in Tanzania. These fees and charges include project application fee, project registration fee, annual administrative charge and annual project charge.[130]
RWANDA 	Activities under Article 6.4 shall contribute with 5% of credits for adaptation and 2% for overall mitigation of global emissions. Whether these same contributions will apply to Article 6.2 activities will be defined by each international agreement signed by Rwanda.
ETHIOPIA 	Private and community project developers must pay a service fee of 5% to the federal government and 15% to the regional government of the revenue from the sale of carbon assets, when they need government support in the sale process.[131] The current regulation does not specify what type of government support triggers the fee.
BURUNDI 	This topic is not yet governed by any specific law or regulation.
SUDAN 	This topic is not yet governed by any specific law or regulation.

Box 8. Beyond carbon market frameworks: Implications of forest or land related laws

In addition to the legal frameworks on carbon markets, land-based carbon projects are subject to other laws, such as forestry and land-use legislation. To ensure the effective management and utilisation of land and forest resources, countries establish dedicated legislation and regulation for land-use projects. These regulations tend to impose the obligation to conduct environmental and social impact assessments to identify and mitigate potential impacts resulting from the implementation of the projects.

Similarly, countries may require obtaining a license, concession or management agreement prior implementing activities in State or community owned land or forest. For example, projects developed in State Forest in Ethiopia[132] are required to develop a management plan and obtain a concession or forest management arrangement.[133] Therefore, project developers should map and assess forest and land use provisions to ensure compliance with national requirements and avoid sanctions that could hinder the project's progress.

Section 8

Annex

8.1. Regional initiatives and associations

Carbon project developers may benefit from engaging with local, national, and regional initiatives or organisations that can provide insights about carbon markets. These include:

■ Eastern Africa Alliance on Carbon Markets and Climate Finance (EAA)

The Alliance is formed by Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Uganda, and Sudan, and has the goal to promote the participation of the region in international climate markets and improve these countries' capacities to access carbon finance. EAA supports building capacity for Article 6 implementation in the private and public sectors and facilitates the exchange of lessons learned across its seven member countries.[134]

■Africa Carbon Markets Initiative (ACMI)

East African countries can count on support from the Africa Carbon Market Initiative (ACMI), launched in 2023, which aims to accelerate the development of transparent and robust carbon markets across Africa.[135] ACMI advises countries from a neutral standpoint on carbon market activation, including issues around regulation and Article 6 and gives technical assistance to single countries or country groups on carbon market legal and policy framework implementation or operationalisation.[136]

■ The Climate Network

With active chapters in Kenya, Uganda, Tanzania, and South Africa, the network brings together local climate professionals to exchange knowledge and foster collaboration. Through their different chapters, the network serves as a bridge between climate-focused professionals and organisations and the wider ecosystem.[137]

■ Carbon Markets Association of Kenya (CAMAK)

Incubated by the Nairobi Climate Network, Kenya's Climate Network, and launched in September 2024, CAMAK brings together carbon market practitioners. Some of the Association's goals are to facilitate sharing best practices and advocate for carbon market developments. [138]

■ Carbon Markets Association of Uganda (CMAU)

Launched in 2025, the Carbon Markets Association of Uganda gathers industry leaders, project developers, and policy makers in Uganda with the objective to help develop supportive policy framework in the country, build technical and managerial capacity, act as a bridge between project developers and potential investors, and promote the adoption of innovative technologies that support carbon credit development.[139]

This association annually organises the East Africa Carbon Markets Forum, which is an annual carbon market event in Kampala, Uganda. The event brings together carbon market actors in the region to foster networking, collaboration, and discussion to unlock carbon market opportunities aligned with sustainable development.[140]

8.2. Relevant NbS methodologies

This Annex provides an overview of NbS methodologies applicable to projects in Eastern Africa. While the manual focusses on individual projects (as opposed to jurisdictional programs), this annex includes applicable methodologies for jurisdictional programs. Project developers are also encouraged to review ICVCM's Assessment Status webpage for the latest updates of approved programmes, credit types, and methodologies.

