



Draft on Establishment of Domestic Forest Carbon Market in India



Indian Council of Forestry Research and Education

(An Autonomous Body of Ministry of Environment, Forest and Climate Change, Government of India)

P.O. New Forest, Dehradun - 248006 (INDIA)



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Prepared under the Ecosystem Services Improvement Project for submission to the Ministry of Environment, Forest and Climate Change, Government of India

Expert Committee Constituted by the Director General, Indian Council of Forestry Research and Education (ICFRE) under the World Bank funded Ecosystem Services Improvement Project for Preparation of a Draft on Establishment of Domestic Forest Carbon Market in India vide ICFRE Office Memorandum No. 72/2018/ESIP/BCC/ICFRE/52 dated 20/01/2022:

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Foreword

Forests are net carbon sinks in India and land use, land-use change and forestry are offsetting about 15% of the total greenhouse gas emission of the country. Activities responsible for deforestation and forest degradation can significantly affect the amount of carbon dioxide in the atmosphere. Concerns about climate change and its impacts on the forests and the economy are encouraging policy-makers and stakeholders globally to explore a range of opportunities that would reduce emissions of carbon dioxide and other greenhouse gases. Reducing deforestation, forest degradation and increasing carbon sequestration in the forests are approaches that have generated considerable interest globally for the ability of forests to support climate change mitigation. Establishment of domestic forest carbon market can pay an important role in conservation and protection of forests, biodiversity conservation and opportunity for providing the income to the local communities in the country. Industries who are required to limit or offset their carbon emissions may purchase carbon credits that are generated from the forests.

The World Bank funded Ecosystem Services Improvement Project (ESIP) has supported the goals of Green India Mission by demonstrating models for adaptation-based mitigation through sustainable land and ecosystem management. New tools and techniques for better management and monitoring of forest carbon stocks are introduced under ESIP which are considered necessity in the forest sector.

Currently, India do not have any domestic forest carbon market but it has the potential of becoming a leading player in forest carbon market. Establishment of forest carbon market may promote forest carbon trading at domestic level which may ultimately contribute in sustainable management of forests. An Expert Committee has been constituted under ESIP for developing a draft on Establishment of Domestic Forest Carbon Market in India for submission to Ministry of Environment, Forest and Climate Change, Government of India for consideration.

I am hopeful that this draft will serve as a framework for establishment of domestic forest carbon market in India. I compliment the Chairperson and all members of the Expert Committee for bringing out the draft on establishment of domestic forest carbon market in India.

Dated: 28/07/2022


(Arun Singh Rawat)

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Contents

1. Introduction.....	01
2. Carbon Markets	03
3. Role of Forest Sector in Carbon Market.....	05
4. Objectives of Domestic Forest Carbon Market.....	11
5. Scope of Domestic Forest Carbon Market.....	13
6. Process Flow: Project Cycle	15
7. Organisational Structure for Domestic Forest Carbon Market.....	19
8. Eligible Activities and Types of Carbon Offsets.....	21
9. Validation, Verification and Issuance Procedures	23
10. National Forest Carbon Registry.....	27

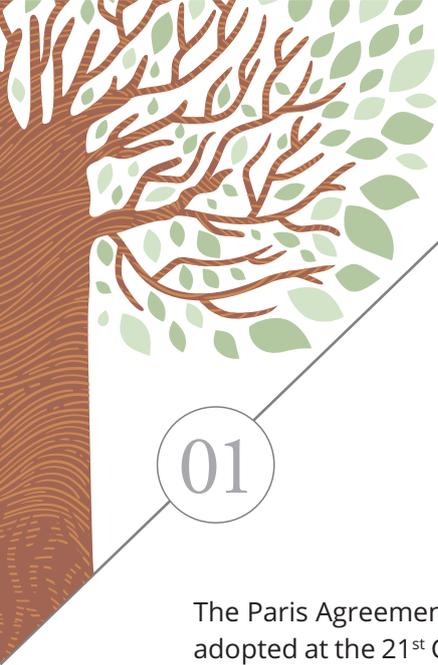




Abbreviation Used

A/R	Afforestation/ Reforestation
AFOLU	Agriculture, Forestry, and Other Land Use
ANR	Assisted Natural Regeneration
BECS	Bioenergy with Carbon Capture and Storage
BUR	Biennial Update Report
CDM	Clean Development Mechanism
CDM-EB	Clean Development Mechanism - Executive Board
CDR	Carbon Dioxide Removal
CO ₂	Carbon Dioxide
COP	Conference of the Parties
DMS	Data Management System
ER	Emission Reduction
FSI	Forest Survey of India
GHG	Greenhouse Gas
GIM	Green India Mission
ICFRE	Indian Council of Forestry Research and Education
IFCR	Indian Forest Carbon Registry
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ITMOs	Internationally Transferred Mitigation Outcomes
LULUCF	Land Use Land Use Change and Forestry
Mha	Million hectare
MoEFCC	Ministry of Environment, Forest and Climate Change
MR	Monitoring Report
MRV	Measurement Reporting and Verification
NCS	Natural Climate Solutions
NDC	Nationally Determined Contributions
PD	Project Developer
PIN	Project Idea Note
UNFCCC	United Nations Framework Convention on Climate Change
VB	Validation and Verification Body





01

Introduction

The Paris Agreement on climate change was adopted at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) on 12 December 2015 at Paris, France. This is a legally binding agreement to limit global temperature rise well below 2°C compared to pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C. The binding agreement is the first of its kind to bring multilateral climate change issue by way of cooperation among nations to reduce their emissions. The IPCC Special Report on Climate Change and Land (2019) and subsequent IPCC 6th Assessment reports brings a very strong message on importance of land restoration for climate change mitigation. There are several options for carbon dioxide removal (CDR as it is referred in various IPCC Reports). The IPCC 1.5 report¹ (2018) assessed pathways relying mainly on afforestation, reforestation (A/R), bioenergy with carbon capture and storage (BECCS). However, some of the CDR measures related to Agriculture, Forests and Other Land Use (AFOLU) can have important positive effect on land and biodiversity on restoration of natural ecosystems. Afforestation/reforestation (A/R) as one of the CDR activities will not only contribute to forest restoration

but also recovery of degraded lands, restoration of other lands and soils along with co benefits of mitigation and adaptation (IPCC, SRCCL, 2019²). The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) also concluded that investment in low carbon development must increase by between three and six times. In addition, cooperation between developed and developing economies – through, for example, technology transfer, capacity building and knowledge exchange and market creation must be scaled up to keep global warming at or below 2°C³. Agriculture, Forestry, and Other Land Use (AFOLU) activities although accounting for 23% (12.0 ± 2.9 GtCO₂eq yr⁻¹) emissions from human activities globally during 2007-2016, is unique among economic sectors because its mitigation potential derives from both an enhancement of removals of greenhouse gases (GHGs) as well as a reduction of emissions through management of land. Thus, the land-use sector plays a critical role for achieving the goals of the Paris Agreement to limit the increase of global average temperature to well below 2°C and to achieve a balance between emissions by sources and removals by sinks in the second half of this century.

¹ IPCC (2018) Special Report on Global Warming of 1.5°C

² IPCC (2019) Special Report on Climate Change and Land.

³ https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf





02

Carbon Markets

With UNFCCC and its offshoot, the Kyoto Protocol, carbon became a tradable commodity to facilitate climate change mitigation through reduction of GHGs. The Kyoto Protocol established the first international carbon market system under UNFCCC compliance regime. Along with Kyoto type of compliance markets, voluntary carbon markets also started booming. Carbon markets transacts quantified units known as carbon offsets (or credits) which represents one metric tonnes of CO₂eq that has been reduced avoided or sequestered by an entity to compensate for emitting the same quantity elsewhere.

