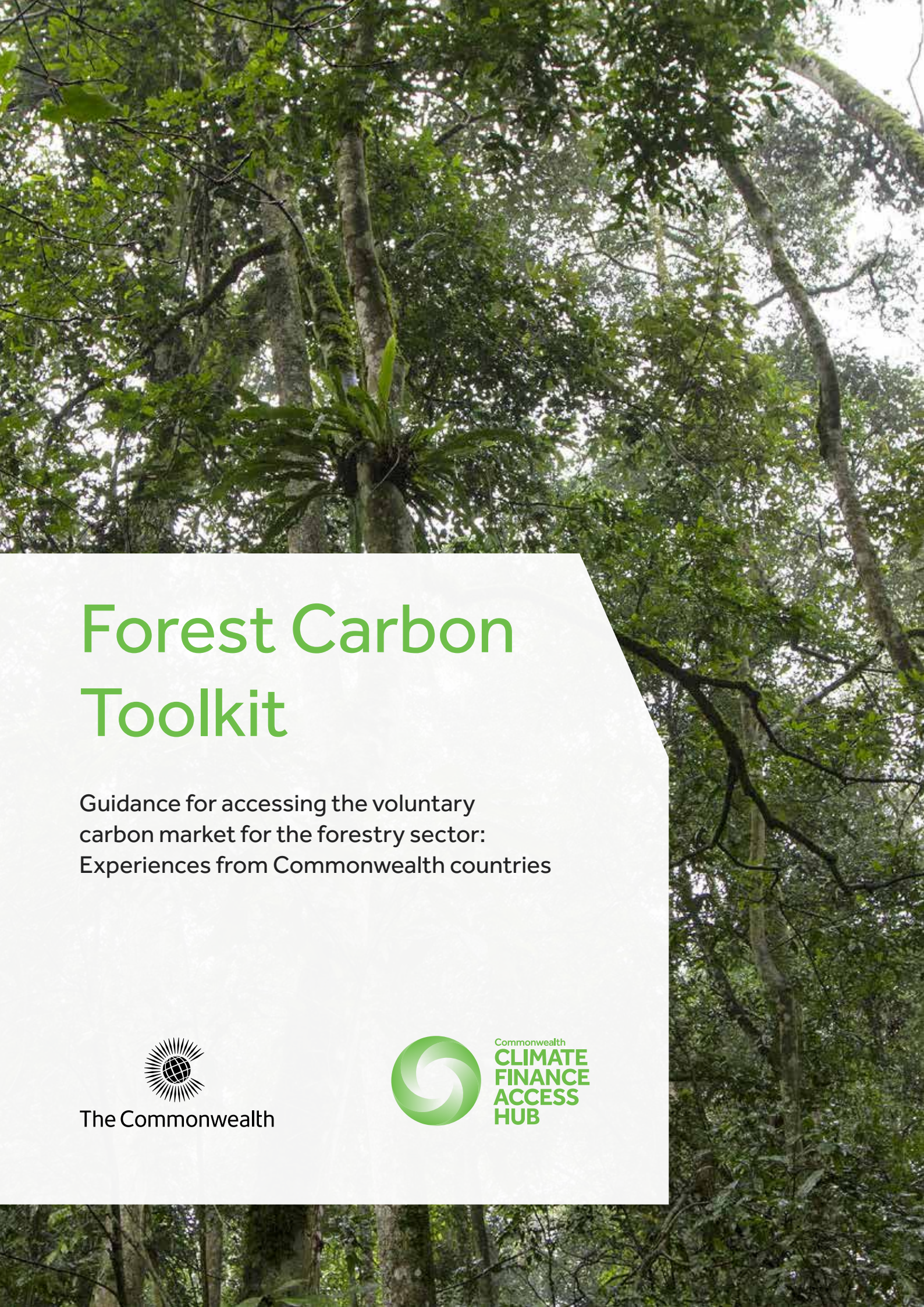

Forest Carbon Toolkit

Guidance for accessing the voluntary carbon market for the forestry sector: Experiences from Commonwealth countries

The Commonwealth

Commonwealth CLIMATE FINANCE ACCESS HUB

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Acronyms and Abbreviations

AF	assessment framework
AFOLU	agriculture, forestry and land use
ART	Architecture for REDD+ Transactions
ARR	afforestation, reforestation and revegetation
CCBS	Climate Community and Biodiversity Standard
CCP	Core Carbon Principles
CDM	Clean Development Mechanism
CH_4	methane
cm	centimetres
CO_2	carbon dioxide
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
ERR	emissions reduction and removal
GHG	greenhouse gas
GS	Gold Standard
Gt	gigatonne
Ha	hectares
HFLD	High Forest, Low Deforestation
ICVCM	Integrity Council for Voluntary Carbon Market
IFM	integrated forest management
ITMO	Internationally Transferred Mitigation Outcome
JNR	Jurisdictional and Nested REDD+
KPI	key performance indicator
LEAF	Lowering Emissions by Accelerating Forest finance
M	metre
MRV	monitoring, reporting and verification
NGEOs	Nature-based Global Emissions Offsets
N_2O	nitrous oxide
NYDF	New York Declaration on Forests
PDD	project design document

REDD	reducing emissions from deforestation and forest degradation
tC	Tonne carbon
ToF	Trees-outside-Forests
TREES	The REDD+ Environmental Excellence Standard
UNFCCC	United Nation Framework Convention on Climate Change
VCM	voluntary carbon market
VCS	Voluntary Carbon Standard

1. Introduction

Role of forests in climate change mitigation

Forests are crucial for maintaining biodiversity and act as a natural sink for carbon dioxide (CO_2) emissions.[1] They are vital carbon vaults that, together, absorb around 2.6 billion tons of carbon dioxide each year, or about a third of humanity's annual fossil fuel emissions. This is in addition to providing timber and non-timber forest products. Thus, forests play a significant role in fulfilling the Paris Agreement objectives, providing opportunities to deploy climate-change mitigation action at scale while contributing to increased climate resilience and protection of biodiversity, ecosystem services and local livelihoods.[2]

Intergovernmental Panel on Climate Change (IPCC) (2019) estimates that the agriculture, forestry and other land use (AFOLU) sector accounted for 13-21% of global anthropogenic GHG emissions in the period 2010-2019[3], with estimates rising to 80 per cent of GHG emissions in some developing countries.[4] Forests are also crucial for developing countries to achieve their nationally determined contribution (NDC) targets. This is reflected in the revised NDCs of many countries. As of July 2021, 75 per cent of the new or updated NDCs included mitigation measures in the AFOLU sector, with many developing countries highlighting reducing emissions from deforestation and forest degradation (REDD)+ as a priority measure (UNFCCC 2021)[5].

What is a 'forest'?

For land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4 of the Kyoto Protocol, the following definition of 'forest' applies.

A minimum area of land of 0.05–1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10–30 per cent with trees with the potential to reach a minimum height of 2–5 metres at maturity in situ and may include:

a) either closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or open forest;

b) young natural stands and all plantations which have yet to reach a crown density of 10–30 per cent or tree height of 2–5 metres; or

c) areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest.

Source: *Clean Development Mechanism Methodology booklet* (2022)[6]

Usually, the definition of forest is determined by the policies of individual countries. For example, forest in India is defined as all lands more than one hectare in area, with a tree canopy density of more than 10 per cent. Such lands may or may not be statutorily notified as forest area, which is the area recorded as a forest in government records. Forest cover includes all cultivated tree plantations or orchards with an area of more than one hectare. Forests are further classified as:

- very dense forest: Forest with a canopy density of 70 per cent and above;
- moderately dense forest: Forest with a canopy density of 40–70 per cent;
- open forest: Forest with a canopy density of 10–40 per cent;
- scrub cover: All lands, generally in and around forest areas, having bushes and or poor tree growth, chiefly small or stunted trees with canopy density less than 10 per cent; and
- non-forest land: defined as lands without any forest cover.

Climate finance provided for forest-related mitigation represents between 0.5 and 5 per cent of the investment necessary to avoid deforestation and forest degradation, and to encourage the afforestation and forest management practices essential to harness the mitigation potential of the forest sector. This underscores the need to enhance support to countries with significant forest covers (New York Declaration on Forests 2021). For countries with significant forest cover, preserving the forests come at a price of avoiding diversion of forest lands for other development purposes. Incentives provided through the carbon markets can help tropical forest countries to diversify funding sources and increase investment in the forest sector. The World Economic Forum considers forest carbon through the voluntary carbon market (VCM) as a critical tool for accelerating finance for indigenous peoples, local communities, landowners and governments; for halting deforestation and forest degradation; and for increasing forest restoration.[7] Combined with the benefits of forestry projects for biodiversity conservation, prevention of desertification, local ground water recharge and sustainable livelihood services, forestry projects typically command a higher premium in VCMs compared to other mitigation activities.

Forests and carbon markets

The growth of forest carbon markets in recent years has been driven by increasing concerns over climate change and the need to lower GHG emissions. The forest carbon credit market is complex and involves multiple players, such as forest landowners, compliance buyers and voluntary buyers. To understand the market, it is crucial to first understand the concept of forest carbon credits.

Issuance of forest carbon credits under international market-based programmes has taken place principally in VCMs. A forest carbon credit is a certificate that represents a unit of GHG emission reduction resulting from activities such as reforestation, afforestation and improved forest management, expressed as a metric tonne of CO_2 equivalent. After being verified, certified and registered, these credits can be transacted on forest carbon markets and used by companies and governments to offset their GHG emissions.

Forest carbon credit supplies ensue from two types of projects – stand-alone forestry projects and jurisdictional/national approaches. Stand-alone forestry projects are comparatively smaller projects which target specific geographic areas within a country. These projects define a baseline deforestation or forest degradation rate for the project area based on monitored data for the particular project location. If monitored baseline data for the project location is not available, a proxy location is used as reference for the baseline, such that the reference area has been facing the same set of drivers for deforestation as the project area. Jurisdictional approaches consider the entire national or subnational jurisdiction of a country to define the baseline deforestation rate and monitoring of project deforestation to calculate the avoided emissions in baseline and project scenarios. Jurisdictional approaches necessitate significant national or subnational government interventions as they consider the whole country as the geographic area of the emission reduction activities. While jurisdictional approaches were earlier considered for results-based payment, that is, payments were made post facto based on demonstrable results, such approaches are now also being considered for generating tradeable carbon credits in the voluntary or compliance markets.

Forest carbon credit market buyers can be divided into two main categories: compliance buyers and voluntary buyers. Compliance buyers are companies and governments that are subject to mandatory carbon-reduction targets under various carbon-reduction schemes, such as the European Union Emissions Trading System (EU-ETS) and the California Air Resources Board Cap-and-Trade Program. Voluntary buyers are individuals, companies and governments that choose to purchase forest carbon credits to offset their carbon emissions voluntarily, as a way of demonstrating their commitment to reducing their carbon footprint, promoting sustainable forest management and achieving other co-benefits. Afforestation or reforestation carbon credits are not allowed to be traded under the EU-ETS.[8]

This document focuses on monetising forest carbon through voluntary market mechanisms only. Similar mechanisms, methodologies and processes apply for developing forest-based projects for participation in market mechanisms under Articles 6.2 and 6.4 of the Paris Agreement. However, while developing forest carbon projects, project implementers/developers should consider specific provisions of Articles 6.2 and 6.4 mechanisms as provided by the UNFCCC.

Table 1.1 Compliance and voluntary carbon market

Compliance/Regulated market	Voluntary/Unregulated market
Kyoto Protocol laid the foundation of legally binding targets to the Annex 1 countries to reduce overall GHG emissions by at least 5 percent below 1990 emission level during the first commitment period 2008-2012.	No legal binding. Participants could be company, individuals etc. who wants to volunteer in GHG emission reduction.
Three flexible market mechanisms – Clean Development Mechanism (CDM) – between annex I and non-annex I countries Joint Implementation (JI) – between annex I countries Emissions Trading System (ETS) – between annex I countries	Broader project coverage than compliance markets. Covers payments for ecosystem services (PES) schemes, REDD+, agricultural land management (ALM), integrated forest management (IFM), avoided conversion of grasslands and shrublands (ACoGS), wetland reforestation and conservation (WRC), biodiversity conservation, livelihood development, institutional capacity and governance strengthening, and social and economic safeguards
These mechanisms allowed only afforestation/ reforestation projects. There was no consideration for non-carbon benefits	
The regulated market is slowly transitioning to article 6 mechanismwhich is a market mechanisms provided by the Paris Agreement	These mechanisms focus on both carbon and non-carbon benefits and emphasise conserving mixed natural forests
Applicable standard: CDM	Applicable standards: Voluntary Carbon Standard, Gold Standard, Plan Vivo, Architecture for REDD+ Transactions, Climate Community and Biodiversity Standard, Social Carbon

Source: Enviance Consulting Private Ltd

Article 6 of the Paris Agreement

Article 6 of the Paris Agreement provides mechanisms for countries to achieve their NDC mitigation targets through market and non-market mechanisms. Article 6 contains provisions for three specific pathways: co-operative approaches under Article 6.2; a carbon credit mechanism under the aegis of UNFCCC under Article 6.4; and non-market approaches under Article 6.8.

For co-operative approaches (Article 6.2) and the new mechanism (Article 6.4), the requirements are demanding. They introduce a different role for participating countries compared to the Kyoto Protocol, especially a new role for developing country governments. The transferring country (host country) becomes responsible for authorising the transfer of mitigation outcomes that cannot be simultaneously used towards the country's NDC. Developing countries have targets through their NDCs and can participate as countries transferring or receiving mitigation outcomes. Countries must ensure that participation in any of the Article 6 mechanisms, whether through Articles 6.2, 6.4 or 6.8, does not result in difficulty in reaching their NDC targets.

