Enabling Operationalization of Domestic Forest Carbon Mechanism for Mongolia

November 2025

A study conducted as part of the country support of the United Nations Framework Convention on Climate Change (UNFCCC) Regional Collaboration Centre for Asia and the Pacific (RCC AP) to the Government of Mongolia under the Collaborative Instruments for Ambitious Climate Action (CiACA) initiative

Executive summary

Mongolia faces an urgent need to accelerate climate action while strengthening its forest sector, which plays a critical role in carbon sequestration, ecosystem protection, and climate resilience. Achieving the country's long-term climate and development objectives is estimated to require investments exceeding USD 10 billion over the next 25 years. In this context, the development of a Domestic Forest Carbon Mechanism (DFCM) is being explored as a strategic option to mobilize climate finance, scale up forest restoration efforts, and prepare Mongolia for participation in emerging international carbon market frameworks.

The DFCM is a proposed nationally regulated, sector-specific forest carbon crediting framework designed to align with Mongolia's climate policies, Nationally Determined Contributions (NDCs), and forest restoration objectives under the Billion Tree Initiative (BTI). If operationalized, the DFCM would aim to provide a transparent, credible, and market-oriented domestic mechanism to support afforestation and reforestation (AR) activities, while also enabling Mongolia to engage, where appropriate, with international carbon market opportunities, including cooperative approaches under Articles 6.2 and 6.4 of the Paris Agreement.

The proposed DFCM envisions a hybrid governance model that balances strong public-sector oversight with private-sector participation. At the national level, the Ministry of Environment and Climate Change (MECC) would provide strategic direction, policy coherence, and regulatory alignment with Mongolia's NDCs. At the sectoral level, the Forest Agency (FA) would be responsible for overseeing implementation, ensuring compliance with forest and carbon standards, and supervising credit issuance processes. A multi-stakeholder Technical Committee comprising relevant government entities, private-sector actors, community representatives, and technical experts would support methodological development, safeguard environmental integrity, and facilitate continuous improvement of the system.

The proposed DFCM framework places strong emphasis on a robust MRV system to ensure transparency, data accuracy, and environmental credibility. This would include standardized monitoring protocols, quality assurance and quality control procedures, independent verification, and public access to key information through a centralized registry. The integration of GIS-based screening criteria covering land-use history, ecosystem suitability, protected area boundaries, and agricultural land constraints would further enhance environmental safeguards and technical rigor.

In addition, the DFCM concept includes a structured approach to carbon credit certification and trading, integrated within Mongolia's broader national climate governance framework. Credits generated under the DFCM could potentially be used for domestic purposes or, subject to national authorization and international requirements, transferred through bilateral arrangements. This would allow Mongolia, if it so decides, to generate emission reductions and, where applicable, Internationally Transferred Mitigation Outcomes (ITMOs) in a manner consistent with national priorities and Paris Agreement rules.

Financing for the DFCM, if established, would be mobilized through a diversified mix of Corporate Social Responsibility (CSR) contributions, long-term carbon credit purchase agreements, blended finance instruments, public–private partnerships, and support from international climate finance institutions. Banks and financial institutions would play an important role in capital provision and risk sharing. Clear benefit-sharing arrangements are

envisaged to ensure that revenues flow to local communities and stakeholders, thereby promoting social equity and sustained engagement in forest restoration activities.

Overall, the proposed DFCM represents a structured and forward-looking framework for Mongolia to scale up afforestation and reforestation, strengthen forest governance, and unlock climate finance. By linking domestic forest initiatives with emerging international carbon market architectures and Article 6 opportunities while maintaining national control and environmental integrity, the DFCM offers a coherent pathway for Mongolia to advance its climate commitments and generate long-term economic, environmental, and social benefits.

Foreword

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Around the world, countries are strengthening the institutional and regulatory foundations needed to participate effectively in international carbon markets. Under Article 6 of the Paris Agreement, the ability to generate, authorize, transfer, and account for internationally transferred mitigation outcomes (ITMOs) requires a high degree of national preparedness. This has led many Parties to develop comprehensive domestic frameworks that govern how mitigation activities are approved, monitored, verified, and integrated into national climate strategies. These frameworks serve as the backbone of credible participation in global cooperative approaches. They ensure environmental integrity, promote transparency, safeguard national interests, and establish clear roles for government, private sector actors, and implementing entities.

Mongolia is similarly advancing its institutional readiness to engage with international carbon markets and mobilize climate finance through high-quality mitigation activities. With increasing interest from project developers, development partners, and potential buyers, Mongolia recognizes the need for a coherent national system that governs Article 6 transactions, ensures robust MRV, prevents double counting, and aligns market participation with Mongolia's NDC and long-term climate priorities. The development of a Domestic Framework for Carbon Markets (DFCM) presents an opportunity to formalize Mongolia's processes, clarify institutional responsibilities, create a pipeline of eligible mitigation activities, and signal readiness to international partners.

This report provides an initial assessment of Mongolia's institutional landscape and identifies key building blocks required for a functional DFCM. It examines Mongolia's current policies, MRV systems, NDC architecture, existing mitigation initiatives, and ongoing readiness efforts. It highlights opportunities to strengthen governance, authorization procedures, registry development, stakeholder engagement, and safeguards. The report is intended as a foundational step toward designing a comprehensive DFCM that positions Mongolia for effective participation in Article 6 cooperative approaches and enhances its access to results-based climate finance.

Preface

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The preparation of this report represents an important step forward in our collaboration with the Government of Mongolia under the CiACA initiative. Responding to Mongolia's request for structured technical support, this assessment was undertaken to help the country strengthen the institutional foundations needed to engage in Article 6 cooperative approaches and emerging carbon market opportunities.

The CiACA support to Mongolia has been intentionally designed to address near-term readiness gaps while contributing to a longer-term vision for a coherent Domestic Framework for Carbon Markets (DFCM). This report brings together policy review, institutional mapping, and stakeholder insights to identify the systems and procedures required to guide authorization decisions, ensure environmental integrity, and safeguard Mongolia's national interests in carbon market participation. It examines the essential building blocks of a DFCM including governance arrangements, MRV processes, authorization pathways, registry needs, and benefit-sharing considerations while remaining grounded in Mongolia's national climate priorities and implementation capabilities.

The development of this assessment has been informed by continuous engagement with government counterparts, whose guidance helped ensure that the work reflects Mongolia's evolving priorities, including those emerging from the implementation of its updated NDC and long-term climate priorities. This collaborative, country-driven approach remains central to CiACA's support model and is critical to establishing durable systems capable of adapting to shifting international and domestic contexts.

As Mongolia advances toward the next phase of its Article 6 readiness journey, we remain committed to supporting the development of its DFCM through further technical advisory services, institutional strengthening, and piloting of cooperative approaches. We extend our gratitude to the Government of Germany for its continued support, and to all national partners whose contributions made this work possible.

Country Support to Mongolia under the CiACA Initiative

CiACA is a technical assistance initiative launched by the UNFCCC Secretariat to support countries in adopting carbon pricing instruments and developing institutional frameworks for effective engagement in international carbon markets under the Paris Agreement, particularly through Article 6 mechanisms. The initiative is funded by the Government of Germany, specifically through the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN) and implemented by the UNFCCC's Regional Collaboration Centres (RCCs), which work closely with national governments and implementing partners to provide hands-on guidance, stakeholder engagement, and knowledge sharing.

The CiACA initiative aims to enhance the ambition, integrity, and transparency of climate actions by enabling participating countries to develop governance systems, legal frameworks, and operational tools to access cooperative approaches that facilitate the transfer of mitigation outcomes.

CiACA supports countries in aligning carbon market instruments with their Nationally Determined Contributions (NDCs) and broader sustainable development goals. It also plays a pivotal role in strengthening technical capacity, promoting policy coherence, and integrating carbon pricing mechanisms into national climate strategies. By focusing on readiness and institutional development, CiACA helps ensure that carbon market participation contributes to long-term decarbonization pathways.

The present study, undertaken under the CiACA initiative, responds to an official request from the Ministry of Environment and Tourism (MET) of Mongolia (now referred to as Ministry of Environment and Climate Change or MECC) and has been implemented through the RCC Asia-Pacific. The assessment examines the institutional, legal, and procedural requirements for establishing a Domestic Forest Carbon Mechanism (DFCM) that can guide Mongolia's participation in Article 6 cooperative approaches and interactions with voluntary carbon markets. It provides evidence-based recommendations on governance structures, authorization modalities, MRV alignment, registry needs, and safeguards to ensure environmental integrity and national oversight. By outlining practical pathways for integrating the DFCM into Mongolia's existing climate and development planning processes, the study represents a critical step toward operationalizing the country's carbon market architecture in a manner that supports national climate ambition, enhances transparency, and strengthens institutional readiness for future international engagement.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

AFoCO	Asian Forest Cooperation Organization
AHP	Analytic Hierarchy Process
ALAMGaC	General Authority for Land Management, Geodesy, and Cartography
AR	Afforestation and Reforestation
ARR	Afforestation, Reforestation, and Revegetation
ACR	American Carbon Registry
BMUKN	Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety of the Government of Germany
BTI	Billion Tree Initiative (Mongolia)
BTM	Billion Tree Movement (Mongolia)
CA	Cooperative Approach
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CFI	Carbon Farming Initiative
CiACA	Collaborative Instrument for Ambitious Climate Action
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CO_2	Carbon dioxide
COP	Conference of Parties
CS	Conservation Standard
CSR	Corporate Social Responsibility
DFCM	Domestic Forest Carbon Mechanism
DMS	Digital Mapping System
EIA	Environmental Impact Assessment
ETS	Emission Trading System
FA	Forest Agency
FAO	Food and Agriculture Organization
FCMs	Forest carbon markets
FCOR	Mongolian Forest Carbon Offset Regulation
FCPF	Forest Carbon Partnership Facility
FIS	Forest Information System
FPE	Forest Professional Enterprise
FRDC	Forest Research and Development Center
FUG	Forest User Group
GASI	General Agency for Specialized Inspection
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIS	Geographical Information System
GLM	Generalized Linear Model
GS	Gold Standard
Ha	Hectares
IGES	Institute for Global Environmental Strategies
ICVCM	Integrity Council for the Voluntary Carbon Market

IFM	Improved Forest Management
IoT	Internet of Things
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ITMO	Internationally Transferred Mitigation Outcome
JCM	Joint Crediting Mechanism
JI	Joint Implementation
Maxent	Maximum Entropy
MCA	Multi-criteria Assessment
MECC	Ministry of Environment and Climate Change
MET	Ministry of Environment and Tourism
MFCP	Mongolian Forest Carbon Program
MNDWI	Modified Normalized Difference Water Index
MNS	Mongolia National Standard
MNT	Mongolian Tögrög
MoFALI	Ministry of Food, Agriculture and Light Industry
MRV	Measurement, Reporting, and Verification
$MtCO_2e$	Million tonnes of Carbon dioxide equivalent
NDCs	Nationally Determined Contributions
NDVI	Normalized Difference Vegetation Index
NDWI	Normalized Difference Water Index
NFI	National Forest Inventory
NGO	Non-Governmental Organization
OIMP	Other International Mitigation Purpose
OLOLT	OLOLT Climate Change and the Carbon Market Development Center
PA	Project Activity
PACM	Paris Agreement Crediting Mechanism
PPP	Public Private Partnership
QGIS	Quantum Geographic Information System
RCC AP	Regional Collaboration Center for Asia and the Pacific
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RSF	Resource Selection Function
SBTi	Science Based Targets Initiative
SDGs	Sustainable Development Goals
SHP	Shapefile
SPA	Special Protected Area
SVM	Support Vector Machine
TNC	The Nature Conservancy
UNFCCC	United Nations Framework Convention on Climate Change
UN REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation
USD	United States Dollar
VCM	Voluntary Carbon Market
VCS	Verified Carbon Standard
WB	World Bank
WWF	Worldwide Fund for Nature

1. Introduction

1.1. Purpose of study

The Government of Mongolia through the President's Office has requested the United Nations Framework Convention on Climate Change (UNFCCC) Regional Collaboration Center for Asia and the Pacific (RCC-AP) to provide support through the Collaborative Instrument for Ambitious Climate Action (CiACA) initiative to enable the operationalization of a Domestic Forest Carbon Mechanism (DFCM) by strengthening institutional, regulatory and data frameworks. RCC-AP through the Institute for Global Environmental Strategies (IGES) has contracted OLOLT Climate Change and the Carbon Market Development (hereinafter referred as "OLOLT Center") to:

- conduct a comprehensive analysis of the legal, regulatory, institutional, and data aspects relevant to the national forest sector and identify existing gaps in the framework.
- propose a framework for a Domestic Forest Carbon Mechanism (DFCM) including guiding principles, governance, structure, operational strategy and key legal and regulatory recommendations to ensure successful implementation.
- propose a methodology for the establishment of an integrated Digital Mapping System (DMS), which shall help identify the most suitable locations for forest carbon projects.
- provide recommendations on the next steps to operationalize the DFCM.

1.2. Scope of study

The report is structured as follows:

Chapter 1 establishes the context and scope of the study.

Chapter 2 provides an overview of the forest sector including discussion on the status of Mongolia's forests, national legislations relevant to the forest sector and the global commitments ratified by Mongolia.

Chapter 3 overviews the extant regulatory and institutional environment as well as data systems relevant to the forest sector in Mongolia. The Chapter also identifies existing gaps in the regulatory, institutional and data frameworks that may impact operationalization of a DFCM.

Chapter 4 provides discussion on the proposed DFCM for Mongolia. It builds on the gap analysis in chapter 3 to propose guiding principles, governance structure and key regulatory and institutional recommendations to operationalize the DFCM.

Chapter 5 outlines a methodology for the establishment of an integrated DMS, as part of the DFCM, to identify the most suitable locations for forest carbon projects.

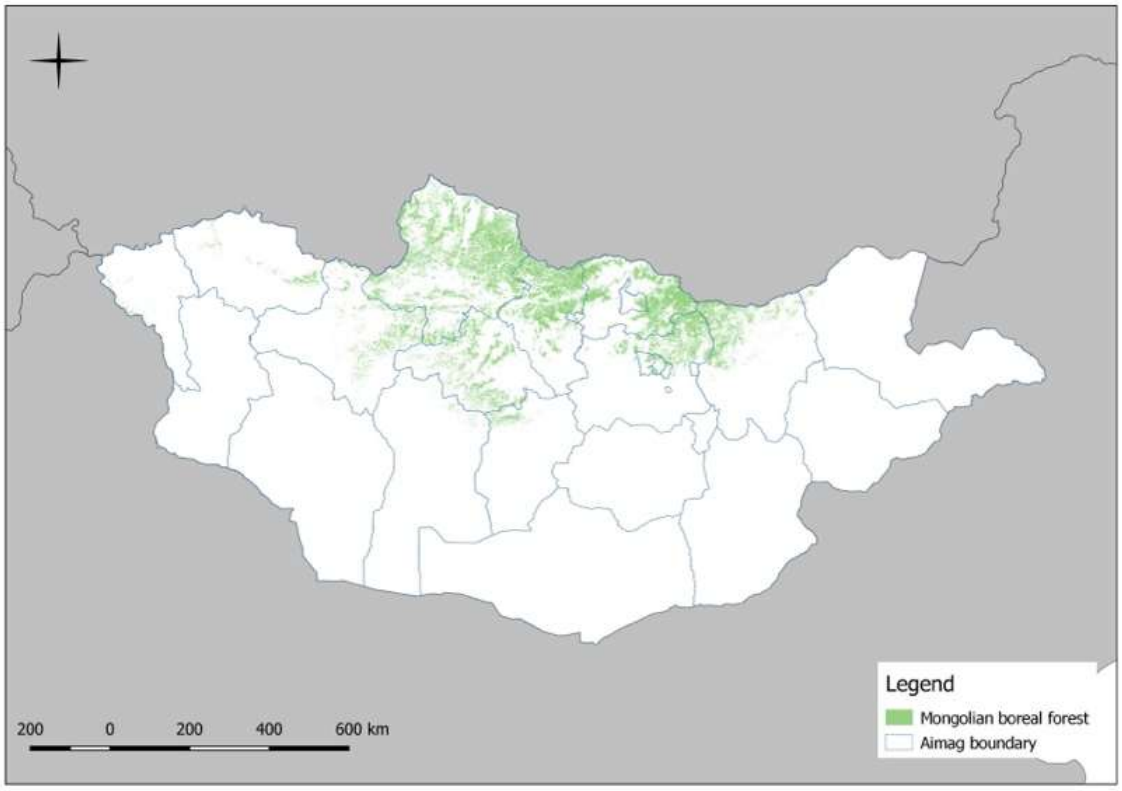
Chapter 6 maps a way forward including a phased roadmap outlining steps needed to operationalize the proposed DFCM.

2. Background

2.1. Overview of Mongolia's Forest

Mongolia's forest resources consist of coniferous and deciduous trees, concentrated primarily in the Altai, Khentii, and Hovsgol mountain ranges in the north, while saxaul forests dominate in the arid Gobi region in the South. As of 2020, the national forest land (also referred as forest fund) cover approximately 18.6 million hectares (ha), representing 8.2% forest cover.[1] Mongolia's forests are home to over 140 species of trees and shrubs. Coniferous and broad-leaved forests account for 84.9% (9.9 million ha) of forested land, whereas saxaul forests represent 15% (1.8 million ha). Total forest biomass is estimated at 1.25 billion cubic meters.

Figure 1: Mongolia's Forest Cover



Source: Bat-Ulzii Chultem, 2024

Historically, Mongolia's forestry sector was heavily extraction-oriented. Between 1924 and 1990, forest policies prioritized timber production, and the sector contributed up to 15% of Gross Domestic Product (GDP). Following Mongolia's transition to a market economy, policy emphasis shifted toward conservation, and by 2023 the sector contributed only 0.3% of GDP, reflecting a major decline in commercial logging.

Despite improved policies, forests remain under pressure from climate change and human activity. Average annual temperatures have increased by 2.24°C over the past 75 years, intensifying desertification and reducing forest productivity. Mongolia loses an estimated

[1]Forest Reference Data and Conditions Study (FRDC) for Mongolia, 2020

140,000 ha of forest annually to degradation and 5,300 ha to deforestation, contributing approximately 3.48 million tonnes of Carbon dioxide equivalent ($MtCO_2e$) in annual emissions from forest loss.[2]

Reforestation efforts began in 1968 and gradually expanded with increased nursery capacity. By 2020, around **218,402 ha** of degraded land affected by fire, logging, and pests had been reforested, primarily with conifer species. However, survival rates have remained moderate due to climatic stresses and ongoing human pressures such as land-use change and illegal logging.[3]

Afforestation efforts have been more limited. Projects such as the *Green Belt* initiative were largely donor-funded, in part because afforestation is costlier than natural regeneration. Lessons from past AR initiatives underscore the need for improved site selection, ecological restoration planning, and climate-resilient species choices.

Despite national efforts, deforestation remains a significant challenge. Former Ministry of Environment and Tourism (MET) data indicate 306,167 ha of deforested land in the northern boreal region requiring urgent restoration following clear-cutting, fires, and pest damage. Afforestation is also critical for combating desertification, which affects 76.9% of Mongolia's territory, by stabilizing soils, enhancing water retention, improving microclimates, and supporting livelihoods.

The forest area classified further into two main categories based on its condition: forested and non-forested land (steppes and grasslands). Within the forested category, areas are further divided into those covered by trees and those that are not.

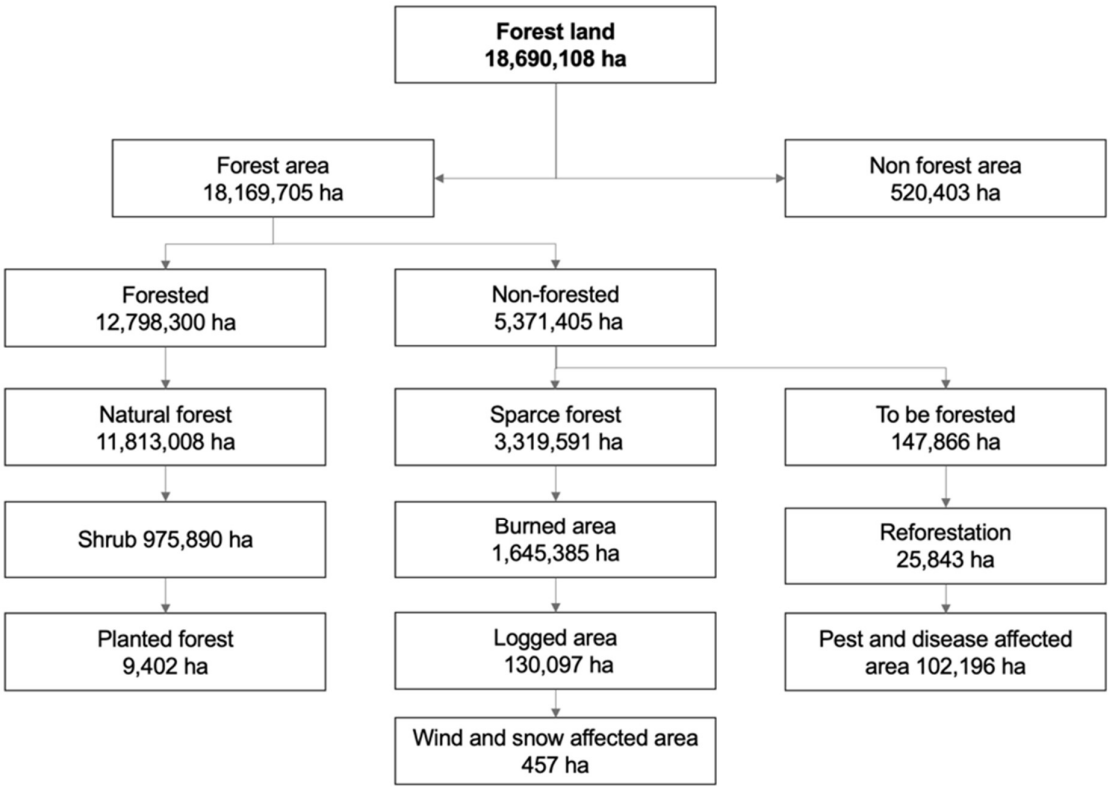
The classification of non-forested areas includes:

- 3,319 thousand ha of scrubland
- 1,645 thousand ha affected by wildfires
- 130 thousand ha where logging has occurred
- 102 thousand ha impacted by pests and diseases

Figure 2 provides a comprehensive overview of the overall structure of the forest land.