Compliance markets are used by companies and governments that by law have to reduce GHG emissions which sets the rules for regulating entities to obtain and surrender offsets to meet regulatory targets. The compliance market is regulated by mandatory national, regional or international carbon reduction regimes. Offset buyers are entities with regulatory obligations. Example Kyoto type markets.

Voluntary markets are the collective global transactions that are not driven by regulatory obligations. On the voluntary market the trade of carbon credits is on a voluntarily basis. Anyone, for example, local governments, a company, an individual, any entity etc. can buy an offset. No single marketplace exists but rather a diverse and growing landscape of exchanges and over the counter (i.e., bilateral transactions) also take place under voluntary markets.

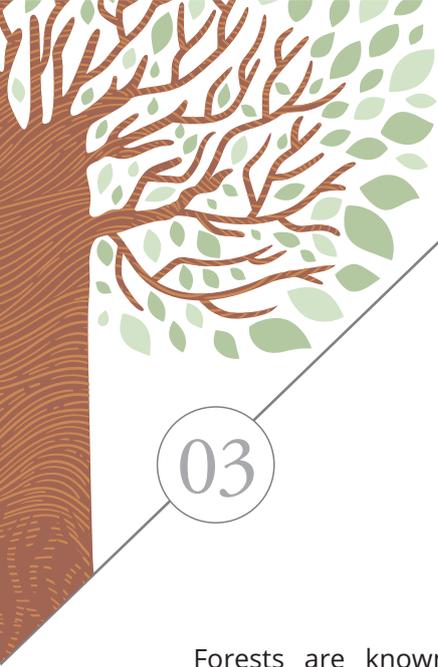
The transition from the CDM mechanism under the Kyoto Protocol to Article 6

mechanisms (or New Market Mechanism) under the Paris Agreement has potentially important implications for the continuation of existing mitigation activities established through the CDM. Establishment of Article 6, which governs carbon markets is one of the key outcomes of the Paris Agreement. Article 6 allows parties to voluntarily cooperate with one another to achieve the emission reduction targets set out in each party's NDCs. The first two of these instruments (Article 6.2) involve cooperation which will result in the transfer of mitigation of emissions between countries, from the country that achieved the reduction to the country that acquire that reduction. Internationally Transferred Mitigation Outcomes (ITMOs) under article 6.2 can be in "non-GHG" metrics (e.g. kWh of renewable energy, hectares of forest etc.), which seems to be methodologically complex issue. However, reporting on the non-GHG trade will have to include information on how it can be converted to CO₂eq. Under non-market approaches (Article 6.8), countries are enabled to work together to achieve mitigation and adaptation, as well as sustainable development and poverty reduction. By making it clear that countries can transfer carbon offsets internationally to deepen their emission reductions, Article 6 explicitly enables international carbon trading.

With more than 1,000 projects registered under the UNFCCC Clean Development Mechanism, India is currently one of the world's biggest exporters of carbon credits next to China. A national carbon market for India, has potential to become one of the biggest mitigation programme leading the

country to meet its Paris Agreement targets, and to meet its net-zero greenhouse gas emissions goal by 2070 as announced by India at COP 26 in Glasgow. India's carbon market poised for growth, India is well poised to reap the benefits of global carbon market by leveraging its decarbonizations into credible offsets generations, which will help in enhancing the country's share of international green finance. In view of India's target to meet net-zero greenhouse gas emissions goal by 2070 it is high time that India should think of developing its

own domestic forest carbon market. A new 'Registered Entity' – National Forest Carbon Registry (Indian National Forest Carbon Registry) under the Ministry of Environment, Forest and Climate Change, Government of India or an Agency authorized by Ministry of Environment, Forest and Climate Change, Government of India, can be established for registering new forestry-based carbon projects with its own modalities, procedures, regulation and MRV protocols in line with credible international registry systems.



03

Role of Forest Sector in Carbon Market

Forests are known as the sink as well as the source of carbon. Amidst climate change concerns, role of forests has been increasingly recognized as most cost-effective option for climate change mitigation through carbon captured in biomass and soils. Forest carbon particularly tropical forests offers one of the most significant and cost-effective solutions for climate actions in coming decades. Research indicates that forests and other natural climate solutions (NCS) are capable of providing up to one-third of climate mitigation needed by 2030, yet receive less than 3% of climate mitigation funding¹. Forest carbon is considered as a forest product that can be a viable alternative source of income for forest communities and landowners as well. Managing forests for carbon sequestration offers the opportunity to reverse or stabilize human and societal emissions from fossil fuels and land use. Moreover, forests offer multiple ecosystem services to the public like water quality and quantity regulation, non-timber forest products, soil moisture conservation, providing habitat for biodiversity etc.

The role of forest and other carbon sinks associated with land use changes were recognized by UNFCCC by acknowledging that activities in the Land Use Land Use Change and Forestry (LULUCF) sector can provide a relatively cost-effective way of offsetting emissions. However, forest carbon markets especially under CDM of the Kyoto Protocol globally failed to achieve the large potential for climate change mitigation

described by various expert, IPCC reports etc. The slow gain from forestry mitigation projects appears to be largely from lack of investment and other institutional and social barriers. Very cumbersome rule, eligibility of lands, permanence and leakage are some issues that time to time create hindrance in afforestation/ reforestation projects. Globally out of 7844 registered CDM project activities, only 67 are afforestation/ reforestation (A/R) projects. India with 19 registered A/R CDM projects is still leading in global A/R CDM portfolio. So far, carbon credits from forest-based activities have mainly been used in the voluntary market. However, with New Market Mechanism under Paris Agreement especially Article 6.2 on cooperative approaches, nature based (forestry) activities are likely to be the preferred choice to reduce GHG emissions at relatively lower cost along with other significant co-benefits of forest ecosystem services. In recent years, carbon market approaches have been increasingly embraced as a means to incentivise emission reductions and removals from the land-use sector. There are different approaches that aim at reducing emissions or enhancing removals in the land-use sector, some of them can be referred to as nature-based solutions. Bamboo is also a potential candidate for forest carbon market in India so bamboo need to be included in the definition of forest under new market mechanism of the Paris Agreement, voluntary carbon markets and also for proposed domestic forest carbon market.

¹ Ecosystem Marketplace (2021) Green Growth Spurts: State of Forest Carbon Finance 2021

Need for Domestic Forest Carbon Market:

The revised Green India Mission (GIM) Document² (MoEFCC, 2021) emphasized on tapping of carbon market under the Mission. The GIM further advocates, that voluntary carbon market can be tapped for the sale of carbon of forestry origin for both forestry and agroforestry plantations. Forestry potential (afforestation/ reforestation/ restoration of degraded landscapes/ agroforestry/ farm forestry/ forest conservation efforts etc.) could not be tapped in the carbon market due to various reasons including the absence of a national carbon market. The initiative could be supported under GIM. Establishing a Carbon Registry would also function as an innovation for generating additional financial incentives to the land owners, small and marginal farmers. However, the involvement in international carbon markets in the post 2020 period (including voluntary markets) would depend on the rules for market mechanisms finalized under Article 6 of the Paris Agreement, and its implications for achievement of India’s nationally determined contribution (NDCs) targets. Rules for market-based mechanism under Article 6.4 are still being finalised at UNFCCC.