Research by Trove Research finds that investment levels in the VCM over the past three years are five times the value of the global carbon credit market. This is indicative of an industry poised for significant future growth. Between 2021 and 2023, more than US$18 billion has been raised to invest in carbon credits of which 80 per cent is for afforestation/ reforestation, improved forest management and REDD – covering a total area of 30 million ha through 246 projects. The same study finds that

a further US$90 billion in capital will be needed by 2030 to achieve the volume of credits required under the 1.5°C scenario. A Boston Consulting Group study[9] suggests that, in 2021, the VCM grew at a record pace, reaching US$2 billion – four times its value in 2020 – and the pace of purchases was still accelerating in 2022. By 2030, the market is expected to reach between US$10 billion and US$40 billion. In 2021, forestry and land use projects represented around half (47 per cent) of the total volume transacted, while in 2020 and 2019 this category represented about 28 per cent and 37 per cent respectively (Forest Trends' Ecosystem Marketplace 2021[10]). In the period 2016–2021, projects under the forestry and land use category were among the highest priced at an average of US$ 4.39 per tonne. The Boston Consulting Group study also suggests that more than half of companies surveyed expect removal credits[11] to dominate their portfolio by 2030. Although removal credits are expensive, they have gained a following because of their quality — it is easier to verify a project's impact with these than with avoidance credits. Technology-based removals are expected to gain market share as the technology matures and becomes more affordable. This implies that, in the near future, forestry-based carbon credits will remain a viable and attractive option in the VCMs to offset emissions.

There are, however, a few concerns with the forestry-based carbon market:

a. **Double counting and limited clarity on the impact of Article 6 of the Paris Agreement and corresponding adjustments.** Article 6 of the Paris Agreement allows countries to help each other achieve their NDC to global emission reduction. One country can, for example, sell its carbon credits to another, but *only one may apply the credit to its NDC*. Corresponding adjustments are an accounting mechanism to prevent any double counting between countries, but they could impact companies that wish to source credits internationally. Market wisdom is also divided on whether Article 6 will lead to a global compliance market, though it is expected that an infrastructure for corresponding adjustments will be put in place over the next five years.

b. **Integrity of the forest carbon credits.** The pricing of forestry carbon credits is highly dependent on the integrity of the credits being generated. In recent times, there have been reasons for concern in the forestry-based VCM with reporting of 'non-additional' carbon credits,[12] 'phantom' carbon credits[13] and over-crediting of carbon emission reductions. The amount of 'avoided deforestation' credits supplied to the market 'shrank by a third from 2021 to 2022'[14] due to loss of confidence in the VCM. Most of these integrity issues arose due to over-estimating the baseline emissions; lack of robust monitoring and governance practices; and lack of suitable mechanisms to ensure that deforestation avoided in one area is simply not shifted to another area (known as leakage emissions).

   Independent governance bodies are working to raise the integrity of supply and demand across the VCM. The Integrity Council for Voluntary Carbon Market (ICVCM) has developed core carbon principles (CCPs) and an assessment framework (AF) to act as a quality standard against which all carbon credits – including forest carbon credits – should be measured.

Jurisdictional REDD+ approach to ensure integrity of forest carbon credits

While high integrity of forest carbon credits can be ensured through guidelines provided by the ICVCM, discussed below, some of the integrity issues with stand-alone forestry projects can be eliminated through a jurisdictional REDD+ approach. Since jurisdictional REDD+ sets the baseline and monitoring of emission reductions at the jurisdictional (national or sub-national) level, it reduces the risk of inflated emissions baselines and subsequent over-crediting. By considering deforestation across the whole jurisdiction, using methodologies that must be aligned with international reporting standards, the risk of baseline deforestation being misrepresented is lower. Also, the jurisdictional approach reduces the chance of 'leakage' emissions due to shifting of deforestation activities from one area to another in stand-alone projects, since the entire jurisdiction is monitored. The jurisdictional approach also helps in convergence of national policies and increased national or sub-national co-ordination. This allows for more efficiency of scale while incentivising changes to policy and regulation at the national or sub-national levels, which is highly improbable for stand-alone forestry projects.

c. **Carbon price volatility.** Prices for nature-based global emissions offsets (NGEOs)[15] have been trading at a premium over the other offsets in June 2022 and comprised 45 per cent of all offsets in 2022. However, NGEO prices crashed by 90 per cent in 2023[16] due to loss of market confidence. This is not to say that the VCM for forestry projects is not an appropriate route for generating climate finance but to highlight that the climate finance generated through this route will require a strong rule-based mechanism with high integrity – both on the project proponent side as well as on the regulator side.

Experience of Guyana with pricing of generated credits

In 2009, Guyana decided that high integrity REDD+ required action at national scale. From 2009 to 2016, Guyana produced results which led to the payment of US$227 million from the Government of Norway in a non-market phase that enabled the build-up of market-facing capabilities. As a result, Guyana generated 37.5 million carbon credits from 2016 to 2020 and will be generating 7.5 million credits every year till 2030. In line with the strategy set out in 2009 to ensure integrity of the carbon credits generated, Guyana opted for a national REDD+ project, now known as the jurisdictional REDD+ approach. Jurisdictional REDD+ approaches cover REDD+ activities in all forested areas of the country thereby ensuring that there is no leakage due to the project activity through displacement of deforestation activities outside the project boundary. Over time, Guyana has also put in place a very robust monitoring and verification system which provides confidence in the veracity of the emission reductions reported. Guyana also committed one-third of its credits at a floor price, which averages US$20/t to VCM and compliance buyers which ensured that the revenues from the credits are protected in the case of severe market fluctuations. This has resulted in an agreement to purchase US$750 million in credits for the period 2016 to 2030, of which US$237 million has been received by Guyana to date. Revenues are invested in Guyana's low carbon development strategy (LCDS) as was the case with the US$227 million revenues from the Guyana-Norway Agreement.

d. **Rights over lands and forests of developing countries.** For countries with significant forest resources, participating in a carbon market mechanism could entail transfer of management practices of forests to different foreign private or public entities that would be buying the forest credits. In some cases, such types of arrangement bring into question the sovereign rights of a country over its own forest resources to be used for other economic purposes. Also, for forested countries, since the emission reductions from the forests will be transferred to a different entity, this would also mean that such countries will have to take possibly costlier and longer routes to fulfil their own Paris Agreement commitments.[18]

In some countries, for example, Rwanda, the carbon stored in and absorbed by trees in owned by the state, even if it is on private land. In such cases, the carbon rights and the forest rights may belong to different entities. In such cases, a right-sharing agreement is to be established transparently before developing the project so that there are no legal challenges to participating in the compliance or voluntary market mechanisms.

Such right-sharing frameworks may also be built into the forest management framework and guidelines of countries, keeping in mind the countries' NDC targets from forest-based activities such that mitigation targets are not impeded due to any transfer of carbon rights.

Rwanda, for example, has developed a national carbon market framework, which mandates the following for forestry sector projects: 'the sale of forestry services such as the carbon market and others shall be made in accordance with an agreement between the person seeking such a service and the Authority. The conditions of sale of such services and requirements to be met by beneficiaries of such services shall be determined by the Authority'. The framework, therefore, provides clear and transparent guidelines covering how carbon rights are to be issued and monetised and under what conditions.

e. **'Buffer' pools.** Forests are vulnerable to wildfire, droughts and diseases. This brings into question the durability of forest carbon credits. Forestry projects are also vulnerable due to bad management practices or change of developmental goals of the host country. This is more prominent for forestry projects which claim credits for avoidance or improved practices. To tackle this challenge, forest carbon project developers typically create 'buffer pools' – a reserve of non-tradeable credits that covers unforeseen losses in carbon stocks. However, accounting for buffer credits often does not consider any increase in reversal risks over the duration of the project. For example, California wildfires reportedly eliminated all reserve credits intended to cover reversal risks for the next 100 years.[17]

Relevant stakeholders

Project owners: Forest landowners are the primary stakeholders in forest carbon credit projects. These include individuals, organisations, companies and governments that own the forests and are responsible for the management practices that reduce emissions and increase carbon sequestration. Landowners can sell their carbon credits directly through a forest carbon market or involve the services of third-party aggregators. Forest carbon market opportunities for landowners who own smaller acreages are becoming available and several entities offer programmes for smaller landowners.

Verifiers: Forest carbon credit verifiers are independent organisations responsible for verifying the accuracy of carbon credits generated by a project and for ensuring that these meet the standards set by the relevant carbon credit certification scheme.

Registries: Forest carbon registries are independent organisations that maintain a database of all forest carbon credits that have been created, traded and retired. There are several different registries that certify these credits. The 'Verified Carbon Standard program registry' operated by Verra is the most widely used for projects. It registers offsets for afforestation, avoided conversion and improved forest management. Other most used project-based registries are the American Carbon Registry, the Climate Action Reserve and Gold Standard. Jurisdictional approach-based registries include ART and Verra JNR, although to date, ART is the only registry to issue jurisdictional credits. The purpose of these registries is to provide a platform for transparent exchange and tracking of voluntary carbon credits between buyers and sellers. Therefore, the registry must have the ability to record actions related to verified/certified emission reductions (or Internationally Transferred Mitigation Outcome (ITMO) in case of Article 6 mechanisms), such as their authorisation, transfer and use, and that track and account for emission reductions through unique identifiers.

Aggregators: Undertaking a carbon offset project is expensive. So many landowners participate through forest carbon programmes in which third-party companies assist with the up-front and ongoing costs of the project in exchange for a share of the revenues. Carbon credit aggregators are entities that group together several carbon credits from different projects and sell them as a portfolio. They often help small-scale project developers and landowners access the carbon credit market by aggregating the credits and making them more accessible to buyers.

Role of governments:[19] To engage with VCMs, host country governments can act as regulators, implementers and facilitators. As **regulators**, governments institute policies, regulations and safeguards to guide the development of forest carbon projects in their territories and attract carbon market finance. Governments may maintain transparent databases of projects, emission reductions achieved and traded, and formulate and enforce safeguards and benefit-sharing arrangements to ensure sustainable development co-benefit outcomes. Governments may incentivise participation in the VCM by permitting use of VCM credits in mandatory carbon pricing schemes (for example, carbon tax, emission trading schemes).

Under the Kyoto Protocol, all participating countries established a designated national authority (DNA) whose approval was mandatory for any project to participate in the clean development mechanism (CDM), joint implementation (JI) or European Union emission trading scheme (EU-ETS). The DNA provides administrative and technical services in the form of approval of mitigation activities, issuing no-objection letter, letter of approval, letter of authorisation for participating in the compliance-based market mechanisms – CDM and Article 6 of the Paris Agreement. The role of the DNA is limited for voluntary market participations for which host country approval is 'voluntary'. However, if the VCM emission reductions are used for compliance offsets outside the UNFCCC mechanisms, such as CORSIA,[20] host country approval is necessary. Rwanda's carbon market framework requires that VCM projects with corresponding adjusted units for use in compliance mechanisms should obtain project approval and authorisation whereas VCM offset projects, independent of the use of the mitigation outcomes, should obtain a letter of no objection from the Government of Rwanda.

Some DNAs (for example, Ghana) also maintain a registry including all voluntary carbon offset projects.

A major emerging area for government intervention would be to define policies and institutional and regulatory frameworks for corresponding adjustments of traded VCM credits with the country's NDC commitments under Article 6 of the Paris Agreement.

Rwanda's national carbon market framework

Rwanda has established a national carbon market framework to provide adequate domestic carbon crediting guidelines, including institutional, legal and governance structures and robust national carbon market registry to avoid double counting of GHG emissions. The purpose of developing and establishing this is to facilitate Rwanda's participation in carbon markets, both within and outside Article 6 (6.2 and 6.4), in non-market approaches under Article 6.8 and in VCMs. The framework aims to build confidence in the market and reduce uncertainty for project participants, particularly for the private sector.

The framework establishes a governance and institutional structure that will make it possible for Rwanda to make further considerations regarding its participation in carbon markets. The framework also provides operational/technical elements, such as determining specific procedures necessary to participate, including but not limited to, the project cycle, requirements to ensure environmental integrity, and processes for reporting.

The framework contains four main elements: policy framework, legal and regulatory framework, institutional and governance structure, and implementation processes. These elements build on, and are integrated with, the existing governance, policymaking, legislative and administrative practices in Rwanda.

The policy framework provides a set of guiding principles and decisions that will determine Rwanda's climate actions.

The institutional framework and governance structure provides the organisational set-up of agencies and bodies that will implement the national framework, including the roles, responsibilities and accountabilities of different actors.

The legal and regulatory framework provides a set of laws, regulations and rules that apply in the context of the national carbon market framework. The regulatory framework is a sub-set of the legal framework, denoting a set of regulations that is valid for the implementation of the national carbon market framework. It builds on the previously developed structures for participation in the CDM and other types of international collaboration for climate mitigation, and existing mandates for government bodies.

The process for implementation provides procedures for the specific activities for the operationalisation of the framework and the responsibilities for their execution. The procedures include or refer to templates and other relevant documents.

The components aim to facilitate effective, transparent and smooth decision-making regarding mitigation activities eligible for the international carbon market, whether under Article 6 or the voluntary carbon market. The scope of the framework is the international carbon market in the broad sense, that is Article 6.2, Article 6.4, independent carbon standards (the VCM), as well as Article 6.8, which is a non-market approach.

As **implementers**, governments are the project owners of VCM activities directly. Subnational entities (for example municipalities or states) or public agencies (for example natural park authorities or investment agencies) can be direct implementers of carbon projects. In the context of REDD+, governments can sponsor jurisdictional and nested programmes and adopt rules for private sector engagement. In some instances, governments can also be co-implementers with private sector agencies. In such cases, sufficient checks and balances should be established to ensure that the role of government as implementer is not in conflict with the role of government as regulator as this would be detrimental to the integrity of the project and the emission reductions generated.

As **facilitators**, governments create an enabling environment for participation in VCMs by providing regulatory certainty through predictable, efficient and standardised processes for granting approvals and authorisations; reporting to national registries; receiving guidance on benefit sharing and rights; and communicating with relevant national and subnational authorities. Governments could also ensure the alignment of the projects with the national priorities of the country in terms of NDC/SDG commitments.