METHODOLOGY	STANDARD	PROJECT TYPE	APPLICABILITY AND ELIGIBILITY CRITERIA
PM001 Agriculture and Forestry Carbon Benefit Assessment Methodology v1.0	Plan Vivo	REDD	Applicable to projects that take place on or result in conversion to forest land, cropland, or grassland. Includes: • Agroforestry and farm forestry • Changes to cultivation practices • Changes to livestock and manure management • Afforestation and reforestation • Forest restoration • Forest protection • Improved forest management Projects can generate future, reported, or verified Plan Vivo Certificates (fPVCs, rPVCs, and vPVCs) depending on project characteristics established in the methodology.
Coastal Blue Carbon Methodology v1.0	Plan Vivo	Blue Carbon	Applicable to mangrove restoration, afforestation, assisted natural regeneration, and conservation, including through improving the sustainability of mangrove wood harvesting. Emission removal projects (i.e. restoration projects) can generate future, reported, or verified Plan Vivo Certificates (fPVCs, rPVCs, and vPVCs), while emission reduction projects will generate reported and verified Plan Vivo Certificates.
AM-001 Methodology for Quantifying Carbon Benefits from Small-scale Agroforestry v1.0	Plan Vivo	ARR	Applicable to agroforestry projects where planted trees are native or naturalized species, and: • Areas have not been deforested within 5 years prior to the start of the Project Period • Projects do not take place on wetlands. Conditions and limitations on the use of synthetic fertilizer, slash-and-burn activity, or heavy machinery apply.
Afforestation/reforestation GHG Emissions Reduction and Sequestration Methodology v2.1	Gold Standard	ARR	Applicable to afforestation and reforestation in areas that do not fall under the definition of forest. Eligible projects may apply silvicultural systems, agroforestry, and silvopasture activities, and shall not be developed on wetlands. Limitations on the disturbance of the soil, and special considerations for afforestation and reforestation of mangrove forests apply.
Methodology for Sustainable Management of Mangroves v1.0	Gold Standard	Blue Carbon	Applicable to reforestation activities of native mangrove trees and mangrove-related species with a demonstrated historical relation to native mangrove trees in the project area.

Soil Organic Carbon Framework Methodology v1.0	Gold Standard	IALM	Applicable to land management activities that use a variety of soil organic carbon improvement approaches. The project shall not be developed on wetlands or forests. Managed cropping systems must have been in place for at least 5 years prior to project implementation. Reduction to crop yield attributed to the project is not allowed.
Afforestation and Reforestation of Lands Except Wetlands v2.0	Clean Development Mechanism	ARR	Applicable to afforestation and reforestation projects in lands other than wetland. Certain types of land (i.e. organic soils) are limited to a soil disturbance no larger than 10% of the project area.
Afforestation and Reforestation of Degraded Mangrove Habitats v3.0	Clean Development Mechanism	ARR, Blue Carbon	Applicable to degraded mangrove habitats where more than 90% or the area is planted with mangrove trees, and the project does not cause a soil disturbance larger than 10% of the project area. If more than 10% of the project area is planted with non-mangrove species the project activity shall not alter the hydrology of the project area or any connected wetland area.
VM0003 Methodology for improved Forest Management through Extension of Rotation Age v1.3	Verified Carbon Standard	IFM	Applicable to Improved Forest Management (IFM) project activities that involve an extension in rotation age (ERA). Forest management includes harvesting techniques such as clear cuts, patch cuts, seed trees, continuous thinning, or group selection practices. The project area must comply with one of the following criteria before their first verification: • Be certified by Forest Stewardship Council (FSC) • Be subject to an easement that prohibits commercial harvesting for the duration of the project. Peat forests are not included in the project and there are no changes in wetlands caused by the project. When fire is used as a management mechanism, fire control measures must be taken.
VM0006 Methodology for Carbon Accounting for Mosaic and Landscape-scale REDD Projects v2.2	Verified Carbon Standard	REDD	Applicable to activities aimed at reducing unplanned deforestation and forest degradation of the mosaic configuration or implementing a landscape-scale Reduced Emissions from Deforestation and Forest Degradation (REDD+) project that addresses land and resource needs of communities in a holistic way. Project areas must meet the following conditions: • The project area consists of either one contiguous area or multiple discrete parcels that meet the definition of forest. • The project area must be deforested or degraded before the project activities and the deforestation or degradation must be mosaic. • The deforestation and degradation drivers must fall into the list of categories defined in the methodology and must not be planned. The project must implement at least one of the following activities: • Strengthen land-tenure status and forest governance.