Enhancing Tree Cover under the GIM:

Enhancing tree cover through undertaking agroforestry and social forestry, fallow lands, drylands, degraded farm and marginal lands, croplands, bunds, would be taken up under the plantation. The Mission propose to support a program of nurseries for raising quality seedlings of agroforestry species for large-scale tree plantation on the farm land along with high agricultural productivity and improved soil nutrient regime. Bamboo and no-timber forest product-based models would be promoted to enhance the incomes of farmers and to enhance carbon sequestration. The Mission may also consider dovetailing institutional financial support to farmers to go in for farm-forestry on their fallow lands/ unproductive lands.

Under Green India Mission, agroforestry and farm forestry shall be taken up in the contiguous landscape of the areas selected for the other sub-missions to create a larger and synergistic impact on the interventions. These plantations shall further be explored for financing under the voluntary carbon markets to provide additional incentives to the farmers and landowners. GIM also proposes to provide necessary support for enabling the same under the Mission.

National Agroforestry Policy, 2014 recognized role of agroforestry in the domain of environmental services. Agroforestry is known to have the potential to mitigate the climate change *inter alia* through carbon sequestration. Agroforestry species are known to sequester as much carbon in below ground biomass as the primary forests. The National Agroforestry Policy (2014) further emphasizes to create an enabling environment to implement strategies for quantifying carbon sequestration and other environmental services for the economic benefit of farmers.

Meeting India’s Forest Sector NDC Target:

Keeping in view its development agenda, particularly the eradication of poverty coupled with its commitment to following the low carbon path to progress and being sanguine about the unencumbered availability of clean technologies and financial resource from around the world, Government of India in its NDC *inter alia* committed to create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030³. India is determined to continue with its on-going interventions, enhance the existing policies and launch new initiatives in the priority areas *inter alia* full and effective implementation of Green India Mission and other programmes of afforestation. The activities which may be included in the strategy for creating additional carbon sink of 2.5 to 3.0 billion tonnes through additional forest and tree Cover by 2030 can be broadly outlined as follows⁴ (FSI, 2019):

² MoEFCC (2021) Revised GIM document

³ MoEF&CC (2015) India INDC to UNFCCC

⁴ FSI (2019) Technical Paper

- A. Improvement / Restoration of Natural Forests
 - Improving forests which have lost canopy density in the last few years
 - Improving open forests of longer vintage
- B. Tree planting on culturable wastelands & other available lands in villages
- C. Tree planting along:
 - Roads (National Highways, State Highways and Other Roads)
 - Railway lines including railway siding
 - Rivers and Canals
- D. Greening of urban spaces
- E. Agroforestry

Based on the above, ten possible activities have been considered by FSI (2019) for meeting NDC target of forest sector. The potential area which may be available for each activity is given in the following Table 1:

Table-1: Potential area available for different activities

S.No.	Activities	Area in Mha
1	Restoration of forests impaired in the last 6 years	13.7
2	Restoring open forests of more than 6 years vintage to moderately dense forests	18.9
3	Plantations on culturable wastelands	12.5
4	Agroforestry plantations	13.7
5	Green corridor along national and state	1.40
6	Plantations along other roads	2.89
7	Plantations along railway tracks	0.07
8	Plantations around railway sidings	0.01
9	Plantation along important rivers and canals	0.39
10	Expanding urban green spaces and avenue plantations	12.2
Total		75.76

Source: FSI (2019)

This is a massive task indeed that need massive efforts at national level by roping all possible opportunities to meet the NDC commitment. Under different possible scenarios, FSI (2019)⁵ estimated that increase in area of 18 to 24 million hectares of forest and tree cover would be required to meet India's NDC target. In India forestry sector is net sink of CO₂. India's 3rd Biennial Update Report (BUR3) to the UNFCCC estimates that land use, land-use change and forest (LULUCF) in India capture about 15% of the total national emissions arising from different sources⁶. India's forests play a major role in mitigation and adaptation to climate change in India. Planned afforestation has been seen as a major mitigation strategy

in forestry sector. India is one of the few countries where forest and tree cover has increased in recent years transforming country's forests into a net sink owing to national policies aimed at conservation and sustainable management of forests. India has been successful in improving carbon stock in its forest by about 5%, from 6,621.5 million tonnes in 2005 to 7204 million tonnes in 2021⁷ (FSI, 2021). India will be attempting to meet its NDC commitments with existing policies and programmes.

Initiatives like Green India Mission (GIM) aimed to further increase the forest/tree cover to the extent of 5 million hectares (mha) and improve quality of forest/tree cover on another 5 mha of forest/non-forest lands along with

⁵ FSI (2019) India's Nationally Determined Contribution of Creating an Additional Carbon Sink of 2.5 to 3 billion tonnes of CO₂ eq through Additional Forest & Tree Cover: Possibilities, Scale & Costs for Formulating Strategy Technical Information Series, Volume 1 (3), Forest Survey of India Dehradun

⁶ MoEF&CC (2021) India; Third Biennial Report to UNFCCC

⁷ FSI (2021) State of Forest Report India 2021, Forest Survey of India, Dehradun

providing livelihood support. These efforts have been further augmented by policies like National Agroforestry Policy⁸, National REDD-plus Strategy (MoEFCC, 2018), Joint Forest Management; National Afforestation Programme, Forestry interventions under Namami Gange, afforestation along the major river basins and Green Highway Mission etc. India has formulated Green Highways (Plantation, Transplantation, Beautification & Maintenance) Policy-2015 to develop 140,000 km long “tree-line” with plantation along both sides of national highways. 1% of total civil cost of projects is to be set aside to implement the policy. Government of India has also expressed its support to Bonn Challenge initiative by committing restoration targets of 26 million ha of degraded and deforested landscapes into restoration by 2030. The National Bamboo Mission also aims to increase the area under bamboo plantation in non-forest land to supplement farm income and contribute towards the resilience to climate change and the availability of quality raw material requirement of industries.

Availability of Land with Government Agencies: Government of India’s long-term goal is to bring 33% of its geographical area under forest and tree cover. As per Forest Survey of India’s 2021 Assessment, total land under forest and tree cover is 79,42 million ha or 24.16% of the total geographical area of the country (FSI, 2021⁹). The difference in existing forest cover and the target area suggests that an additional 29.58 million ha need to be brought under the tree cover to achieve 33% tree cover. A significant part of the “Open Forest” (30 million ha) category of 10-40 % canopy density is either patchy or degraded and needs restoration efforts. (~42% of forest cover i.e, 9.14% of geographical area). In addition, large tracts of land, which likely extend to several million hectares, are available with numerous Government Agencies (e.g., State Governments, Panchayats, Railways, Defence, Posts and Telegraph etc.), and public sector undertakings, which are currently not put to any particular productive use (but part thereof may be needed by them

in the future for various purposes). Precise estimates of holdings of such land are not available.