Vision matters

Forests in Guyana cover as much land area as the whole of the UK. The forest stores 19.5 Gt of CO2e and removes 154 million tonnes of CO2e annually, the equivalent of the annual emissions of Norway, Sweden, Finland and Denmark combined. Guyana believes that international payments for ecosystem services (PES) are essential to value the global ecosystem services provided by tropical forest countries, including climate, biodiversity and water management. The vision of leadership of Guyana to monetise its forest resources was clear from the outset. The pathway was divided into three phases:

a. Building capacity in implementing forestry projects, land titling, monitoring of emission reductions and ensuring social, environmental and economic safeguards through **bilateral assistance**. Guyana did this successfully by entering a bilateral arrangement with Norway to implement a REDD+ project as early as 2009. The project provided Guyana with the opportunity to strengthen its institutional and personnel capabilities and to build the foundation for integrity of its generated credits as well as evidence of the socio-economic benefits of the REDD+ project. Guyana received US$227 million in payments for climate services, with payments from Norway at US$5/tonne emission reduction for the period 2009–2015.

b. Leveraging the knowledge gained from the initial bilateral assistance to **enter the VCM to continue monetising** the forest resources through generation of high integrity carbon credits. The learning from the bilateral project was successfully integrated in a jurisdictional REDD+ project with the crediting period from 2016 to 2030. The systems developed through the bilateral assistance helped Guyana to ensure that the credits claimed are robust and marketable at a premium. To date, US$750 million has been agreed in sales under the voluntary market, with US$237 million received.

c. The next step in the low carbon development strategy of Guyana entails entering the UNFCCC compliance market as and when it takes off. Guyana has already started revising its NDC with a strategy to transition from the voluntary market to the compliance market as necessary.

2. Developing a Forestry Carbon Market Project

Three main types of carbon credit projects can be used to participate in carbon markets.

1. **Avoided conversion:** Protecting the forest from future development to keep the carbon in the forest's trees and soils. These projects usually include the establishment of a conversion of forest lands to reserved category or the transfer of private land to public ownership with suitable management practices. Avoidance credits are, however, difficult to monitor and attribute with less certainty. These projects are also known as REDD.[5]
2. **Afforestation, reforestation and revegetation (ARR):** Growing new trees to remove CO_2 from the air and store carbon. For these projects, trees are planted and/or conditions are created that will encourage the growth of trees in an area previously absent of trees. This type of project generates credits which are easier to monitor and calculate, and hence are considered more marketable than avoidance credits.

REDD+ is defined as activities in the forest sector that reduce emissions from deforestation and forest degradation, as well as the sustainable management of forests and the conservation and enhancement of forest carbon stocks.

Stand-alone project-based REDD+ refers to REDD+ activities focused on individual projects in a defined area of forest, which can be small or thousands of ha.

Jurisdictional REDD+ refers to REDD+ activities in which all the forest in a national (that is whole country) or subnational (for example state or province) jurisdiction must be considered when setting a baseline and monitoring deforestation. The jurisdictional approach is confined to REDD+ only as compared to a historical emission baseline due to deforestation and forest degradation.

Until as recently as 2022, jurisdictional approaches to REDD+ were used for only result-based payments and not to issue carbon credits. However, this has started to change with Guyana being the first country to have successfully implemented a jurisdictional REDD+ project that has successfully transitioned to the VCM.

The Architecture for REDD+ Transactions (ART) has issued the world's first TREES (The REDD+ Environmental Excellence Standard) credits to Guyana. Guyana's TREES credits are also the first market-ready credits issued to a jurisdiction classified as 'High Forest, Low Deforestation' (HFLD), which means it has high forest cover and low historical rates of deforestation. This is also a deviation from the previously issued carbon credits which predominantly focus on areas that have already experienced high rates of deforestation.

3. **Improved forest management (IFM):** Using practices that increase the amount of CO_2 removed from the air and carbon stored in an existing forest. Strategies to do this might include setting aside a reserve area, harvesting less frequently to grow larger trees, thinning to allow remaining trees more room to grow, and/or increasing the diversity of species and age classes (that is, forest structure). This is the most common forest carbon offset type.

Type 1 (REDD) and type 2 projects (ARR) are relatively straightforward in terms of defining the activity to be implemented. However, the enabling conditions required to undertake the activities may be quite challenging. IFM projects may take many different forms[21] such as:

a. Consolidate forest area; create a forest management group: Consolidated, community-based forest management systems are more effective than individually managed disjointed forests at achieving climate-change mitigation or adaptation outcomes.

b. Ensure optimal harvesting times: Optimise the time of harvesting trees in managed plantations according to maximum carbon sequestration (highest growth rates) and optimum economic gain (largest carbon stocks).

c. Reduce harvest intensity: While managing a natural forest or plantation, leave more trees standing after a harvest. Instead of denuding an entire area, harvest less trees and keep some trees standing. A multi-aged forest system that allows for differently aged trees, while maintaining a constant density of trees, contribute to better forest management and increased GHG emission reductions.

d. Keep livestock out of the forest: Livestock in forests feed on saplings, young trees and seeds thereby resulting in low replacement of mature or harvested trees.

e. Plant different species: Using a mixture of species, local species, instead of exotic or alien varieties strengthens the health and resilience of forests. Mixtures of species also help in climate-change adaptation by supporting a greater variety of other plants and wildlife (biodiversity).

f. Prevent forest fires: Forest fires release carbon stored in living trees and in other carbon pools back into the atmosphere.

Forestry VCM projects could also cover ARR activities outside designated forest areas. Such projects are typically known as 'Trees-outside-Forests' (ToF) projects. Some common examples of forestry VCM projects involving ToF are:

a. **Agroforestry:** A land use management system that that involves planting at least two kinds of species, of which one is a woody perennial. In common terms, agroforestry is growing trees and crops in interrelating combinations.

b. **ARR in private land:** Restores trees to suitable landscapes through replanting, assisted naturally regeneration and plantation of trees, and eventually increases tree biomass on degraded or open patches of land.

c. **Developing urban and peri-urban plantations:** Undertaking perennial plantation programmes in public parks and through avenue plantation. This helps combat climate change and ensures community, local environment and biodiversity benefits.

Stand-alone forestry project versus jurisdictional approach versus nested REDD+ projects

A forestry carbon market project could be proposed by any project proponent – private or public. However, countries taking up ambitious mitigation targets under their NDCs face an important choice. This is whether to allow stand-alone forestry projects, especially REDD+ projects, to be taken up by individual project proponents with the sole right to the forest carbon credits, or to pursue a country-driven jurisdictional approach encompassing the entire geographic area of the country. This would give an average deforestation baseline for the entire country. With the latter, the right to the forest carbon credits remains solely with the country.

Another approach is to allow for 'nested' forestry projects. Nesting is essentially an intermediate step between a stand-alone project-based approach and a jurisdictional approach wherein certain provisions are made to accommodate stand-alone REDD+ programmes and projects into larger scale jurisdictional initiatives.[22] It includes criteria and requirements to ensure that stand-alone projects are aligned with jurisdictional baselines and national policies. Nesting enables implementation of REDD+ projects at different scales by creating incentives for both public and private actors.[23] The nesting approach undertaken will vary from country to country depending on the willingness and preparedness of the countries to transfer or share the rights to the forest carbon credits. In an extreme case, countries might require stand-alone projects to completely transition to a jurisdictional approach, thereby foregoing any separate accounting or crediting of forest carbon credits. Table 2.1 summarises the three approaches.

Table 2.1 Comparison of three approaches for developing REDD+ projects

	Project-level REDD+	Nested REDD+	Jurisdictional REDD+
Scale	Defined area of forest	Defined area of forest	Entire jurisdiction (national or subnational)
Baseline	Independently set for that specific area	Variety of approaches	Average deforestation across the whole jurisdiction, aligned with international reporting standards
Framework	Independent standards (CDM, VCS, Gold Standard, Plan Vivo) or national methodologies	Independent standards (Verra JNR)	National or international frameworks (for example World Bank's Forest Carbon Partnership Facility) Independent standards (ART TREES, Verra JNR)
Founding	Mostly through CDM (no longer permitted) and VCM	Nested projects are only beginning to be developed	Mostly result-based financing; recently through VCM
Pros	• Often easier to implement • Smaller scale • Proven success • Local context and needs considered	• Better monitoring of leakage • More reliable baselines • Easier transition than implementing jurisdictional approaches	• Economies of scale leading to lower development and MRV costs • Leakage automatically considered • Land rights can be more clearly addressed • Incentivises changes in national policies
Cons	• Baselines often inflated • Hard to monitor leakage	• Methodologies yet to be proven • Ignores local drivers of deforestation	• Complex to manage • Challenging to obtain enough samples to set baselines • Benefit-sharing risks entailing procrastinated negotiations with stakeholders

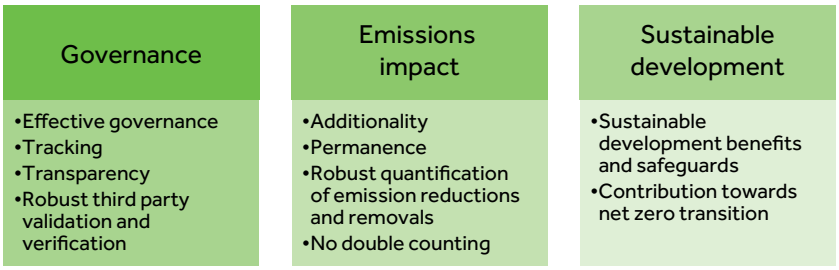
Source: Sylvera (2022)[24]

Requisites for a carbon credit project

To be considered a valid carbon credit project:[25]

- The project must be **additional**: that is, amount of CO_2 absorbed by a forest, and/or the amount of carbon it stores, must be higher than that in the absence of the project. For the jurisdictional approach, the deforestation rates in the project scenario must be lower than historical baselines and could also strive to adopt a declining baseline level, adjusted periodically.
- The project must not lead to **leakage**: that is, the project will not lead to a loss of forest carbon or increased emissions directly attributable to the project in areas outside the defined project boundary. For the jurisdictional approach, since the forest carbon is estimated over the entire jurisdiction, leakage is automatically adjusted.
- It must have a long-term time commitment to ensure the additional CO_2 absorption is not short-lived, otherwise known as **permanence.** For the jurisdictional approach, permanence is ensured as the increase or lower decrease in forest carbon is estimated over the entire jurisdiction.

Figure 2.1 ICVCM core carbon principles



- It must be periodically checked to verify that the impact of the project continues to meet the carbon credits awarded/projected.

Considering the above points, to ensure the integrity of voluntary carbon projects, the ICVCM, an independent governance body for the VCM, has developed ten core principles in three key areas of governance, emissions impact and sustainable development, to which all carbon credit projects should adhere:[26]

Project development cycle and timeline

The project development process is a multistep endeavour[27] that must meet specific standards to ensure forest management actions result in additionality, permanence, proper monitoring, reporting and verification.

Step 1: Conduct a feasibility analysis of the proposed project or the jurisdictional approach to be implemented. To satisfy feasibility, the project proponent must be the legal owner of the project. If the proposed project area was already undertaking forest conservation, afforestation, reforestation or a cost-sharing programme, the project may not be 'additional' and hence ineligible. For the jurisdictional approach, the projected deforestation rates have to be lower than the historical deforestation rates to be considered additional. The feasibility report will be followed up with a project design document (PDD).

Step 2: Conduct an inventory of carbon stocks in the pre-project scenario. For stand-alone projects this will be conducted within the boundaries of the project area. For the jurisdictional approach, the carbon stock will be established for the entire jurisdiction. Project developers must determine the projected net GHG reductions and removals considering the present or historical practices. This is defined as a 'business-as-usual' (BAU) scenario. The emissions in the BAU scenario determine the project baseline against which additionality is measured. Additionality of a project is determined through a series of tests, such as establishing financial, technological or regulatory barriers impeding the implementation of the project. Project developers need to ensure that the mitigation impacts of the project are not short-lived; provide a projection of GHG reductions over the crediting period of the project; assess risk for carbon loss; and create a plan for future project monitoring including identification of key indicators. These considerations will form the basis of the PDD. Different 'standards' and 'methodologies' are available that provide the required guidance for developing the PDD.

Step 3: Third-party **validation and verification** entities assess the project against specific standards and measure the GHG reductions during the reporting period based on the proposed monitoring plan in the PDD. If the project activities have already been implemented, VCM allows for carrying out validation and the first verification simultaneously. These can be conducted by the same approved third party. This approach is time- and cost-effective. The validator/verifier may recommend approval, rejection or conditional approval of the project to the respective registries. Third-party validation and verification is mandatory to determine the eligible quantity of carbon credits generated by any forestry activity, stand-alone or jurisdictional.

Step 4: On recommendation from the third-party verifier, the registry will complete a review of the verification results and will **issue credits upon approval**. These credits could then be purchased by other entities or governments seeking to offset their emissions or meet their NDC targets. Usually, each of the registries provides stringent guidelines to ensure the transparency and quality control required for developing verified forest carbon credits.

The registries also require setting aside necessary carbon buffer pools, determined as a certain percentage of carbon credits issued, as insurance against possible future carbon losses due to unavoidable events (such as wildfire, pests or disease disturbance) and avoidable events (such as additional harvest). These buffer pools are not allowed to be traded through the registries. The registries serve as publicly available platforms for reporting and tracking projects, carbon credits issued and transferred between buyers and sellers, ownership of the transferred credits and retirement of traded credits from national registries to avoid double counting, as applicable. Registries are essential to maintain transparency of the transactions in the carbon market.

Once project credits are registered, they can be used by a variety of actors within carbon markets.

The crediting period for forestry projects varies from 15 years to 100 years depending on the standard selected for developing the project proposal. For example, in CDM, the crediting period may be selected as fixed for 30 years or a twice renewable crediting period of 20 years for a combined period of 60 years. The Global Carbon Council allows forestry project crediting periods of not less than 15 and not more than 30 years. The crediting period may be renewed up to four times (but the entire project crediting cycle should not be longer than 100 years).

The above steps are summarised in Figure 2.2.

It typically requires 19 to 25 months from the start of developing a project proposal to receiving finance through sale of credits:

The terms and timelines used in Figure 2.3 are typical for VCM projects and are illustrative. These should not be construed as actual timelines for project development and monetisation. For Article 6 mechanisms, the terminologies are a bit different. For example, the PDD is replaced with the mitigation activity design document (MADD). While similar information is required in both the templates, the templates themselves are separate. The choice of template depends on the selected voluntary carbon mechanism or Article 6 mechanism. You can view a sample template for Article 6 projects from Rwanda at this link. Project proponents (PPs) seeking to submit proposals under Article 6.4 are requested to refer to 'Article 6.4 activity standard for projects' accessible through the UNFCCC website.