[2] UN – REDD Mongolia, 2018c.
[3] Batjargal 2007, Muhlenberg et al, 2006

Figure 2: Structure of the National Forest Land



Source: Forest Database Report 2022, Forest Agency

National forest datasets remain partly inconsistent due to differing definitions, classifications, and methodologies across institutions. This lack of harmonization poses challenges for establishing a credible forest carbon mechanism, particularly regarding MRV requirements.

2.2. Mongolia's International Engagement

Mongolia actively participates in major global climate and environmental agreements, underscoring its commitment to sustainable forest management and climate action.

Paris Agreement (2016). Mongolia ratified the UNFCCC in 1992 and the Paris Agreement in 2016. It is advancing forest-related mitigation through the Reducing Emissions from Deforestation and Forest Degradation (REDD+) program, sustainable land management, and the exploration of carbon market opportunities to meet its Nationally Determined Contributions (NDCs).

Sustainable Development Goals (SDGs). Adopted in 2015, the SDGs support Mongolia's development agenda, particularly Goals 13 (Climate Action), 15 (Life on Land), and 1–12 where land and forest degradation have cascading effects on livelihoods, ecosystems, and water security.

Convention on Biological Diversity (CBD). Mongolia's rich biodiversity makes the CBD especially relevant. Integrating biodiversity safeguards into forest restoration and carbon initiatives ensures that carbon strategies complement conservation and sustainable use.

Bonn Challenge. Mongolia's participation in this initiative to restore 350 million ha globally by 2030 aligns its AR priorities with international restoration efforts, offering potential co-benefits including resilience building and enhanced carbon sequestration.

New York Declaration on Forests (2014). By endorsing this declaration, Mongolia has committed to halving natural forest loss and supporting restoration efforts, positioning itself to leverage global forest-carbon and biodiversity finance.

Glasgow Leaders' Declaration on Forests and Land Use (2021). Mongolia joined 141 countries in pledging to halt and reverse forest loss by 2030, reinforcing its commitment to inclusive and sustainable land governance.

EU–Mongolia Forest Partnership (2021). This partnership supports Mongolia in adopting EU-aligned best practices for sustainable forest management and strengthens its long-term capacity for climate-resilient forestry.

UNFCCC COP28 (2023). Mongolia reaffirmed its commitment to zero forest loss by 2030, aligning its national forest strategy with global climate mitigation priorities.

Overall, Mongolia's international engagements aim to (i) contribute to global climate and biodiversity goals, and (ii) leverage international cooperation and market-based mechanisms to address domestic environmental and socio-economic challenges in the forest sector.

2.3. National Efforts in Forest Sector

To meet its national and international commitments, Mongolia is implementing long-term strategic policies, medium-term programs, and operational plans to enhance forest restoration, conservation, and sustainable forest management.

2.3.1. Policy Measures

Vision 2050. In 2020, the State Great Khural of Mongolia approved the "Vision-2050 Long-Term Development Policy" through Resolution No. 52, setting a strategic roadmap for the nation's sustainable development. One of the primary objectives of this policy is the "Green Development", which prioritizes ecological sustainability and aims to maintain environmental integrity for future generations. The policy outlines targeted initiatives for 2021-2030, including implementing sustainable forest management practices, conducting regular forest ecosystem assessments, and promoting forest agro-parks with designated zones to reduce direct pressure on natural resources. A key focus of these initiatives is to combat forest degradation through AR, natural forest expansion, ecosystem restoration, and strengthened protection measures. As a result, aims to increase national forest cover to 9% of its total land area, simultaneously enhancing the nation's capacity for carbon sequestration.

National Biodiversity Program. This program, approved in 2015, outlines a strategic vision for Mongolia's ecological development, restates the national goal to enhance forest cover in correlation with biodiversity conservation measures. It emphasizes strengthening forest management, implementing conservation initiatives, and safeguarding the nation's biodiversity through sustainable practices and targeted interventions.

National Strategy and Action Plan for Reducing Emissions from Deforestation and Forest Degradation (REDD+). In 2019, Mongolia approved the strategy aimed at reducing Greenhouse Gas (GHG) emissions caused by forest degradation and deforestation; however, this strategy and plan has yet to be implemented. Although no tangible results have emerged,

significant progress has been made in several key areas. This includes establishing baseline calculations for emissions from forests, assessing funding flows for the forestry sector, evaluating its economic value, and exploring the possibility of incorporating sustainable forest management funding into the sector's budget. Furthermore, the operational plan for the National Forest Monitoring System under the UN-REDD framework and a preliminary assessment of the factors contributing to forest degradation and deforestation in Mongolia have been developed. Collectively, these important methodologies, plans, and recommendations provide the foundational information necessary for the forest sector to engage effectively in strengthening the sectors MRV system.

NDC and its Action Plan. Under its commitment to the Paris Agreement within the framework of the UNFCCC, the Government approved its first NDC through Resolution No. 407, issued on 19 November, 2019. The NDC Action Plan was adopted in 2021 by the National Climate Committee. Mongolia has set an unconditional national target to reduce GHG emissions by 22.7% by 2030, compared to a business-as-usual scenario. Within, under the adaptation objectives it highlights measures aimed at enhancing GHG sequestration in land use and forestry. These measures emphasize the implementation of sustainable forest management practices and the strengthening climate-resilient ecosystems.

New Recovery Policy. In 2021, the State Great Khural adopted the "New Recovery Policy" through Resolution No. 106, establishing a strategic framework for national development that prioritizes environmental sustainability. A key aspect of this policy is its fifth objective, “Green Development Recovery,” which encompasses the ambitious “Billion Trees National Movement (BTI). This commitment reflects Mongolia's determination to enhance its forest resources and address pressing environmental challenges.

Action Program of the Government of Mongolia (2024-2028*).* On 27 August, 2024, the State Great Khural approved the "Action Program of the Government of Mongolia for 2024-2028" through Resolution No. 21, which outlines targeted objectives for the forest sector. One of the key goals is to enhance and expand the BTI, aiming to increase forest coverage to 8.8% of the total national land area. The program also emphasizes strengthening forest fire prevention and pest control measures by implementing advanced technologies and smart management systems to mitigate forest loss and degradation. Additionally, it aims to establish an incentive system to recognize and reward citizens and enterprises for their positive contributions to reducing environmental impacts and promoting ecosystem sustainability. Furthermore, in relations to the MRV, the objective is set to strengthen GHG reporting system to enable conditions necessary for carbon mechanism implementation.

2.3.2. Implementation Measures

Billion Trees National Movement (BTI). On 4 October, 2021, the President of Mongolia issued Decree No. 58, initiating the transformative “Billion Trees” national movement. It established a framework aimed at mitigating climate change, enhancing forest and water resources, and maintaining ecological balance by combating desertification.

The objective of the BTI is to plant and maintain one billion trees by 2030, ultimately increasing forest cover to 9.0%. The six priority objectives as follows:

1. *Maintain and Enhance Urban Forests:* Focus on preserving and improving the ecological balance in urban areas while enhancing living conditions for citizens through the development of "*Urban Forests*."

2. *Combat Desertification:* Reduce sources of land degradation and dust storms while curbing the movement of sand.
3. *Develop Agroforestry:* Align with the goals of the "Food Security and Safety" national movement to promote diversified agroforestry practices.
4. *Increase Forest Cover:* Address forest depletion and degradation, aiming to expand areas covered by trees.
5. *Innovate Forest Sector:* Introduce scientific innovations and technologies in the forest sector while strengthen human resource capacity.
6. *Establish Integrated Management Policies:* Establish a comprehensive governance and regulatory framework, along with necessary infrastructure.

To achieve these ambitious goals, the Government defines a series of targeted strategic measures, including:

- *Legal and Financial Commitments:* The initiative mandates a minimum annual allocation of one percent of Mongolia's GDP towards climate and desertification mitigation activities, alongside the inclusion of eco-friendly green space investments in both national and local budgets. This ensures the institutionalization of sustainable environmental practices within Mongolia's fiscal and developmental strategies.
- *Forest Agency and Sector Governance:* Following the notification of the Decree No. 58, a dedicated Forest Agency (FA) has been established to harmonize and oversee national forest policies and operations. Additionally, it encourages public-private partnerships in forestry enterprises to mobilize resources more effectively and enhance engagement and inclusivity.
- *Agroforestry Expansion:* As a strategy to combat desertification and land degradation while simultaneously supporting sustainable livelihoods, the initiative advocates for agroforestry system expansion. This includes developing a supportive legal framework with tax and non-tax incentives to encourage participation from both individuals and businesses.
- *Expansion of Registered Forest Resource:* The initiative aims to incorporate trees planted by individuals and organizations into the national forest inventory by purchasing them, ensuring their official registration in a centralized state database.
- *Market Mechanisms:* The initiative aims to create a market-based financing mechanism in the forest sector, as an attempt to transition from the traditional reliance on public funding to increased market financing. This system will incentivize AR by incorporating trees planted by individuals and organizations, with the integration of carbon market instruments considered a priority option for mobilizing resources to support these efforts.

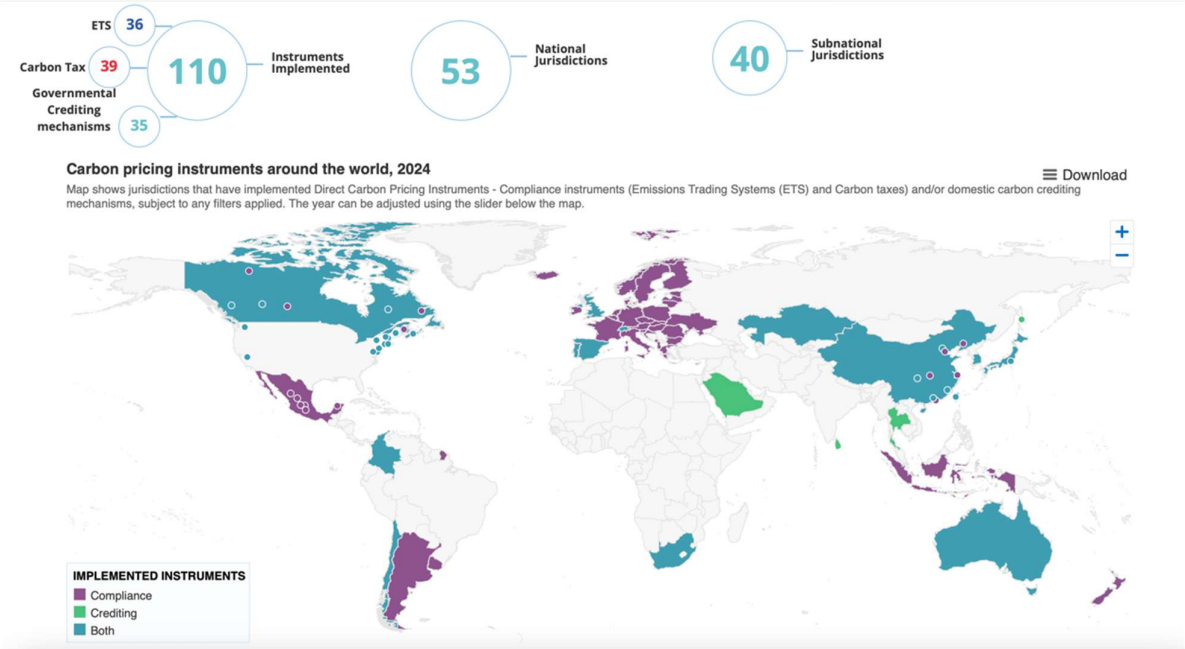
As of 2024, a total of 24 companies have pledged to plant approximately 467 million trees nationwide under the BTI, formalizing their commitments through agreements with the President of Mongolia. (Annex 1 enlists the companies and their pledged tree-planting commitments). Estimations from individuals and organizations suggest that 64 million trees have been planted thus far, though official documentation is currently unavailable. The Government is working to establish a robust online registry system to better track and officially acknowledge these efforts. This registry would also contribute to a database for forest carbon market in future.

Among the six BTI objectives, prioritizing the **expansion of forest cover** is particularly advantageous for carbon mechanisms. This objective tackles the pressing issue of forest loss and degradation while creating significant opportunities for carbon credit generation through enhanced GHG sequestration. With the project's primary focus on the carbon market mechanism within the forest sector, the following sections will delve into this specific goal, expansion of forest cover.

2.4. Carbon Market Instruments

International Trend. By 2023, the total value of the global carbon market spanning compliance and voluntary markets was estimated at around $ 850 billion.[4] Domestic carbon markets and carbon pricing instruments are increasingly important as countries seek tailored, context-specific mechanisms to reduce emissions, enhance local engagement, and support sustainable development. Figure 3 illustrates the carbon pricing instruments at the global level.

Figure 3: Carbon Pricing Instruments Around the World, 2024



Source: World Bank, 2024

The global surge in domestic carbon market frameworks highlights a growing recognition of the need for localized solutions to effectively address GHG emissions while advancing sustainable development. These markets often incorporate more flexible regulations and facilitate direct engagement with local stakeholders. Key advantages of domestic carbon mechanisms include:

- **Alignment with local conditions**: Domestic carbon standards are tailored to address specific local needs and conditions, making them complementary to international schemes.

[4] Market Research Institute, 2023

- **Flexibility to integrate national development priorities**: Regulatory adjustments that align with national policies and development goals, enhancing implementation effectiveness.
- **Stakeholder engagement**: Domestic standards promote community involvement and ownership, leading to better outcomes in carbon market projects.
- **Economic opportunities for green job creation**: These standards can create jobs in green sectors and stimulate local economies, contributing to overall economic growth.
- **Enhanced transparency and accountability**: Domestic carbon markets enhance trust and investment by promoting accountability and transparent processes.
- **Alignment with climate commitments**: As countries aim to meet their NDCs under the Paris Agreement, domestic carbon markets serve as essential tools in achieving these goals.
- **Alignment with national MRV systems**: Domestic carbon standards can be more aligned with national MRV systems, ensuring data availability and maintaining integrity.

As of 2024, the Asia–Pacific region hosts 17 active national and subnational carbon pricing instruments, 3 under development, and 5 under consideration, reflecting rapid regional progress toward market-based climate action.

Figure 4: State of Carbon Markets in Asia Pacific

Country	NDC targets	Compliance mechanisms	Voluntary Crediting schemes	Acceptance of international credits in compliance schemes	Bilateral collaborations
Indonesia[7]	**2030:** Reduce GHG emissions by 31.9% below BAU (unconditional); up to 43.2% below BAU (conditional) **2060:** Climate neutrality.	Phase One (2023 and 2024) of the mandatory ETS in the power sector regulates 99 coal-fired power plants with a capacity of 25 MW or more. A carbon tax is anticipated around 2025.	IDXCarbon was launched in September 2023 to trade credit certificates known as Sertifikat Pengurangan Emisi Gas Rumah Kaca (SPE-GRK).	Through mutual recognition agreed by the Minister of Environment and Forestry.	**Japan:** 35 projects under the JCM. **Norway:** MOU to support GHG. reductions from FOLU **Singapore:** MOU to collaborate on climate change, including carbon markets.
Vietnam[7]	**2030:** Reduce emissions by 43.5% compared to BAU levels. **2050:** Net zero domestic emissions.	A pilot ETS is planned to be implemented between 2025 and 2027 to cover the steel, cement and thermal power sectors.	A domestic pilot carbon crediting mechanism and a carbon trade exchange (CTX) are planned for 2025.	To be determined.	**Japan:** 18 projects under the JCM. **South Korea:** 3 projects contracted under Article 6.2. **Singapore:** Article 6 MOU signed.
Malaysia[7]	**2030:** 45% reduction of economy-wide carbon intensity compared to 2005 levels (unconditional) **2050:** Net zero emissions.	A feasibility study with the World Bank is being conducted to explore the implementation of carbon pricing instruments.	Bursa Carbon Exchange (BCX) was launched in December 2022 to trade VCS-registered carbon credits.	To be determined.	**Singapore:** Framework on Cooperation (FOC) In Green Economy, including carbon industry collaboration.
Singapore[7]	**2030:** reduce emissions to around 60 MtCO2e. **2050:** Net zero emissions.	A carbon tax was introduced in 2019 and raised from SGD5/tCO2e to SGD25/tCO2e in 2024, aiming to reach SGD50-80/tCO2e by 2030.	No domestic scheme. International credits are traded through AirCarbon Exchange (ACX) and Climate Impact X (CIX).	Yes. From 2024 onwards, international credits meeting the eligible criteria can cover up to 5% of taxable emissions.	Bilateral agreements with 18 countries across Latin America, Asia, Africa, and the Pacific.
Thailand[7]	**2030:** 30% reduction (unconditional) and 40% (conditional) compared to BAU. **2065:** Net-zero emissions.	The government is exploring options to develop either an ETS or a carbon tax.	Thailand Voluntary Emission Reduction Scheme (T-VER) was established in 2013 to promote domestic carbon trading.	To be determined.	**Japan:** 24 projects under the JCM. **Switzerland:** The Bangkok E-Bus Program is authorised under Article 6.2.

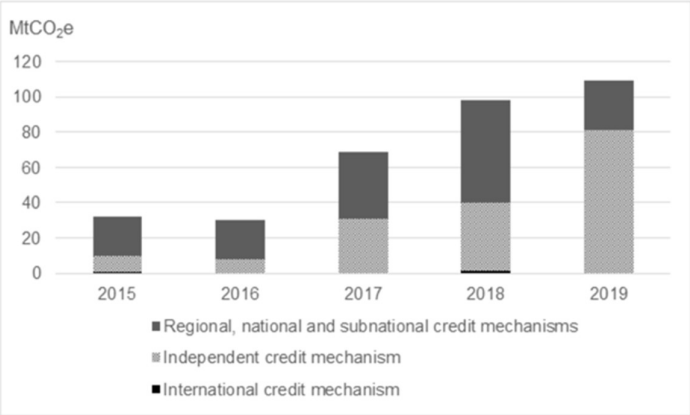
Country	NDC targets	Compliance mechanisms	Voluntary Crediting schemes	Acceptance of international credits in compliance schemes	Bilateral collaborations
China	**2030:** Peak CO2 emissions and reduce carbon intensity by over 65% from 2005 levels. **2050:** Carbon neutrality.	The Chinese national ETS (CETS) has operated since 2021 to regulate the power sector alongside eight pilot ETSs at the regional level.	The Chinese Certified Emissions Reduction Scheme (CCER) was relaunched in January 2024 to supplement the national ETS, covering up to 5% of verified emissions.	Not currently.	Not currently.
India	**2030:** 45% reduction of emissions intensity below 2005 levels. **2070:** Net zero emissions.	A Carbon Credit Trading Scheme (CCTS) is currently being developed and is expected to launch in 2026.	A voluntary baseline-and-credit system is anticipated to be established by 2024, with trading expected to commence in 2025.	To be determined.	Not currently. An updated list of eligible Article 6.2 activities is available.
South Korea	**2030:** 40% reduction below 2018 levels. **2050:** Carbon neutrality.	Launched in 2015, the Korean ETS (KETS) covers large emitters across seven sectors: power, industry, buildings, waste, transport, domestic aviation, and maritime.	The Korean Carbon Offset Scheme is a key part of the KETS in supplying Korean Offset Credits (KOCs) for up to 5% of compliance use in Phase III (2021 - 2025).	Yes. The government plans to use 37.5 Mt of international credits to meet its 2030 NDC target.	Article 6 bilateral agreements with **Gabon**, **Ghana**, **Mongolia**, **Uzbekistan**, **Vietnam**, **Laos**, **Indonesia**, **Kazakhstan**, **Cambodia**, and **Bangladesh**.
Japan	**FY2030:** 46% reduction from FY2013 levels. **2050:** Net zero emissions.	A carbon tax is currently set at JPY289/tCO2 (AUD2.87/ tCO2). A voluntary ETS (GX-ETS) is also being piloted and will transition to a mandatory scheme in 2026.	Implemented in 2013, the J-Credit Scheme issues credits (J-Credits) to support voluntary targets, the new GX-ETS, and Saitama ETS at the prefecture level.	Yes. The government aims to secure 100 Mt of overseas reductions through the Joint Crediting Mechanism (JCM) to meet its 2030 NDC target.	Partner with 29 countries spanning Africa, the Americas, Asia, Europe, and the Pacific under the JCM.
Australia	**2030**: 43% below 2005 levels. **2050**: Net zero emissions.	In 2023, the Safeguard Mechanism was reformed into a declining baseline-and-credit system to cover the industrial sector.	The Australian Carbon Credit Unit Scheme (ACCU) operates alongside the Safeguard Mechanism to supplement compliance and voluntary uses.	To be determined.	Article 6 bilateral agreements with **Fiji** and **Papua New Guinea**.
New Zealand	**2030**: 50% reduction of net emissions below 2005 levels. **2050**: Net zero emissions except biogenic methane.	The New Zealand ETS (NZ ETS), operational since 2008, covers eight sectors, including forestry, maritime, and domestic aviation.	Not currently.	The government intends to use high-integrity international credits to meet its 2030 target.	In discussions with **Singapore** and **the Philippines** to collaborate on carbon markets.

Source: Carbon Market Institute, 2024

GLOBAL FOREST CARBON MARKET

Between 2015 and 2019, compliance forest credits saw a significant increase in both traded volume and global market share, with forestry accounting for 42% of all compliance credits. During this period, approximately 340 $MtCO_2e$ were issued under compliance mechanisms. Growth was largely driven by regional, national, and subnational crediting systems, which increasingly outperformed international mechanisms such as the Clean Development Mechanism (CDM) and Joint Implementation (JI) under the Kyoto Protocol. Figures 5 and 6 illustrate the volume of forest credit transactions across compliance and voluntary markets during this period.

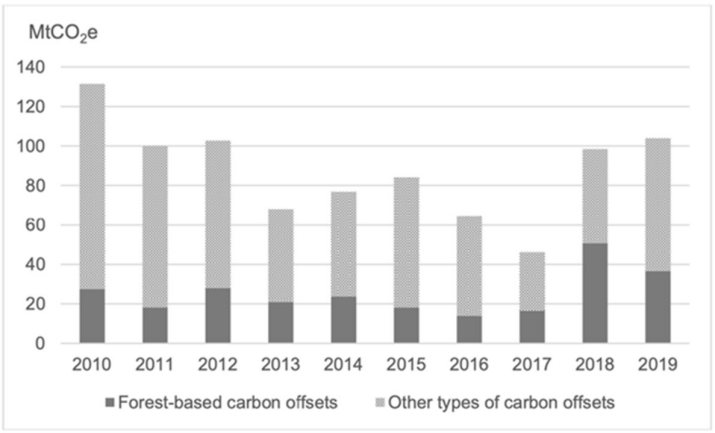
Figure 5: Forest Credit Trading in Compliance Markets



Source: World Bank's carbon pricing dashboard (database)

Independent standards also generate compliance-eligible credits; however, they are predominantly used in the voluntary carbon market, where organizations and individuals purchase offsets. Voluntary market activity expanded significantly between 2015 and 2019, with forest-based credits reaching around 145 $MtCO_2e$. From 2010 to 2019, forestry contributed between 25% and 50% of global voluntary offset volumes.