Challenges for Forest Carbon Market:

Using market or market-based approaches for the land-use sector also has some peculiar challenges. Various government backed and non-governmental carbon crediting mechanisms have permitted the registration of land-use activities. So far, carbon credits from these activities have mainly been used in the voluntary market. Some governments also recognise carbon credits from land-use activities under national climate policies. An evaluation of approaches employed by carbon crediting programmes, also have key environmental integrity challenges for including different types of land-use activities in carbon crediting mechanisms. Some of the key challenges are:

a. Demonstrating Additionality: Additionality is essential to ensure that carbon credits are backed by actual emission reductions or removals. Emission reductions or removals are only additional if they are caused by the incentives from carbon crediting revenues. If they also occur in the absence of the incentives from carbon credits, they are not additional. Non-additional emission reductions or removals undermine the effectiveness of crediting mechanisms. Robust additionality assessments are must to any carbon crediting mechanism and for activities in any sector. Additionality would be the average of the vegetation/ carbon stock of the last four years.

b. Determining Baselines: A baseline represents the level of emissions or removals against which actual emissions or removals are compared to in order to determine the emission reductions or removals resulting from an activity. In practice, baselines can involve considerable uncertainty as they form counterfactual scenarios which cannot be observed or verified. To address uncertainty and preserve environmental integrity, many carbon crediting mechanisms require that baselines be established in a conservative manner. The Paris Agreement sets new conditions for establishing baselines. The

⁸ MoA, (2014) National Agroforestry Policy, Ministry of Agriculture and Farmers’ Welfare, GoI

⁹ FSI (2021) India State of Forest Report 2021, Forest Survey of India, Dehradun

NDC and policies needed to implement the NDC should be reflected in determining baseline levels, such that baselines for international carbon crediting are set at least at a level that is consistent with the NDC, or at more ambitious levels.¹⁰ Carbon crediting programmes use a variety of approaches for establishing baselines, including reference areas (for projects), (adjusted) historical averages (for projects and jurisdictions), historical trends (for projects and jurisdictions), and modelling (for jurisdictions). For afforestation and reforestation activities the uncertainty of the baseline is relatively low.

c. Addressing Leakage: Leakage from carbon projects happens when GHG reductions in one area results in an unintended increase in GHG emissions in another location and attributed to the project activity. Project developers must demonstrate their project does not cause excessive leakage. The risk of leakage depends partly on the type of activity but even more on the activity design, scale and underlying drivers. An ideal approach for addressing leakage includes identifying and mitigating leakage risks (e.g., by excluding activities with material risks of indirect leakage), monitoring and quantifying any remaining leakage during the activity's lifetime, and accounting for leakage by deducting leakage emissions in the calculation of total emission reductions and removals.

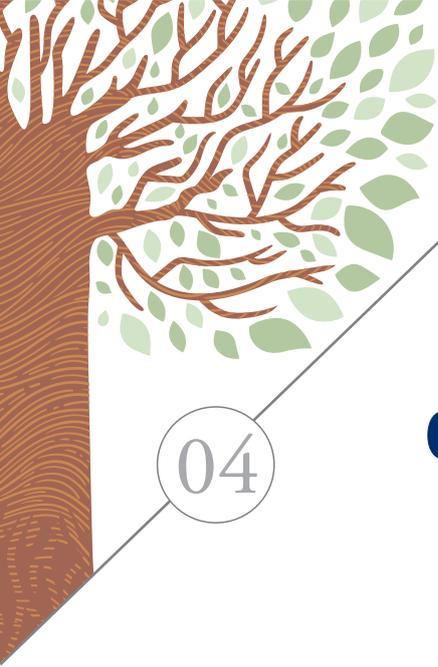
d. Addressing Permanence: Permanence for forestry projects requires that GHG removal enhancements be maintained for up to 100 years. Non-permanence in land-based activities has always been a problematic issue. Owing to biological nature of the credits generated by a forestry projects, there was considerable concern that carbon sequestration would be subject to a risk of re-emission, due to either human action or natural events such as insect past outbreak, wildfires etc. This was called the permanence risk and it is unique to land based projects. Institutional processes attempting to address this issue, such as establishing buffer pools or insurance mechanisms, are either too short (for example, less than 100 years) or unrealistic (i.e., guaranteeing the existence

and operation of a buffer pool for over 100 years), and sometimes both. Most carbon offset programs outside the scope of CDM have established "buffer reserves" to address the risk of GHG reductions being reversed. Under this approach, certain amount of offset credits from individual projects are set aside into a common buffer reserve (or "pool"), which functions as an insurance mechanism. Reserved credits can be drawn upon to compensate for reversals from any project. If a reversal occurs, credits are retired or cancelled from the buffer reserve on behalf of the project's buyers. The number of credits a project must contribute to the buffer reserve is usually based on an assessment of the project's risk for reversals. Over finite time periods, this approach can fully cover catastrophic losses affecting individual projects, as long as the buffer reserve is sufficiently stocked with credits from projects across an entire program.

The carbon credits arising from CDM afforestation and reforestation projects are, although, considered temporary or expiring certified emission reductions (CERs), but could be re-issued or renewed at definite intervals after an independent verification to confirm sufficient carbon was still sequestered within the project to account for all credits issued. This deals effectively with the permanence risk and guarantees that any losses of sequestered carbon for which credits have been issued will have to be made up through either additional sequestration elsewhere or through credits derived from non-LULUCF activities. This approach effectively guarantees permanence if it is enforced in new mechanism under Article 6.4 of the Paris Agreement. However, it has faced significant hurdles, not least because it puts the onus for ensuring permanence on offset credit buyers. As a result, buyers have been far less willing to pay for these credits or are sold at a highly discounted rates as compared to credits generated from other sources. It still remains to be seen how permanence is addressed in the New Market Mechanism under Article 6 of Paris Agreement.

¹⁰ Böttcher, H., Schneider, L., Urrutia, C., Siemons, A., and Fallasch, F. (2022) Land use as a sector for market mechanisms under Article 6 of the Paris Agreement, Final report, CLIMATE CHANGE 49/2022 on behalf of the German Environment Agency.





04

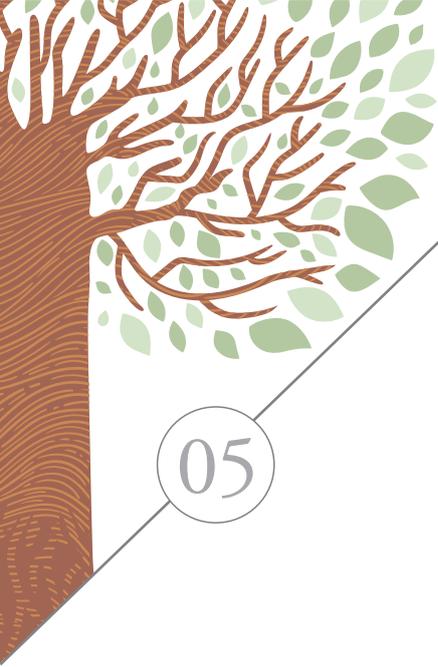
Objectives of Domestic Forest Carbon Market

The overarching objective of the domestic forest carbon market will be to tap the carbon capture potential of forest sector for climate change mitigation and to incentivise the millions of small land owners or tree growers. The initiative will assist eligible private sector players, corporates, public sector organisations, land owners, small and marginal farmers to achieve emission reductions through land use based (afforestation/ reforestation, agroforestry, farm forestry etc.) projects by providing financial and technical assistance. Among other objective of this market *inter alia* are:

- To increase the country's capacity to benefit from potential future new market mechanism emerging under the Paris Agreement with positive incentives.
- To enhance income of land owners and farmers practicing agroforestry/ farm forestry and to promote future large-scale positive incentives for such activities.
- To provide a platform for the buyers and sellers of forestry carbon credits at domestic level
- To disseminate the knowledge gained from the development and implementation of land-based projects and programmes for readiness at national level.