Any project activity which intends to participate in the VCM needs to first determine whether it is eligible to do so. The following checklist provides

Figure 2.2 Steps for participating in voluntary carbon markets

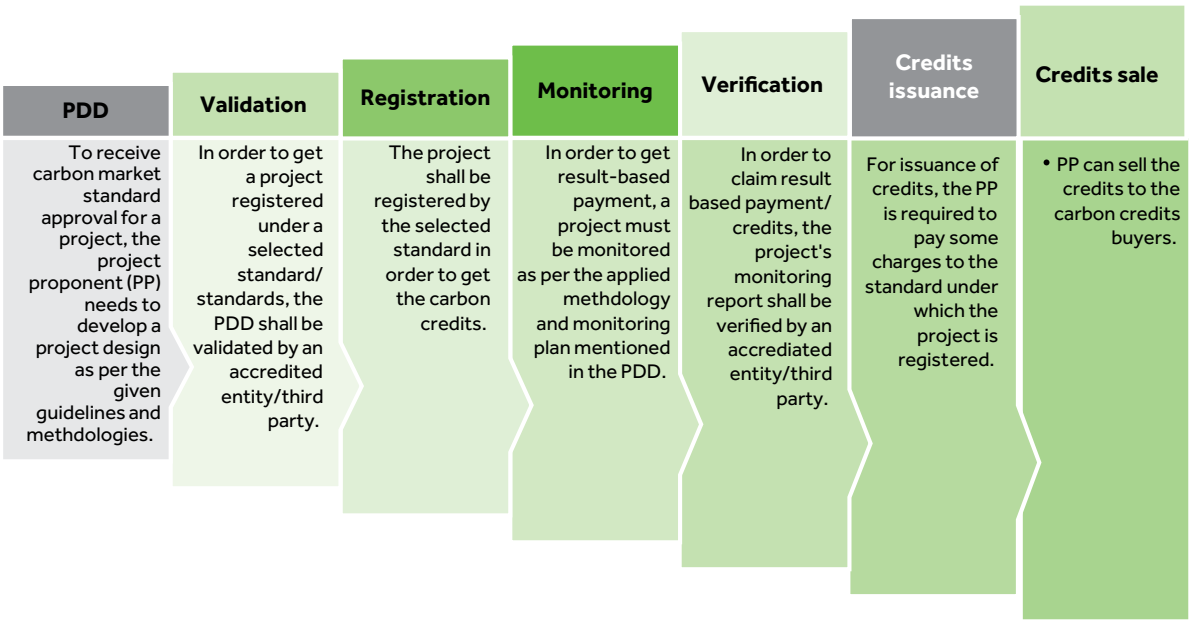
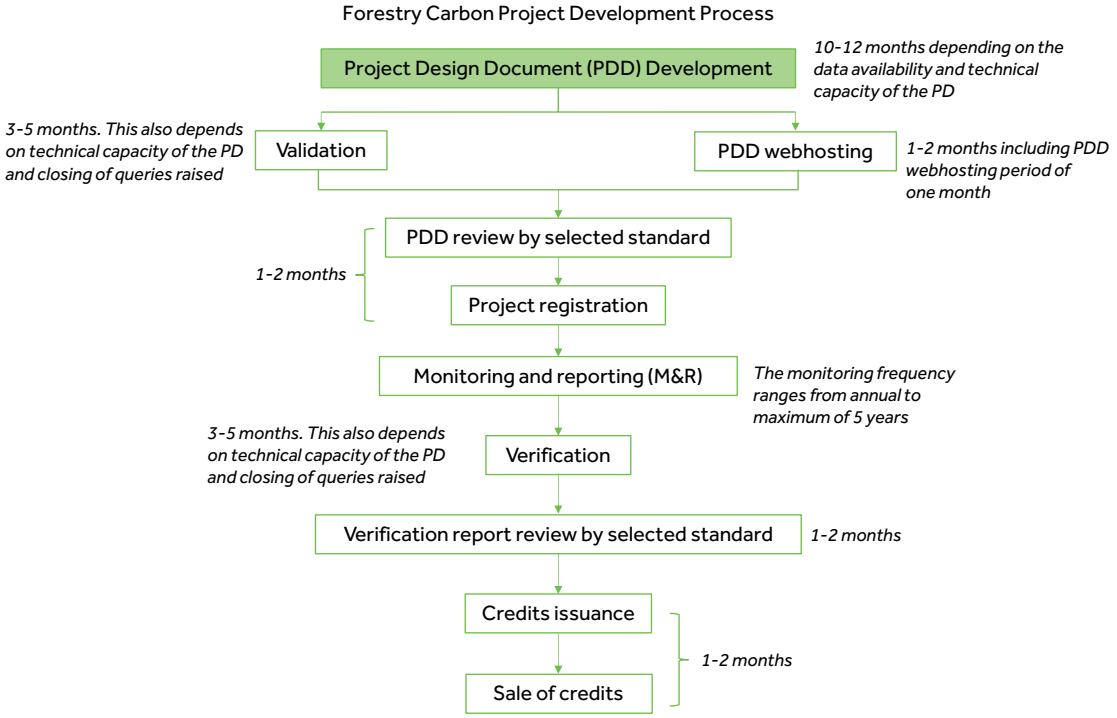


Figure 2.3 Typical timelines for developing VCM projects



the basic information that any PP would need to consider before embarking in the VCM to enable them to develop a feasibility study for the project.

Selection of criteria and indicators for feasibility study of forestry carbon market projects

Any forestry project seeking to benefit from the VCM should, ideally, initiate a feasibility study which includes criteria and indicators that have been used internationally for forestry VCM projects.[28,29,30,31] As a minimum, any feasibility study should emphasise the following criteria and corresponding indicators. These follow from the checklist above:

- GHG mitigation outcomes and expected impacts;
- potential to increase GHG mitigation over time;
- national appropriateness;
- co-benefits;
  - community wellbeing – including livelihood, health, knowledge sharing and skill development
  - ecosystem wellbeing – enhancing biodiversity and forest health, landscape diversity, species diversity, native forests and species and so on
  - maximum stakeholder reach and engagement
  - technological wellbeing – transfer and increase in using best practices for implementation and management
- technical feasibility;
- financial feasibility; and
- measurement, reporting and verification (MRV) viability.

While determining the alignment of the project activity to national policies and objectives, PPs should assess the alignment of the project, as a minimum, with the NDCs as well as the SDG indicators. Forestry projects typically have strong linkages to SDGs and PPs should highlight the contribution of the project to meet the country's SDG targets. Typically, forestry projects contribute to the following SDG indicators.

Table 2.2 Checklist for developing a forestry VCM project

Sl. No.	Questions	Reasons
1	What is the total area included in the project boundary in terms of land?	Determines the number of credits that may ensue, cost to be incurred, management/ governance practices to be followed, standard to be selected based on stand-alone or jurisdictional approach
2	What is the project start date?	Eligibility criteria for standard to be used
3	What are the GPS co-ordinates of the project boundary?	Pinpoints the exact locational boundary of the project to delineate from other projects
4	What was/were the land uses when the project started?	Eligibility criteria of standard to be used
5	What activities have been carried out from the start of project until (date)? (for example afforestation, gap plantation, reforestation, conservation)	Types of activities that will be covered by the project. This will also be used to calculate the emission reductions, set-up monitoring practices and frame key performance indicators (KPIs)
6	What is the land tenure? Any role of government in the land ownership?	Establishes legal ownership of the project and the carbon credits
7	Are harvesting of timber, fuelwood collection and charcoal production allowed inside the project boundary?	Determines management practices, calculation methods, monitoring methods, KPIs
8	What are the basic details of the implementation schedule of the project and current status?	Determines start date and timelines for accrual of emission reductions
9	Are there any ongoing land conflicts inside the project boundary?	Relates to socio-economic risks of the project
10	What are the major drivers of forest degradation and deforestation in the area?	Determines the baseline for the project and the types of mitigating activities that need to be undertaken
11	Was deforestation and degradation happening before the project start in the project boundary was planned (allowed by the government or other management body) or was unplanned (illegal)?	Determines the baseline for the project and the types of mitigating activities that need to be undertaken
12	What policies and regulations have any impact on land use change patterns in the area?	Determines the additionality of the project
13	Any navigable rivers present in the project area?	Effect of the project on other ecosystems as well as potential for degradation of the project due to ecological reasons
14	What is the proximity of the project boundary to population centres? (approximate value in kilometres)	Accessibility, leakage issues pertaining to the project
15	Have any deforestation and forest degradation activities shifted outside the project boundary due to the project activities?	Leakage issues – shifting of deforestation activities from project location to other locations
16	What are the risks identified, risks involved in the project boundary?	Design potential mitigation measures
17	How are stakeholders identified and what is the process involved? What community groups are involved in the project?	Stakeholder consultation, joint community management, sustainable development indicators of the project
18	Has any displacement of people happened due to the project activities?	Socio-economic safeguards for the project

Table 2.3 Essential criteria and indicators to be covered in feasibility studies

Serial No.	Criterion	Definition	Indicators
1	Eligibility	Proposed models should be in line with the national or sectoral priorities and be developed using existing standards and methodologies.	1. In line with national policies, schemes and objectives (NDCs, SDGs and so on) 2. Legal ownership 3. Geographical reach 4. Mitigation potential
2	Ecosystem resilience	Should help in enhancing ecosystem and biodiversity health; in reducing risks to sustainability; and in climate-change adaptation.	1. Sustainable development benefits 2. Carbon benefits 3. Sectoral transformation 4. Regional transformation 5. Potential additional GHG mitigation 6. Biodiversity components 7. Ecosystem services – soil, water, and so on 8. Sustainable supply of forest resources
3	Social and cultural resilience	Should help in improving livelihood opportunities; increase community involvement; help with capacity building; lead to reducing gender gaps; help to reduce risks to sustainability and in climate-change adaptation.	1. Employment creation – direct 2. Employment creation – indirect 3. Livelihood improvement 4. Improvement of standard of living 5. Women's empowerment 6. Better understanding of land tenure and management 7. Skills development 8. Knowledge sharing 9. Increased awareness of climate-change impacts and measures 10. Informed decision-making ability
4	Financial viability	Financial resources availability and probability of existing schemes and proposed models considered here.	1. Availability of existing funding sources 2. Attractiveness to donors 3. Potential for private sector engagement 4. Risks and barriers
5	Technical viability	The technical and management capacity available to design, develop and implement the proposed models.	1. Existing technical capacity of the project developer 2. Institutions involved 3. Management and governance capacity 4. Risks and barriers

(*Continued*)

Table 2.3 Essential criteria and indicators to be covered in feasibility studies

Serial No.	Criterion	Definition	Indicators
6	Monitoring viablity	Availability of ecological and social baseline, indicators and parameters required for monitoring, reporting and verification to ensure result-based payment.	1. Existing technical capacity of the project developer 2. Human resource and institutional arrangements 3. Reporting method and schedule 4. Standard operating procedures and Quality Assurance/Quality Control procedure in place 5. Monitoring and verification methodology

Forestry carbon credits financing low carbon development strategies

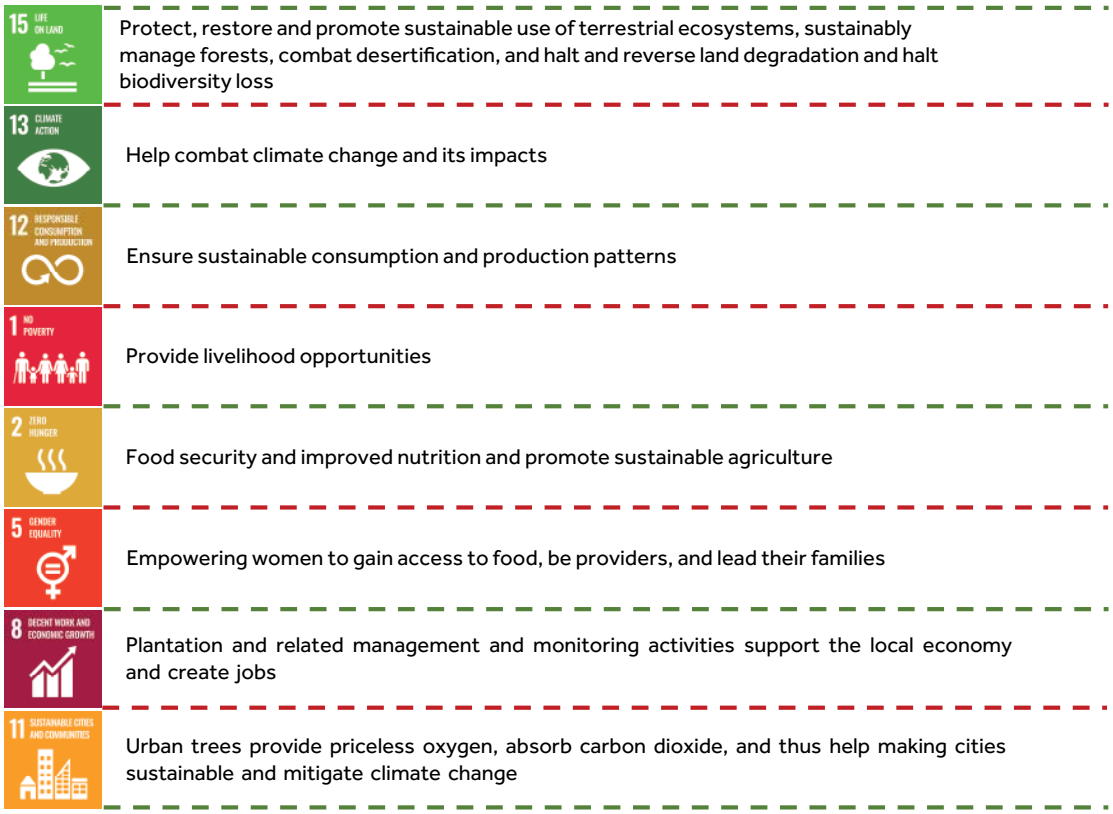
Guyana has set a prime example of how the revenue generated through sale of carbon credits could be channelled into financing the sustainable development of the country. The revenue generated through Guyana's REDD+ project is used in three ways:

1. Building institutional capacity to monitor the carbon stocks and to ensure the implementation of social and environmental safeguards. This entails capacity building of local communities to encourage joint forestry management of the designated forest areas as well as enhancing technical capability of government personnel to enhance the transparency of the forest management activities and forest monitoring activities.
2. Managing the generated funds so that it these are not wasted or misused. The World Bank has helped the Guyanese government in managing the funds so that they are used effectively and efficiently.
3. Using the finance generated to fund activities identified under Guyana's low carbon development strategies including installation of solar-based electricity and green livelihood generation for local communities. The funds are channelled through two routes: (i) indigenous people and local communities receive 15 per cent of all revenues directly, to be managed by communities according to their own priorities, and (ii) multi-community and national programmes in areas such as energy and climate adaptation, including, in 2024, one of the biggest investments in Guyana's history to deal with the impact of flooding.
4. All the above measures cater to fulfilment of Guyana's sustainable development goals.
5. At COP28, Costa Rica and Ghana signed Emissions Reductions Purchase Agreements (ERPAs) to sell forest carbon credits to buyers in the LEAF Coalition. The agreements have the potential to unlock more than 60 million US dollars for credits from the period of 2017 – 2019. The proceeds from the credit sales will be distributed to stakeholders through selected financial intermediaries, according to the Benefit Sharing Plans that Costa Rica and Ghana have developed through a public consultation process.