Figure 6: Total Global Voluntary Carbon Offsets and Forest-Based Carbon Offset Volume



Source: Peters-Stanley et al., 2011; Diaz, Hamilton and Johnson, 2011; Peters-Stanley and Hamilton, 2012; Kossoy and Guigon, 2012; Peters-Stanley and Yin, 2013; Peters-Stanley and Gonzalez, 2014; Goldstein and Gonzalez, 2014; Goldstein and Neyland, 2015; Hamrick, 2015; Hamrick and Goldstein, 2016; Goldstein and Ruef, 2016; Hamrick and Gallant, 2017a; Hamrick and Gallant, 2017b; Donofrio et al., 2019.

Average REDD+ credit prices in voluntary markets increased from USD 3.9/tCO_2e in 2019 to USD 4.7/tCO_2 in 2021.[5] During the same period, REDD+ transactions grew from roughly 30% to 40% of total voluntary market activity. AR and Improved Forest Management (IFM) projects typically command higher prices because of their greater implementation costs and the higher perceived value of carbon removals relative to emission reductions.

Forest Trends projects that voluntary market trading volumes could increase five- to fifteen-fold by 2030, potentially reaching 500 $MtCO_2e$ annually.[6] Rising corporate climate commitments—including initiatives under the SBTi Forest, Land and Agriculture (FLAG) framework—are expected to further boost demand for forest credits. However, current credit prices and transaction volumes remain insufficient to achieve the Paris Agreement's 1.5°C temperature goal. Prices for forest credits would need to reach approximately USD 20–50/tCO_2 by 2030 to align with global climate objectives.[7]

As demand grows, scrutiny over the quality and credibility of forest carbon credits has intensified. Global standards such as the Verified Carbon Standard (VCS) and Gold Standard (GS), along with the Integrity Council for the Voluntary Carbon Market (ICVCM), are strengthening requirements to ensure that credits represent real, measurable, and permanent climate benefits. These developments are improving investor confidence and making forest carbon markets more robust and attractive.

In summary, forest carbon markets are increasingly recognized as a critical component of global climate strategies. Many countries now integrate forest-sector mitigation into their NDCs, highlighting the importance of forests in reducing emissions and enhancing resilience. Beyond carbon sequestration, forest projects also deliver valuable co-benefits such as biodiversity protection, improved water resources, and community livelihood support, making them vital for both climate action and sustainable development.

NATIONAL EFFORTS

Recognizing the pivotal role that forests play in carbon sequestration, biodiversity conservation, combating desertification and community livelihoods, Mongolia is focusing on carbon market initiatives that align with international standards while addressing its unique environmental and economic challenges. The following are the initiatives undertaken within the sector to advance carbon market development efforts.

I. **Bilateral Cooperation and Initiatives in Carbon Market Development**

The Government of Mongolia has actively pursued bilateral agreements to enhance its carbon market development notably with Singapore and South Korea, while successfully implementing the Joint Crediting Mechanism (JCM) with Japan. These partnerships are aimed at facilitating knowledge sharing, technology transfer, and investment in carbon offset projects, thereby aligning with global climate commitments.

With Singapore, the agreement emphasizes establishing a collaborative framework within the carbon market, including the development of trading mechanisms and projects that support emission reduction initiatives. This partnership seeks to leverage

[5] UN REDD Program Report, 2023 [Available at : https://www.un-redd.org/sites/default/files/2023-02/ForestCarbonPricing_Report_16Feb_FINAL.pdf

[6] Forest Trends 2021; Trove Research 2021

[7] Pricing forest carbon UN-REDD+, 2023

Singapore's expertise in carbon finance and market operations to strengthen Mongolia's capabilities in managing its carbon assets effectively.

South Korea’s experience with its ETS provides a valuable template for Mongolia, aiding in the formulation of effective regulatory frameworks and market operations that align with the country’s environmental goals. Collectively, these agreements are part of Mongolia's broader strategy to engage with international partners, strengthening its position in the global carbon market while promoting sustainable practices that contribute to national climate objectives.

II. The Mongolian Forest Carbon Program (MFCP)

The MFCP is an initiative led by OLOLT Climate Change and the Carbon Market Development Center, designed to establish a credible voluntary domestic forest carbon scheme in support of the Billion Trees Initiative (BTI). The program aims to align with international best practices while responding to Mongolia’s specific environmental conditions and development priorities. By facilitating high-integrity carbon credit generation from AR activities, the MFCP seeks to advance national climate objectives, promote sustainable land management, and create meaningful incentives for local communities, private sector actors, and other stakeholders engaged in forest restoration.

The objectives of the MFCP align fully with the goals of the BTI, emphasizing the following key areas:

- *Carbon Offsetting:* The program facilitates projects that allow individuals, businesses, and organizations to offset their carbon emissions through AR efforts.
- *Corporate Social Responsibility (CSR):* It encourages companies to actively engage in volunteer activities, make donations, and support AR initiatives as integral components of their CSR commitments.
- *Emission Reduction Targets:* The program contributes to Mongolia’s long-term emission reduction goals by enhancing the potential for future GHG reductions through sustainable forest projects.

III. Individual Projects

Local governments are collaborating with the private sector to explore avenues for enhancing AR initiatives. Several international companies are investing in projects aimed at forest AR projects to obtain carbon credits from the international voluntary carbon market. The participation of international organizations in these efforts has the potential to facilitate technology transfer and capacity building, contributing to the gradual development of local expertise and project viability.

Despite these positive developments, Mongolia still lacks a cohesive strategy, a clear regulatory framework, strong institutional architecture, and a robust MRV system to ensure the long-term sustainability and effectiveness of its carbon market initiatives. The absence of these essential elements limits Mongolia’s ability to fully leverage bilateral partnerships and domestic programs and constrains progress toward meeting international carbon market requirements.

3. Regulatory and Institutional Framework of Mongolia's Forest Sector

Mongolia's forest sector is anchored in an extensive legal and regulatory framework designed to safeguard forest resources, promote sustainable management, and address mounting pressures from deforestation, land degradation, and climate change. This framework brings together laws, regulations, and strategic action plans that guide forest governance at national and sub-national levels while aligning with international environmental commitments. The discussion in this chapter outlines the core legislative instruments, regulatory provisions, institutional arrangements, and planning frameworks that collectively shape Mongolia's forest sector governance. This chapter also provides a critical gap analysis of the existing regulatory, institutional and data systems.

3.1. Legal and Regulatory Framework

Mongolia's forest sector is governed by a comprehensive legal and regulatory framework that aims to manage and protect its forest resources while promoting sustainable development. These frameworks are crucial for addressing challenges such as deforestation, forest degradation, and the impacts of climate change, as well as ensuring compliance with international environmental agreements.

Key sectoral legislation is presented below:

- **Law on Forest (2012)**: The primary legislation governing forest management in Mongolia is the Law on Forest, enacted in 2012. This law establishes the framework for sustainable forest resource management and conservation, outlining the rights and responsibilities of various stakeholders, including government agencies, local communities, and private entities.
- **Environmental Protection Law (1995)**: This law integrates forest conservation into broader environmental management efforts, setting principles for protecting the environment, including forests, from harmful activities. It mandates that all forest-related projects undergo environmental assessments.
- **Biodiversity Law (2012)**: The Biodiversity Law emphasizes the protection of biological diversity, including forest ecosystems, and provides guidelines for conservation efforts and sustainable use of natural resources.
- **Law on Land (2002):** Although this law is not categorized as forest sector-specific, it is closely related to the sector. The Law on Land provides the overarching legal framework for land management in Mongolia, including provisions for forested areas. It governs land classifications, use rights, land tenure, and the responsibilities of land users.

Regulatory framework: Mongolia's legal framework for forest management is supported by 13 active regulations that collectively ensure comprehensive oversight and promote sustainable forestry practices. These regulations establish protocols for the approval of forest ecology and economic assessments, along with the requirements and procedures for professional forestry organizations. They also set forth guidelines for database registration,

reporting forms, and the maintenance of related data, thereby enhancing transparency and accountability in forestry activities.

The framework further outlines procedures for conducting forestry operations on state special needs land, as well as initiatives for forest cleaning. Additionally, it details protocols for issuing and supervising certificates of origin and the management of logging activities, along with regulations aimed at the protection and sustainable use of non-timber forest products.

Moreover, the regulations encompass the development and approval of technologies, norms, and standards for forest protection, sustainable use, rehabilitation, and regeneration. They include programs of activities for forest user groups and economic entities focused on forest protection, restoration, and hunting services.

Importantly, these regulations provide a structured approach for planning, organizing, and financing AR activities, assessing planted forests, and managing the purchase and privatization of the state forest area. They also incentivize the reporting of violations of forest legislation to facilitate detection and enforcement efforts, while regulating contracts for forest possession. Collectively, these regulations contribute to a legal framework that aligns with national and environmental sustainability objectives. The comprehensive list of the regulations in force is detailed in Annex 3.

Action Plans. Strategic plans in Mongolia's governance framework are systematically categorized into national and sectoral plans to facilitate coherent policy implementation. Since 2021 the government is focused on integrating all policies and action plans across three distinct time frames: short-term, medium-term, and long-term.

- *Short-Term Plans:* Typically covering a duration of 1 to 3 years, are approved at the sub-sectoral and sectoral levels. These plans are designed to address immediate needs and challenges within specific areas of governance, allowing for swift responses to emerging issues.
- *Medium-Term Plans:* Such strategic plans, which span 4 to 10 years, are approved at both the sectoral level and, in some cases, at the government level. For instance, in the forest sector, strategic plans are integrated into broader frameworks such as the Environmental Sector Strategy (10-year duration), the Government Action Program (4 years), NDCs and its Action Plan (both with 5-year duration).
- *Long-Term Strategies:* are primarily established at the national level, focusing on overarching goals that guide the country's development trajectory over an extended period. These strategies are critical for ensuring that Mongolia's sustainable development objectives are met in alignment with both national priorities and international obligations.

This structured approach to action planning aims not only enhances coherence across various levels of governance but also facilitates the effective allocation of resources and monitoring of progress towards Mongolia's environmental and sustainable development goals.

Under the implementation, the forest sector action plans are listed below:

- Environmental Sector Strategy (under progress)
- Action Program of the Government of Mongolia (2024-2028)
- Billion Tree Strategic Action Plan (2021)

The listed action plans are intended to guide the implementation of Mongolia's forest sector policy and regulatory frameworks. While they aim to provide an effective approach to forest management, there are ongoing challenges such as deforestation and climate change that these plans seek to address, although the extent of their effectiveness remains to be seen.

3.2. Institutional framework

The national institutional framework for the forest sector is a multi-faceted system designed to address the complex challenges of forest management and conservation. This framework encompasses a network of governmental bodies, specialized agencies, local authorities, and stakeholder groups, all working collaboratively to ensure the sustainable utilization and protection of the national forest resources.

- **Central Government Body:** At the forefront of Mongolia's forest governance is the Ministry of Environment and Climate Change (MECC), which plays a pivotal role in shaping and approving forest policies and regulatory frameworks. MECC is tasked with formulating and approving national strategies that prioritize forest conservation and sustainable management. It serves as the key authority for coordinating inter-sectoral efforts, fostering environmental stewardship, including forestry, across the nation.
- **Specialized Implementation Agency:** Integral to the MECC's mission is the FA, a specialized entity dedicated to implementing forest management. This agency is responsible for the development and operationalization of forest policies, overseeing resource management, conducting essential research, and implementing programs aimed at sustainable forest use and biodiversity conservation. The FA also manages critical data systems, including the national forest inventory and the MRV system, which provide essential insights into the state of forests and carbon emissions.
- **Local Authorities:** At the sub-national level, aimag (provincial) and soum (district) governments, especially their environmental and forest units, play a significant role in the practical implementation of forest policies. As of today, there are 47 forestry units in total, of which 42 are inter-soum, while the remaining 5 are soum-level forestry units. These local authorities oversee the management of community forest resources, conduct forest assessments, and enforce regulations to ensure sustainable practices. By promoting community engagement, they empower local populations to take an active role in forest stewardship, fostering a sense of responsibility and connection to their natural surroundings.
- **Forest Professional Enterprises (FPEs)** provide specialized services in forest management, conservation, and sustainable resource use. This diverse group includes consulting firms, logging companies, and research institutions that conduct assessments, offer training, and support Forest User Groups (FUGs) etc. There are 362 activities reported in the tree nurseries and afforestation sector, 36 in pest control sector, 20 in forest management sector, 669 in logging, and 31 in the use and protection of forest by-products, totaling 1,118 documented activities from existing materials.[8] FPEs promote sustainable practices through responsible logging and AR initiatives, collaborating with governmental and non-governmental organizations to advance research and best practices in forestry. Their technical expertise enhances

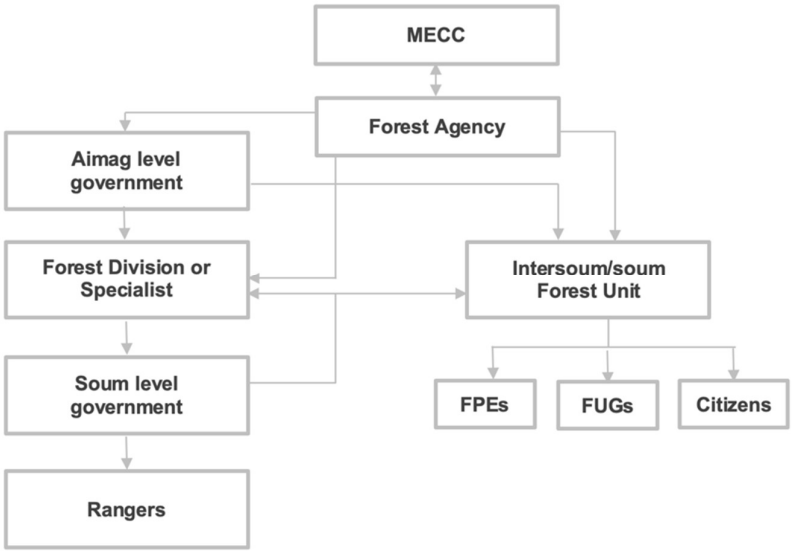
[8] Environmental Status Report 2019-2020

the sector's capacity, fostering sustainable management aligned with national and global environmental objectives.

- **Forest User Groups (FUGs)** are essential to Mongolia's forest sector, promoting community engagement and sustainable resource management. Comprising local residents who depend on forests for their livelihoods, FUGs facilitate participatory decision-making and collective action in forest governance. In 2020, there were 1,342 FUGs managing a total of 4.5 million hectares of forested land on a contract basis. By involving communities in conservation and restoration efforts, FUGs ensure that policies reflect local needs and knowledge. They act as intermediaries between the government and local stakeholders, enhancing transparency and monitoring forest health. Through collaboration with various partners, FUGs build capacity and raise awareness of sustainable practices, addressing challenges like deforestation and climate change.

  The existing institutional framework of the forest sector is illustrated in Figure 7.

Figure 7: Forest Sector Institutional Structure



In summary, while Mongolia's current institutional arrangement for the forest sector is established, it requires further strengthening to effectively support the carbon market mechanism. Enhancing these frameworks will improve governance and collaboration among stakeholders, facilitating efficient and transparent carbon market initiatives.

3.3. Data System for Monitoring, Reporting and Verification

The effective implementation of forest carbon market schemes is fundamentally dependent on the establishment of a comprehensive data system that enables robust MRV processes. Specifically, data concerning land, land use and safeguards, as well as geographical information, are vital for accurately assessing forest carbon stocks, identifying potential areas for AR activities, and understanding land use dynamics. This data system acts as the foundation for ensuring that forest carbon projects are designed, executed, and evaluated based on the established criteria and rigorous standards outlined in global climate agreements, while also being tailored to the national context. By offering detailed geospatial

and environmental data including land cover, land use change, and ecosystem, the system facilitates precise evaluations of project eligibility. Moreover, high-quality and accessible data are essential for verifying the effectiveness and integrity of these projects, thereby ensuring transparency and accountability within the carbon market.

The national forest and land data system framework exhibits a degree of interconnectedness but requires significant enhancement to adequately support comprehensive management and governance. Currently, various organizations compile essential datasets that encompass a wide range of information necessary for informed decision-making in forest management and land use. Table 1 below provides an overview of the available data types, the organizations responsible for collecting them, and the geographical areas each dataset covers:

Table 1: Existing Data, Database and Responsible Stakeholders

Responsible Entity	Data Type	Data Format	Data Content	Coverage
Forest Agency	Polygon	shp	Boreal forest data	Nationwide
Ministry of Environment and Climate Change	Polygon	shp	Boundaries and internal zoning of special protected areas	Nationwide
ALAMGaC	Polygon	shp	Land use data for individuals and enterprises	Nationwide
ALAMGaC	Polygon	shp	Pasture and rotational grazing areas	Nationwide
ALAMGaC	Polygon	shp	Agricultural land/arable land	Nationwide
ALAMGaC	Polygon	Raster	Land cover and vegetation data	Nationwide
Geo-ecology Institute	Polygon	shp	Soil types and classification	Nationwide
Water Agency	Polygon, Line	shp	Rivers and lakes	Nationwide
WWF Mongolia	Polygon	shp	Ecosystems	Nationwide
WWF Mongolia	Polygon	shp	Wildlife corridor areas	Nationwide
WWF Mongolia	Polygon	shp	Distribution of rare and endangered species	Nationwide

The General Authority for Land Management, Geodesy, and Cartography (ALAMGaC) is at the forefront of compiling this data. As part of the Government Resolution No. 110, dated 25 March 2020, which aimed to introduce an Integrated Electronic System for the Management of the Integrated Land Fund, ALAMGaC developed the National Geoportal Information System. This system is designed to facilitate coordination among various state and non-state organizations that create and utilize spatial databases necessary for policy formulation, decision-making, planning, and disaster prevention in environmental, social, and economic domains.

The integrated electronic system adheres to the localized ISO Standard 19100 series (Geographic Information Quality Standards in National Mapping and Cadastral Agencies) and has been translated into the MNS 6925:1-18 standards. These standards encompass a

diverse range of specifications, including spatial data for geodetic control points, topographic maps, land use, and other critical geographic information categories. The complete list of standards includes:

- MNS 6925-1:2021: Spatial Data Specifications for Geodetic Control Points
- MNS 6925-2:2021: Spatial Data Specifications for Topographic Maps
- MNS 6925-3:2021: Spatial Data Specifications for Geographic Names
- MNS 6925-4:2021: Spatial Data Specifications for Land Use
- MNS 6925-5:2021: Spatial Data Specifications for Land Cover
- MNS 6925-6:2021: Spatial Data Specifications for Buildings and Structures
- MNS 6925-7:2021: Spatial Data Specifications for Infrastructure
- MNS 6925-8:2021: Spatial Data Specifications for Transportation Networks
- MNS 6925-9:2021: Spatial Data Specifications for Engineering Geology
- MNS 6925-10:2021: Spatial Data Specifications for Cadastral Parcels
- MNS 6925-11:2021: Spatial Data Specifications for Orthoimagery
- MNS 6925-12:2021: Spatial Data Specifications for Elevation Data
- MNS 6925-13:2021: Spatial Data Specifications for Historical, Cultural, and Archaeological Heritage
- MNS 6925-14:2021: Spatial Data Specifications for Hydrography
- MNS 6925-15:2021: Spatial Data Specifications for Addressing
- MNS 6925-16:2021: Spatial Data Specifications for Administrative Boundaries
- MNS 6925-17:2021: Spatial Data Specifications for Soils
- MNS 6925-18:2021: Spatial Data Specifications for Population and Social Dat

To ensure the effective implementation of these standards, an inter-agency working group comprising central government administrative bodies has been established by government resolution. The National Geoportal currently integrates 18 types of data, which include:

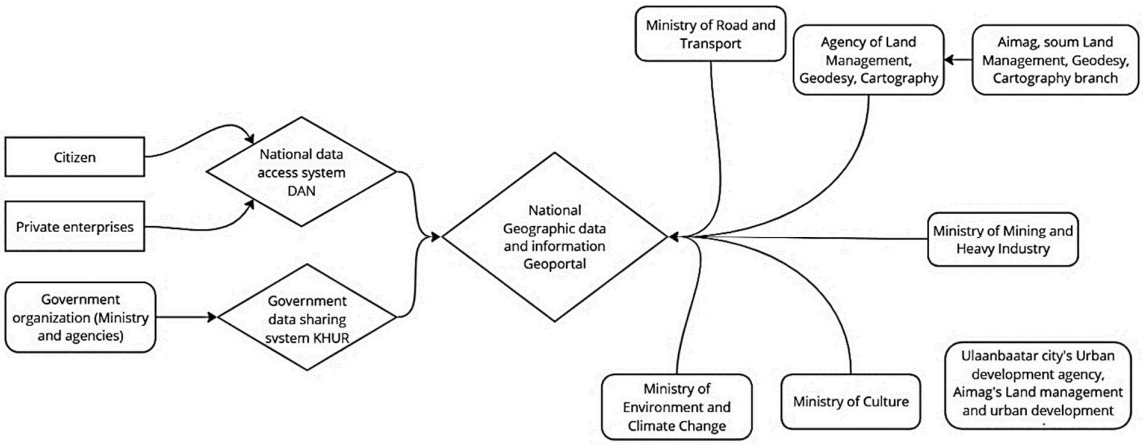
- Geodetic Control Network
- Addressing
- Geographic Names
- Cadastral Parcels
- Hydrography
- Geology
- Topographic Maps
- Buildings and Settlements
- Land Use

- Infrastructure
- Orthoimagery
- Historical and Cultural Heritage
- Administrative Boundaries
- Elevation and Depth
- Land Cover
- Transportation Networks
- Soils
- Population and Social Data

While the majority of this information is publicly accessible, some datasets are classified into three categories—open, closed, and confidential—based on the conditions established by the respective state administrative bodies responsible for the data management.

The overall data system is presented in Figure 8.

Figure 8: Data flow of the Geoportal System



The key stakeholders are summarized below.