05

Scope of Domestic Forest Carbon Market

Definition of forest and trees to be decided on the basis of existing definition adopted by India for the purpose of CDM and analysing its implication on CDM projects or what is practices in voluntary markets or definition of forest followed by forest survey of India for the assessment of forest carbon stocks. Other pertinent issues like project start date, retention period (permanence), monitoring criteria and periodicity, monitoring plan, addressing permanence, leakage, additionality, scope of trading (domestic, bilateral and international), project scale (small, medium and large), financial mechanism, role of institutional investor, corporate investor, private sector need to be elaborated further at the time of developing detailed modalities and procedures for operationalisation of forest carbon market at national level.

Forest carbon market will allow farmers landholders to sell the carbon captured by the plantations (afforestation/ reforestation) activities to another entity to compensate for emissions made elsewhere. The typology of forest carbon offset projects can include:

- Afforestation/ Reforestation (AR) projects activities
- Agroforestry and farm forestry programs
- Commercial plantations
- Horticulture plantations
- Community plantations,

- Restoration of degraded lands
- Urban forestry/ Nagar Van
- Improved forest management practices,
- Assisted natural regeneration (ANR) activities within natural forests

Environmental Integrity: A robust additionality test of projects and effective registry system for ensuring corresponding adjustments will ensure the environmental integrity of the credits generated through the projects. Article 6 of the Paris Agreement mandates corresponding adjustments for all carbon credits authorised by host countries., regardless of whether they were generated in “sectors or GHGs” covered in the host country’s NDC or not. All authorised credits have a *de facto* expiration date, since they must be used (and adjusted for) in the NDC period in which they occurred.

Social and Environmental Safeguards: Safeguards are essential to minimise potential social and environmental risks when implementing land use-based activities under carbon markets. Safeguarding the risks for ecosystem services and social impacts e.g., rights and concession enjoyed by the indigenous communities and local peoples need to be ensured. A system of reporting on safeguards, grievance and redressal mechanisms etc can be developed to minimise the associated risks.





06

Process Flow: Project Cycle

In the first phase the domestic forest carbon market would limit itself to plantation activities both by individuals and organizations including government, public sector undertakings and business organizations, and as experience is gained over two to three years the carbon sequestered under more complex systems of natural ecosystems and biodiversity enrichments etc. would also be brought within the purview of carbon market. This first phase envisions two types of activities (based on the land area under plantation):

i. Project Type A: Plantation on area less than 100 hectares (these will include individual planned plantations by small landowners as well individual trees in individual households). Baseline will be the carbon contents of the pre-existing vegetation on the land. Leakage will be assumed to be zero. Permanence will be ensured by requiring the establishment of buffer plantation(s) of adequate sizes

by the State Forest Department/ Forest Development Corporation for which the smaller states may also be extended financial assistance by the Ministry of Environment, Forest and Climate Change, Government of India under a specifically devised scheme. For ease of management, clustering of very small plantations and individual household and farm boundary trees etc will be done by the State Forest Departments so that each such cluster will have an estimated minimum of 100 carbon credit generated annually.

ii. Projects Type B: Plantation on area more than 100 hectares (these will include block plantation, boundary plantations, roadside plantations. Moreover, smaller land areas can be aggregated or bundled together as well to achieve the plantation size). Baseline will be the carbon contents of the pre-existing vegetation on the land. Permanence will be ensured by buffer plantation(s) of 10% of the planted area raised by the plantation owners themselves.



Process Flow for Project Type A

Step 1: Subscription to the program by Project Developers / Tree owners

- Project Developer (PD) or tree owners can register themselves on the App created by Indian Forest Carbon Registry by providing following details:
 1. Name
 2. Address
 3. Contact number
 4. Identification document
 5. Baseline information including the carbon contents of pre-existing vegetation
 6. Date of plantation / planting of trees
 7. Plantation area / Number of trees
 8. Geo-coordinates of the trees / plantation area
 9. Name of the plant (in vernacular language)
 10. Type of plantation (block, boundary, or roadside)
 11. Upload pictures/ images



Step 2: Validation of the Initial Information

- Local office of State Forest Department would validate the details as provided by the project developer or tree owner on sample basis or for each tree whose details have been provided in the App.



Step 3: Registration of Project Developers / Tree owners

- Project Developer (PD) or tree owners will be registered under the program upon successful validation of the information provided by the local office of State Forest Department.



Step 4: Monitoring

- Local office of State Forest Department will monitor the height and girth of trees on sample basis or for each tree whose details have been provided in the App.
- The results of monitoring would be maintained in excel spreadsheet and calculation of amount of carbon sequestered would also be recorded.



Step 5: Verification

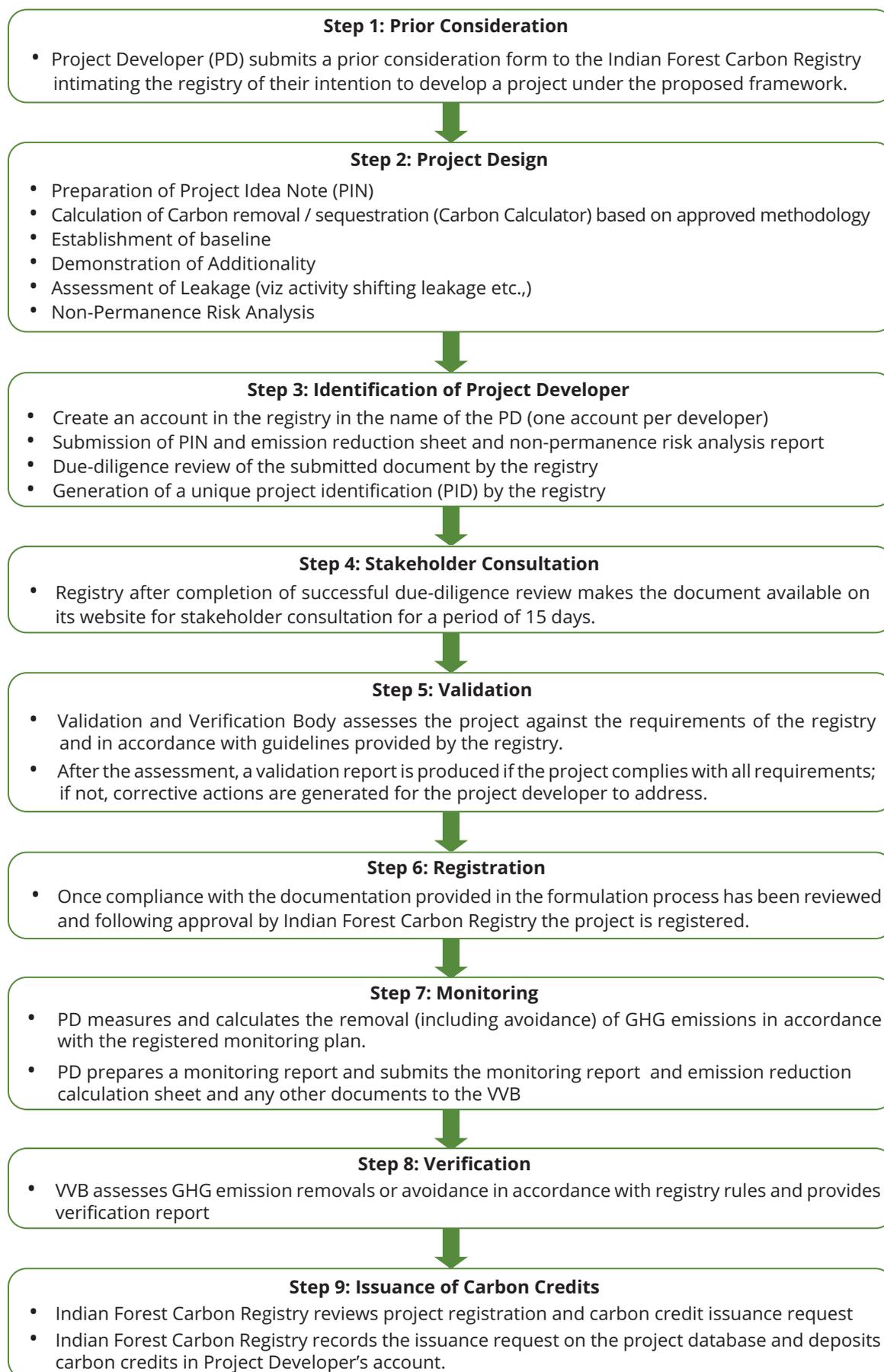
- Verification Body assesses GHG emission removals or avoidance in accordance with registry rules and provides verification report



Step 6: Issuance of Carbon Credits

- Indian Forest Carbon Registry reviews project registration and carbon credit issuance request
- Indian Forest Carbon Registry records the issuance request on the project database and deposits carbon credits in Project Developer's account.