Source: https://www.nicfi.no/2023/12/02/cop28-breakthrough-for-leaf-and-jurisdictional-redd/

All the above measures cater to fulfilment of Guyana's sustainable development goals.

Figure 2.4 Typical SDG indicators for forestry VCM projects



Major VCM standards

The potential carbon registry standards under which the project can be developed in the voluntary markets are:

1. Verified carbon standards (voluntary market): Most widely used. Project developers can choose the methodologies most appropriate to them for different types of projects under the categories of ARR, REDD, IFM and more. New methodologies may be proposed if the existing ones do not meet their needs.
2. Plan Vivo (voluntary market): Scottish registered charity. Represents a system for developing community-based 'payment for ecosystem services' (PES) projects and programmes. This standard is specifically geared towards communities and biodiversity benefits.
3. Climate Community and Biodiversity (CCB) standard (voluntary market, mostly developed in combination with VCS): Ensures that the project not only mitigates climate change, but also meets stringent social and environmental requirements and is, hence, more likely to demand a premium in the carbon markets. However, since CCB does not certify the quantity of carbon credits, it has to be used in conjunction with a carbon accounting standard such as VCS, which results in additional effort and cost.
4. Gold Standard (voluntary market).
5. Social Carbon (voluntary market, mostly developed in combination with VCS).
6. American Carbon Registry (voluntary market).
7. Global Carbon Council (GCC) (voluntary market): Has developed comprehensive regulations for the assessment and registration of high-quality AFOLU project activities. The regulations ensure that registered projects offer significant climate benefits and support sustainable development, and that their construction and operations will not cause any net harm to the environment and local communities.

The above standards are applicable to stand-alone forestry projects. For the jurisdictional approach, the following standards are available.

1. ART TREES (voluntary market): Architecture for REDD+ Transactions is a global voluntary carbon

programme (architecture) to register, verify and issue high-quality jurisdictional REDD+ emission reduction credits to countries and jurisdictions to attract REDD+ finance at scale. ART determines carbon credits through a standard called TREES (The REDD+ Environmental Excellence Standard). TREES is endorsed by the LEAF (lowering emissions by accelerating forest finance) Coalition as the sole REDD+ standard. TREES credits are eligible under the CORSIA scheme of the International Civil Aviation Organization.

2. VCS Jurisdictional and Nested REDD+ (JNR) Framework comprises accounting and verification requirements for jurisdictional REDD+ programmes and nested projects. The JNR framework is rigorous enough to meet the standards of market-based mechanisms such as CORSIA.

The choice of standard will depend on the project – stand-alone, jurisdictional or nested – and the applicable registry to which the PP would like to apply to for registering its generated credits.

The selection of the carbon registry will depend on the:

- type of project activities implemented/planned – whether the project is REDD+, ARR or IFM;
- project start date – each standard has specific requirements regarding project start date. For example, for VCS ARR projects, the project area shall not be cleared of native ecosystems within the ten-year period prior to the project start date.

Guyana, for example, selected the ART registry specifically because it was the only registry at the time that allowed for market-ready carbon credits from jurisdictional approaches and allows for claiming emission reduction from five years prior to the registration of the project.

- type of land use at the time of project start date, and
- technical and financial capacity of the client.

The VCM registries also provide standard methodologies for calculation of emission reductions and for developing monitoring and evaluation plans. A list of such methodologies with applicability criteria are provided in the annex.

Table 2.4 provides a summary of the major VCM standards for coverage, categories and eligibility for forestry VCM projects. The clean development mechanism (CDM) which is not a VCM mechanism has also been mentioned as CDM methodologies have also been used in the VCM.

Additionality

Additionality of a forest carbon project seeking to participate in the VCM establishes that the proposed project is not a BAU scenario. To satisfy the conditions of additionality, PPs need to establish that:

a. The project is unlikely to take place and nor viable without the financial and technical assistance received by sale of carbon credits of the proposed project.

b. The proposed project must not owe its existence to legislative decrees nor economically viable land use initiatives.

c. The existing land use and management plans alone must not be sufficient to prevent degradation and enhancement of tree biomass stock in the area.

d. In the absence of carbon finance, the project area would not be adequately protected and nor will there be an increase in tree cover due to identified barriers.

Table 2.4 Major standards for developing forestry carbon market projects

Standard	Geographic coverage	Eligible activities	Category details	Eligibility	'Trees-outside-forests' (ToF) applicable	Weblink
Clean Development Mechanism (CDM)	Global	Afforestation/ Reforestation (ARR)	Increase carbon sequestration (CS) and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover (forest or non-forest) through planting, sowing or human-assisted natural regeneration of woody vegetation.	Only those lands are eligible for afforestation and reforestation project activities which were already deforested on or before 31 December 1989 (CDM).	Yes	https://cdm.unfccc.int/
Voluntary Carbon Standard (VCS)	Global	Afforestation, reforestation and revegetation (ARR)	Increase CS and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover (forest or non-forest) through planting, sowing or human-assisted natural regeneration of woody vegetation.	The project area shall not be cleared of native ecosystems within the ten-year period prior to the project start date (VCS).	Yes	https://verra.org/project/vcs-program/
		Agricultural Land Management (ALM)	Reduce net GHG emissions on croplands and grasslands by increasing carbon stocks in soils and woody biomass and/or decreasing CO_2, N_2O and/or CH_4 emissions from soils.	The project area shall not be cleared of native ecosystems within the ten-year period prior to the project start date.	Yes	
		Improved Forest Management (IFM)	Increase CS and/or reduce GHG emissions on forest lands managed for wood products such as saw-timber, pulpwood and fuelwood by increasing biomass carbon stocks through IFM practices.	The baseline and project scenarios for the project area shall qualify as *forests remaining as forests* (as set in IPCC 2006 national GHG inventories).	No	

(*Continued*)

Table 2.4 Major standards for developing forestry carbon market projects (*Continued*)

Standard	Geographic coverage	Eligible activities	Category details	Eligibility	'Trees-outside-forests' (ToF) applicable	Weblink
		Reducing Emissions from Deforestation and Degradation (REDD)	Reduce net GHG emissions by reducing deforestation and/or degradation of forests and increase CS by sustainable management of forests, conservation and enhancement of forest carbonstock.	Shall qualify as forest for a minimum of ten years before the project start date and definition of the UNFCCC host country threshold.	No	
		Avoided Conversion of Grasslands and Shrublands (ACoGS)	Reduce net GHG emissions by reducing the conversion of grassland and shrubland ecosystems to other land uses with lower carbon densities.	Avoiding, at a minimum, the removal/replacement of vegetation and may also include avoiding soil disturbance. There is no specific requirement with respect to the post-conversion land use that would have occurred in the baseline scenario.	Yes	
		Wetlands Restoration and Conservation (WRC)	Increase net GHG removals by restoring wetland ecosystems or reduce GHG emissions by rewetting or avoiding the degradation of wetlands.	Shall meet an internationally accepted definition of wetland, such as from the IPCC, Ramsar Convention on Wetlands, those established by law or national policy, or those with broad agreement in the peer-reviewed scientific literature for specific countries.	Yes	

(*Continued*)

Table 2.4 Major standards for developing forestry carbon market projects (*Continued*)

Standard	Geographic coverage	Eligible activities	Category details	Eligibility	'Trees-outside-forests' (ToF) applicable	Weblink
Climate Community and Biodiversity Standard (CCBS)	Global	The standards can be applied to all types of land management projects, including reforestation, afforestation, revegetation, forest restoration, agroforestry, sustainable agriculture and other land management. The standard programme can be combined effectively with the CDM and VCS standard, where CCBS provides a basis for evaluating a project's social and environmental impacts. The other (combined) carbon accounting standard enables quantification, registration and verification of GHG emission reduction from the project.	The standards can be applied to all types of land management projects, including reforestation, afforestation, revegetation, forest restoration, agroforestry, sustainable agriculture and other land management.	The projects have to adhere to the requirements of VCS guidelines and methodologies for eligibility. There is a vast set of rules and requirements which all projects must follow to be certified.	Yes	https://verra.org/project/ccb-program/

(*Continued*)

Gold Standard (GS)	Global	Broad coverage. However, approved methodologies are for A/R, water, livestock and agriculture activities only.	Eligible land use project types are A/R and Agriculture (AGR projects).	A/R projects can include: • planting trees; • single-species plantations; • applying all silvicultural systems; for example: ◦ conservation forests (no use of timber); ◦ forests with selective harvesting; ◦ rotation forestry; • agriculture (agroforestry) or pasture (silvopasture) activities. AGR projects can include eligible project activities that are covered by an approved Gold Standard SDG impact quantification methodology.	Yes	https://www.goldstandard.org/

(*Continued*)

Table 2.4 Major standards for developing forestry carbon market projects

Standard	Geographic coverage	Eligible activities	Category details	Eligibility	'Trees-outside-forests' (ToF) applicable	Weblink
Plan Vivo (PV)	Across world (Sub-Saharan Africa, and in other regions where the RothC[32] model has been validated)	Ecosystem restoration	Enabling the recovery of an ecosystem which has been degraded, damaged or destroyed. This is done by re-establishing the structure, productivity and species diversity that was previously present, such as through planting trees.	It shall meet PV 2013 Standard requirements. Plan Vivo projects operate with smallholders and/or communities. • require recognised land tenure or user rights; • organised, or in the process of being organised, into co-operatives, associations, community-based organisations; and • able to use existing farmland, forest, woodland or other land type for project activities without undermining livelihood needs. Producers should also not be structurally dependent on permanently hired labour, and should manage their land mainly with their own and their family's labour force. No other carbon projects are operating in the same area.	Yes	https://www.planvivo.org/
		Ecosystem rehabilitation	Assisting the recovery of an ecosystem which has been degraded, damaged or destroyed by repairing processes, productivity and services, but without re-establishing pre-existing structures. For example, inter-planting native tree species on degraded agriculture land to restore soil functions.		Yes	
		Prevention of ecosystem conversion or degradation	Protecting an ecosystem from degradation or conversion. An example would be preventing deforestation by reducing agricultural expansion into forest land, or the introduction of new grazing practices to stop grassland degradation.		Yes	
		Improved Land Use Management	Improving land use and land use management to increase the provision of ecosystem services, for example to reduce GHG emissions and/or increase carbon stocks.		Yes	

(*Continued*)

Architecture for REDD+ Transactions (ART)	Global	Reducing Emissions from Deforestation and Degradation (REDD+) at jurisdictional level	Reduce net GHG emissions by reducing deforestation and/or degradation of forests and increase CS by sustainable management of forests, conservation and enhancement of forest carbon stock at jurisdictional level.	Projects shall meet the requirements of latest version of TREES. Projects shall be submitted by national governments or subnational governments one step lower than the national governments. The jurisdiction must comprise a total forest area of at least 2.5 million hectares at the beginning of the crediting period.	No	https://www.artredd.org/

Additionality for the TREES standard for jurisdictional REDD+ projects is determined on a performance-based approach. Only emissions achieved below a conservative historical crediting level and removals achieved any year above a historical crediting level will be eligible for crediting. In this way, additionality is ensured by issuing only TREES credits that are below historical forest emissions and in excess of historical removals. Only reported emission reductions and removals that are verifiably better than the TREES crediting level will be eligible for receiving TREES credits. Instead of the performance-based approach to additionality, TREES credits using the HFLD crediting approach are deemed automatically additional for any participant that meets the HFLD score threshold as defined in the standard since model-based projections calibrated with historical patterns of deforestation forecast that deforestation rates will rise in Latin America and Africa and will stay roughly constant in Asia over the next 15 years in the absence of economic incentives for forest conservation.

Source: The Redd+ Environmental Excellence Standard (Trees), Version 2.0, 2021

Additionality of any project is established using the latest version of the additionality tool as mentioned in the applied methodology. The general steps followed in the tools are:

Monitoring and reporting requirements

Monitoring in the context of carbon offset projects in the forestry sector refers primarily to collecting and archiving all relevant data of the selected carbon pools[33] necessary for estimating and measuring the net anthropogenic GHG emissions and removals by carbon sinks of a project activity during the crediting period. Depending on the methodology selected, a suitable monitoring plan (including the parameters monitored and to be monitored, and management plan) shall be developed according to the guidelines provided in the methodology. Table 2.5 gives the general parameters to be monitored (apart from those specifically mentioned in the methodology followed). These are provided as guidance to prospective PPs. The MRV will be done through field inventory data related to specific implementation areas. If adequate measures are built into the design of the MRV plan, co-benefits can be efficiently monitored and reported along with GHG mitigation achieved. Depending on the context of the project, some parameters may not be applicable.

