Carbon Storage in Malaysia: A Review of the Current Legal Framework and Its Limitations

Azni Mohd Dian, Azhani Arshad*, Noraziah Abu Bakar, Siti Sarah Sulaiman, Ismah Ismail

Faculty of Law, University Technology MARA, Shah Alam, Selangor, Malaysia

***Corresponding author**

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ABSTRACT

This study examines Malaysia's legal framework for carbon storage in light of its Paris Agreement commitments and Nationally Determined Contributions (NDCs). Using doctrinal legal research and comparative analysis with Australia and New Zealand, the paper reviews core statutes including the Carbon Capture Utilization and Storage Act 2025, Environmental Quality Act 1974, National Land Code (Act 828), Town and Country Planning Act 1976, and National Forestry Act 1984. Findings reveal four major gaps: absence of statutory carbon rights, lack of land-use classification for carbon activities, limited permanence provisions, and no legal registry for carbon credits. Voluntary market mechanisms operate in a legal vacuum, raising concerns over enforceability and investor confidence. Drawing on international models, the study recommends enacting legislation to define carbon rights, integrate permanence and MRV standards, and establish a statutory registry. These reforms are critical to aligning carbon storage governance with Malaysia's climate targets and strengthening its forest policy credibility.

Keywords— Carbon storage; Malaysia; legal framework; land governance; NDCs; climate law

INTRODUCTION

Carbon capture and storage is a process of capturing and storing carbon dioxide to prevent it from entering the atmosphere with the purpose of mitigating climate change. Carbon storage through forest conservation and land-based mitigation is increasingly recognised as a critical component of climate change policy. As a party to the Paris Agreement, ratified in on 16 December 2016, Malaysia has committed to reducing the greenhouse gas emissions intensity of its Gross Domestic Product (GDP) by 45% by 2030, compared to 2005 levels, that is, lowering the amount of emissions produced per unit of economic output. This commitment is formalised in its Nationally Determined Contributions (NDCs), which explicitly identify land use, forest protection, and nature-based solutions as central to national mitigation efforts (NRECC, 2023; UNFCCC, 2015). In April 2025, Malaysia's Prime Minister reiterated Malaysia's commitment to reduce carbon intensity by 45% in 2030 and to achieve net zero carbon by 2050 (Bernama,2025). Despite these international commitments and the recently enacted Carbon Capture, Utilization and Storage Act 2025 (CCUS Act), Malaysia currently lacks a comprehensive legal framework to support the implementation of carbon storage activities. There is no legislation defining "carbon rights," project eligibility, or regulatory omission, and existing land and environmental laws do not yet address carbon as a legal asset or land use category. This creates a regulatory vacuum that weakens the effectiveness of domestic carbon initiatives and depreciates investor and stakeholder confidence, particularly in relation to rights ownership, land tenure security, and credit enforceability.

The current legal landscape is defined by statutes such as the Environmental Quality Act 1974, National Land Code (Act 828), Town and Country Planning Act 1976, and National Forestry Act 1984. However, none of these laws contain provisions specific to carbon storage, and they operate independently with minimal coordination. Voluntary carbon market initiatives such as the Bursa Carbon Exchange (BCX) launched in 2022 operate without a clear statutory directive, raising issues of legal enforceability, land tenure, and permanence or durability (Mustafa, 2022; Yusof & Yatim, 2021). CCUS Act provides a statutory framework to regulate

CCUS activities in Peninsular Malaysia and Labuan. The Act covers carbon capture, transport, injection, and long-term underground storage, and is seen as a cornerstone of Malaysia's low-carbon transition in energy and heavy industries. However, the provision pertaining to carbon storage in CCUS Act mainly mandating licenses for operating onshore and offshore storages sites in Malaysia. Even though many have welcomed the legislation, they viewed that it must be supported by clear liability mechanisms, carbon accounting standards, and environmental protections to ensure effective implementation and enforcement.