Process Flow for Project Type B







07

Organisational Structure for Domestic Forest Carbon Market

1. Oversight Body: Cooperative approaches require the coordination among multiple ministries. It is proposed to establish a body with a responsibility for a longer-term oversight, to support the process of adopting the necessary legislation and institutional mandates and to oversee the processes. This body should be responsible for coordination among multiple ministries/ bodies/ agencies. This body may task with advice on Article 6 of the Paris Agreement participation strategy at the highest level of the government, monitor the implementation of the Article 6 framework, coordinate with other climate and sectoral initiatives and ensure sustainability of Article 6 institutional arrangements. Tracking of Internationally Transferred Mitigation Outcomes (ITMOs) in a registry is necessary to comply with the requirements for robust accounting and avoiding double counting. Proper institutional and regulatory frameworks need to be established for effective operationalisation of cooperative approaches. A proper framework would ensure that the process, design, quality assurance (i.e. validation and verification), issuance, transfer, and use of ITMOs are sound and robust.

2. National Authority: It shall be responsible for regulating, supervising the mechanism & registry under the domestic forest carbon market.

3. Secretariat: A body shall be established to support National Authority for providing following services:

- Providing institutional, administrative and technical support to the national authority and its panels;

- Keeping the National Authority informed of the developments in the global carbon market;
- Providing capacity-building services to key stakeholders;
- Acting as an interface between the national authority and stakeholders in the development of new and revised regulations
- Maintenance of the carbon registry

3. Regulatory Body: A body shall be responsible for formulating rules, regulation, and procedures for Indian Forest Carbon Registry. This body shall also act as final authority for approval of projects submitted to the Indian Forest Carbon Registry. The regulatory body shall establish the requirements and processes necessary to operate the mechanism, relating to, inter alia:

- The accreditation of validation and verification bodies.
- The development and/or approval of methodologies and standardized baselines
- The registration of activities under Indian Forest Carbon Registry and the issuance of emission reductions (ERs).
- The registry for the mechanism.
- The development of tools and approaches to assess Baseline, Additionality, Leakage and Permanence for project activities

4. Registry Administrator: A body responsible for the day-to-day operations of the registry.

5. Validation and Verification Body (VVB): An organization approved by Indian Forest

Carbon Registry to act as a validation/ verification body in respect of providing validation and/or verification services in accordance with the Indian Forest Carbon Registry rules.

6. Project Developer: An organization that voluntarily engages in a project to reduce emissions in order to sell carbon units

7. Accreditation Panel: The panel established to support the regulatory body for accreditation of VVBs, conduct assessment of VVBs regarding their compliance with the accreditation requirements and to provide advice on

accreditation requirements and improvement of the accreditation process.

8. Registration and Issuance Body: A body responsible for assessing requests for registration of project activities and requests for issuance of ERs as applicable, that have been placed under review.

9. Methodologies Panel: The panel is responsible to develop recommendations to regulatory body on guidelines for methodologies for baseline and monitoring plans and approval of new proposed new baseline and monitoring methodologies.

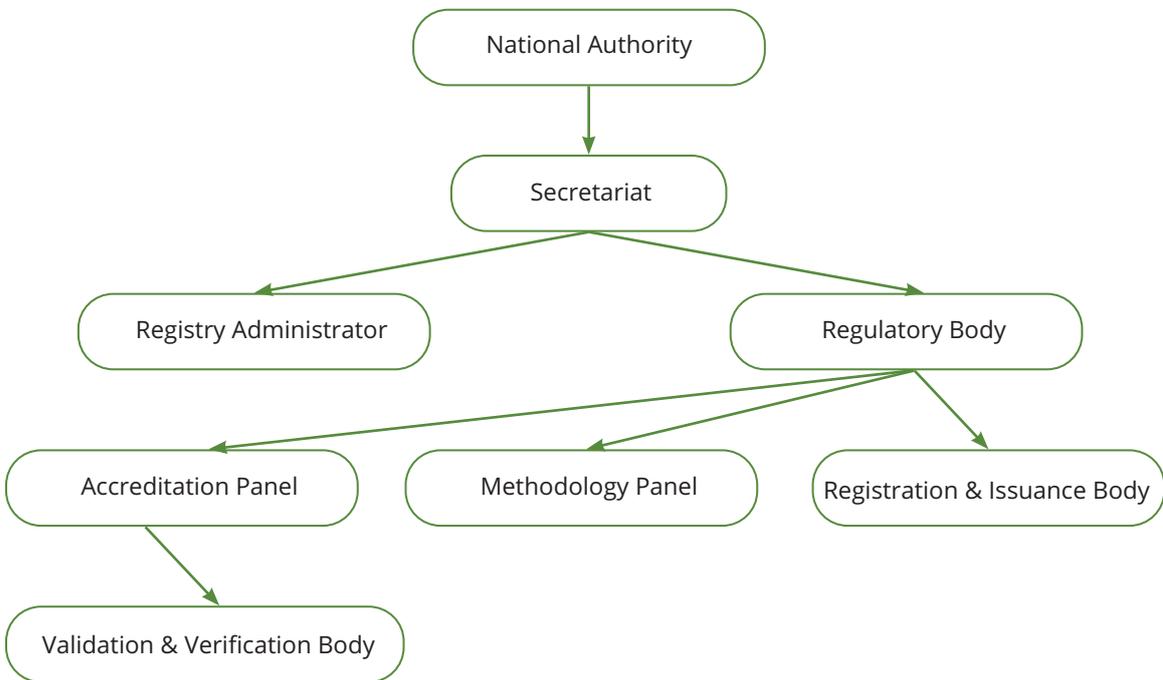
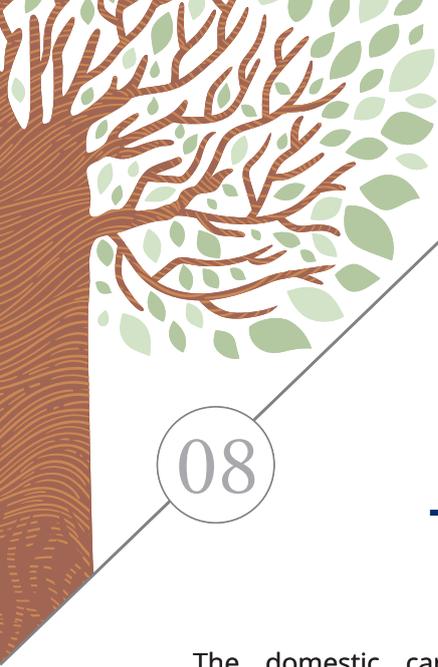


Figure 1: Organisational structure for domestic forest carbon market



08

Eligible Activities and Type of Carbon Offsets

The domestic carbon market is being designed initially as a non-compliance voluntary carbon market to help achieve this objective by creating additional carbon sinks/ generating carbon removals through a variety of activities noted in the Table 2 and, in particular, by incentivizing millions of farmers and other individuals and organizations to plant trees on all available lands, big or small. Each of these activities (new) will generate carbon removal credits which would be labelled differently and is likely to be priced by the market differently as well. The idea behind different labels is not only to ensure identification and traceability of the removals with respect to the activities from which they are generated but also benefit from higher prices that the market is likely to offer for activities that lead to higher

and more complex levels of ecosystem enrichment in addition to the climate change mitigation benefits.