Monitoring the following is necessary:

- project boundaries;
- plantations;
- plantation management; and
- in the case of the CCBS standard, community and biodiversity parameters (as specified in the applied methodology).

Those involved in field measurement should be trained on the procedures to be followed for field data collection and data analysis. Standard

Figure 2.5 Steps for assessing additionality

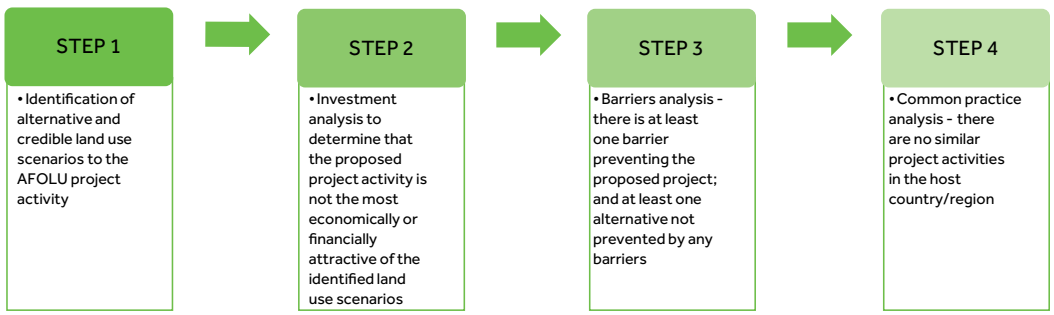


Table 2.5 Typical monitoring parameters for forestry carbon market projects

Data/parameter	Unit	Recording frequency
General parameters usually required to be monitored		
Mean annual increment (MAI)	Cubic meter per hectare per year (m^3 ha-^{1} yr-^{1})	Annually
Specific gravity D	Tonnes dry matter per cubic meter (t d.m. m-3)	Annually (default values can be considered)
Diameter at Breast Height (DBH)	Meter (m) or centimeter (cm)	Annually
Height	Meter (m) or centimeter (cm)	Annually
Average annual above-ground biomass increment (Gw)	Tonnes per hectare per year ($t.ha^{-1}y^{-1}$)	Annually
Carbon fraction of dry matter (CF)	Tonnes carbon per tonne of dry matter [$tC.(t\ d.m.)^{-1}$]	Annually (default values can be considered)
Root-shoot-ratio (R)	dimensionless	Annually (default values can be considered)
Biomass expansion factor (BEF)	dimensionless	Annually (default values can be considered)
Soil organic carbon (SOC) (if included – in most cases SOC is excluded as a conservative approach)	Tonnes carbon per hectare ($tC\ ha^{-1}$)	Once in five years (default values can be considered)
Proposed number of trees to be planted	Number	Annually
Project area	Number	Annually
Area of stratum	Number	Annually
Number of plots to be sampled	Number	Annually
Permanent sample plots	Number	Annually
Plot location	Number	Annually
Species' name and number planted	Number	Annually
Certain project-specific parameters for different projects		
Number of trees planted/ha	Hectares per year (ha/year)	Annually
Species planted	Number	Annually
Spacing between trees	m	Annually
Synthetic fertiliser used/applied per year	kg/year	Annually
Areas in cropland	ha/year	Annually
Price of inorganic fertiliser	USD/kg	Annually
Harvested annual dry matter yield for crop i	Kilogram dry matter per hectare (Kg d.m./ha)	Annually
Total annual area harvested of crop i or N-fixing trees i	ha/year	Annually
Annual area of crop i or N-fixing trees i burnt	ha/year	Annually

(*Continued*)

Table 2.5 Typical monitoring parameters for forestry carbon market projects

Data/parameter	Unit	Recording frequency
Mass of crop residues burnt	t d.m./year	Annually
Mass of grasslands residues burnt	t d.m./year	Annually
Combustion factors that depend on vegetation type	unitless	Project start
Fossil fuel consumed in vehicle or equipment recorded by vehicle and fuel type	Litres	Annually
Project areas in cropland with management practice	ha	Annually
SOC density, to a depth of 30 cm, at equilibrium for cropland with management practice	tC/ha	Once in five years (default values can be considered)
Production in cropland per month with management practice from within the project	t/ha/month	Annually
Project manure input in cropland per month with management practice	t/ha/month	Annually
SOC density, to a depth of 30 cm, at equilibrium for grassland with management practice	tC/ha	Once in five years (default values can be considered)

operating procedures (SOPs) for each step of field measurement should be prepared and followed. To ensure the collection of reliable field data:

- field staff should be fully aware of all procedures and the importance of collecting data as accurately as possible;
- field staff should be aware of the plots in the field and measure all pertinent components using the SOPs;
- staff should be adequately trained; and
- proper data collection and storage systems should be established and followed.

The above monitoring parameters represent robust parameters that might be used for monitoring forest projects and calculating forestry carbon credits. Alternatively, project proponents may opt to use simpler monitoring systems using acceptable 'proxies' rather than direct monitoring in the initial stages of project implementation. Guyana's experience in setting up its monitoring system is quite enlightening in this matter. When the REDD+ strategy was initiated in 2009 through bilateral support, Guyana had to depend on satellite-based proxy measurements to ensure that the overall approach was delivering its objectives. Proxies were used both for carbon accounting and for monitoring of social safeguards in line with emerging UNFCCC decisions at the time. However, over the years, Guyana has built capacity of its personnel and strengthened its monitoring systems. This meant that it successfully defended the project against third party verification when it intended to enter the VCM. The monitoring system presently implemented by Guyana could be considered as one of the most robust monitoring systems implemented for REDD+, both at national level and for projects.

Managing leakage

Leakage emissions occur when a carbon project displaces emission-generating activities outside the project or programme boundary rather than halting them in actual terms. Leakage is, therefore, defined as emissions due to the project activity outside the project boundary. There are several different possible types of leakage that could occur in forestry projects including positive or negative leakage, mostly occurring at local scale. To be conservative, positive leakages, if any, are usually neglected while negative leakages are mandatorily calculated. Leakage sometimes becomes difficult to quantify, sometimes it is relatively significant and sometimes it is not. The leakage must be monitored against the given procedure in the applied methodology. Assessment and monitoring of leakage ensures the quality of the carbon credits generated.

In forestry projects, leakages typically result from deforestation/harvesting activity displacement from project area to outside project area; resource substitution – IFM practices preventing access to forests could lead to other biomass consumptions by communities; and site preparation activities for activities displaced by the project. Activities resulting from the implementation of the project should be noted and included in the calculation of leakage emissions.

Uncertainty assessment

Uncertainty includes measurement errors in the stratification, sampling, statistical approaches (as set out in chapter 5.2 of the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*), inventory and laboratory processing. This is necessary for decision-making and calculation of emission reductions and removals.

The uncertainty associated with the quantification of emissions and emission reductions must be estimated as specified in the applied methodology. In most of the methodologies, a precision target of a 95 per cent confidence interval half-width equal to or less than 15 per cent of the recorded value should be used.

Non-permanence risk assessment

Forestry projects are notoriously affected by several environmental and ecological risks including forest fires, pests, droughts and diseases. This can significantly reduce the amount of carbon credits projected to be generated by a proposed forestry project. To account for this risk of non-performance, all forestry projects are required to create a buffer pool – credits generated but not sold, and held in reserve as compensation against possible non-performance. The number of buffer credits to be contributed to the buffer account must be determined by applying the latest version of the applicable tool in the applied methodology. In most cases, methodologies require that at least 10 per cent of the credits are contributed to the buffer pool.

Guyana, for example, uses the ART-TREES methodology for determining carbon credits. ART-TREES provides for a maximum level of 25 per cent reversal risk for contribution to the buffer pool. The methodology also takes into account mitigating factors that can lower risk and hence the contribution to the buffer pool. For example:

- legislation or executive decrees actively implemented and demonstrably supporting REDD+ would lower the risks by 5 per cent;
- low variability of annual forest emissions would lower the risks by 10 per cent; and
- demonstrated national reversal mitigation actions, plan or strategy developed in alignment with Cancun safeguard F would lower the risk levels by 5 per cent. TREES outlines 14 themes of the Cancun safeguards, each theme having a structure, process and outcome indicator.

3. Cost Estimate for Participation in the VCM

Apart from the cost of developing and maintaining a forestry carbon project, participation in the VCM itself has associated costs due to various transactions involved at different levels while registering, validating and verifying a project. Table 3.1 provides a basic structure of costs involved.

From the above estimates, it can be inferred that, to develop a forestry carbon market project at a small scale, the fixed cost implication is between US$45,000 and $55,000. In addition, there are variable annual operating and maintenance costs. A conservative value of variable costs (land selection and preparation, sapling, fencing, maintenance and so on) is estimated at US$10,000, considering plantation activity on 30 ha every year for ten years (total plantation on 300 ha in ten years).

Compared to a stand-alone forestry VCM project, a jurisdictional approach benefits from economies of scale. A typical jurisdictional project is likely to have the annual costs shown in Table 3.2.

While the total cost seems high at US$2.5 million, this is for 18 million ha, that is, the entirety of Guyana. Therefore, the per hectare cost of a jurisdictional approach is significantly lower than that of a stand-alone forestry VCM project.

Table 3.1 Typical transaction costs for developing a forestry carbon project for VCMs

Services	PDD development	Validation	Verification
Fees	US$20,000 to $25,000 consultancy fee (may increase depending on project scale and location)	US$7,000 to 10,000 (varies from third party to third party)	US$4,000 to $10,000 (varies from third party to third party)
VCM, for example: Verified Carbon Standard[34]	Account opening fee	US$500	
	Account maintenance fee	US$500 [35]	
	Pipeline listing request fee	US$1,000	
	Project registration review fee	US$2,500	
	Verified carbon unit (VCU) issuance fee	US$0.20 per VCU, payable at the time of the issuance request	

Table 3.2 Typical annual transaction costs for developing a jurisdictional forestry approach (Guyana example)

MRV development	Validation and independent verification	Issuance fee on registry	Reporting and NDC tracking	Other administrative expenses
US$500,000 (this is inclusive of fieldwork and generation of baseline datasets)	US$200,000 (varies from third party to third party)	US$800,000 (could differ based on selected registry)	US$350,000	US$400,000

4. Key Messages

High-integrity VCM initiatives are a viable option for generating climate finance through forestry initiatives, for providing capital to protect forests and for supporting the transition towards carbon neutrality.

VCMs create economic incentives for reducing emissions as cost-effectively as possible. They provide livelihood options for forest communities, biodiversity protection and sustainable development of forested lands/countries. Ensuring high integrity through stringent governance is crucial for VCM projects to deliver climate finance to forested countries. Broader aspects of robustness of social and environmental safeguards are also crucial to achieve a premium on the value of credits traded in the VCMs.

Investing in systems and processes that enable high-integrity voluntary carbon credits ensures higher payback.

Developing high-integrity VCM initiatives in the forest sector requires some sustained initial efforts to develop robust monitoring systems through institutional capacity building and training of field staff/communities. This is well worth the effort as projects with higher level of data robustness will command higher demand and, consequently, a higher premium when traded in VCMs. Such projects will also have a higher chance of qualifying against the standards set by the different VCM registries.

Host countries should consider their participation in VCMs after assessing their NDC commitments.

While participating in VCMs, emission reduction traded will be transferred to a different entity and would need to be adjusted on the host country's GHG inventory. Host countries should, therefore, be cognisant of the effect of participating in the VCMs on their NDC commitments.

VCM initiatives in the forest sector could be used to scale-up jurisdictional REDD+ approaches.

REDD+ was not developed as a market approach. Therefore, REDD+ projects have many gaps. Those need to be addressed to fulfil the requirements for participating in high-integrity VCMs. VCMs offer opportunities to build on existing REDD+ efforts to develop jurisdictional REDD+[36] activities to maximise climate finance inflows and reduce potential integrity issues of stand-alone REDD+ projects. Jurisdictional approaches open up the possibility for countries with high forest, low deforestation rates to participate in the VCM. Until recently, this was out of bounds for such projects.

Alignment of policy approaches could lead to greater transparency of climate finance and GHG accounting.

In most countries, there are siloed approaches and inconsistencies in accounting for NDCs and REDD+ programmes, and for crediting initiatives under VCMs. To promote robust accounting, tropical forest countries can align their REDD+ reporting with national GHG inventory estimates and explore nesting approaches to support the consistency of accounting methods across national GHG inventories, projects and programmes. Alignment of activities at different scales will also involve deploying a consistent approach to implementing safeguards policies.[37]

Revenue generated through participation in the VCMs can be successfully utilised to finance the host country's low carbon sustainable development agenda.

Revenue generated through the VCMs can be integrated with low carbon development strategies of the country. This helps forested developing countries to effectively utilise their forest resources to fund their low carbon development agenda while preserving/protecting their forest resources. Thus, forestry VCM initiatives can successfully diverge from the supposed dichotomy of forest preservation and sustainable development.

Annex: List of Major Approved Methodologies

The following list is a live list since methodologies are revised, retired and consolidated from time to time. PPs may use the following list as a reference document. Please check the website of the specific selected carbon registry or UNFCCC CDM for the latest versions of methodologies.

Standard	Methodology number	Methodology name	Brief description	Applicability criteria
Gold Standard	N/A	Gold Standard Afforestation/ Reforestation (A/R) GHG Emissions Reduction &Sequestration Methodology	This methodology presents requirements to quantify changes in GHG emissions and SOC through the adoption of improved A/R practices. Activities can achieve avoidance of emissions as well as sequestration of carbon in the carbon pools, both of which result in increased biomass content.	The following conditions apply: • Projects that include the planting of trees on land that does not meet the definition of a forest at planting start are eligible to apply this methodology. The project areas shall meet all of the requirements below for this methodology to be applicable for the calculation of CO_2 certificates from the project. • Projects can apply all silvicultural systems: ◦ conservation forests (no use of timber); ◦ forests with selective harvesting; and ◦ rotation forestry. • All projects can include agriculture (agroforestry) or pasture (silvopasture) activities. • Project areas should not be on wetlands. • Soil disturbance (through ploughing, digging of pits, stump removals, infrastructure, and so on) on organic soils shall be in less than 10 per cent of the area that is submitted to certification (not 10 per cent of the entire project area). • The most likely scenario without the project (baseline scenario) should be defined for the project area. This scenario should not show any significant increase of the baseline biomass ('tree' and 'non-tree'). • Projects shall apply the Gold Standard Land-use Activity Requirements as applicable to A/R projects.