Table 2: Key stakeholders in forest sector data systems in Mongolia

Key Stakeholder	Relevant Data
Ministry of Environment and Climate Change (MECC)	Environmental and Ecosystem Impact
Forest Agency (MECC)	Forest Land
Water Agency (MECC)	Peatland, wetland
Special Protected Area Administration (MECC)	Special Protected Area
Ministry of Culture, Sport, Tourism and Youth	Cultural Heritage Site

Ministry of Urban Development, Construction and Housing	No Urban Planning Overlap
Ministry of Labour and Social Protection Ministry of Economics and Development National Statistics Office	Impact on Local Community and its Livelihoods
General Authority for Land Management, Geodesy, and Cartography (ALAMGaC)	Land classification, borders, rights
Ministry of Food, Agriculture and Light Industry (MoFALI) Land Agency (MoFALI)	Agricultural Land
WWF Mongolia	Biodiversity Data

The regulatory and institutional frameworks governing Mongolia's forest sector play a crucial role in the successful implementation of forest carbon market mechanisms. These frameworks provide essential guidelines and protocols for sustainable forest management, ensuring compliance with both national and international environmental standards. However, to effectively meet these requirements, it is imperative to strengthen and enhance both the regulatory and institutional frameworks. This improvement will ensure that Mongolia can navigate the complexities of the carbon market while promoting sustainable practices in its forest sector.

Furthermore, a robust data system that encompasses comprehensive datasets on land use, forest carbon stocks, and ecological conditions is essential for ensuring the eligibility, development, and monitoring of forest carbon projects. Although the current national data system has improved through integration, it still needs greater coherence and enhancements for the effective operationalization of forest carbon mechanism.

3.4. Gap Analysis

The gap analysis of the existing regulatory, institutional and data frameworks, identifies specific areas for improvement. The insights derived from this analysis will inform the development of the DFCM (Chapter 4), the DMS (Chapter 5) and actionable recommendations for implementation (Chapter 6).

Table 3 lists listing the key gaps identified in the legal and regulatory framework discussed above.

Table 3: General Framework Level Legal and Regulatory Gaps

Gap	Explanation
Undefined institutional arrangement and roles and responsibilities	The existing institutional arrangements are inadequate to fully operationalize a carbon market mechanism. Ambiguity surrounding the roles of various stakeholders, including government entities, local communities, and private sector participants, leads to confusion and potential overlaps in responsibilities.

Fragmented regulatory frameworks	There is lack of cohesive legal and regulatory frameworks that integrate AR initiatives with successful implementation of the market mechanism.
Insufficient regulatory oversight	Existing regulatory bodies have challenges of insufficiency in authority, capacity and resources to enforce compliance and ensure market integrity.
Inadequate MRV systems	• *Lack of Standardized Protocols:* Absence of nationally accepted protocols specifically for measuring carbon stocks and emissions, leakages, risks related to AR efforts, leading to inconsistencies in data quality. • *Inadequate Data Collection Methods:* Insufficient methodologies tailored for accurate and comprehensive data collection on AR activities, such as specific remote sensing techniques or ground-based assessments. • *Fragmented Data Management:* There is a lack of centralized data management systems capable of integrating and analyzing data from eligibility criteria and other relevant parameters. • *No Reporting Guidelines:* The lack of clear reporting requirements specific to AR projects can result in discrepancies in carbon data reporting, which complicates efforts to ensure compliance with carbon market standards. • *Insufficient Quality Assurance and Control:* Weaknesses in quality assurance and control mechanisms specific to AR data. • *No Independent Verification System:* The absence of a structured system for qualified third-party verifiers and established verification standards necessitates a complete re-evaluation and definition of the verification process for forest carbon projects and the crediting system. • *No Fraud Prevention Protocols:* There is no anti-fraud measures at the moment.
Absence of a carbon pricing mechanism	• *Lack of Clear Pricing Framework:* Absence of a well-defined framework for pricing carbon credits. • *Inadequate Market Structure:* Limited establishment of a robust market structure that supports effective trading of carbon credits. • *Insufficient Data on Carbon Value:* Lack of reliable data and methodologies for accurately assessing the carbon value of forest carbon reduction projects. • *Limited Awareness and Education:* A lack of awareness and understanding of carbon pricing mechanisms among stakeholders, including government officials, investors and local communities.
Limited stakeholder engagement	• *Limited Community Involvement:* There exist gaps in ensuring diverse community representation and participation in decision-making processes. • *Communication and Awareness:* The need for effective communication strategies to educate local authorities and communities about the benefits and requirements of participation in global carbon market are critical.
Co-benefits and social safeguards	• Specific measures to ensure that AR projects yield both ecological and socio-economic advantages are not adequately defined.

Market transparency and integrity gaps	• *Lack of Disclosure Requirements:* Lack of clear regulations mandating the disclosure of transaction details. • *No Monitoring Mechanisms*: Absence of the guideline for robust monitoring systems to oversee market transactions. • *Absence of public Registry System:* No registry and/or tracking system at present. • *Undefined Standards for Credit Issuance:* Lack of standardized criteria for the issuance of carbon credits.
Capacity building gaps	• *Limited Training Programs:* Insufficient development and availability of training programs focused on best practices for forest management and carbon accounting, resulting in a skills gap among stakeholders. • *Inadequate Stakeholder Engagement:* Lack of mechanisms for involving local communities and stakeholders in the capacity-building process. • *Poor Knowledge Dissemination:* Absence of frameworks for sharing knowledge and best practices across stakeholders. • *Weak Institutional Support:* Limited support from governmental and non-governmental institutions for capacity-building efforts.
Lack of comprehensive risk assessment	• While buffer credits and insurance mechanisms are proposed, a thorough risk assessment identifying specific vulnerabilities and scenarios related to non-permanence and leakage is crucial. Consequently, relevant guideline and regulations are required.

Establishing a robust framework for the DFCM requires addressing legal and regulatory gaps at a fundamental level. By implementing comprehensive measures to enhance market transparency and integrity such as clear disclosure requirements and effective MRV systems stakeholders can build trust and mitigate the risks of fraud and double-counting of carbon credits. A cohesive legal framework that integrates these elements will not only promote effective governance but also attract investment, ensuring the long-term success and credibility of the domestic forest carbon mechanism, which can significantly contribute to national climate goals.

4. Domestic Forest Carbon Mechanism (DFCM) for Mongolia

Building on the assessment of Mongolia's existing regulatory and institutional framework in Chapter 3, this chapter proposes the DFCM. It outlines the guiding principles, governance structure, operational strategy, and legal and regulatory framework necessary for effective implementation. The DFCM aims to strengthen Mongolia's forest sector initiatives, enhance carbon sequestration, and support the country's climate and sustainable development goals.

4.1. Objectives of the DFCM

The DFCM is designed to support Mongolia's forest sector while advancing carbon market development. Its objectives include:

1. **Propose a governance structure and strategic framework for the implementation of the DFCM**
   To develop a coherent and functional governance architecture that clearly defines institutional roles, decision-making processes, and coordination mechanisms. This includes outlining strategic pathways for planning, oversight, and implementation of DFCM activities, ensuring alignment with Mongolia's forest sector priorities, carbon market objectives, and long-term sustainable development goals.
2. **Strengthen the Legal, Policy, and Regulatory Foundations for Forest Carbon Market Activities**
   To align DFCM implementation with Mongolia's existing forest, environmental, land, and biodiversity laws, ensuring full compliance with national regulations and international climate commitments. This includes harmonizing AR-related procedures, standards, and safeguards across ministries, agencies, and local authorities to create an enabling environment for high-integrity carbon credit generation.
3. **Enhance Institutional Coordination and Capacity for Effective DFCM Implementation**
   To reinforce collaboration between key stakeholders including the MECC and the FA, aimag/soum authorities, Forest User Groups (FUGs), and Forest Professional Enterprises (FPEs), enabling streamlined decision-making, efficient project approval, and effective execution of AR activities supported by the DFCM.
4. **Establish a Robust Digital Mapping System to contribute to national MRV for Forest Carbon Activities**
   To develop the methodology for an integrated DMS leveraging national forest inventory data, geospatial systems, enabling accurate carbon accounting, monitoring of AR interventions, and verification of emission reductions in line with international best practices.
5. **Promote Sustainable, Community-Centric Afforestation and Reforestation Interventions**
   To ensure DFCM-supported AR activities contribute to ecological restoration, carbon sequestration, and improved livelihoods by empowering local communities, supporting FUGs, and encouraging adoption of sustainable forest management practices that enhance resilience and biodiversity.

4.2. Scope of the DFCM

The DFCM focuses on afforestation and reforestation to increase carbon sequestration while restoring degraded ecosystems. Key areas include:

- **Afforestation Initiatives:** Promote the establishment of new forests on previously non-forested lands. Site selection should be informed by ecological assessments to optimize biodiversity and carbon capture benefits.
- **Reforestation Projects:** Target degraded or deforested areas for replanting, prioritizing native species to restore ecological balance, improve habitat quality, and enhance carbon storage.
- **Community Engagement:** Involve local communities in planning, planting, and maintaining forests to ensure projects reflect local knowledge and foster ownership of forest resources.
- **Sustainable Management Practices: E**ncourage native species, mixed plantings, and ecological restoration techniques to enhance resilience, carbon sequestration, and adaptability to climate change and pests.
- **Measurement, Reporting and Verification:** Establish a comprehensive framework to track AR project progress and effectiveness. Assess carbon sequestration rates, biodiversity impacts, and community participation to support adaptive management and evidence-based decision-making.

4.3. Guiding Principles for the DFCM

In designing the framework for Mongolia's DFCM, several key principles have been identified to ensure the framework is robust, adaptable, and aligned with both national priorities and global climate commitments:

1. **Robust Governance**: Establishing strong governance structures is essential to ensure effective oversight and implementation of the mechanism. This includes defining clear roles and responsibilities for stakeholders, creating policies that promote ethical practices, and maintaining accountability throughout the process, reflecting best practices observed in successful carbon market frameworks globally.
2. **Market-Based Approach**: The mechanism embraces a market-based approach that leverages economic incentives to drive investment in AR projects. By enabling carbon credit trading, the framework can enhance the financial viability of forest projects, attracting private sector participation and fostering innovation. This approach aligns with international trends that recognize the importance of market dynamics in achieving environmental and climate goals.
3. **Additionality**: The framework focuses on achieving additional carbon sequestration that would not have occurred without the implementation of the mechanism. By complying with recognized additionality principle, the mechanism ensures that the benefits derived from AR efforts are genuine and contribute meaningfully to climate change mitigation.

   Under the additionality principle, the mechanism recognizes the importance of enabling financial and other incentives to encourage stakeholders, particularly local communities and landowners, to engage in AR activities. These incentives are

necessary because, in many cases, landholders may lack the economic motivation to implement forest restoration or planting projects without external support.

By alleviating financial burdens and providing economic benefits, these incentives can make AR projects more attractive. By addressing the economic barriers to participation, the mechanism ensures that stakeholders are motivated to undertake activities they might not otherwise pursue, thereby resulting in increased carbon sequestration.

Additionally, the mechanism shall incorporate non-financial incentives, such as technical assistance, capacity-building programs, and access to resources or technologies that enhance the effectiveness of AR projects. By equipping communities with knowledge and skills, the mechanism helps to create a supportive environment where high-quality forest projects can thrive.

4. **Permanence**: Ensuring the long-term sustainability of carbon storage is crucial. This principle emphasizes that carbon sequestered through AR projects should be maintained over at least 30-100 years. Adopting mechanisms such as long-term monitoring and reforestation guarantees can help mitigate the risks of carbon reversals, in line with the Standard on Requirements for Activities Involving Removals under the Article 6.4 Mechanism.
5. **Inclusivity**: Engaging a diverse range of stakeholders, including local communities, government agencies, NGOs, and private sector partners, is essential. An inclusive approach fosters shared ownership and ensures that the mechanism reflects local needs, incorporating traditional knowledge, which has proven effective in many successful national and international forestry programs.
6. **No-Harm**: The mechanism is designed to avoid negative impacts on local ecosystems and communities. By prioritizing environmental and social safeguards, the mechanism will promote sustainable practices that benefit both the forest and the people who depend on it, aligning with international policies aimed at promoting social equity and environmental justice.
7. **Transparent Management**: Implementing transparent processes is vital for building trust among stakeholders and promoting accountability. Establishing clear reporting mechanisms for carbon credits, financial flows, and project outcomes enhances credibility and facilitates effective governance, following international best practices in effective carbon market transparency.
8. **Independent Validation**: To enhance credibility, the mechanism incorporates independent validation and verification processes. Third-party assessments will ensure that reported data on carbon sequestration and project outcomes are accurate, reliable, and meet established standards, mirroring practices widely adopted in successful carbon trading systems.
9. **No-Double Counting**: It is essential to implement mechanisms that prevent the double counting of carbon credits. By adopting clear definitions and tracking systems, the mechanism ensures that the benefits of carbon sequestration are accurately attributed, thus providing clarity for stakeholders involved in both national and international carbon markets.

By interlinking these principles with international best practices, DFCM is positioned to effectively support ecological conservation, community engagement, and climate change mitigation.

Table 4: Global Best Practices for Domestic Forest Carbon and REDD+ Mechanisms

Country	Mechanism	Best Practices
Brazil	Amazon Fund and REDD+ initiatives	Result-based financing tied to verified outcomes. Community involvement and equitable benefit-sharing. Satellite-based MRV.
Colombia	Carbon tax with voluntary offsets	Hybrid markets incorporating tax incentives by allowing offset credits for taxable emissions Localized protocols for project certification. Capacity building.
Kenya	Community-centric carbon projects (e.g., Kasigau Corridor REDD+)	Focus on co-benefits such as job creation and infrastructure. Blockchain for transparency. Public-private partnerships.
New Zealand	Emissions Trading Scheme (ETS)	Forest carbon credits trade within the ETS. Long-term contracts for permanence. Flexible land-use incentives.
Australia	Carbon Farming Initiative (CFI) under Emissions Reduction Fund	Customized methodologies for ecosystems. Baseline assessments to ensure integrity. Support for smallholders.
Indonesia	Jurisdictional REDD+	Align regional and national policies. Performance-based payments. Landscape-level approach integrating forestry and agriculture.

4.4. Strategic Operational Framework for DFCM

As Mongolia continues to build its capacity for climate investments, it recognizes the need for over $10 billion in funding over the next 25 years to achieve its climate and development goals.[9] Establishing a domestic carbon market presents a viable solution to achieve climate targets in a cost-effective way and raise climate finance for climate action through carbon credits while attracting international investments. Therefore, the implementation of a DFCM could be transformative for Mongolia in meeting its climate objectives.

[9] World Bank Group Report Spotlights Critical Climate Challenges and Pathways to Strengthen Mongolia's Economic Resilience

Effectively achieving national climate goals and engaging in international carbon markets requires a coherent strategy that integrates domestic initiatives with global frameworks. Aligning sectoral and national mechanisms ensures that local actions contribute meaningfully to global climate objectives while advancing Mongolia's Nationally Determined Contribution (NDC). This involves balancing participation in international carbon trading under Article 6 with domestic mitigation actions to maintain environmental integrity and deliver real climate benefits.

Integrating sectoral carbon mechanisms with national frameworks is essential for developing a comprehensive climate strategy. Each sector presents unique challenges and opportunities for emission reduction. Therefore, it is crucial to develop structures and mechanisms at the sectoral level that address these specific needs effectively while aligning with the national frameworks to ensure coherence. This alignment not only enhances the effectiveness of individual sectoral initiatives but also promotes a unified approach to national climate strategies, ensuring that all efforts contribute meaningfully to the country's commitments and objectives.

Due to its structure, the BTI operates as a government-backed, public-private, and voluntary effort, fostering collaboration across diverse stakeholders, a model referred to as a hybrid. By implementing a similar hybrid market model grounded in market-based principles for the proposed domestic forest carbon mechanism, Mongolia can prioritize public-private partnerships, offering a transparent alternative to traditional, government-controlled schemes. This approach aims to integrate compliance policies with a voluntary mechanism, balancing government oversight and market-driven dynamics to ensure environmental integrity, economic viability, and active private sector engagement.

Interlinkages with Article 6

Article 6 of the Paris Agreement promotes international cooperation through mechanisms such as carbon trading and bilateral agreements, helping countries meet their NDC targets more effectively while facilitating the mobilization of climate finance for decarbonization. In addition to its national efforts, Mongolia should align its AR initiatives with the Article 6.2 and 6.4 mechanisms by adopting the standards, PACM methodologies and reporting requirements under the Article 6 framework by the UNFCCC. This alignment will enable Mongolia to access global carbon markets, attract international funding, and facilitate technology transfer. Such coordination will not only strengthen Mongolia's national carbon framework but also ensure that AR projects contribute to global climate goals, delivering measurable, verifiable, and sustainable outcomes.

At the national level, the MECC, in collaboration with both national and international stakeholders, is working on developing a comprehensive national carbon framework. This framework will serve as the overarching mechanism to guide Mongolia's carbon market and climate action efforts. Within this broader framework, sector-specific carbon frameworks, including one for the forest sector, will be established to address the unique challenges and opportunities in each area. While these two processes—developing the overarching carbon framework and the sectoral DFCM frameworks—are progressing simultaneously, aligning them is crucial to ensure coherence, effectiveness, and a unified approach toward achieving national and global climate goals.

Operational strategy of the DFCM

The proposed operational structure for Mongolia's DFCM, details the integration of national, sectoral and international efforts to establish a robust forest carbon market. At its core, the framework emphasizes alignment with the UNFCCC guidance and ICVCM principles and recognized ARR methodologies, ensuring environmental integrity and credibility of the carbon credits generated.

At the international level, Mongolia interacts with buyer countries/entities under the framework of the Paris Agreement's Article 6. Buyer countries finance projects in Mongolia and these Cooperative Approaches (CAs) lead to generation of Internationally Traded Mitigation Outcomes (ITMOs) upon authorization by the Government. The ITMOs may be used to meet buyer countries' NDC targets or Other International Mitigation Purposes (OIMPs). Corresponding Adjustments are applied to authorized ITMOs, which guarantees that double counting does not occur.

Private sector engagement is facilitated through three primary models: public private partnerships (PPPs), blended finance models and consortium arrangements. PPPs foster collaboration for MRV infrastructure, including satellite monitoring, drones and LIDAR systems. Blended finance models combine concessional funding with private capital to de-risk projects, while consortium models pool resources from government agencies, private firms and NGOs to support larger-scale forest carbon initiatives. Key activities include deploying advanced monitoring tools, financing and managing forest sequestration projects, developing trading platforms and conducting MRV research to enhance system efficiency.

At the national level, the MECC (previously known as the MET) shall oversee the DFCM with the FA and the Forest Sector Experts' Council, providing sector-specific oversight. The MFCP engages local authorities, communities and corporate actors to implement AR projects. Project developers and implementers act as sellers, generating carbon credits, which are recorded in the national registry. The market operator manages issuance and trade, ensuring transparency, while third party validation and verification guarantee the integrity of reported outcomes.

Risk management is integral to the mechanism. Banks provide guarantees through instruments such as catastrophic loss insurance (protection against natural disasters), performance insurance (underperformance against sequestration targets) and market volatility buffer pool (stabilizing supply-demand fluctuations).

Ultimately, this operational structure fosters integrated forest carbon market in Mongolia, linking local implementation with international finance, robust governance and stakeholder engagement. It promotes sustainable forest management, community involvement and credible carbon credit generation, positioning Mongolia as a leader in both domestic and international markets.

4.5. Governance and Structure of DFCM

A multi-stakeholder governance model is essential for the DFCM, ensuring inclusivity and transparency. It involves government representatives for regulatory oversight, private sector actors for project implementation and credit trading, civil society and community representatives to protect local rights. The following key elements are proposed for the governance and structure of Mongolia's DFCM.

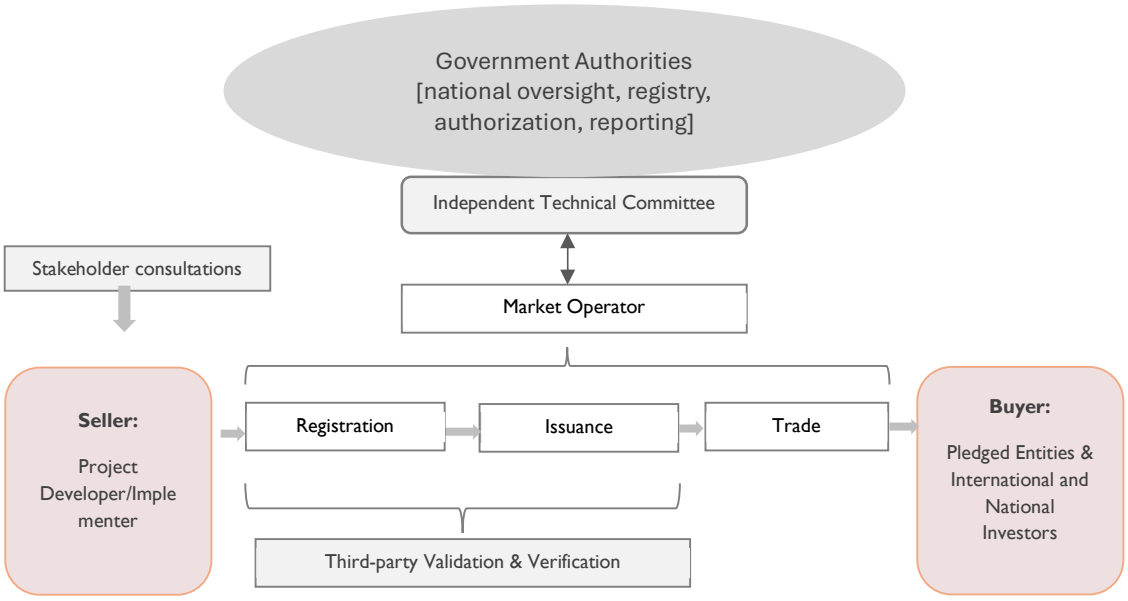
4.5.1. Institutional Framework and Regulatory Oversight

The regulatory oversight of the proposed DFCM will be led by government authorities at both national and sectoral levels. At the national level, the MECC will oversee the DFCM's alignment with national climate policies, including NDCs, and set strategic direction and regulatory standards.

At the sectoral level, the FA will regulate the implementation of the DFCM and forest carbon activities, ensuring compliance with national and sectoral standards. Together, these bodies will ensure the effective and transparent operation of the DFCM.

The suggested structure of the DFCM is illustrated in Figure 10.

Figure 9: Proposed Structure of the Domestic Forest Carbon Mechanism (DFCM)



A **Technical Committee,** comprising government representatives and private sector experts will provide strategic guidance to the DFCM. Its responsibilities include offering expert advice, reviewing project progress, overseeing credit issuance and addressing challenges. It will ensure the system stays aligned with scientific advancements, best practices, and international standards, refining methodologies and verification processes as needed to maintain adaptability and long-term effectiveness.