This article upholds that Malaysia's existing legal framework is inadequate to support the development of a transparent and effective carbon storage management. Without reforms to define carbon rights, complement relevant laws, and integrate climate goals into land governance, Malaysia risks failing to meet its Paris Agreement obligations. By applying legal experiences from Australia and New Zealand, this article identifies key elements of carbon laws that Malaysia can adopt to make its regulations clearer and more reliable.

The paper begins by setting out the conceptual framework on carbon storage and its legal context, followed by an overview of Malaysia's climate policy commitments. It then examines the principal statutory instruments related to land use and environmental regulations, identifying the legal gaps and limitations that hinder the implementation of carbon storage initiatives. This is followed by a comparative analysis of the legal frameworks in Australia, New Zealand, and Malaysia. The discussion concludes with proposed legal and policy reforms to improve legal certainty, coordination, and enforceability within Malaysia's carbon storage framework.

Conceptual Framework Of Carbon Storage

Carbon storage in forests, soils, and wetlands has become a significant component of international climate strategies. Yet, while the science of carbon storage or capture is well understood, its legal conceptualisation remains underdeveloped in many jurisdictions particularly in Malaysia. The implementation of land-based carbon storage depends on whether the law recognises carbon as a property interest, whether carbon rights can be transferred, and how such rights are verified and enforced through regulatory institutions. While this article focuses on land-based storage, it is worth observing that geological storage is now governed under the CCUS Act. It legally regulates the capture, injection, and underground control of industrial CO_2. The Act defines who can operate storage sites, what technical standards must be followed, and how long-term responsibility is handled. This model provides a level of legal clarity on ownership, monitoring, and liability, yet it is still lacking in forest-based carbon initiatives, such as reforestation, forest conservation, and peatland restoration projects. These initiatives are vital as they generate carbon credits by protecting or enhancing natural carbon sinks, but without legal definitions for carbon rights or enforceable project rules, they face challenges in attracting investment, ensuring permanence, and preventing disputes over land tenure.

In international practice, carbon credits are often treated as intangible assets or choses in action, legal interests that represent verified environmental outcomes. For example, under Australia's Carbon Credits (Carbon Farming Initiative) Act 2011, carbon credits are defined as personal property and linked to a national registry, giving them a legally enforceable status (Gupta & Das, 2024). Such recognition enables project developers to finance, contract, and trade credits with greater confidence. In contrast, Malaysia lacks a legal definition of carbon rights in land law or environmental legislation, which limits the enforceability of carbon-related contracts and reduces investor confidence (Mustafa, 2022). Recent academic work by Mustafa and Abdullah (2025) emphasized that Malaysia still lacks a clear legal framework to support carbon pricing. Although their study focuses on carbon tax, it also shows that the country needs better laws to manage carbon as a tradeable asset. This supports the call for new legislation on carbon trading and storage.

A second key concept is permanence which refers to its durability of stored carbon — the requirement that carbon held in natural ecosystems stays there for a set period (often 25 to 100 years). Permanence is central to the environmental integrity of carbon credits. In legal systems like New Zealand's, permanence is addressed through statutory covenants attached to land titles under the Climate Change Response Act 2002 (Durrant, 2011). Malaysia's forestry and land statutes, however, do not yet include permanence conditions, which means there is a risk that stored carbon may be released back into the atmosphere if the land is cleared, burned, or logged. This could lead to the cancellation or reversal of previously issued carbon credits.

Third, the concept of Measurement, Reporting and Verification (MRV) is crucial to the credibility of carbon storage projects. MRV refers to scientific and administrative processes that estimate, audit, and register carbon stock changes. Credible MRV systems are generally supported by national or international standards such as Verra's Verified Carbon Standard (VCS). VCS is a widely used international standard that sets rules for how carbon credits are measured, reported, and verified. It ensures that emission reductions from projects such as forest conservation or reforestation are real, measurable, and independently audited before credits are issued. Without statutory authority or institutional directives to enforce MRV, Malaysia's voluntary carbon initiatives lack the legal assurance needed to scale constantly (Yusof & Yatim, 2021).