(*Continued*)

	N/A	Soil Organic Carbon Framework Methodology	This methodology presents requirements to quantify changes in GHG emissions and SOC stocks through the adoption of improved agricultural practices. Activities can achieve avoidance of emissions as well as sequestration of carbon in the soil, both of which result in increased SOC content.	Projects shall comply with the applicability conditions specified in the framework methodology and in the respective applicable activity module. A project cannot apply the framework methodology without an applicable activity module. The following conditions apply: • Geographic location: ◦ projects are eligible in all countries. SOC activity modules may limit geographic applicability. • Project area: ◦ project activity shall take place on the same parcel of land as the baseline; ◦ project area(s) shall not be on wetlands.; and ◦ project area(s) shall not be on forest according to the Land Use and Forests Activity Requirements (LUF activity requirements). • Site preparation: ◦ no biomass burning for site preparation is allowed in the project scenario; and ◦ project activities shall not include changes in surface and shallow (<1m) soil water regimes through flood irrigation, drainage or other significant anthropogenic changes in the ground water table. • Land use: ◦ managed cropping systems (such as single crop or crop rotation) must have been in place for at least five years prior to project implementation; and ◦ project activity shall not lead to land use change. • Food security: ◦ no reduction in crop yield which can be attributed to the project activity shall be allowed. Activities in the project area shall deliver a yield at least equivalent to the baseline yield (five-year average, prior to project start). If regional crop productivity changes (for example due to climatic factors), yield in project area shall not decrease significantly (5 per cent) more than yield in the project region.

(*Continued*)

Standard	Methodology number	Methodology name	Brief description	Applicability criteria
Verified Carbon Standard	VM0003	Methodology For Improved Forest Management Through Extension Of Rotation Age	This methodology quantifies the GHG emission reductions and removals generated from improving forest management practices to increase the carbon stock on land by extending the rotation age of a forest or patch of forest before harvesting.	This methodology is applicable under the following conditions: • Forest management in both baseline and project scenarios involves harvesting techniques such as clear cuts, patch cuts, seed trees, continuous thinning or group selection practices. • Forests which are not subject to timber harvesting, nor managed without an objective for earning revenue through timber harvesting in the baseline scenario, are not eligible under this methodology. • Prior to the first verification event, the project area must meet one of the following conditions: a) certified by Forest Stewardship Council (FSC); or b) subject to an easement, or equivalent instrument, recorded against the deed of property that prohibits commercial harvesting for the duration of the crediting period unless later certified by FSC. • The project does not encompass managed peat forests, and the proportion of wetlands is not expected to change as part of the project. • Where fire is used as part of forest management, fire control measures such as installation of firebreaks or back-burning must be taken to ensure fire does not spread outside the project area. • There must be no leakage through activity shifting to other lands owned or managed by project proponents outside the boundary of the project area.

(*Continued*)

	VM0005	Methodology for Improved Forest Management: Conversion of Low Productive to High-Productive Forest	This methodology facilitates the quantification of the net GHG benefits of IMF projects in natural evergreen tropical rainforests that achieve carbon benefits in one of, or a combination of, two activities: • avoiding emissions from relogging of already logged-over forest; and, • rehabilitation of previously logged-over forest by cutting climbers and vines, or liberation thinning, or enrichment planting, or a combination of these activities.	The applicability conditions for this methodology are the following: • Project activities aim at the avoidance of relogging of logged-over, degraded natural evergreen tropical rainforest, or the rehabilitation of logged-over natural evergreen tropical rainforest through direct human intervention such as cutting of climbers and vines, liberation thinning and/or enrichment planting, or a combination of these activities. • In the baseline, the logged-over forest in the project area is unlikely to revert to normal regrowth patterns due to vines and climbers, which may include climbing bamboos, resulting from high intensity logging operations in the past. • The soil carbon pool within the project boundary is either in a steady state at project commencement, or, if not, the soil carbon pool is expected only to increase. • Soil disturbance or soil erosion due to site preparation is negligible. • The use of nitrogen fertiliser in the project activities is prohibited .. • During the project crediting period, harvesting must not occur in the project. • Biomass burning, fuel gathering, removal of litter, or removal of dead wood do not occur in the baseline scenario or in the project scenario within the project boundary. • A reference area may be used to derive relevant parameter values for the baseline scenario. This area must be of similar size to the project area, or larger (that is, 75 per cent of the project area or more), for which similarity with the project area can be demonstrated using criteria outlined in this methodology. • Flood irrigation or drainage of primarily saturated soils is not permitted. • There is no peatland within the project area.

(*Continued*)

Standard	Methodology number	Methodology name	Brief description	Applicability criteria
	VM0007	REDD+ Methodology Framework	This methodology provides modules for various components of a methodology for REDD. The modules, when used together, quantify GHG emission reductions and removals from avoiding unplanned and planned deforestation and forest degradation.	• This methodology is applicable to forest lands, forested wetlands, forested peatlands and tidal wetlands that would be deforested or degraded in the absence of the project activity. • The methodology includes a module for activities to reduce emissions from forest degradation caused by extraction of wood for fuel. No modules are included for activities to reduce emissions from forest degradation caused by illegal harvesting of trees for timber; such a module may be included in the future. • The methodology also includes a module for activities that include forest regeneration and specific modules for project activities located on peatlands and tidal wetlands. • The modules in the methodology apply to the following activities: ◦ avoiding unplanned deforestation; ◦ avoiding planned deforestation; ◦ afforestation, reforestation and revegetation; ◦ conservation of intact wastelands, which includes avoiding planned and unplanned wetland degradation; and ◦ restoring wetland ecosystems. • Improved forest management is not covered by this methodology.

(*Continued*)

	VM0010	Methodology for Improved Forest Management: Conversion from Logged to Protected Forest	This methodology quantifies the GHG benefits generated from preventing logging of forests that would have been logged in the absence of carbon finance. It is applicable if the baseline scenario includes planned timber harvest. Under the project scenario, forest use is limited to activities that do not result in commercial timber harvest or forest degradation. This methodology is applicable to tropical, temperate or boreal forests.	• Forest management in the baseline scenario must be planned timber harvest. • Under the project scenario, forest use must be limited to activities that do not result in commercial timber harvest or forest degradation. • Planned timber harvest must be estimated using forest inventory methods that determine allowable off-take as volume of timber. • The boundaries of the forest land must be clearly defined and documented. • The baseline scenario cannot include conversion to managed plantations. • The baseline scenario, project scenario and project case cannot include wetland or peatland.
	VM0011	Methodology for Calculating GHG Benefits from Preventing Planned Degradation	This methodology quantifies the GHG emission reductions generated from improving forest management and preventing the planned degradation of a forest by stopping selective logging. It accounts for a reduction in GHG emissions by stopping logging as well as an increase in carbon stock growth. It is applicable to previously logged or intact tropical forests where selective logging would have occurred in the absence of carbon finance.	The methodology is applicable in the following conditions: • IFM – legally sanctioned planned logging to protected forest with no removals (such as harvesting or planned biomass burning) occurring in the project area on implementation of the actual project (with the exception of felling sample trees for validating or deriving project-specific parameters); • intact forest or previously logged forest (also known as forest degraded due to logging); • land within the project area must have qualified as forest at least ten years before the project start date; • tropical forests including evergreen tropical rainforests, moist deciduous forests, tropical dry forests and tropical upland forests, except peat swamp forests; and • harvested wood products, that is sawlog, pulp log and commercially harvested fuelwood.

(*Continued*)

Standard	Methodology number	Methodology name	Brief description	Applicability criteria
	VM0012	Improved Forest Management in Temperate and Boreal Forests (LtPF)	This methodology quantifies the GHG emission reductions generated by improving forest management and preventing logging in temperate and boreal forests. Specifically, it quantifies GHG emission reductions from LtPF activities, or activities that protect logged or degraded forests from further logging or that protect unlogged forests from future logging.	The following applicability conditions apply for the methodology: • projects which meet the most recent approved criteria for VCS Improved Forest Management – Logged to Protected Forest (IFM-LtPF) eligible projects; • projects located in temperate and boreal domain global ecological zones (as defined by FAO (FAO, 2001)) which are forest lands remaining forest lands (as defined by IPCC (IPCC, 2003)), and which can meet IPCC GPG LULUCF Tier III inventory and data requirements (IPCC, 2003); • projects that meet the most current approved VCS standard requirements for ownership; • projects on properties where the starting average annual illegal, unplanned and fuelwood removals are less than 5 per cent of total annual harvest levels (in CO_2e) in the baseline scenario; • projects that do not encompass managed peatland forests; • projects where the total percentage of wetlands in the project area is not expected to change as part of project activities; • projects that can demonstrate that there will be no activity shifting to other lands owned or managed by project proponents outside the project boundary at the beginning of the project (within the first year of the project start date); and • projects that do not include non-de minimis application of organic or inorganic fertiliser in the project scenario.

(*Continued*)

	VM0015	Methodology for Avoided Unplanned Deforestation	This methodology estimates GHG emissions from areas where unplanned deforestation occurs. It quantifies the emission reductions achieved by curbing deforestation. It provides a comprehensive set of tools for analysing both frontier and mosaic deforestation patterns to establish the baseline deforestation rate, monitor emission reductions and assess leakage.	This methodology applies to avoiding unplanned deforestation project activities and is applicable globally under the following conditions: • Baseline activities include planned or unplanned logging for timber, fuelwood collection, charcoal production, agriculture or grazing activities as long as the category is 'avoiding unplanned deforestation' according to the most recent VCS standard. • Project activities include one or a combination of the eligible categories defined in the description of the methodology scope. • The project area includes one or a combination of forest types, such as, but not limited to, old-growth forest, degraded forest, secondary forests, planted forests or agroforestry systems meeting the definition of 'forest'. • At the project start, the project area includes only land qualifying as 'forest' for a minimum of ten years prior to the project start date. • The project area may include forested wetlands (such as bottomland forests, floodplain forests, mangrove forests) where they do not grow on peat. The methodology is not applicable to project areas that include forested wetlands growing on peat (such as peat swamp forests).

(*Continued*)

Standard	Methodology number	Methodology name	Brief description	Applicability criteria
	VM0032	Methodology for the Adoption of Sustainable Grasslands through Adjustment of Fire and Grazing	This methodology quantifies the GHG emission reductions and removals from activities that introduce sustainable adjustment of the density of grazing animals and the frequency of prescribed fires into an uncultivated grassland landscape. The methodology shows how to determine additional carbon offsets through grassland soil sequestration and/or reduction in methane emissions as a result of reducing fire frequency and altering the density and/or activities of grazing animals.	This methodology is applicable under the following conditions: • The project area must be grasslands in the baseline and project scenarios. • Lands are grazed and/or subject to fires in the baseline and/or project scenarios. Lands may be used for different purposes, such as livestock production, conservation, hunting or tourism. • The project must be structured to keep livestock within the project area, and the PP must be able to enforce the boundaries of the project area. • The project must result in no net increase in the density of, or time spent by, animals in confined corrals where dung can pile up and begin to decompose anaerobically and result in CH4 and N_2O emissions, such as an increase in the number of livestock aggregated (for example, kept in corrals or pens) that would result in more than 50 per cent of the ground area covered by dung. • Baseline emissions derived from livelihood-driven human impacts on above-ground woody biomass (such as cutting for fuelwood, charcoal or timber sales) must be deemed de minimis (that is, not included in the cumulative 95 per cent of total baseline emissions) and project activities cannot significantly alter such livelihood-driven activities. • For projects that propose to modify grazing, the maximum individual project size is three million ha or 5 per cent of a country's land area currently or potentially used to graze livestock, as judged by national government land use inventories or other documentation. This methodology is not applicable under the following conditions: • project activities that involve mechanical vegetation removal or soil tillage; and • project area receives a net import of inorganic or organically derived fertiliser.

(*Continued*)

	VM0035	Methodology for Improved Forest Management through Reduced Impact Logging	This methodology is applicable to projects which implement reduced impact logging practices to reduce GHG emissions (hereafter named as RIL-C) in one or more of three GHG emission source categories: timber felling; skidding; and hauling. This may entail a range of improved logging and harvest planning practices, including, but not limited to: directional felling, improved log bucking, improved harvest planning via pre-harvest inventory, skid trail planning and/or monocable winching, and reduction on width of haul roads and size of log landings.	This methodology is applicable under the following conditions: • The project activity does not involve a deliberate reduction in harvest levels. The criteria to demonstrate no intentional reduction in harvest levels are provided in the applicable RIL-C performance method module in the methodology. • The project activity and the baseline scenario do not involve conversion of forest to non-forest land use/land cover (that is, both represent forests remaining as forests). • In every year credited, the PP must hold legal authorisation for all logging activities referenced in the project from the relevant government authority. • The project area must be located in a logging landscape developed for a corresponding region-specific performance method module. It must be demonstrated that the entire project area is contained within the applicable logging landscape. • The entire project area meets the definition of forest, either host country-specific, UNFCCC or FAO definition. • Practices implemented as part of the project activity must not increase BAU levels of impact on pre-existing dead wood stocks through slash management, salvage harvesting or other planned removal of dead wood.