The **Market Operator**, a non-governmental entity accredited by the FA, will play a central role in implementing the DFCM. Its responsibilities include managing the issuance and registration of carbon credits, facilitating market transactions, and supporting accreditation of carbon offset projects. The Market Operator will also oversee monitoring and reporting, ensuring projects

meet performance standards, and coordinate third-party verification and audits. Additionally, it will engage with stakeholders, provide capacity-building support to project developers, and ensure compliance with DFCM regulations. Through these functions, the Market Operator will ensure the DFCM operates transparently, efficiently, and credibly, supporting Mongolia's climate goals and participation in global carbon markets.

The roles and responsibilities of key stakeholders are further defined in Table 5.

Table 5: Key DFCM Stakeholders and their roles and responsibilities

Entity	Detailed Role
	Enabling legal and regulatory environment
Ministry of Environment and Climate Change (MECC)	• Acts as the central governing body responsible for overseeing the National Carbon Scheme, which sets the policy and regulatory framework for forest carbon initiatives while maintaining minimal direct involvement in market operations. • Ensures alignment with international agreements, including the Paris Agreement and relevant UNFCCC guidelines. • Monitors the progress and impact of national and private sector-driven forest carbon activities. • Facilitates inter-ministerial coordination and engagement with international climate bodies.
	Accrediting, Monitoring, Evaluating and Approving
Forest Agency	• Develops sectoral policies, legal and regulatory frameworks and adopts these within its mandate. • Implements the policies and frameworks established by the MECC, ensuring they are operationalized effectively at the sectoral and local levels. • Manages sectoral MRV systems to track carbon sequestration, deforestation rates, and project outcomes. • Provides strategic direction to sectoral programs like the Mongolian Forest Carbon Program (MFCP). • Liaises with local authorities, project developers, and other stakeholders to ensure smooth on-ground execution. • Ensures that projects are consistent with national and sectoral climate goals and carbon market requirements.
Forest Sector Experts' Council (yet to be established)	• Provides technical and scientific guidance on forest carbon initiatives, including MRV methodologies, carbon accounting protocols, and sustainable forestry practices. • Advises on the development of cost-effective and advanced monitoring tools, such as satellite imaging, drones, and Internet-of-Things (IoT) sensors. • Acts as a consultative body for stakeholders to incorporate technical recommendations into policy, standards, protocols and practice. • Engages with indigenous communities and local experts to ensure culturally sensitive and inclusive project implementation. • Advises on adaptive management practices by evaluating the effectiveness of ongoing projects and recommending improvements.
	Operating and Implementing

Entity	Detailed Role
Technical Committee (to be established)	• Advising on carbon accounting methodologies. • Setting technical standards. • Ensuring scientific integrity. • Evaluating forest carbon projects. • Approving carbon credit registration, issuance, cancellation. • Monitoring market performance. • Providing policy recommendations. • Facilitating capacity building. • Engaging with stakeholders. • Advising on legal and regulatory frameworks. • Ensuring transparency through regular reporting.
Market Operator (to be appointed)	• Functions as the central authority for the issuance, tracking, and trading of carbon credits in domestic forest carbon market. • Maintains transparency and trust in carbon markets by ensuring adherence to national and international standards. • Facilitates communication and coordination between project developers, third-party verifiers, and credit buyers. • Develops standards and methodologies in collaboration with multiple stakeholders. • Develops platforms or systems for seamless trading of carbon credits, ensuring market efficiency. • Provides updates to stakeholders on market trends, credit prices, and trading activities. • Manages Buffer Credit Funds. • Plays a role in capacity building by disseminating technical knowledge and operational guidelines to local partners.
Third-Party Validation and Verification Bodies	• Conduct independent audits of carbon projects to ensure compliance with national standards and guidelines. • Validate project design and baseline emissions to confirm the credibility of carbon credits. • Verify actual emissions reductions or removals achieved by projects to maintain market integrity. • Provide validation/verification reports that enhance the trust of buyers and investors in the quality of credits. • Offer advisory support to developers to address gaps and improve project design during the validation process.
	Market Participants
Sellers: Project Proponent	• Develop and implement forest carbon projects. • Act as sellers of carbon credits generated through verified projects, creating new revenue streams for local stakeholders. • Collaborate with national and international stakeholders to integrate local knowledge and expertise into project design and execution. • Support community-level engagement to ensure equitable benefits and participation in carbon projects.

Entity	Detailed Role
Buyers: Pledged Entities & Investors	• Purchase carbon credits to meet sustainability goals, offset emissions, or comply with voluntary market demands. • Provide financial resources for long-term partnerships, supporting the development of forest carbon projects. • Drive market growth by creating demand for high-quality, verified carbon credits. • Collaborate with project developers to ensure investments align with international standards and deliver co-benefits like biodiversity conservation and community development. • Advocate for transparent and ethical practices in carbon markets, promoting trust and credibility.
	Supporting, Collaborating and Approving
Local and other Relevant Sectoral Authorities	• Granting permission for forest carbon projects within their jurisdiction. • Reviewing and approving land use plans related to forest carbon activities. • Ensuring that forest carbon projects comply with local environmental and land use regulations. • Issuing permits for land-based carbon sequestration activities. • Coordinating with national authorities to align local projects with national policies. • Verifying that carbon project activities do not conflict with local land rights or other land uses. • Providing necessary local-level documentation and approvals for carbon credit issuance. • Monitoring the ongoing compliance of approved carbon projects within their region.
Local Communities	• Participating in AR, and forest management activities. • Contributing to data collection and monitoring of forest carbon stocks. • Assisting in the identification and implementation of sustainable land-use practices. • Providing local knowledge for the development and adaptation of carbon offset projects. • Supporting awareness campaigns related to carbon markets and environmental protection. • Ensuring the protection of forests and natural resources within their communities. • Engaging in capacity-building initiatives to enhance local participation in carbon trading mechanisms. • Facilitating the involvement of local stakeholders in decision-making processes related to forest management and carbon projects.

4.5.2. Measurement, Reporting and Verification (MRV) System

To ensure the integrity and transparency of carbon credits generated by the DFCM, a robust MRV system is required. Under the leadership of the Market Operator and in collaboration with sectoral stakeholders, project proponents, and third-party verifiers, the MRV system will oversee monitoring of carbon sequestration, accurate reporting, and independent verification of data. It will include quality assurance measures, maintain transparency through public

registries, and ensure continuous improvement of methodologies and data collection techniques. This collaborative approach will ensure the credibility and effectiveness of the DFCM.

4.5.3. Carbon Credit Certification and Trading

A carbon credit registry and trading system will be established at the sectoral level, integrated with national systems, to validate and track issued carbon credits, ensuring transparency and preventing double counting. The issuance process will comply with national standards for recognition, supported by an accredited and independent Market Operator. The Market Operator will ensure adherence to both national and internationally recognized methodologies for forest carbon accounting, guaranteeing that credits meet the key principles and remain verifiable. The trading system operates through standardized bilateral agreements or exchanges, where buyers (corporations, investors, or compliance entities) purchase credits from project developers. Transactions follow strict verification and documentation processes, with credits transferred within the registry before final retirement. This structured approach, aligned with international best practices, ensures credibility, market stability, and investor confidence.

4.5.4. Risk Management System

The Market Operator is responsible for risk management and the Buffer Credit Fund to ensure the stability and integrity of the DFCM. The operator will assess and mitigate risks, including environmental, financial, and operational threats, through regular risk assessments, monitoring, and compliance audits. The Buffer Credit Fund will serve as a safety net, holding a reserve of carbon credits to cover losses due to unforeseen events, such as forest degradation or natural disasters. A percentage of credits from each project may be allocated to the fund, ensuring that the market remains stable and trustworthy, in alignment with the international best practice.

4.5.5. Market Mechanism

The DFCM will operate on a supply-and-demand model, aligning with environmental and economic objectives.

On the **supply side**, project developers, local authorities, and communities lead AR initiatives. These efforts will be supported by capacity-building programs to design high-quality carbon offset activities, ensuring the credibility and marketability of the credits generated.

On the **demand side**, corporate buyers from both domestic and international markets will purchase carbon credits to meet sustainability goals and offset emissions. This demand not only provides a valuable revenue stream for project developers but also encourages businesses to integrate environmental accountability into their operational and strategic priorities.

To facilitate the smooth interaction between supply and demand, the Market Operator will act as the backbone of the system. It will oversee the market mechanism, ensuring transparency, efficiency, and adherence to established standards. This governance role will build trust among stakeholders, attract investment, and maintain a fair and financially sustainable marketplace.

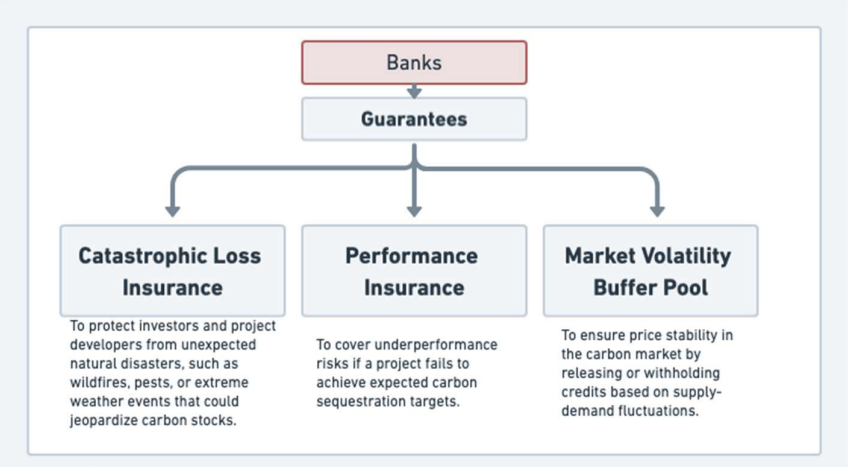
To ensure the long-term sustainability of AR projects, a **benefit-sharing principle** will be prioritized. A portion of the proceeds from carbon credit sales will be distributed among local communities and stakeholders, incentivizing continued participation and fostering enduring engagement.

4.5.6. Financial Resources

The DFCM offers a transformative opportunity to align forest conservation efforts with climate action and sustainable economic growth. However, the success of the mechanism will depend on securing long-term financial resources and strengthening institutional capacity. Building a robust infrastructure, including digital monitoring systems, public carbon registries, and capacity-building programs demands strategic collaboration among government agencies, private sector stakeholders, and international organizations. This section delves into the essential components of funding, support, and resource mobilization needed to establish and maintain a functional, transparent, and scalable DFCM.

- **Corporate Social Responsibility (CSR) Investments:** Growing CSR allocations support AR initiatives and provide companies with climate risk mitigation opportunities while reinforcing environmental commitments.
- **Carbon Credit Investments:** Carbon credit investments are a cornerstone of many corporate decarbonization strategies. Companies, particularly those in high-emission sectors like energy, transportation, and manufacturing, prioritize investing in emissions reduction activities within their operations first. They then neutralize their residual emissions using high-quality carbon credits generated by AR projects to meet both regulatory and voluntary carbon neutrality targets. Long-term purchase agreements for carbon credits provide financial stability for project developers, ensuring the continuity of forest carbon projects and the generation of verifiable emission reductions. This trend has not yet been fully mainstreamed, but it is already evident among leading companies that are pioneering and embracing it.
- **Banks and Financial Institutions:** Banks and financial institutions play a critical role in supporting forest carbon projects by providing capital and risk mitigation tools. Besides having established the Billion Tree Fund to support the BTI, they also can offer specialized financial products such as:
    - ***Catastrophic Loss Insurance:*** Protects AR projects from natural disasters like wildfires, droughts, and floods, ensuring financial stability even during environmental shocks.
    - ***Performance Insurance:*** Guarantees compensation if AR projects fail to meet carbon sequestration targets, addressing risks from adverse climatic or ecological conditions.
    - ***Market Volatility Buffer Pools:*** Stabilize revenue streams for AR developers by managing carbon market fluctuations, releasing or withholding credits based on market dynamics. Proper rule setting is required to ensure effective implementation and market stability. See Figure 11.

Figure 10: Role of Bank in Financial Guarantees for Carbon Market Stability



The existing Billion Tree Fund, managed by a Steering Committee comprising representatives from the Mongolian Bankers Association, the Mongolian non-bank Financial Institutions Association, independent members, and other donors. It currently provides an annual donation cap of MNT 2 billion (approximately half a million USD). By incorporating complementary financial mechanisms, the government can enhance resource allocation and bolster the long-term sustainability of AR initiatives. To attract carbon market investors, Mongolia must demonstrate financial additionality, proving that AR projects rely on carbon finance for viability and scale. This can be achieved through financial gap analysis, showing that existing funds are insufficient, and baseline comparisons, highlighting project feasibility with and without carbon revenue. Stacking and blending mechanisms ensure scalability, while cost-sharing structures confirm private sector engagement depends on carbon returns. Additionally, risk mitigation evidence reinforces the role of carbon finance in reducing investment risks. By applying these strategies, Mongolia can enhance financial additionality, attract investors, and ensure the long-term success of its AR initiatives.

- **Government Funds and Incentives**: The government has approved the allocation of 1% of its GDP toward the implementation of the BTI. While the actual disbursement of these funds has yet to be realized, this decision marks a significant step forward in advancing the country's commitment to its climate and sustainability goals. In addition to direct funding, subsidies and tax incentives further encourage private entities and landowners to engage in AR projects. Financial benefits such as reduced taxes or direct grants alleviate the financial burden on stakeholders, fostering widespread participation. Land and other equipment tax exemptions are under discussion, which could play significant role in attracting carbon investors for long-term.
- **Public-Private Partnerships (PPPs)** have also emerged as an effective model for financing AR projects. Governments contribute seed capital, land access, or other resources, while private entities bring expertise, funding, and management

capabilities. The European Union's LIFE Program exemplifies this approach, funding large-scale afforestation and ecosystem restoration projects to promote carbon sequestration and biodiversity conservation.

- **International Funding Mechanisms:** International organizations and multilateral funds play a crucial role in financing AR projects, particularly in regions with limited local resources. These institutions provide grants, concessional loans, and technical expertise, empowering countries to implement large-scale and sustainable initiatives.
    - ***The Forest Carbon Partnership Facility (FCPF),*** managed by the World Bank (WB), incentivizes countries to prioritize forestry and carbon mitigation through financial rewards tied to verified emission reductions.
    - ***The Green Climate Fund (GCF),*** the world's largest climate fund, allocates substantial resources to large-scale reforestation efforts aligned with global climate adaptation and mitigation goals.
    - ***The Asian Forest Cooperation Organization (AFoCO)*** is a regional intergovernmental body focused on sustainable forest management in Asia. It promotes cooperation among member countries through afforestation, reforestation, and climate resilience projects, aiming to enhance forest ecosystems, combat climate change, and improve the livelihoods of forest-dependent communities.
    - ***The Nature Conservancy (TNC)*** in Mongolia focuses on funding and supporting environmental conservation initiatives, particularly in the areas of biodiversity protection, sustainable land management, and climate resilience. TNC works in collaboration with local communities, government agencies, and international organizations to fund projects aimed at preserving Mongolia's unique ecosystems, such as its vast grasslands, forests, and water resources. Through these efforts, TNC aims to promote sustainable practices that balance environmental conservation with economic development, contributing to both local and global conservation goals.
    - ***The EU-Mongolia Forest Partnership*** signed an MoU to strengthen cooperation in sustainable forest management, biodiversity conservation, and climate change mitigation. The agreement focuses on AR, forest protection, and improving forest governance, with joint efforts to build capacity for local stakeholders and align with both parties' environmental and climate goals.

  These mechanisms not only provide financial backing but also ensure the long-term sustainability of forest ecosystems by helping Mongolia to meet its climate commitments.

- **Blended Finance Mechanisms:** Blended finance mechanisms combine grants, concessional loans, and private investments to scale forest conservation projects effectively. By de-risking private investments, these mechanisms leverage public and philanthropic funding to ensure financial sustainability. For instance, Mongolia could adopt a blended finance model similar to the Amazon Fund, where government, international donors, and private sector partners collaborate to finance large-scale projects. Such an approach would attract domestic and international investments,

reduce financial risks for private investors, and support Mongolia's AR goals while generating long-term environmental and economic benefits.

In conclusion, the proposed governance, structure and process of the DFCM is designed to ensure effective oversight, transparency, and the achievement of the national objectives. By incorporating a multi-stakeholder approach, with active involvement from private sector actors, local communities, and government authorities, the DFCM will foster inclusivity and accountability. The Market Operator will play a central role in overseeing the operationalization of the market mechanism by executing issuance, trading, and management of carbon credits, ensuring that all activities align with national standards and international best practices. The DFCM will be cohesive and integrated with the national carbon framework and its Article 6 mechanism, ensuring alignment with both national and global carbon markets. Through robust risk management and the Buffer Credit Fund, the system will maintain stability and credibility, supporting sustainable forest management and contributing to global climate efforts.

4.6. Legal and Regulatory Framework for the DFCM

The legal and regulatory framework serves as the foundational structure for carbon market activities. It establishes the legitimacy and binding nature of the carbon market, ensuring that the rights, responsibilities, and obligations of stakeholders are clearly defined. Key legal elements required for implementing a carbon market mechanism include:

- **Recognition of Market Participants:** Legal provisions for identifying who can participate in the carbon market, such as businesses, government bodies, and individuals, ensuring inclusivity and broad participation.
- **Carbon Credit Ownership and Transfer:** Clear legal definitions of who owns carbon credits and how they can be transferred between market participants. This includes addressing issues related to carbon credit title and the legal process for trading credits.
- **Regulatory Compliance and Enforcement:** Laws that outline penalties and sanctions for non-compliance, including fraudulent trading or failure to meet carbon reduction targets, which help maintain the integrity of the carbon market.
- **International Agreements and National Policies:** Legal alignment with international agreements, such as the Paris Agreement, and national climate policies that set targets for emissions reductions and carbon sequestration. This ensures that the carbon market contributes to broader environmental goals.
- **Social and Environmental Safeguards:** Legal mechanisms to protect vulnerable communities and ensure that carbon offset projects do not lead to negative environmental or social impacts.

While the legal framework provides the overarching principles, the regulatory framework is crucial for the detailed operation and technical implementation of the carbon market. It provides the rules and standards that ensure the carbon market functions effectively and transparently. The regulatory framework for the DFCM should include:

- **MRV:** Detailed guidelines on how carbon sequestration and emissions reductions are measured, reported, and verified. This includes defining methodologies, protocols, and the roles of accredited third-party verifiers to ensure transparency and accuracy.

- **Carbon Credit Certification:** Regulations for certifying carbon credits to ensure they represent real, additional, and permanent emissions reductions. This includes setting criteria for projects eligible to generate carbon credits and establishing certification bodies.
- **Market Operation and Oversight:** Regulatory standards for the operation of carbon markets, including the establishment of trading platforms, registration systems, and the oversight of market operators to ensure fair and efficient trading practices.
- **Monitoring and Reporting Compliance:** Regulations that ensure carbon market participants adhere to legal and regulatory standards, including regular reporting, audits, and inspections of projects generating carbon credits.

Mongolia currently lacks a dedicated legal and regulatory framework for implementing a domestic carbon market. Efforts are underway to address this gap. Mongolia is working on a Climate Change Law, which will lay the foundation for a national policy on emissions reductions and carbon trading. Additionally, regulation on a carbon registry has been approved in 2024, marking an important step toward a carbon market. However, this registry is not yet part of a broader framework that addresses market operations, trading rules, or legal protections.

Despite these efforts, the forest sector has not been a primary focus. While the Climate Change Law and national carbon framework may eventually include forest-specific mechanisms, they are currently more general in scope and do not prioritize domestic carbon market mechanisms.

To effectively implement the DFCM, it is proposed to develop two new key regulations and amend one existing regulation. These measures will create a robust legal framework for the establishment and operation of a forest carbon market in Mongolia, ensuring clarity and consistency. Furthermore, it is vital to establish operational guidelines for the Forest Sector Expert's Council, third-party validation and verification bodies (VVBs), and market operators to ensure transparency, credibility, and oversight. The proposed regulations are as follows:

- Regulation for the Operation of the Forest Sector Experts' Council - new
- Mongolian Forest Carbon Offset Regulation (FCOR) – new
- Regulation for the Contractual Management of Forested Areas – existing

4.6.1. Regulation For The Operation Of The Forest Sector Expert's Council

The regulation for the operation of the Forest Sector Experts' Council will define the operational framework for the council responsible for overseeing and guiding forest-related activities at the technical level in Mongolia. This regulation aims to ensure that the council operates with transparency, expertise, and in alignment with national forest policies and international best practices. The scope of the regulation will include the following key elements:

1. **Council Structure and Membership**

- Definition of the composition of the council, including the roles and qualifications of members (e.g., forest experts, industry stakeholders, and government representatives).
- Criteria for membership selection, term lengths, and the process for appointing members.

2. **Roles and Responsibilities**
   - Outline of the council's mandate, including advising on forest management practices, carbon offset standards, methodologies, stakeholder guidelines, projects, and sustainable forestry policies.
   - The council's responsibility for providing technical expertise on forest-related matters, including carbon sequestration, market mechanism strategies.
3. **Operational Procedures**
   - Rules for council meetings, frequency of sessions, and decision-making processes.
   - Procedures for the development and review of policies, regulations, and standards related to forest management and carbon offset initiatives.
   - Establishment of working groups or subcommittees for specialized tasks (e.g., standard regulation development, carbon credit verification).
4. **Guidance and Recommendations**
   - Processes for providing recommendations on national forest carbon projects, carbon offset standards, and the overall direction of forest sector activities.
   - Advisory role on the implementation of regulations and methodologies related to forest carbon markets.
5. **Collaboration and Stakeholder Engagement**
   - Mechanisms for collaboration with other government bodies, international organizations, and stakeholders involved in forest management and carbon markets.
   - Public engagement strategies to ensure transparency and incorporate feedback from local communities and forest-dependent populations.
6. **Monitoring and Evaluation**
   - Guidelines for assessing the council's effectiveness in fulfilling its role and making recommendations for improvement.
   - Regular reporting requirements to the government or relevant authorities on the progress of forest management initiatives and carbon offset projects.
7. **Conflict Resolution**
   - Processes for resolving disputes or disagreements within the council or with external stakeholders.
   - Establishment of procedures to ensure accountability and address potential conflicts of interest among council members.

8. **Amendments and Review**
    - Procedures for reviewing and amending the regulation as needed to adapt to changes in forest management practices, carbon market developments, and international climate agreements.

This regulation will be pivotal in ensuring the operational effectiveness of the Forest Sector Experts' Council, providing a clear and structured approach to its responsibilities in forest management and carbon offsetting.