			• Support sustainable forest and land use management plans. • Implement fire prevention and suppression activities. • Reduce fuelwood consumption and/or increase energy efficiency. • Create alternative sources of fuelwood. • Intensify agriculture on agricultural land sustainably. • Develop local enterprises based on sustainably harvested non-timber forest products. • Demarcate forest boundaries, conduct forest patrolling, promote social inclusion and local stewardship including capacity building, create alert mechanisms to inform local authorities of forest trespassing.
VM0007 REDD+ Methodology Framework v1.8	Verified Carbon Standard	REDD	Applicable to Reducing Emissions from Deforestation and Forest Degradation (REDD), Wetlands Restoration and Conservation (WRC), and Restoration of Wetlands Ecosystems (RWE). Includes: • Avoiding unplanned deforestation (AUDef) and wetland degradation (AUWD) • Avoiding planned deforestation (APDef) and wetland degradation (APWD)
VM0015 Avoided Unplanned Deforestation v1.2	Verified Carbon Standard	APD, AUDD, APC, AUC	Applicable to Avoiding Unplanned Deforestation project activities. The following conditions apply: • Baseline activities include planned or unplanned logging for timber, fuel-wood collection, charcoal production, agriculture or grazing activities. • The project area includes on or a combination of forest types. • The totality of the project area shall qualify as forest at least 10 years before the project start date. This methodology is not eligible for forested wetlands growing on peat.
VM0033 Methodology for Tidal Wetland and Seagrass Restoration v2.1	Verified Carbon Standard	ARR, Blue Carbon	Applicable to tidal wetland restoration project activities, including seagrass meadows. Project activities may include creating, restoring, and/or managing hydrological conditions, altering sediment supply, changing salinity characteristics, improving water quality, reintroducing native plants, and/or improving management practices. The project area must meet at least one of the following criteria, which must be demonstrated by the project developer: • The project area has been abandoned for two or more years prior to the project start date, the project area is not profitable for commercial purposes and there is no timber harvesting in the baseline scenario, or degradation of new wetlands will not occur or is prohibited by law; or • The project area is under a land that could be displaced outside the project area; or

			• The project area is under a land that will maintain a similar level of service or production during the project period. This methodology in not eligible for projects with the following conditions: • Qualify as REDD or IFM. • Baseline activities include commercial forestry. • Project activities lower the water table. • The hydrological connectivity of the project area with adjacent areas lead to larger GHG emissions elsewhere. • Project activities include burning of organic soil. • Nitrogen fertilizers are applied in the project are during the project period.
VM0047 Afforestation Reforestation and Revegetation v1.1	Verified Carbon Standard	ARR	Applicable to afforestation, reforestation and revegetation (ARR) activities. Project activities must Increase vegetative cover. If a project is conducted on wetlands or organic soils, activities must be developed using a multiple project activity design. This methodology is not eligible under the following conditions: • If the project area has met the definition of managed forest in the past 10 years • Clearing of pre-existing woody biomass involves timber harvesting • The project is planting fewer than 50 panting units • Woody biomass has been removed within the last 10 years • The project activity leads to a soil inversion to a depth exceeding 25 cm
VM0048 Reducing Emissions from Deforestation and Forest Degradation v1.0	Verified Carbon Standard	REDD	• REDD activities aim to reduce GHG emissions by preventing deforestation (conversion of forest to non-forest land) and forest degradation (loss of carbon stocks without land-use change). • Forest Definition: Project areas must meet internationally recognized forest definitions (e.g., UNFCCC or FAO), with at least 10 years of forest status prior to the project. • Eligible Forest Types: Includes mature, secondary, degraded forests, and forested wetlands like mangroves and peatlands. Avoiding Planned Deforestation (APD): • Stops deforestation legally authorised for conversion (e.g., to agriculture, infrastructure, or commodity production). • Applies to degraded or mature forests. • May involve government, community, or individual decisions to forego conversion for carbon revenue. Avoiding Unplanned Deforestation and/or Degradation (AUDD): • Prevents unauthorised or illegal clearing/degradation due to weak governance or economic pressures.