(*Continued*)

Standard	Methodology number	Methodology name	Brief description	Applicability criteria
	VM0045	Methodology for Improved Forest Management Using Dynamic Matched Baselines from National Forest Inventories	This methodology applies to a wide range of IFM practices. It uses a dynamic performance benchmark for additionality. The crediting baseline is created from national forest inventories. Eligible projects must adopt one or more specific, non-pre-existing, IFM practices. The focus of accounting is on estimation of GHG emissions and/or carbon stock change on permanent plots, not on estimation of stocks in itself. This improves the precision of reported GHG emission reductions and/or removals.	This methodology applies to all improved forest management activities, including activities representing discrete interventions and activities representing changes in management regime realised over long time horizons. This methodology is applicable under the following conditions: • The project area qualifies as forests remaining as forests, and the project activity involves an intervention expected to achieve improved net carbon emission outcomes relative to BAU practices. • The project is located in a national or subnational jurisdiction for which approved data sources, and matching covariates and procedures in which they occur, are specified in an appendix to this methodology. This methodology is not applicable under the following conditions: • The project activity involves reducing the frequency and/or intensity of timber harvest and the project area is subject to any pre-existing legal encumbrance specifically restricting timber harvest. • The project activity involves a change in hydrology and/or soil disturbance exceeding 10 per cent of the project area. The methodology is not applicable to wetland restoration and conservation (WRC) activities. • The project activity involves any deliberate reduction in lying dead wood stocks that is expected to exceed 5 per cent of net emission reductions.

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	VM0047	Afforestation, reforestation, and revegetation	This methodology quantifies carbon removals from activities that increase the density of trees or other types of woody vegetation. It provides two approaches for quantifying such carbon removals from ARR activities: • **area-based approach:** Combines plot-based sampling, remote sensing and a dynamic performance benchmark to test additionality. Establishes the crediting baselines at every verification; and • **census-based approach:** Applies to smaller projects where a full census of plantings is feasible. This best suits dispersed planting activities (such as urban forestry, agroforestry, shelterbelts and revegetation activities that do not meet the forest definition).	This methodology is applicable under the following conditions: • Project activities increase vegetative cover. • For area-based approach: ◦ project activities produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare; and ◦ projects may include direct (for example manual planting, broadcast seeding) and indirect activities (for example activities that permit or facilitate natural regeneration, like herbivory exclosures). • For census-based approach: ◦ project activity must be direct planting (that is, must not involve facilitated natural regeneration); ◦ project activity must not produce continuous tree and/or shrub cover on any contiguous area exceeding one hectare; ◦ individual planting units of woody biomass must be clearly defined (such as tree, shrub, bamboo clump) and identifiable in the field, with each planting unit given a physical marker onsite with a unique ID and location recorded by GPS with a minimum accuracy of five metres; ◦ project activity must: a) occur within an area classified as non-forest for the past ten years with less than 10 per cent pre-existing woody biomass cover; and/or b) occur in an area subject to continuous cropping, in 'settlements' or 'other lands' land use category; ◦ an initial complete census of all planting units at t=0 must be conducted; ◦ projects are considered ineligible if woody biomass, which serves a similar purpose as the planting units in the project, has been removed within the last ten years (confirmed via pre-project photos and/or attestation); and

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Standard	Methodology number	Methodology name	Brief description	Applicability criteria
				◦ any soil disturbance from the project activity (that is, from site preparation): a) occurs only once during the project crediting period (that is, at site preparation); or b) does not involve soil inversion to a depth exceeding 25 cm (for example, that would result from a mouldboard plough). This methodology is not applicable under the following conditions: • Project activities involve mechanical removal offsite or burning of significant stocks of pre-existing dead wood (for example, for site preparation). If project site preparation includes chipping, mastication or machine piling, all material must remain onsite within the project boundary. • Project activities take place in tidal wetlands (for example, mangroves, salt marshes). • Project activities that occur on organic soils or in wetlands and result in a manipulation of the water table. Planting species that do not naturally occur in organic soils or wetlands is considered a manipulation of the water table. If projects take place on organic soils or wetlands and manipulate the water table, they must be developed using a multiple project activity design applying this methodology and a WRC methodology (for example, VM0036 Methodology for Rewetting Drained Temperate Peatlands). In such cases, the project activities must comply with all applicable conditions of the selected WRC methodology and this methodology.
	VM0048	Reducing Emissions from Deforestation and Forest Degradation	This methodology applies to individual forestry projects and jurisdictional REDD+ activities that reduce emissions from unplanned deforestation, planned deforestation and unplanned forest degradation.	The applicability of the methodology is determined by several individual modules referred to in the methodology, depending on the type of project proposed.

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ART TREES	TREES 2.0	The Redd+ Environmental Excellence Standard (Trees)	This standard applies to projects proposed by national governments or subnational governments no more than one administrative level down from national level. Activities that are eligible under TREES include all REDD+ activities except removals from forests remaining forest. Each TREES participant must submit a REDD+ implementation plan as part of the initial documentation and each subsequent TREES monitoring report. This should outline new and ongoing programmes or activities including locations planned to achieve the emissions reduction and removal (ERRs). It is expected that the implementation plan will be the national REDD+ strategies/ action plan developed in accordance with the Warsaw framework. If a different implementation plan is submitted under TREES,	During an interim period through to December 31, 2030, subnational accounting areas may be registered under ART as a recognised step to national-level accounting. After the interim period, accounting shall be at a national level. Participants registering subnational accounting areas may be a national government or a subnational government. Where a subnational accounting area is registered by a national government: • The boundaries of the subnational accounting area shall correspond with the entire area of one or several administrative jurisdictions no more than one administrative level down from national level and/or one or several recognised Indigenous territories; and • The included jurisdiction(s) and/or recognised Indigenous territory(ies) do not need to be contiguous; and • Aggregation of jurisdictions and/or recognised indigenous territories must be conducted in line with the safeguards in TREES Section 12; and • The total subnational accounting area must comprised a total forest area of at least 2.5 million ha based on area at the beginning of the TREES crediting period; and • The crediting period for subnational accounting shall end on December 31, 2030 regardless of how many years have passed in the crediting period. Where a subnational accounting area is registered by a subnational government: • The boundaries of the subnational accounting area shall correspond with the entire area of the single administrative jurisdiction; and

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Standard	Methodology number	Methodology name	Brief description	Applicability criteria
			the participant must explain any differences between the two plans. If a participant is using a sub-national accounting area, they must specify which REDD+ interventions from its national REDD+ strategies/action plan are relevant to the subnational accounting area.	• The jurisdiction must comprised a total forest area of at least 2.5 million ha based on area at the beginning of the TREES crediting period; and • The crediting period for subnational accounting shall end on December 31, 2030 regardless of how many years have passed in the crediting period. Subnational jurisdictions may not aggregate as direct subnational participants. However, they may aggregate as part of a national government submission of a subnational accounting area. In addition, national government participants must demonstrate conformance with related requirements of the Cancún safeguards, including: • having addressed and respected the safeguards (section 12 of TREES); • having submitted the most recent summary of Information to the UNFCCC for any year for which results-based payments under TREES are sought; and • having either a digital or analogue system for providing information about safeguards.
CDM	AR-AM0014	Afforestation and reforestation of degraded mangrove habitats	This methodology allows large-scale A/R of wetland that constitutes degraded mangrove habitat. This allows use of mangrove species and non-mangrove species with certain conditions.	This methodology is applicable under the following conditions: • The land subject to the project activity is degraded mangrove habitat. • More than 90 per cent of the project area is planted with mangrove species. If more than 10 per cent of the project area is planted with non-mangrove species, then the project activity does not lead to alteration of hydrology of the project area and hydrology of connected up-gradient and down-gradient wetland area. • Soil disturbance attributable to the A/R CDM project activity does not cover more than 10 per cent of area.

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	AR-ACM0003	Afforestation and reforestation of lands except wetlands	This is for developing large-scale A/R projects on any land that does not fall into the category of wetland.	This methodology is applicable under the following conditions: • The land subject to the project activity does not fall in wetland category. • Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary: (i) Land containing organic soils. (ii) Land which, in the baseline, is subjected to land use and management practices and receives inputs listed in the appendix of the methodology. This includes different types of cropland and grasslands.
	AR-AMS0003	Afforestation and reforestation project activities implemented on wetlands	This is for developing small-scale A/R projects (emission reductions limited to 16,000 tCO_2 per annum)[38] on wetlands. Lands containing peat soils are not allowed.	This methodology is applicable to small-scale A/R CDM project activities. It does not apply to large-scale A/R CDM project activities. This methodology is applicable under the following conditions: • The land subject to the project activity falls under one of the following wetland categories: (i) Intertidal wetlands (such as mangrove habitats) with a tree crown cover that is less than 20 per cent of the minimum tree crown cover adopted by the host party for the purpose of definition of forest under the CDM. (ii) Flood plain areas on inorganic soils. (iii) Seasonally flooded areas on margin of water bodies/reservoirs. • The project activity does not lead to alteration of the water regime of the project area or areas hydrologically connected to the project area. • Soil disturbance attributable to the A/R CDM project activity does not exceed 10 per cent of the project area.

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Standard	Methodology number	Methodology name	Brief description	Applicability criteria
	AR-AMS0007	Afforestation and reforestation project activities implemented on lands other than wetlands	This is for developing small-scale A/R projects (emission reductions limited to 16,000 tCO_2 per annum)[37] on any land that does not fall into the category of wetland.	This methodology is applicable under the following conditions: • The land subject to the project activity does not fall in wetland category. • Soil disturbance attributable to the project activity does not cover more than 10% of area in each of the following types of land, when these lands are included within the project boundary: (i) Land containing organic soils. (ii) Land which, in the baseline, is subjected to land use and management practices and receives inputs listed in the appendix of the methodology. This includes different types of cropland and grasslands.
Plan Vivo	PM001	Agriculture and Forestry Carbon Benefit Assessment Methodology	This methodology can be used in conjunction with the Smallholder Agriculture Monitoring and Baseline Assessment (SHAMBA) tool to quantify the expected climate benefits of tree planting, agroforestry and agricultural interventions implemented by smallholders that increase organic inputs to soils and/or reduce burning of fields and agricultural residues	This methodology covers all interventions that take place on forest land, cropland or grassland; or that result in conversion to-forest, cropland or grassland. This includes: • Agroforestry and farm forestry; • Changes to cultivation practices; • Changes to livestock and manure management; • Afforestation and reforestation; • Forest restoration; • Forest protection; and • Improved forest management. The methodology is applicable to all types of forest including forested wetlands such as swamp forest and mangroves; and all types of croplands and grassland. Project activities shall meet all of the following applicability conditions: • Project activities must not include flood irrigation, drainage, or other activities that affect the ground water table.

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				• Project activity areas have not have been negatively altered prior to the start of project activities for the purpose of increasing climate benefits. • The baseline land use scenario in the project activity areas can be modelled using the SHAMBA tool, or can be conservatively assumed to be zero (for example if the baseline land use is expected to result in declining carbon stocks in soil and biomass). • Project activities involve tree planting, agroforestry or conservation agriculture. • Project activities will not increase GHG emissions or reduce carbon stocks in or around the project area, relative to the baseline scenario, by changing: ◦ livestock management; ◦ manure application; ◦ external organic inputs such as mulch; ◦ tillage, leaching or erosion of soil; or ◦ management of existing trees and woody vegetation. • Project activities are not carried out in areas where tree planting is planned in the baseline scenario. • Soils in the project area are not waterlogged or flooded regularly, and are at least 30 cm deep

Notes and References

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4 Sato, I., Langer, P., and Stolle, F. (2019) 'Enhancing NDCs: Opportunities in the forest and land-use sector', Working Paper, available at: https://www.wri.org/research/ndc-enhancement-opportunities-forest-and-land-use-sector

5 UNFCCC (2021) REDD+ is a framework created by the UNFCCC for Reduced Emissions from Deforestation and forest Degradation, plus the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries.

6 https://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf

7 https://www.weforum.org/agenda/2023/01/5-reasons-forest-carbon-credits-climate-action/

8 https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/use-international-credits_en

9 https://www.bcg.com/publications/2023/why-the-voluntary-carbon-market-is-thriving

10 https://www.forest-trends.org/publications/state-of-the-voluntary-carbon-markets-2021/

11 Companies that wish to offset their GHG emissions can purchase two different types of credits in the voluntary market: avoidance credits for external projects that avoid or reduce emissions production, such as building a wind farm, and removal credits for projects that lower existing emissions. Removal projects deploy either nature-based solutions such as afforestation (introducing trees to a previously unforested area) or technology-based solutions such as renewable energy generation.

12 Non-additional carbon credits results from emission reductions which would have happened anyway, even in the absence of the project.

13 Phantom carbon credits are emission reductions that cannot be genuinely considered as representing any emissions at all.

14 https://about.bnef.com/blog/carbon-offset-market-could-reach-1-trillion-with-right-rules/

15 Nature-based global emissions offsets (NGEOs) are generated by projects that reduce, remove, or prevent carbon emissions through nature-based solutions such as forest conservation or restoration projects.

16 https://carboncredits.com/the-collapse-of-ngeo-carbon-prices-an-in-depth-analysis/

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18 https://rmi.org/can-we-count-on-forest-carbon-credits/

19 https://vcmintegrity.org/wp-content/uploads/2023/05/VCMI-VCM-Access-Strategy-Toolkit.pdf

20 CORSIA is the Carbon Offsetting and Reduction Scheme for International Aviation. It is the first global market-based measure for any sector and represents a co-operative, harmonised approach to reduce emissions from international aviation.

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32 RothC is a model for the turnover of organic carbon in non-waterlogged top-soils that allows for the effects of soil type, temperature, moisture content and plant cover on the turnover process. It uses a monthly time step to calculate total organic carbon, microbial biomass carbon and difference in Carbon-14 (^{14}C) on a years to centuries timescale. For more details, please refer https://www.rothamsted.ac.uk/rothamsted-carbon-model-rothc

33 IPCC Guidelines for National Greenhouse Gas Inventories (2006), chapter 1, introduction: www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_01_Ch1_Introduction.pdf

34 https://verra.org/wp-content/uploads/2023/03/Program-Fee-Schedule-v4.3-FINAL.pdf

35 Multiple projects/programmes can be managed by a project developer opening one account.

36 Jurisdictional REDD+ refers to REDD+ activities in which all the forest in a national (whole country) or subnational (state or province) jurisdiction must be considered when setting a baseline and monitoring deforestation. Until recently, jurisdictional approaches to REDD+ have not been used to issue carbon credits.

37 UNDP Climate and Forests Programme, (2021) *High-integrity voluntary carbon markets (VCM): Emerging issues in forest countries*. https://www.undp.org/publications/high-integrity-voluntary-carbon-markets-vcm-emerging-issues-forest-countries

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