4.6.2. Mongolian Forest Carbon Offset Regulation (FCOR)

The gap analysis of the current legal and regulatory framework in Chapter 3 reveals that the majority of the criteria, along with the availability of relevant data, can be effectively managed through stakeholder engagement and the regulation of roles and responsibilities under the proposed "Mongolian Forest Carbon Offset Regulation (FCOR)." FCOR will be designed to establish a comprehensive framework for the forest carbon offset mechanism in Mongolia. Its primary goal is to ensure the integrity, transparency, and effectiveness of the mechanism. The FCOR will guide the entire lifecycle of forest carbon projects, including MRV, credit issuance, and market participation. Additionally, the regulation of the registry and trading functions can be integrated into this overarching framework, providing a cohesive structure for the market's operation.

The FCOR will cover key areas to provide clear guidelines and procedures across the following aspects:

1. **Eligibility and Project Types:** The FCOR will define the types of forest carbon projects eligible for crediting, mainly focused on AR activities. It will specify criteria for projects involving various forest ecosystems, such as natural forests, degraded lands, and plantations. The standard will also outline the baseline assessments required to establish project eligibility.
2. **Sequestration Methodology:** The standard will include methodologies for calculating carbon sequestration in forest ecosystems, establishing data requirements. It will provide clear protocols for measuring carbon stocks and ensuring that carbon credits generated are verifiable, additional, and permanent. This section will also cover the ongoing monitoring and reporting processes to track carbon sequestration over time.
3. **Project Development and Management:** The FCOR will set guidelines for the development of forest carbon projects, ensuring that projects are designed with long-term sustainability in mind. It will address project documentation, stakeholder engagement, and the creation of management plans to maintain carbon sequestration benefits over the project's life. The standard will also ensure that risks, such as forest degradation and climate impacts, are assessed and managed effectively and the stakeholder engagements are conducted.
4. **Verification and Crediting:** Independent third-party verification will be a key component of the FCOR. This section will outline the procedures for verifying that forest carbon projects meet the required criteria and accurately report carbon sequestration. It will define the qualifications and responsibilities of verification bodies and the process for certifying projects and issuing carbon credits.

5. **Additionality and Permanence:** The FCOR will emphasize the importance of ensuring that carbon offsets are "additional" (i.e., they would not have occurred without the project) and "permanent" (i.e., the carbon sequestration benefits are maintained over time). Clear guidelines will be provided to assess and ensure these principles are upheld throughout the project lifecycle.
6. **Environmental and Social Safeguards:** To ensure that projects contribute positively to both the environment and local communities, the FCOR will include safeguards addressing biodiversity conservation and social impacts. This section will provide guidelines for stakeholder engagement, including the fair distribution of benefits to local communities and ensuring that projects do not cause harm to the surrounding environment.
7. **Carbon Credit Issuance and Market Participation:** The standard will outline the procedures for issuing carbon credits after a project is verified and certified. It will define how credits can be traded or sold in the carbon market, ensuring transparency and traceability of carbon credit transactions. This section will also establish rules for the registration and tracking of credits within a national registry.
8. **Governance and Oversight:** A governance structure will be outlined in the FCOR to oversee the implementation and enforcement of the standard. This may include the creation of a Technical Committee to monitor compliance, resolve disputes, and ensure the overall integrity of the forest carbon mechanism. The governance framework will also provide for periodic audits and reviews to maintain the standard's relevance and effectiveness.
9. **Database establishment:** A centralized, comprehensive system for managing forest carbon project-related data will be established, emphasizing accurate data collection, organization, and accessibility. This system will be seamlessly integrated with the United Land Management System, ensuring efficient coordination. Additionally, it will facilitate the selection of project sites and assess the eligibility of projects, enhancing transparency and supporting the effective implementation of the forest carbon mechanism.
10. **Compliance and Enforcement:** The FCOR will specify mechanisms for ensuring that forest carbon projects comply with the standard's requirements. This will include audit procedures, penalties for non-compliance, and a process for resolving disputes. The enforcement measures will help maintain the credibility of the forest carbon market and ensure that projects meet the necessary environmental and social criteria.

The roles and responsibilities of the stakeholders will be comprehensively defined within each relevant process.

4.6.3. Regulation For The Contractual Management Of Forested Areas

The regulation for the contractual management of forested areas an existing regulation. It may be revised to align with the requirements of the forest carbon mechanism, ensuring that all contractual agreements related to forested lands fully support the objectives of carbon sequestration over long periods. The updated regulation will clarify the scope, roles and responsibilities of stakeholders in forest management contracts, emphasizing sustainability, biodiversity conservation, and the long-term environmental impact of forest activities. By

aligning the regulation with forest carbon mechanism requirements, it will facilitate the smooth integration of forested areas into carbon offset projects and ensure compliance with legal and environmental standards.

By implementing these regulations, Mongolia can establish a functioning and credible DFCM, enabling the country to capitalize on its forest resources while contributing to global climate change mitigation efforts.

5. Digital Mapping System Approach

To implement forest carbon projects focused on AR, several criteria are identified and considered in selecting land. Within the framework of the DFCM, the following 10 criteria have been identified as the foundational requirements for the successful implementation of forest carbon projects in Mongolia. The land requested for approval must be suitable for AR activities and should be registered as forest land in the national forest registry. The land must have long-term project usage agreements with forest cooperatives, and a concession agreement for forest land should be made with the local governor, validated by the FA. The identified criteria are:

1. The land has not been forested in the last 10 years and has not naturally regenerated
2. Not a peatland or wetland area
3. Not located within urban or residential areas
4. Not a site of cultural heritage
5. Not used for agricultural purposes
6. Not within a protected area (except under special circumstances)
7. Does not have negative environmental or ecosystem impacts
8. Does not affect adversely the livelihoods of local communities
9. Aligns with national policies and legal frameworks.
10. The land tenure rights must be secure and long-term

The approach to developing a DMS system began by identifying the GIS data and mapping criteria based on the 10 predefined criteria presented above. Relevant GIS data and methodologies were then selected to ensure comprehensive and accurate analysis. Following this, a Multi-Criteria Analysis (MCA) was conducted to refine and develop the conceptual approach for the DMS.

The criteria, which can be expressed applying GIS analysis are categorized based on their source, data requirements, rotation frequency, and necessary corrections (adjustments and refinements applied to the raw GIS data or criteria to make it accurate for us in DMS). Table 6 provides a detailed breakdown.

Table 6: Criteria Relevant for GIS-based DMS Establishment

Standard	Source	Data Rotation/Approval	Correction
The land has not been forested in the last 10 years and has not naturally regenerated.	Forest Management Inventory Data	Data rotation every 10 years	Utilize deforested, logged, or burned areas for analysis.
Not peatland or wetland area	Wetland Maps	Not defined in Mongolian law	Use wetland data with buffer zones due to the lack of a clear peatland category.

Not located within urban or residential areas	Land Use Cadastral Maps	Real-time updates	Employ buffer zones due to transparency challenges in urban development.
Does not have negative environmental or ecosystem impacts	Ecosystem Maps, Vegetation Cover Maps, Wildlife Connectivity Areas	Based on site-specific ecosystems	Match afforestation and reforestation sites to corresponding ecosystems (e.g., steppe, forest, meadow).
Not in protected areas	Special Protected Area Maps	Boundary approved by Parliament	Use general boundaries, which are firmer than internal zoning boundaries approved by the MECC.
Not used for agricultural purposes	Agricultural Cadastral Maps	Real-time updates	Use well-tracked boundaries maintained by ALAMGAC.

The remaining criteria cannot be directly applied to GIS-based analysis due to the absence of spatial data or geographic context. These criteria often involve non-spatial factors, such as policy guidelines, regulatory requirements, or socio-economic conditions, which are not represented in a geographic format. Consequently, these non-spatial elements must be incorporated into the analysis through alternative methods, such as statistical models, surveys, or expert input, to ensure the GIS-based analysis captures the full range of relevant criteria. These criteria include:

- No Negative Impact on Local Community Livelihoods: This standard is tied to Environmental Impact Assessments (EIA) as defined under Mongolian law. Since it does not involve spatial data, it cannot be analyzed using GIS.
- The land tenure rights must be secure and long-term
- Aligns with national policies and legal frameworks

Both criteria (i.e. secure long-term land tenure and alignment with national policies) are regulated by law and do not require corresponding spatial datasets.

Based on the above considerations, spatial analysis and the development of a conceptual approach should focus exclusively on the six criteria relevant to GIS mapping. This approach will ensure a comprehensive and effective evaluation of potential carbon project sites.

The analysis of the spatial GIS data-associated the criteria is presented in Table 7.

Table 7: Spatial Data by Criteria

Criteria	Data Source	Data Agency	Overlap
The land has not been forested in the last 10 years and has not naturally regenerated.	Forest management inventory map	Forest agency/ALAMGAC	Overlap with deforested area
Not peatland or wetland area	Wetland map	Water agency/ALAMGAC	Do not overlap

Not located within urban or residential areas	Urban land use cadastral map	ALAMGAC	Do not overlap
Does not have negative environmental or ecosystem impacts	Ecosystem map	WWF/ALAMGAC	Overlap with forest ecosystem
	Wildlife connective area map	WWF/ALAMGAC	Do not overlap
	Vegetation cover map	ALAMGAC	Overlap with corresponding vegetation zone
Not in protected areas	SPA map	MECC/ALAMGAC	Do not overlap
Not used for agricultural purposes	Agriculture land map	ALAMGAC	Do not overlap

The data sources, responsible entities, and available datasets are summarized in Table 8.

Table 8: Details of available datasets

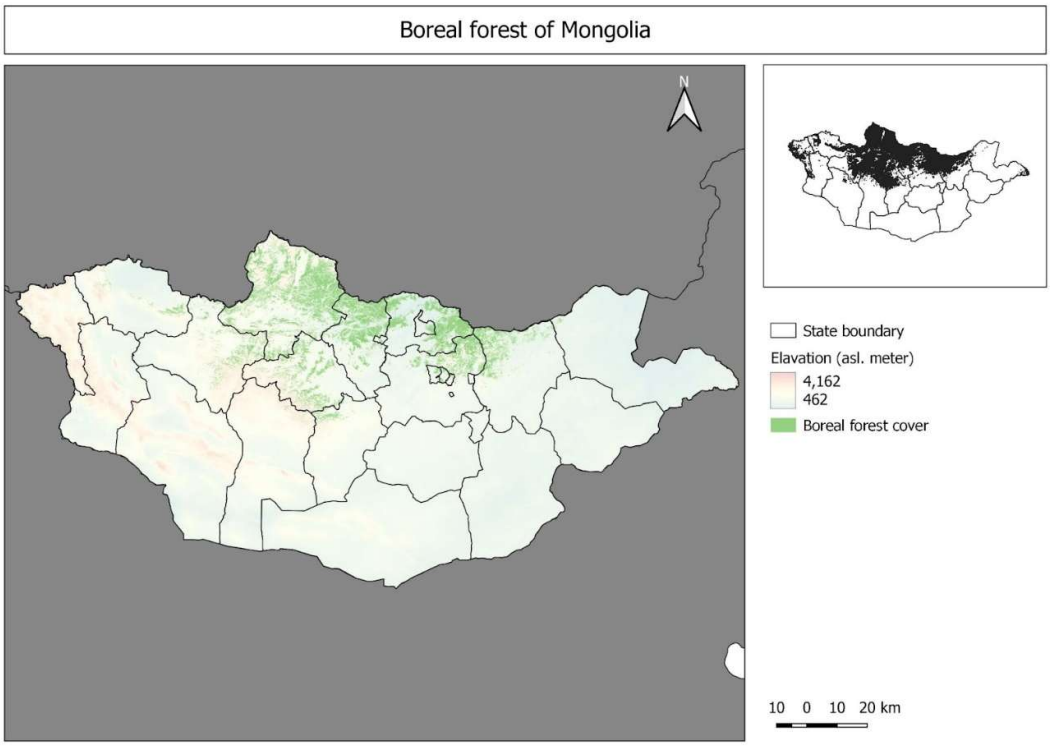
Responsible Entity	Data Type	Format	Data Category	Coverage
Forest Agency	Polygon	Sph	Boreal Forest Data	Nationwide
Ministry of Environment and Climate Change	Polygon	Sph	Boundaries and Internal Zoning of Special Protected Areas	Nationwide
ALAMGAC	Polygon	Sph	Land Use Data for Individuals and Enterprises	Nationwide
ALAMGAC	Polygon	Sph	Pasture and Rotational Grazing Areas	Nationwide
ALAMGAC	Polygon	Sph	Agricultural Land/Arable Land	Nationwide
ALAMGAC	Polygon	Raster	Land Cover and Vegetation Data	Nationwide
Geo-ecology Institute	Polygon	Sph	Soil Types and Classification	Nationwide
Water Agency	Polygon, Line	Sph	Rivers and Lakes	Nationwide
WWF Mongolia	Polygon	Sph	Ecosystems	Nationwide
WWF Mongolia	Polygon	Sph	Wildlife Corridor Areas	Nationwide
WWF Mongolia	Polygon		Distribution of Rare and Endangered Species	Nationwide

The following discussion outlines the specific datasets, resource, methodology required for the DFCM's DMS system build up, which would contribute to the MRV framework in Mongolia.

Criterion 1: The land has not been forested in the last 10 years and has not naturally regenerated.

Mongolia's forest coverage is identified through two main inventory types: the Forest Development Inventory and the Forestry Census. The Forest Development Inventory, conducted every 10 years at the administrative level, provides a comprehensive assessment of forest area, resources, distribution, composition, quality, condition, and the status of forest protection, sustainable use, and restoration efforts. The Forestry Census, on the other hand, focuses on determining the current state of forests, monitoring changes over time, calculating greenhouse gas absorption, and conducting biomass research to inform operational strategies. The main output of the data is the boreal forest map illustrated in Figure 12.

Figure 11: Boreal Forest Cover (Mongolia)



A forest is defined as an area of at least one hectare with a canopy cover exceeding 10% and trees taller than 2 meters. National forest inventories often target specific regions, using methodologies such as wall-to-wall mapping or satellite-based assessments, including Landsat 8 imagery, to determine forest extent.

In 2013, a Forest Cover Map Mask was developed through image classification techniques applied to Landsat 8 data, identifying stocked forests and delineating areas for field inventory sampling. In 2015, an updated Forest Cover Map was created using open-source R scripts and new Landsat data, illustrating the spatial distribution of Mongolia's boreal forests. The methodology involved defining "training areas" based on high-resolution remote sensing data from QGIS and Google Earth, which were then used to calibrate the R scripts for accurate classification of forested regions in the Landsat 8 imagery.

Field inventories, based on the forest cover map, are conducted to assess forest changes. These inventories record all necessary forest stand data, including areas of temporary deforestation and degradation. This information is critical for identifying and monitoring temporarily deforested areas in the assessment.

Criterion 2: Not peatland or wetland area

Determining wetland areas in Mongolia involves remote sensing techniques and geospatial analysis to map and monitor these ecologically significant zones. Mongolia's wetlands are diverse, including freshwater lakes, river floodplains, and peatlands, all of which are critical for biodiversity conservation, water regulation, and climate change mitigation.

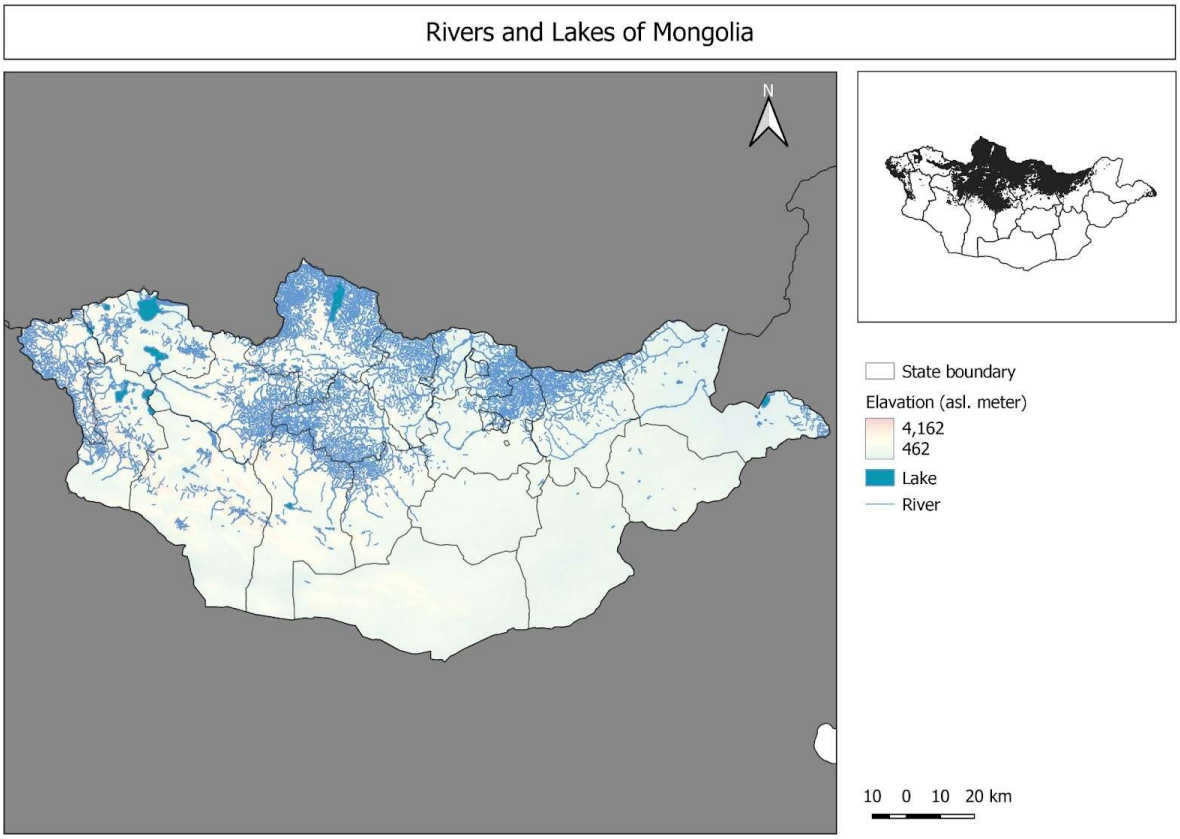
The process begins with satellite imagery from sources such as Landsat, Sentinel-2, or MODIS, which provide multi-spectral data essential for detecting water and vegetation dynamics. Preprocessing steps, including radiometric and atmospheric corrections, ensure accurate reflectance values for analysis. Spectral indices, such as the Normalized Difference Water Index (NDWI) and the Modified NDWI (MNDWI), are applied to distinguish wetlands from other land cover types, while the Normalized Difference Vegetation Index (NDVI) helps identify vegetation associated with wetland areas.

High-resolution remote sensing data, combined with field validation, is used to define "training areas" for supervised classification methods like Random Forest or Support Vector Machine (SVM). GIS tools, such as QGIS, are employed to integrate remote sensing outputs with topographical and hydrological data, ensuring more accurate delineation of wetlands.

Mongolian Geo-Ecological Institute has developed a national wetland map, which is made publicly available through the National Geoportal Spatial Web Database.[10]

[10] https://nsdi.gov.mn

Figure 12: Wetland spatial data, shows rivers and lakes (Mongolia)



Criterion 3: Not located within urban or residential areas

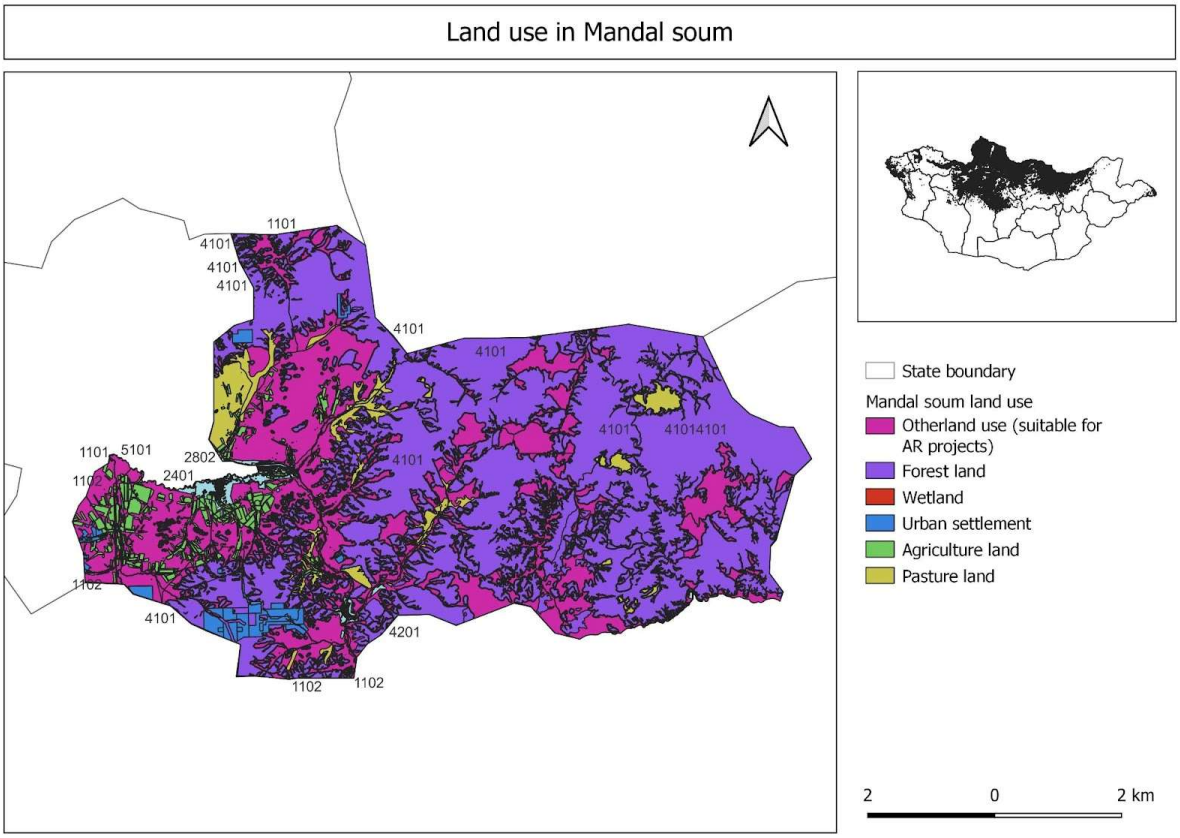
Mongolia's land use categories align with the IPCC standards and are divided into six main classifications:

- Agricultural land
- Urban and settlement areas
- Roads and other linear infrastructure
- Forest land
- Water bodies
- Special use land (e.g., state special use, military installations)

For the purpose of carbon sequestration activities, particular attention will be given to urban and settlement areas and their development plans to avoid overlap with potential afforestation and reforestation sites.