			• Applies to forest mosaics (patchwork landscapes) or frontiers (newly accessed areas due to infrastructure expansion). • Common drivers include subsistence farming, illegal logging, and poor law enforcement.
Jurisdictional and Nested REDD+ (JNR) Framework v4.1	VCS	REDD+	JNR participation is limited to national governments, or under specified conditions, subnational governments one administrative level below the national level. The following conditions apply: • Eligible activities include reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable forest management, and enhancement of forest carbon stocks. • Accounting must be carried out at the jurisdictional (national or subnational) level, with the possibility for projects and programs to be nested. • Reference levels (jurisdictional baselines) are aligned with VCS requirements. • Jurisdictions and nested programs must apply approved monitoring, reporting, and verification (MRV) systems, and comply with safeguards and leakage and permanence provisions. Not applicable under the following conditions: • Activities implemented solely at project scale without jurisdictional nesting. • Project types outside the scope of REDD+ (e.g., peatland restoration, agricultural soil carbon, or non-forest land use activities).
The REDD+ Environmental Excellence Standard (TREES), Version 2.0	Architecture for REDD+ Transactions	REDD+	ART participation is limited to national governments or, under certain conditions, subnational governments one level below the national level. The following conditions apply: • Eligible activities include reducing emissions from deforestation and forest degradation, sustainable forest management, conservation of forest carbon stocks, and enhancement of forest carbon stocks. • The accounting framework applies at national or subnational jurisdictional scale, with the option to nest projects or programs. • Baselines (reference levels) are established using historical forest cover change, emissions data, and national forest inventories, following ART's standardized procedures. • The jurisdiction must demonstrate national forest monitoring capacity, adherence to ART's safeguards, and compliance with permanence and leakage requirements. Not applicable under the following conditions: • Activities limited to site-specific project areas without jurisdictional alignment. • Project types outside the scope of REDD+ (e.g., peatland rewetting, agricultural soil carbon, or blue carbon ecosystems).

Note: Methodologies are continuously evolving. Please refer to the latest version for the most up to date information.

8.3. Fees and levies structure in EAA countries

Kenya

TYPE OF FEE	AMOUNT CHARGED (KSHS)	
Carbon Project Application Fee (Citizen)	10000	NOTE: a) a body corporate shall be regarded as a citizen only if the body corporate is wholly owned by one or more citizens; and wholly owned by one or more citizens; and b) a body corporate held in trust shall be regarded as being held by a citizen only if all the beneficial interest of the trust is held by persons who are citizens.
Carbon Project Application Fee (Non-Citizen)	10.000	
Carbon Project Design Document Fee (Citizen)	100.000	
Carbon Project Design Document Fee (Non-Citizen)	200.000	
Administrative Fee	Upon the Designated National Authority approval of the project design document: a) A carbon project with projected annual issuance of 15,000 carbon credits per annum or less- KES 150,000 b) A carbon project with projected annual issuance of more than 15,000 carbon credits per annum - KES 300,000 The fixed administrative fee paid by a project proponent will be deducted from the administrative fee payable by a project proponent at first issuance. Upon Issuance To be paid within thirty days following the sale of the issued carbon credits: a) The Kenya Shilling equivalent of USD 0.10 per carbon credit issued for the first 15,000 tonnes of CO2 equivalent for issuance is requested in a given year. b) The Kenya Shilling equivalent of USD 0.20 per carbon credit issued for any amount in excess of 15,000 tonnes of CO2 equivalent for which issuance is requested in a given year.	
Corresponding Adjustment Fees	The Kenya Shilling equivalent of USD 4 per unit of Internationally Transferred Mitigation Outcome.	

Source: The Climate Change (Carbon Markets) Regulations, 2024.

Uganda

TYPE OF FEE	CATEGORY	FEES (UGX)
Application for approval of climate change mechanism	Project Proponent	2,000,000/=
Corresponding Adjustment (CA) fee (CA fee/ ITMO)	Project Proponent	10% of each ITMO
Registration of verifier	Verifiers	6,000,000/=
Inspection of Register	Interested persons	3,000,000/=

Source: The National Climate Change (Climate Change Mechanisms) Regulations, 2025.

Tanzania

TYPE OF FEE	FEES
Application fee (non-citizen)	USD 500
Application fee (citizen)	USD 250 in Tanzania shillings equivalent
Project registration fee	1% of the average expected annually gross revenue from the sale of the carbon credit payable once for the lifetime of the project determined by the Designated National Authority or National Focal Point based on the existing global market price.
Annual administrative fee	5% of the gross revenue from the sale of carbon credit paid
Annual project fee	3% of the gross revenue from sold carbon credit

Source: The Environmental Management (Control and Management of Carbon Trading) (Amendment) Regulations, 2023

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