Finally, an effective legal framework for carbon storage requires registry infrastructure to document and track ownership, issuance, and withdrawal of credits. Registries reduce the risk of double counting and support cross-jurisdictional compliance. In Malaysia, no legal registry for carbon units currently exists under national land or environmental laws (Ng et al., 2022), meaning carbon credits remain largely contractual and lack statutory recognition.

Considering the above, the legal basis for carbon storage rests on four interdependent concepts carbon ownership, permanence, MRV, and registry systems. Without embedding these elements in enforceable statutes, carbon storage initiatives face legal uncertainty, weak investor protection, and limited recognition in carbon markets.

METHODOLOGY

This study adopts a qualitative, doctrinal legal research approach to examine the adequacy and limitations of Malaysia's current legal framework governing carbon storage. Doctrinal research is the principal method in legal scholarship and involves systematic identification, interpretation, and analysis of legal sources such as constitutions, statutes, regulations, case law, and policy instruments (Hutchinson & Duncan, 2012). This method is appropriate for the present study, which seeks to critically evaluate whether existing laws in Malaysia provide sufficient legal basis for regulating land-based carbon storage activities. Primary legal sources reviewed include the Environmental Quality Act 1974 (EQA), National Land Code (Act 828), Town and Country Planning Act 1976 (TCPA), and National Forestry Act 1984 (NFA). These statutes were selected because they constitute the core legislative instruments governing environmental protection, land use planning, and forest management in Peninsular Malaysia. Secondary sources, such as government policy documents (e.g., Malaysia's Nationally Determined Contributions and the 12th Malaysia Plan), were also examined to show how Malaysia's climate commitments fit within the current legal framework.

In addition to doctrinal analysis, the research incorporates a comparative legal method, drawing on statutory models and policy frameworks from Australia and New Zealand. These jurisdictions were selected due to their advanced and integrated legal regimes for land-based carbon activities. Australia's Carbon Farming Initiative Act 2011 and New Zealand's Climate Change Response Act 2002 provide understandings into how statutory carbon rights, regulatory enforcement, and land-use compatibility can be legally constructed. The comparison is used not to adopt foreign models directly, but to identify core principles such as clarity of legal definitions, institutional coordination, and ownership of carbon units that may inform legal reform in Malaysia.

No empirical or field-based data were used in this study. Instead, the analysis is grounded in desk-based legal research, with interpretive emphasis placed on legislative language, judicial decisions, and policy instruments. Relevant case law (e.g., Sagong bin Tasi [2002] and Adong bin Kuwau [1997]) is also referenced where appropriate to demonstrate how judicial interpretation of land rights may intersect with emerging carbon-related legal issues. This qualitative methodology enables a focused and critical evaluation of how Malaysian environmental and land law can support or hinder the legal development of carbon storage mechanisms within the broader framework of climate governance.

FINDINGS & DISCUSSIONS

Malaysia's Climate Commitments and Policy Context

Malaysia's national climate strategy is guided by its commitments under the Paris Agreement, ratified in 2016. Through its updated Nationally Determined Contributions (NDCs) submitted in 2021, Malaysia pledged to reduce the greenhouse gas (GHG) emissions intensity of its GDP by 45% by 2030, compared to 2005 levels. Of this, 35% is unconditional using domestic resources, laws, and policies, while the remaining 10% is conditional on international support (NRECC, 2023). The NDC identifies land-based mitigation measures as a cornerstone of its national strategy, specifically highlighting forest conservation, peatland restoration, and sustainable land use practices. These land-based solutions leverage Malaysia's ecological endowments and long-standing forestry policy. Forests and peatlands serve as natural carbon sinks, absorbing and storing large volumes of atmospheric carbon. The NDC commits to maintaining at least 50% of national land area as forest, a pledge consistent with the National Forestry Policy 2020. Forest protection efforts aim not only to avoid emissions from deforestation and degradation but also to enhance long-term carbon sequestration. However, current statutes such as the National Forestry Act 1984 do not define carbon as a forest product or asset, nor do they establish any mechanism for crediting avoided deforestation under legal authority.