This domestic forest carbon market shall be made compatible with the requirements of the New Market mechanisms that are evolving under Article 6 of the Paris Agreement once some experience is gained in running it and also the rules governing this New Market Mechanism become clearer. Till that time the credits generated shall be used only for non-compliance purposes so that these remain available for meeting India's NDC target. Credits generated and traded on this market and meeting the standards set by the New Market Mechanism can, however, be used for compliance with the express permission of the Ministry of Environment, Forest and Climate Change, Government of India.

Table-2: Eligible activities

S.No.	Activities
1	Commercial Plantations: Mixed or monospecific
2	Agroforestry: Block Plantation or Boundary Plantation
3	Plantations on institutional lands, along national /state highways, along village roads, village panchayat lands, PSU lands (viz., railways)
4	Reclamation of mines
5	Plantations on the degraded patches within natural forests
6	Urban Forestry (Plantations within cities)
7	Mangroves plantations on degraded areas
8	Conservation Protected Areas (National Parks, Wildlife Sanctuaries, Biosphere reserves)
9	Conservation of mangrove forests, tidal marshes, and sea grasses
10	Horticulture plantations





09

Validation, Verification and Issuance Procedures

Validation: Validation is the systematic, independent, and documented process for evaluating a GHG mitigation activities against defined criteria to verify that it conforms to the requirements specified in current standards and as stipulated by Indian Forest Carbon Registry (IFCR). The Project Developer (PD) shall request validation of the GHG project, they shall provide all the information as required by the VVB to conduct the validation process. The VVB shall conduct the validation process according to the guidelines established for this purpose by the IFCR and according to the project type and the ISO 14064-3 standard (Greenhouse gases- Part 3: Specification with guidance for the verification and validation of greenhouse gas statements). Once the provided information has been assessed and all necessary activities/procedures have been carried out, the VVB shall inform the PD of its decision to validate the GHG project activity.

The notification to the GHG project developer shall include:

- In case of successful validation, the confirmation of the validation and the date of submission of the validation report to the IFCR, or
- In case of rejection, where a VVB based on the review of documents and provided information determines that the project does not meet the requirements of IFCR for registration, an explanation of the reasons for rejection.

Verification: It is a periodic, systematic, independent, and documented review

process for evaluating the monitored removal of/reduction in GHG emissions that have occurred because of the implementation of the project activity over a defined period. Verification process shall be conducted in accordance with the guidelines established for this purpose by IFCR and according to the project type and the ISO 14064-3 standard:

- conformity with applicable verification criteria, including the principles and requirements of IFCR in the scope of verification,
- information and documentation on project planning, including procedures and criteria for the project, baseline, quality control and assurance, risk management, monitoring, and reporting,
- any significant changes in procedures or criteria of the project since its last reporting period or validation,
- GHG emissions, removals, and removal enhancements reported in the baseline and project scenario, and
- any significant changes in GHG emissions removals and removals enhancements since the last reporting period or since the project's validation.

Contractual Agreement: Project Developer shall sign an agreement with VVB for the validation or verification audit process. The agreement at the minimum should specify the type of engagement, level of assurance, objective, criteria, scope and materiality threshold

Desk Review: As part of this process, the VVB shall request to the project developer

for information (not limited to PIN, MR, ER sheet) to determine the purpose and scope of the validation or verification, considering the following:

- if the project activity corresponds to a type of project eligible for the Certification Program,
- if the project activity applies a methodology eligible under the requirements of the Certification program,

- if the monitoring plan or report complies with the methodology applied by the project activity,
- if the determination of the baseline considers the considerations provided by the ICFR Program and by existing sectoral and national regulations.

Steps of the Validation and Verification Process: The VVB shall complete the validation and verification activities through the steps described below:

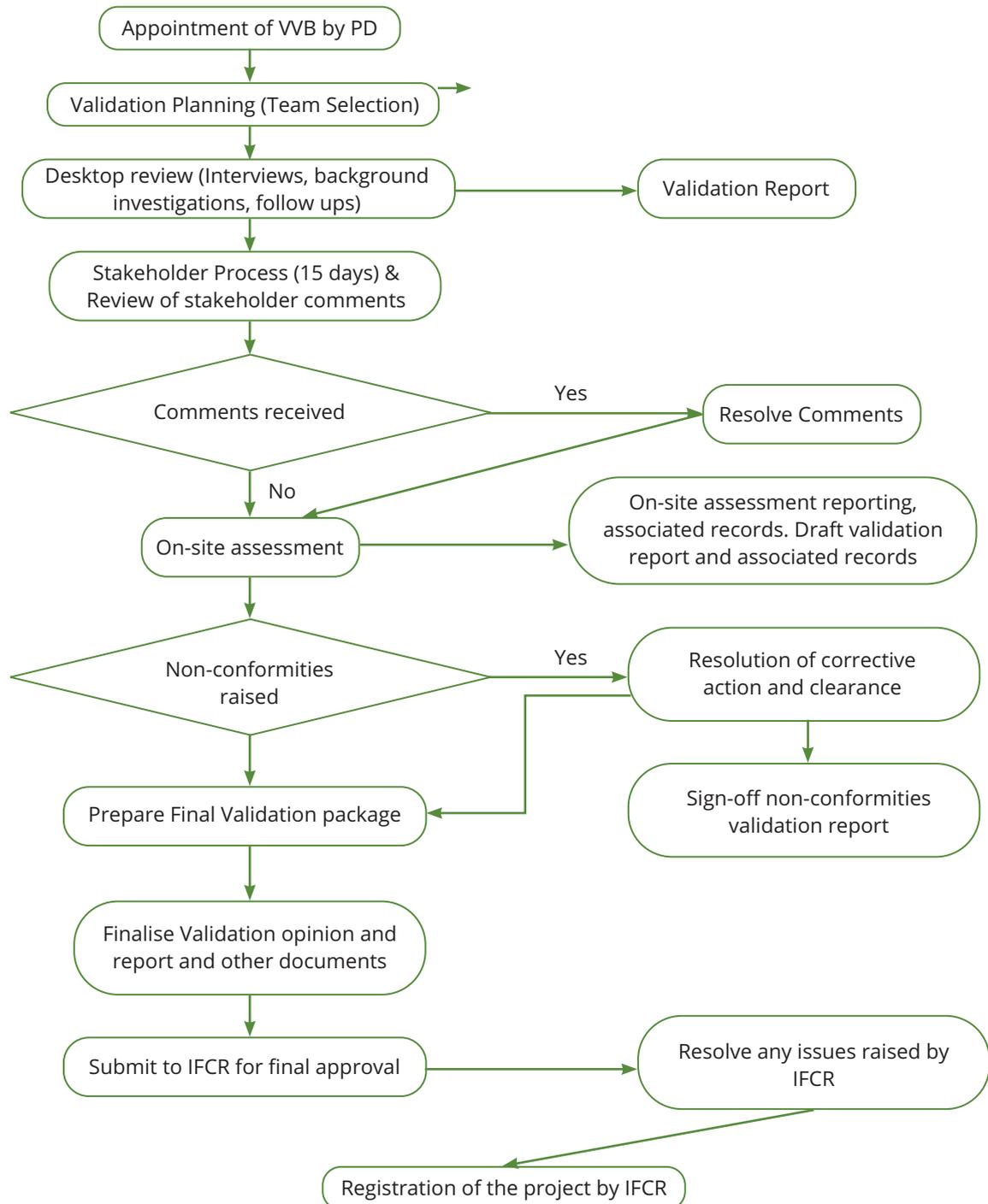


Figure 2: Verification Process

Validation or Verification Plan: The VVB shall develop a validation or verification plan, including a documented sampling plan addressing the aspects detailed in ISO 14065:2013 (Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition) and considering the requirements specified by the IFCR, specifically:

- assign competent personnel to carry out the activities,
- determine the validation or verification activities, based on the project's characteristics and the client needs,
- assess the risk of material error concerning the information evaluated,
- confirm the times and logistics required to carry out the validation or verification activities
- define the evidence collection activities necessary to complete the validation or verification under the specified requirements
- prepare an evidence collection plan, considering (c) and any measures the client has implemented to control the sources of possible errors, omissions, and misrepresentations; and
- prepare a validation or verification plan, including objectives and scope, validation or verification team (roles and responsibilities), duration of validation or verification activities, specific requirements, and the level of assurance and materiality

Sampling Plan: The VVB shall develop a sampling plan that considers the following:

- the level of assurance,
- the scope of validation or verification
- the validation and verification criteria
- the quantity and type of evidence (qualitative and quantitative) required to achieve the agreed level of assurance,
- the methodologies for determining representative samples,

- the risks of potential errors, omissions, or misinterpretations.

The sampling plan shall be modified based on any risks or concerns related to materiality that could lead to errors, omissions, or misinterpretations identified during the validation or verification process. The sampling plan shall be used as an input element to develop the validation or verification plan.

Conducting the Validation or Verification

Audit: The VVB shall carry out the validation or verification activities per the validation/ verification plan agreed with the client. If necessary, the plan shall be reviewed and adjusted during the execution of the validation or verification activities. Following activities shall be carried out:

- (a) collection of sufficient and objective evidence on the data and information provided by the project developer, their traceability through the data and information management process, and any additional analysis and calculations,
- (b) conformity assessment to specified requirements,
- (c) prepare a conclusion on the conduct of validation or verification activities,
- (d) a draft validation or verification report; and,
- (e) the validation or verification statement.

Internal Review: The VVB shall internally review the validation or verification activities and the documents/reports prepared by the validation or verification team. This review shall be carried out by professionals who were not involved in the validation or verification process. This internal review shall confirm the following:

- the validation or verification activities were performed following the agreement between the parties and the specific requirements that apply,
- sufficient and appropriate evidence to support the decision of the validation or verification team,
- all findings resulting from the validation or

verification process have been identified, documented, assessed and resolved,

- the competence of the members of the validation or verification team,
- whether the validation or verification planning has been appropriately designed, including its scope, strategic risk assessment, validation or verification plan and evidence collection; and,
- whether the opinion of the validation or verification team is properly presented.

Validation or Verification Statement: The VVB shall issue a validation or verification statement upon completion of the validation or verification, which complies with the following:

- address the intended users of the GHG declaration,
- describe the level of assurance of the validation or verification statement,
- describe the objectives, scope, and criteria for validation or verification,
- describe whether the data and information supporting the GHG

declaration are hypothetical, projected, or historical,

- be accompanied by the GHG declaration made by the responsible party, and
- be accompanied by the statement that include the conclusion of accredited body on the GHG statement, including any qualifications or limitations made by the responsible party.

Specific Requirements for Validation and Verification of GHG Projects:

In all cases, the VVB shall also consider the following criteria to validate and verify GHG projects:

- the level of assurance of the validation and verification of the Project shall not be less than 95%
- the material discrepancy in the data supporting the GHG Project baseline and the estimate of GHG emission removals may be up to $\pm 5\%$
- the consistency of the GHG project baseline under existing national regulations and the methodology applied, as appropriate



10

National Forest Carbon Registry

A registry is an electronic database system that records issuance and distribution of emission reductions to project developers. The registry is operated by “Registry Administrator” and maintained by the secretariat. It facilitates tracking of project and issues credits for each unit of emission reduction or removal that is verified and certified. It also registers and records information including credits generated, ownership, sale, and retirement.

The legal and administrative arrangements necessary for the establishment and future operationalization of registries largely depends on the type of registry i.e., simple v/s complex. The more elaborate the registry's structure, the larger the number of building blocks required to create its legal and administrative framework. The legal framework may address issues such as:

- Data protection,
- Confidentiality, and disclosure
- Legal nature of the carbon unit
- Tax implications of carbon unit transfers; and
- Rules to be applied in the event of insolvency of account holders.

Components of Registry¹:

1. **GHG Inventory:** An inventory that records physical GHG emissions and removals

2. **Register:** A database that records serialized carbon units and any other information specific to the carbon unit, as required by policy
3. **Transaction Registry:** A database that has all the features of a register, plus the capability to transfer carbon units between multiple account holders
4. **Data Management System (DMS):** A database that records information about emission reductions (e.g., the type of carbon unit, relevant methodologies, the policies, and programs) and, more generally, any information that is not stored in the transaction registry or register, but that for transparency purposes should be recorded and archived

Functions of Registry: A registry shall/can perform following functions²:

- **Issuance:** The creation of a carbon unit by a Registry Administrator and its allocation to an account holder
- **External transfer:** The transfer of a carbon unit from an account in one registry to an account in another registry
- **Internal transfer:** The transfer of a carbon unit from one account to another one within a registry
- **Retirement:** The disposal of a carbon unit for compliance with an emissions

¹ Emission Trading Registries: Guidance on Regulation, Development, and Administration by World Bank Group; 2016

² Emission Trading Registries: Guidance on Regulation, Development, and Administration by World Bank Group; 2016

target; in some contexts, retirement is referred to as “surrender”

- **Cancellation:** The disposal of a carbon unit where the unit is not used for compliance with an emissions target, and cannot be used by others for compliance either
- **Conversion:** The transformation of one carbon unit type to another
- **Banking:** The carrying over of unused carbon units from one compliance period to the next
- **Borrowing:** The use of carbon units from future compliance periods to meet obligations in the current compliance period

Key Participants/Players in Registry³:

- **Regulator:** A public authority appointed by law to oversee and enforce the market mechanism

- **Registry administrator:** A body responsible for the day-to-day operations of the registry; this can be a public or private body
- **Regulated entity:** A body that is legally subject to an emissions limit or other obligation; this could be a country under international law or a company under domestic law
- **Project developer:** An organization that voluntarily engages in a project to reduce emissions to sell carbon units
- **Validation and Verification Bodies (VVBs):** Responsible for ensuring, among others, that the emission reductions reported by project developers are real and additional
- **Broker:** Engages in carbon unit transactions on behalf of a client
- **Intermediary:** Purchases a carbon unit on its own behalf for a purpose other than compliance (e.g., resale)

³ Emission Trading Registries: Guidance on Regulation, Development, and Administration by World Bank Group; 2016