Mongolia's land use determination is primarily guided by the Mongolian Cadastral Law. According to this law, the local branches of the Agency for Land Administration, Geodesy, and Cartography (ALAMGAC) are responsible for measuring and demarcating land use categories, including urban planning and other land use classifications. This legal framework ensures that land use data is consistently updated and accurately reflects the current spatial distribution of land across the country.

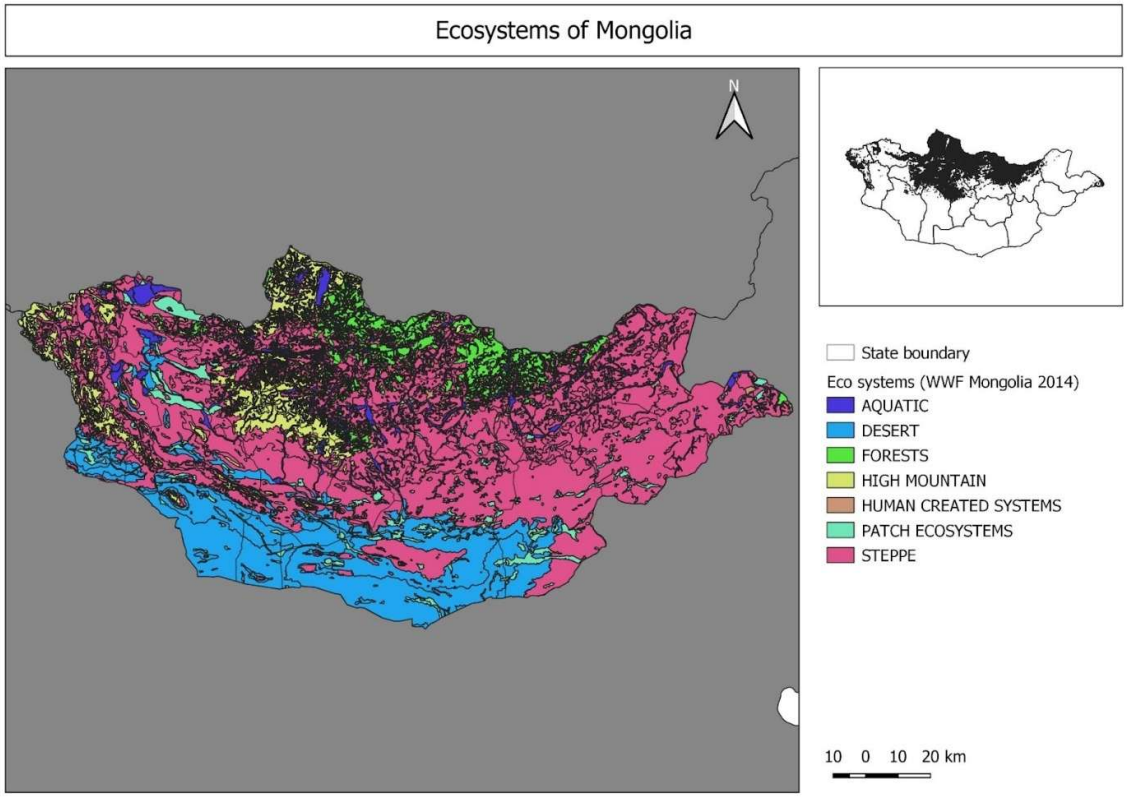
Figure 13: Land use Cadastral Data



Criterion 4: Does not have negative environmental or ecosystem impacts.

The national-scale ecosystem distribution map developed by WWF Mongolia in 2012 serves as the primary input data for this assessment. According to this map, the boreal forest ecosystem is predominantly found along the northern regions of Mongolia (green color in Figure 15), while the majority of the country is covered by steppe and semi-arid steppe ecosystems (yellow color in Figure 15). These steppe and semi-arid steppe areas are characterized by unique climatic and soil conditions that make them naturally unsuitable for afforestation activities. This distinction is crucial for guiding the selection of appropriate sites for carbon sequestration projects, as afforestation efforts are most effective in regions with suitable ecological conditions for forest growth.

Figure 14: Ecosystem Distribution Map of Mongolia (WWF, 2012)



Source World Wildlife Fund, 2012

Criterion 5 & 6: Not a site of cultural heritage & Not within a protected area

Mongolia's commitment to expanding Special Protected Areas (SPAs) aligns with Aichi Biodiversity Target 11, which aims to protect 30% of representative and vulnerable ecosystems by 2025. This effort involves integrating ecosystem protection into both national and local land-use planning, strengthening management capacities, and promoting international collaboration for transboundary conservation. The initiative focuses on safeguarding biodiversity hotspots, supporting migratory species, and ensuring sustainable land use while contributing to global conservation objectives. Currently, Mongolia has designated 32,891,339 hectares as Special Protected Areas, representing 21% of the country's total land area.

Table 9: Protected Areas in Mongolia

Special Protected Area type	Land Area (ha)
Special Protected Area	13,798,789
National Park Area	13,284,853
Natural Reserve Area	5,701,140
Monumental Area (including natural and historical)	106,557

In the context of Mongolia, the Conservation Standards (CS) play a pivotal role in addressing the country's unique environmental challenges while harnessing its rich natural heritage. Mongolia's diverse biodiversity, expansive landscapes, and nomadic cultural traditions create a distinct conservation environment that requires a framework that is both flexible and inclusive. The CS methodology is particularly suited for Mongolia, as it emphasizes stakeholder engagement, scientific rigor, and adaptive management—elements essential for balancing conservation efforts with the needs of local communities and the national economy.

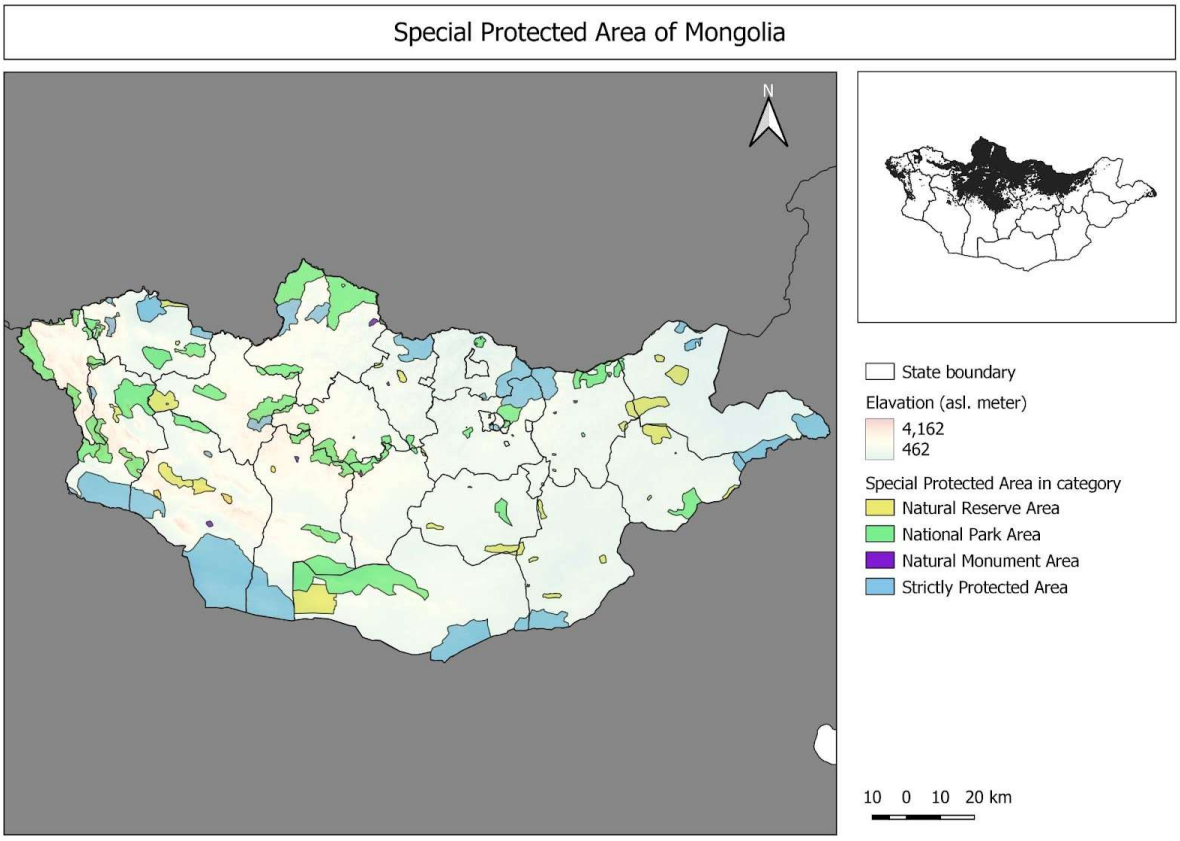
Mongolia faces numerous environmental challenges, including overgrazing, mining, climate change, and habitat fragmentation. The CS offers a structured approach to mitigate these threats by identifying conservation targets, analyzing the root causes of environmental degradation, and developing strategic, evidence-based solutions. For instance, tools such as situation analysis and results chains enable practitioners to assess the impacts of mining on water resources or evaluate how climate change threatens key species like the snow leopard.

One of the major strengths of the CS methodology in Mongolia is its emphasis on participatory planning. Local herders, government agencies, NGOs, and the private sector are encouraged to collaborate, ensuring that conservation efforts respect cultural traditions while promoting sustainable livelihoods. Additionally, the integration of human well-being into conservation planning is particularly relevant to Mongolia's nomadic heritage, where the health of the environment is closely tied to the survival of communities.

In selecting SPAs, Mongolia follows the guidance of the CS. Over the past decade, 73 of the country's 116 protected areas have developed management plans. In January 2021, an upgraded version of this methodology was officially approved by the MET as the official planning framework for all protected areas in Mongolia. This updated methodology is designed to address the evolving needs of conservation efforts, offering several key advantages:

- It fully integrates all steps of the CS methodology.
- It aligns with the government-approved Strategic Plan Development Methodology, a tool that mandates evidence-based planning for all state organizations.
- It provides detailed recommendations on incorporating climate change considerations, human well-being targets, participatory approaches, and implementation mechanisms.
- It reflects the valuable experiences and lessons learned by protected area staff over the last decade.

Figure 15: Special Protected Areas of Mongolia



Wildlife Corridor Area

Study by WWF Mongolia evaluated the impacts of linear infrastructure on 16 key wildlife species in Mongolia, encompassing a diverse range of mammals and birds of significant ecological and conservation value.[11] Sample points, ranging from 61 for Syrrhaptes paradoxus to 67,145 for Procapra gutturosa, were gathered from a variety of sources, including field surveys, GPS collar tracking, camera traps, and historical databases collected between 2009 and 2020. The 16 species and sample points are listed in Table 10.

Table 10: Connective Region Determined Species

Common Name	Scientific Name	Sample Points
Snow Leopard	Panthera uncia	8,739
Siberian Ibex	Capra sibirica	1,732
Argali Sheep	Ovis ammon	1,954
Mongolian Gazelle	Procapra gutturosa	67,145

[11] https://mongolia.panda.org/en/publications/?377696/IDENTIFYING-CONNECTIVITY-AREAS-OF-MONGOLIAN-GAZELLE-PROCAPRA-GUTTUROSA-IN-EASTERN-MONGOLIA

Saiga Antelope	Saiga tatarica mongolica	40,559
Gobi Bear	Ursus arctos gobiensis	9,675
Wild Bactrian Camel	Camelus ferus	768
Red Deer	Cervus elaphus	2,453
Roe Deer	Capreolus pygargus	2,391
Goitered Gazelle	Gazella subgutturosa	1,966
Kulan (Wild Ass)	Equus hemionus hemionus	1,152
Moose	Alces alces	339
Demoiselle Crane	Anthropoides virgo	1,069
Great Bustard	Otis tarda	68
Relict Gull	Larus relictus	85
Pallas's Sandgrouse	Syrrhaptes paradoxus	61

Species distribution was modeled using Maximum Entropy Modeling (Maxent), with input variables such as 19 bioclimatic factors, elevation, and human impact indices, including roads and settlements. To enhance model accuracy, highly correlated variables ($r \geq 0.75$) were excluded. The dataset was split into 75% for model training and 25% for validation. Habitat suitability scores, ranging from 0 to 1, were categorized into five levels, with areas deemed unsuitable or with minimal habitat (e.g., <31 km² for Capra sibirica) excluded from further analysis.

Connectivity analysis was conducted using least-cost path modeling and Linkage Mapper software, which incorporated terrain ruggedness (VRM) and human disturbance layers. Species-specific movement thresholds (e.g., 10–250 km for Panthera uncia) guided the identification of key linkage areas.

For migratory species such as Procapra gutturosa and Saiga tatarica mongolica, resource selection functions (RSFs) were applied using binomial generalized linear models (GLMs) and pseudo-absence points. These models were optimized through Akaike Information Criterion (AIC) scores.

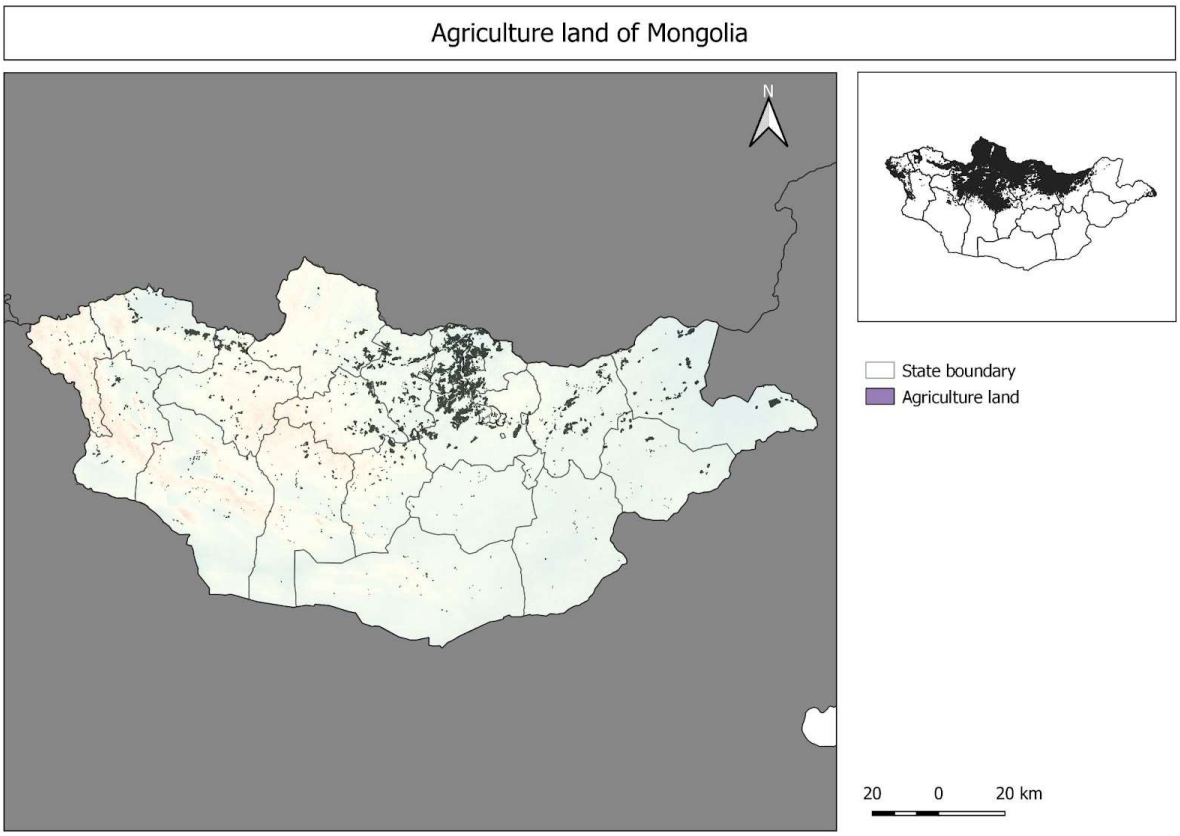
Biodiversity hotspots were identified by overlaying species suitability maps in ArcGIS, focusing on areas with cumulative suitability scores exceeding 0.5. These hotspots, particularly those overlapping with existing and planned infrastructure, were highlighted as critical zones for conservation and mitigation measures.

This comprehensive approach offers a robust framework for understanding species habitat needs, evaluating ecological connectivity, and reducing the impact of infrastructure development on Mongolia's wildlife.

Criterion 7: Not used for agricultural purposes

The cropland map created by the ALAMGAC in 2021 served as a critical resource for identifying suitable agroforestry sites, providing essential information for the analysis (Figure 10).

Figure 10: Cropland Distribution Map of Mongolia



Source: ALAMGAC, 2021

5.1. Multi-Criteria Assessment (MCA)

The methodology employed to evaluate and identify the most suitable locations for AR activities in Mongolia's northern boreal forest region. This methodology integrates multiple criteria that reflect the region's environmental, ecological, and socio-economic conditions, providing a comprehensive decision-making framework.

The MCA process involved several key steps:

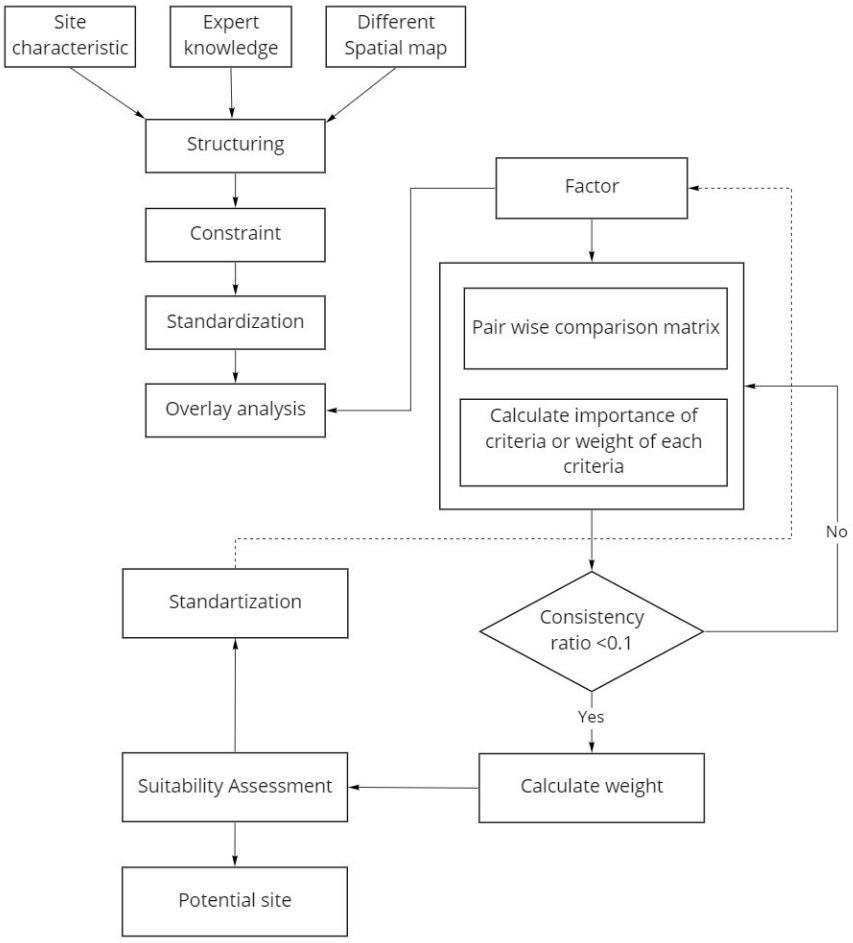
1. **Criteria Identification:** The first step involved identifying relevant criteria that are critical to the success of reforestation and afforestation projects. These criteria include ecological factors such as forest cover, soil quality, biodiversity hotspots, and hydrological features, as well as socio-economic considerations like land use, proximity to communities, and infrastructure development.
2. **Data Standardization:** Once the criteria were identified, each criterion was transformed into a standardized utility score ranging from 0 to 1, where 0 represents the least suitable and 1 represents the most suitable value. This standardization

process, known as utility measurement, ensures that all criteria are evaluated on a comparable scale, regardless of their original units of measurement (Sharifi & Retsios, 2004).

3. **Decision Tree Modeling:** To apply the MCA methodology, decision tree modeling was utilized to assess the suitability of various locations for reforestation and afforestation. This process allowed for the integration of multiple criteria and the visualization of the relationships between these factors. The decision tree model provided a clear framework for evaluating different areas based on their combined suitability scores, leading to the identification of the most appropriate sites for carbon sequestration activities.
4. **Assessment and Ranking:** The final step in the MCA process involved ranking potential sites based on their aggregated utility scores. Sites with higher utility scores were considered more suitable for reforestation and afforestation, while areas with lower scores were deemed less favorable. This ranking helped prioritize areas for intervention, ensuring that the most viable sites were selected for implementation.

Through this structured and systematic methodology, the MCA provides a comprehensive, data-driven approach to identifying optimal locations for carbon sequestration projects, supporting Mongolia’s climate goals and conservation efforts.

Figure 17: Analytical Framework and Methodology



5.2. Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) is a widely recognized decision-making tool that enables the systematic evaluation of multiple criteria by structuring complex problems into a hierarchy. A critical component of AHP is the pairwise criteria evaluation matrix, which facilitates the comparison of the relative importance of criteria based on decision-maker judgments. This structured approach ensures consistency and objectivity in assigning weights to criteria.

Structure of the Pairwise Criteria Evaluation Matrix

The matrix is a square n×nn×n grid, where:

- Rows and Columns: Represent the criteria being compared.
- Matrix Elements (aijaij): Indicate the relative importance of criterion ii compared to criterion jj, based on expert or stakeholder input.
- Diagonal Elements (aiiaii): Are always equal to 1, as a criterion is inherently equally important to itself.

Pairwise Comparison Process

1. Judgment Assignment: Each criterion is compared against every other criterion in a pairwise manner, using a predefined scale (e.g., 1 to 9) to represent the relative importance.
    - A score of 1 indicates equal importance between two criteria.
    - A higher score (e.g., 5) suggests that one criterion is moderately more important than the other.
    - Reciprocal values (e.g., 1/5) reflect the inverse relationship when one criterion is less important.
2. Matrix Population: The comparisons populate the matrix, ensuring consistency through reciprocal relationships (aij=1/ajiaij=1/aji).
3. Weight Calculation: Once the matrix is complete, the relative weights of each criterion are calculated. This is typically done by normalizing the matrix and computing the eigenvector corresponding to the largest eigenvalue. These weights reflect the priority or significance of each criterion in the decision-making process.