Malaysia also emphasises peatland restoration as a climate priority using rewetting, drainage control, and fire mitigation techniques, all of which contribute to preserving underground carbon stocks and reducing emissions from degraded peatlands. Degraded peatlands are among the most significant GHG emitters due to oxidation and fire. Despite its ecological importance, peatland management remains weakly regulated under existing law. The EQA does not classify carbon loss from peat degradation as a pollution offence, nor does it provide for carbon value accounting. In addition, the NDC promotes sustainable land use practices, including agroforestry, low-emissions agriculture, and regenerative land management. These practices seek to retain soil carbon, minimise emissions from land-use change, and align agricultural expansion with climate objectives. Yet, such practices are not legally recognised under the NLC, which does not provide for zoning or tenure arrangements specific to carbon-compatible land uses.

The NDC also references the role of market mechanisms, aligning with the federal government's launch of the Bursa Carbon Exchange (BCX) in 2022 as a voluntary carbon trading platform. However, these initiatives currently operate without a legislative framework defining carbon rights, ownership of emission reductions, or permanence obligations—elements typically found in mature legal regimes. Malaysia's overarching development blueprint, the 12th Malaysia Plan (2021–2025), reinforces the climate agenda by embedding nature-based solutions (NbS) into its policy framework. It promotes land-based mitigation in synergy with economic growth. However, the 12MP remains a policy instrument; it does not carry legal force and does not amend existing land or environmental statutes.

Thus, while Malaysia's policy instruments and international commitments reflect a clear intent to prioritise carbon storage, their implementation remains hindered by legal fragmentation and statutory silence. Without a clear regulatory framework, these land-based climate strategies risk remaining aspirational rather than actionable.

Legal Framework Relevant to Carbon Storage

Malaysia's statutory framework relevant to carbon storage is spread across several legislative instruments: the EQA, NLC, TCPA, NFA and CCUS. These laws govern environmental protection, land tenure, spatial planning, and forest management. However, none of them define or regulate carbon as a legal interest or asset. This section evaluates each statute, highlighting its strengths and limitations in supporting a legal framework for land-based carbon storage.

Environmental Quality Act 1974

The EQA is the principal legislation governing environmental control in Malaysia. It provides for the prevention, abatement, and control of pollution, and empowers the Director General of Environmental Quality

to issue regulations, licenses, and orders. While effective in regulating pollutants such as waste, effluent, and hazardous materials, the EQA does not contain any direct provisions concerning greenhouse gas (GHG) emissions or carbon storage.

In theory, Section 34A of the EQA which requires Environmental Impact Assessments (EIA) for prescribed activities—could apply to large-scale carbon projects involving land conversion or restoration. However, in practice, EIAs are narrowly applied to physical development impacts and do not assess carbon retention, emissions avoidance, or long-term storage permanence (Yaakob & Wook, 2015). Furthermore, the EQA does not define carbon dioxide or methane as pollutants unless they are emitted in association with conventional pollution sources. This omission excludes the proactive regulation of land-based carbon sequestration from its scope.

Scholars have noted that the EQA remains reactive in orientation focused on pollution control rather than climate mitigation. Rizal et al. (2024) stress that even though Malaysia participates in international carbon offset mechanisms, such as REDD+ and voluntary markets through the Bursa Carbon Exchange, these mechanisms operate in a regulatory vacuum because the EQA does not support carbon accounting, monitoring, reporting, or verification (MRV). Without enabling provisions for carbon capture, storage, or offset validation, the EQA cannot support carbon projects with legal certainty.