The advantages of the AHP lie in its ability to transform complex decision-making challenges into a systematic and transparent process. At the heart of this methodology is the pairwise criteria evaluation matrix, which fosters a structured approach to prioritizing competing factors. This systematic framework not only simplifies the evaluation of diverse criteria but also ensures that the process remains consistent and objective.

One of the key strengths of AHP is its capacity to engage multiple stakeholders, including decision-makers, experts, and community representatives, in a collaborative process. By allowing stakeholders to contribute their judgments, the method captures diverse perspectives, ensuring that the resulting priorities are well-informed and inclusive. This participatory nature of AHP fosters alignment with organizational or project goals, creating a sense of shared ownership over the decisions made.

Additionally, AHP offers a built-in mechanism to validate the consistency of judgments. Through its consistency ratio, the method identifies and minimizes potential biases or inconsistencies in the pairwise comparisons, enhancing the reliability of the results. This feature is particularly valuable in decision-making contexts where subjective inputs play a significant role.

Overall, AHP's systematic structure, participatory approach, and emphasis on consistency make it an indispensable tool for prioritizing criteria in multifaceted decision-making scenarios. Its ability to distill complex problems into clear, actionable priorities ensures that decisions are not only robust but also aligned with strategic objectives.

By employing the pairwise criteria evaluation matrix, AHP provides a robust foundation for prioritizing criteria in complex decision-making scenarios, ensuring transparency and alignment with strategic objectives.

Key Rules:

- If $a_{ij} = x$, then $a_{ij} = \frac{1}{x}$. This ensures the matrix is reciprocal.
- The values typically range from 1 to 9, based on the Saaty scale of relative importance:

- 1: Criteria i and j are equally important.
- 3: Criterion i is slightly more important than j.
- 5: Criterion i is moderately more important than j.
- 7: Criterion i is strongly more important than j.
- 9: Criterion i is extremely more important than j
- 2, 4, 6, 8: Intermediate values for fine-tuning.

Table 11: Example of the Pairwise Criteria Evaluation Matrix

Criteria	The land has not been forested in the last 10 years and has not naturally regenerated	Not peatland or wetland area	Not urban or residential area	Does not have negative environmental or ecosystem impacts	Not within a protected area	Not used for agricultural purposes	Not pasture land
The land has not been forested in the last 10 years and has not naturally regenerated	1	3	5	7	9	9	9
Not peatland or wetland area	1/3	1	3	5	7	7	7
Not urban or residential area	1/5	1/3	1	3	5	5	5
Does not have negative environmental or ecosystem impacts	1/7	1/5	1/3	1	3	3	3

Not within a protected area	1/9	1/7	1/5	1/3	1	3	3
Not used for agricultural purposes	1/9	1/7	1/5	1/3	1/3	1	3
Not pasture land	1/9	1/7	1/5	1/3	1/3	1/3	1

Explanation of Matrix Values

1. Diagonal Elements $a_{ii} = 1$):
    - Each criterion is equally important when compared to itself. For example, "Temporary Deforested Land" compared to "Temporary Deforested Land" has a value of 1.
2. Comparison Values (a_{ij}):
    - Example 1:
        - $a_{12} = 3$: "Temporary Deforested Land" is slightly more important than "No Peatland Overlap."
        - $a_{21} = \frac{1}{3}$: The reciprocal value, indicating "No Peatland Overlap" is slightly less important than "Temporary Deforested Land."
    - Example 2:
        - $a_{14} = 7$: "Temporary Deforested Land" is strongly more important than "Environmental Impact."
3. Reciprocal Nature:
    - If one criterion is more important (e.g.,$a_{ij} = 5$), its reciprocal a_{ji} is less important $a_{ji} = \frac{1}{5}$
    - Interpreting Values

- High Values (e.g., 7, 9):
    - Indicate a strong preference for one criterion over another. For example, "Temporary Deforested Land" (value 9) is deemed extremely more important than "Protected Areas."
- Moderate Values (e.g., 3, 5):
    - Suggest a moderate to strong preference. For example, "No Urban Planning Overlap" (value 3) is moderately more important than "Environmental Impact."
- Low Values (e.g., 1/3, 1/5):

- Indicate lower importance. For example, "Environmental Impact" (value 1/5) is less important than "Temporary Deforested Land."

Purpose of the Matrix

The pairwise criteria evaluation matrix serves several critical functions within the Analytic Hierarchy Process (AHP), enabling decision-makers to navigate complex scenarios systematically and effectively:

1. Quantifying Subjective Judgments

   The matrix translates qualitative assessments into a structured, quantitative framework, allowing for systematic comparison of criteria. This approach ensures that subjective judgments are consistently and objectively evaluated.

2. Weight Calculation
   - The matrix is instrumental in deriving the priority vector, or weights, for each criterion.
   - These weights reflect the relative importance of each criterion, guiding the decision-making process with clarity and precision.

3. Consistency Validation
   - By calculating the Consistency Ratio (CR), the matrix ensures that judgments are logically coherent.
   - This step helps identify and address inconsistencies, enhancing the reliability of the analysis.

Implementation of AHP for Variable Factors

Given the multifaceted nature of the criteria and alternatives involved, the Analytic Hierarchy Process (AHP) was selected to comprehensively evaluate all relevant aspects. The estimation process was carried out in a series of methodical steps:

- Developing the Comparison Matrix: Establishing a structured framework to compare all criteria pairwise.
- Conducting Pairwise Comparisons: Assessing the relative importance of each criterion against the others.
- Normalization: Standardizing the comparison matrix to derive a consistent scale for evaluation.
- Performing Consistency Analysis: Validating the logical coherence of judgments to ensure the robustness of the results.

This structured approach provided a robust foundation for evaluating complex decision-making scenarios, ensuring that all critical factors were systematically addressed.

Making Comparison Matrix

Using the aforementioned inputs, we developed the comparison matrix presented in Table 10. This matrix systematically organizes the relative importance of criteria, forming the foundation for the subsequent pairwise analysis and priority weighting process.

$$\begin{bmatrix} C_{11} & C_{12} & C_{13} \\ C_{21} & C_{22} & C_{23} \\ C_{31} & C_{32} & C_{33} \end{bmatrix}$$

Sum of weight

$$C_{ij} = \sum_{i=1}^{n} C_{ij}$$

Table 12: Comparison Matrix, Weights On Each Criteria

	The land has not been forested in the last 10 years and has not naturally regenerated	Not peatland or wetland area	Not urban or residential area	Does not have negative environmental or ecosystem impacts	Not within a protected area	Not used for agricultural purposes	Not pasture land
The land has not been forested in the last 10 years and has not naturally regenerated.	1	3	5	7	9	9	9
Not peatland or wetland area	1/3	1	3	5	7	7	7
Not urban or residential area	1/5	1/3	1	3	5	5	5
Does not have negative environmental or ecosystem impacts	1/7	1/5	1/3	1	3	3	3
Not within a protected area	1/9	1/7	1/5	1/3	1	1	1
Not used for agricultural purposes	1/9	1/7	1/5	1/3	1	1	1
Not pasture land	1/9	1/7	1/5	1/3	1	1	1

Calculate Column Sums: Sum up the values for each column.

Column Sum for Temporary Forest Land=1+0.5+0.33+2+5=8.83 (Column Sum for Temporary Forest Land) = 1 + 0.5 + 0.33 + 2 + 5 = 8.83

Column Sum for Temporary Forest Land=1+0.5+0.33+2+5=8.83

Similarly, calculate sums for all other columns.

Normalization

After comparing all criteria, each criteria is normalized according to below formula.

i) $$X_{ij} = \frac{C_{ij}}{\sum_{i=1}^{n} C_{ij}} \begin{bmatrix} X_{11} & X_{12} & X_{13} \\ X_{21} & X_{22} & X_{23} \\ X_{31} & X_{23} & X_{33} \end{bmatrix}$$

ii) $$W_{ij} = \frac{\sum_{j=1}^{n} X_{ij}}{n} \begin{bmatrix} W_{11} \\ W_{12} \\ W_{13} \end{bmatrix}$$

After normalization each criteria weight changes (Table 11)

Normalize the Matrix: Divide each value in the comparison matrix by the column sum for its respective column. For example:

Normalized Value for (Temporary deforested land, Temporary deforest land) $= \frac{1}{8.83} = 0.113$

Continue normalizing each value by dividing it by the sum of its respective column.

The normalization matrix is derived by dividing each element of the pairwise comparison matrix by the total sum of its respective column. This transformation standardizes the raw comparison values, enabling a consistent and proportional comparison of each criterion.

Table 13: Normalizaation

	The land has not been forested in the last 10 years and has not naturally regenerated	Not peatland or wetland area	Not urban or residential area	Does not have negative environmental or ecosystem impacts	Not within a protected area	Not used for agricultural purposes	Not pasture land
The land has not been forested in the last 10 years and has not naturally regenerated.	0.538	0.563	0.556	0.538	0.538	0.538	0.538
Not peatland or wetland area	0.179	0.188	0.333	0.385	0.417	0.417	0.417

Not urban or residential area	0.108	0.063	0.111	0.231	0.298	0.298	0.298
Does not have negative environmental or ecosystem impacts	0.077	0.038	0.074	0.077	0.179	0.179	0.179
Not within a protected area	0.059	0.027	0.037	0.026	0.060	0.060	0.060
Not used for agricultural purposes	0.059	0.027	0.037	0.026	0.060	0.060	0.060
Not pasture land	0.059	0.027	0.037	0.026	0.060	0.060	0.060

Explanation of Steps

1. Column Sums:
    - Each column in the original comparison matrix is summed.
        - For example, the Temp. Deforested Land column: $1+\frac{1}{3}+\frac{1}{5}+\frac{1}{7}+\frac{1}{9}+\frac{1}{9}+\frac{1}{9}=1.859$
2. Normalization:
    - Each element in the matrix is divided by the sum of its column.
        - For example, for Temp. Deforested Land vs. Temp. Deforested Land: $\frac{1}{1.859}=0.538$
        - For Peatland vs. Temp. Deforested Land: $\frac{\frac{1}{3}}{1.859}=0.179$
3. Normalized Rows:
    - Each row now shows the relative importance of that criterion compared to others.
4. Weights (Priority Vector):
    - Calculated as the average of the normalized row values.
        - For example, for Temp. Deforested Land: $\frac{0.538+0.563+0.556+0.538+0.538+0.538+0.538}{7}=0.431.$

Table 14: Result of the Criteria Weight

Criteria	Weight
Temporary Deforested Land	0.431
Peatland	0.179
Urban Planning	0.108
Environmental Impact	0.077
Protected Area	0.059
Agricultural Land	0.059
Pasture	0.059

Consistency analysis

After normalization of criteria weight, we conducted consistency analyze to determine consistent between criteria.

Weights (Priority Vector)

The normalized weights are calculated as the average of the rows in the normalized matrix. These weights represent the relative importance of each criterion:

1. Temporary Deforested Land: 43.1%
2. Peatland: 24.9%
3. Urban Planning: 14.3%
4. Environmental Impact: 7.7%
5. Special Protected Area: 3.4%
6. Agricultural Land: 3.4%
7. Pasture: 3.4%

Consistency Check

To ensure the consistency of judgments in the pairwise comparisons:

- Consistency Index (CI): $\mathrm{CI} = 0.090$
- Random Index (RI): For a 7x7 matrix, $\mathrm{RI} = 1.32$
- Consistency Ratio (CR): $\mathrm{CR} = \frac{\mathrm{CI}}{\mathrm{CR}} = 0.068$ (6.8%)

Since CR<0.1CR the matrix is consistent and acceptable.

6. Way Forward

The establishment of a DFCM offers Mongolia a strategic opportunity to achieve NDC targets in a cost-effective way by mobilizing climate finance, enhance national forest cover, and position itself as a credible participant in emerging international carbon markets. However, its successful implementation requires a sequenced and coordinated roadmap that strengthens legal foundations, institutional capacity, operational systems, and market readiness. The following chapter outlines the short, medium, and long-term steps needed to operationalize the mechanism in a credible, transparent, and scalable manner.

6.1. Strengthening the Legal and Regulatory Foundations

A fundamental next step is the establishment of a coherent legal and regulatory framework that provides clarity, authority, and enforceability for the DFCM. Mongolia has initiated this process through the development of a Climate Change Law and the recent approval of a carbon registry regulation. However, these instruments remain general and do not sufficiently address the specific requirements of a domestic forest carbon market. The Government of Mongolia must move toward a consolidated legal environment tailored to the needs of forest carbon projects and aligned with international obligations under Article 6 of the Paris Agreement.

The development and adoption of two new regulations—the Regulation for the Operation of the Forest Sector Experts' Council and the Mongolian Forest Carbon Offset Regulation (FCOR)—should be prioritized. Together, they will define operational roles, technical standards, MRV frameworks, crediting rules, project eligibility, and safeguards. Amending the Regulation for the Contractual Management of Forested Areas will also be necessary to ensure that long-term carbon sequestration rights, responsibilities, and benefit-sharing arrangements are legally secure. These legal reforms should be fast-tracked and integrated with the overarching Climate Change Law to avoid fragmentation. Clear legal recognition of carbon credit ownership, transfer rights, liability, and enforcement will be essential to build investor confidence and protect communities and government interests.

6.2. Establishing Institutional Architecture and Governance

The institutional framework for the DFCM must combine strong government oversight with technical and market-oriented bodies capable of ensuring credibility and efficiency. The immediate next step is to operationalize the Forest Sector Experts' Council, defining its membership, procedures, advisory functions, and linkages to both the MECC and the General Agency for Specialized Inspection (GASI). The Council will serve as the technical backbone for forest carbon methodologies, baselines, safeguards, and compliance reviews; thus, its establishment is a prerequisite for launching the first cycle of certification.

Parallel to this, Mongolia should establish or designate a Market Operator responsible for registry integration, project onboarding, credit issuance, and market facilitation under the FCOR. Capacity-building support may be needed to strengthen the Market Operator's technical ability to manage forest carbon datasets and ensure interoperability with the national carbon registry and land-management systems.

Further institutional development is needed for third-party validation and verification bodies (VVBs). Mongolia should create an accreditation pathway, modeled after international

accreditation standards and in line with Article 6.4 guidance from the UNFCCC, to ensure that local institutions can meet compliance-grade validation and verification requirements. In the medium term, this will reduce reliance on foreign VVBs and lower transaction costs for domestic project developers.

6.3. Piloting the Digital Mapping System

Building upon the conceptual approach outlined, the proposed GIS mapping methodology in Chapter 5 may be piloted in a selected soum. This process will test and refine the conceptual framework while demonstrating its feasibility in real-world conditions. The proposed methodology for the pilot intervention is as follows:

- **Selection of Pilot Soum**: Identify a representative soum that aligns with the criteria established during the conceptual phase. The selected soum should encompass diverse environmental, socio-economic, and land-use characteristics to effectively evaluate the GIS-based methodology.
- **Data Collection and Integration**: Compile all relevant geospatial data layers specific to the chosen soum. This includes environmental data (e.g., land cover, elevation, and hydrology), socio-economic data (e.g., population density and land use), and infrastructure data (e.g., roads and settlements). The data will be pre-processed and standardized to ensure compatibility with the GIS system.
- **Application of GIS Mapping Tools**: Utilize the conceptual framework to apply multi-criteria assessment (MCA) techniques within the GIS environment. This involves overlaying data layers, running suitability analyses, and generating spatial outputs that identify potential sites for afforestation and reforestation activities.
- **Stakeholder Engagement**: Collaborate with local stakeholders, including government officials, community representatives, and environmental organizations, to validate the GIS outputs and incorporate local insights into the decision-making process. This participatory approach ensures the practicality and acceptance of the proposed sites.
- **Pilot Testing and Feedback**: Implement the GIS mapping approach in the selected soum and document the process, challenges, and outcomes. The pilot will serve as a proof of concept, highlighting areas for improvement and adaptation.
- **Evaluation and Scaling**: Analyze the results of the pilot test to assess the effectiveness and accuracy of the conceptual approach. Use the findings to refine the methodology and develop a roadmap for scaling the GIS mapping to other soums and regions across Mongolia.

By piloting the GIS mapping approach in a targeted soum, this next step will bridge the gap between conceptual design and operational application, setting the stage for broader implementation and enhanced decision-making in land-use planning and carbon sequestration activities.

6.4. Developing Methodologies, Standards, and MRV Systems

The effectiveness of the DFCM depends on a robust MRV framework that ensures credibility and alignment with international standards. The FCOR should guide the development of standardized and transparent methodologies for afforestation, reforestation, and restoration projects. Key priorities include:

- establishing forest carbon baselines tailored to ecological zones;
- creating standardized monitoring protocols using remote sensing, field sampling, and national forest inventory data;
- defining leakage and permanence requirements, including risk-buffer contributions and long-term monitoring provisions;
- building a centralized forest carbon dataset integrated with the United Land Management System.

Investing early in MRV capacity will be essential. Mongolia should consider partnerships with technical organizations, universities, and satellite-data providers to ensure high-resolution monitoring and analytics. A clear MRV framework will also support interoperability with regional and international carbon markets, enabling Mongolia to position DFCM credits for potential Article 6 transfer opportunities.

6.5. Piloting Forest Carbon Projects

To build momentum and test the regulatory and institutional system, Mongolia should initiate a series of pilot forest carbon projects immediately after the adoption of the FCOR. These pilots would serve as proof-of-concept demonstrations, enabling the country to refine its methodologies, identify bottlenecks, and train stakeholders in real-time. Pilot projects should be selected from priority landscapes with clear land tenure arrangements and high restoration potential, such as degraded rangelands, riparian forests, and areas affected by desertification.

Pilot outcomes should feed into iterative improvements of the DFCM, ensuring that the system reflects practical realities and not solely theoretical constructs. Early pilots also allow Mongolia to generate its first batch of domestic forest carbon credits, which can be showcased at national and international forums to build credibility and attract investment.

6.6. Mobilizing Finance and Engaging Stakeholders

A functioning DFCM will require sustained finance—from project initiation to long-term monitoring. Mongolia must therefore adopt a blended financing strategy. In the short term, donor support from climate funds, bilateral partners, and international organizations will likely be required to build the foundation of the mechanism. In the medium to long term, the DFCM should leverage:

- domestic private-sector CSR investments,
- concessional loans for large-scale afforestation,
- green bonds,
- Article 6 cooperative approaches, and
- voluntary carbon market buyers.

Stakeholder engagement remains equally important. Local communities, forest-dependent households, and aimag-level authorities must be involved from project design through implementation. Establishing transparent benefit-sharing mechanisms and clear land-use agreements will be foundational for long-term project success. The FCOR and contractual regulation amendments should anchor these provisions legally, ensuring that communities are beneficiaries, not bystanders.

6.7. Ensuring Safeguards, Equity, and Long-Term Sustainability

Environmental and social safeguards must underpin all activities under the DFCM. Mongolia should adopt a safeguards framework aligned with international best practices, ensuring that forest carbon projects protect biodiversity, uphold community rights, and deliver equitable benefits. Long-term sustainability further requires that forest carbon projects integrate climate adaptation measures—such as drought-resistant species, fire management strategies, and local ecosystem-based approaches—to protect carbon stocks against climate-induced risks.

6.8. Phased Implementation Roadmap

To ensure manageable progress, Mongolia should adopt a phased approach:

6.8.1. Short Term (0–1 year)

- Finalize and adopt the FCOR and the regulation for the Forest Sector Experts' Council.
- Amend the Regulation for the Contractual Management of Forested Areas.
- Establish institutional roles: Council, Market Operator, and VVB accreditation pathways.
- Develop initial MRV protocols and integrate carbon datasets with the land management system.

6.8.2. Medium Term (1–3 years)

- Launch pilot forest carbon projects.
- Fully operationalize the DFCM registry functions.
- Train subnational authorities, project developers, and communities.
- Begin issuance of the first domestic forest carbon credits.

6.8.3. Long Term (3–7 years)

- Scale up AR projects nationwide.
- Expand crediting to additional forest-related activities if feasible.
- Pursue Article 6 cooperative approaches with buyer countries.
- Regularly review and update regulations, methodologies, and safeguards.

The DFCM represents a transformative opportunity for Mongolia to unlock climate finance, enhance forest ecosystems, empower local communities, and strengthen its role in global climate cooperation. By adopting a structured and sequenced approach grounded in strong legal frameworks, institutional clarity, credible MRV systems, and stakeholder-centered implementation, Mongolia can establish a forest carbon mechanism that is both technically sound and nationally owned. With focused effort and coordinated action, the DFCM can become a cornerstone of Mongolia's transition toward sustainable land management and long-term climate resilience.

Annex I: The Afforestation Plan of Entities Pledged to The National Billion Tree Initiative

No.	Name	Expand forest coverage while minimizing deforestation and improving forest health	Afforestation, reforestation (AR) compliance
1	“Erdenes Tavan Tolgoi” LC	104,162,401.0	Yes
2	“Oyu Tolgoi” LLC	48,000,000.0	Yes
3	“Boldtutmur Yoroo Gol” LLC	65,500,000.0	Yes
4	“Erdenet factory” ТӨҮГ	40,000,000.0	Yes
5	“Eenergy Resource” LLC	35,000,000.0	Yes
6	“Uzukh Zoos” LLC	28,000,000.0	Yes
7	“Southgobi Resources” LLC	10,000,000.0	Yes
8	“Steppe Gold” LLC	6,000,000.0	Yes
9	“Tavan Tolgoi” LLC	3,000,000.0	Yes
10	“Badrakh Energy" LLC	3,000,000.0	Yes
11	“Boroo Gold” LLC	2,000,000.0	Yes
12	“Erdenes Silver Resource” LLC	1,000,000.0	Yes
13	“Burdel Mining” LLC	1,000,000.0	Yes
14	“Altain Khuder” LLC	1,500,000.0	Yes
15	“Mongol Oros Tvetment” ТӨҮГ	1,450,000.0	Yes
16	“Mon-EnKo” LLC	500,000.0	Yes
17	“Mongolian Bank Association”	30,000,000.00	Yes
18	Khurgatai Khairkhan LLC	6,000,000.0	Yes
19	New Progress Group LLC	5,000,000.0	Yes
20	Professional Insurance Associations	3,000,000.0	Yes
21	Ard Financial Group LC	1,000,000.0	Yes
22	Erdene Resource Development LC	500,000.0	Yes
23	General Department of Execution of Court Decisions	71,000,000.0	Yes
24	General Authority for Border Protection	1,000,000.0	Yes
	Total	**466,612,401.0**	