National Land Code (Act 828)

The NLC is the foundational statute regulating land administration in Peninsular Malaysia. It provides for land alienation, tenure registration, use classification, and dealings. However, the NLC does not include any recognition of carbon-related rights, nor does it enable the classification of land for carbon storage or environmental conservation purposes. Under the NLC, land use categories are typically limited to agriculture, building, industry, none of which clearly encompass carbon offset or sequestration activities.

This creates a major legal gap. A landowner seeking to develop a carbon storage project (e.g., forest preservation, peatland restoration) would not be able to register a carbon interest in the land title, nor could such an interest be assigned, leased, or protected in law. As carbon credits are derived from land-based emissions reductions, the lack of a defined legal interest in “carbon” undermines both private investment and regulatory enforcement.

Additionally, because land use decisions are devolved to state authorities under the Federal Constitution, the classification of land for new purposes such as carbon offsetting would require amendments or direction through the National Land Council. Case law reinforces this challenge. In Sagong bin Tasi v Kerajaan Negeri Selangor [2002] 2 MLJ 591, the High Court recognised the customary land rights of the Orang Asli but reaffirmed that land titles and interests remain under state control, governed by the NLC. This confirms that any legal regime for carbon storage must address state-federal coordination and reform the NLC to enable new forms of land use recognition.

Town and Country Planning Act 1976

The TCPA governs land use planning and zoning in Peninsular Malaysia, enabling local authorities to develop and enforce structure and local plans. These plans designate land for various purposes residential, commercial, industrial, agricultural but do not currently include carbon storage or ecosystem services as legal land uses.

This omission restricts the ability of planners to integrate climate mitigation objectives such as reforestation or forest retention into zoning decisions. For example, even if a landowner intends to conserve forested land for carbon storage, the local plan may designate it for development or agriculture, creating conflicts between climate policy and spatial governance. Planners lack the statutory authority to prioritise carbon retention, and no guidance exists under the TCPA to define how carbon storage might be treated within zoning processes.

Yaakob and Wook (2015) note that the planning process in Malaysia is primarily driven by economic development rather than environmental sustainability, and that environmental land uses are often seen as

constraints rather than assets. Without statutory recognition of carbon as a legitimate planning interest, the TCPA cannot serve as a basis for allocating or protecting land for carbon projects. Nor does it offer any mechanism for buffer zones, permanence obligations, or enforcement of climate-related land management standards.

National Forestry Act 1984

The NFA regulates forest reserves, licensing, forest produce, and forest management planning. Although the Act is critical to forest governance, it does not define carbon or GHGs as forest products, nor does it regulate carbon storage or offsets. Forest reserves are classified by use (e.g., timber production, protection, recreation), and while protection forests serve conservation goals, there is no mechanism in the NFA to credit, monetise, or register carbon outcomes from forest preservation.

Malaysia's NDCs and national policies (such as the National Forestry Policy 2020) emphasise the climate mitigation value of forests. However, without amending the NFA to include carbon sequestration as a forest service, these policies remain aspirational. There is also no enabling provision for community participation in carbon projects or for establishing carbon ownership whether by the state, private entities, or indigenous communities.

The absence of MRV standards or permanence obligations in the NFA is also problematic. For Malaysia to engage meaningfully in the international carbon market, it must demonstrate legal and scientific credibility in accounting for forest-based carbon credits. As Moktshim (2020) points out, the lack of statutory integration between forestry law and climate objectives renders the NFA inadequate for governing modern carbon finance initiatives.

Carbon Capture, Utilisation and Storage Act 2025

In March 2025, Malaysia enacted the CCUS Act, providing a dedicated legal framework for industrial carbon storage. The Act governs the full value chain — from carbon dioxide (CO_2) capture to injection and permanent geological storage — and applies to Peninsular Malaysia and Labuan. It is administered by the Ministry of Natural Resources, Environment and Climate Change (NRECC), with technical input from agencies like the Malaysian Green Technology and Climate Change Corporation (MGTC) (Rani et al., 2025).

The Act introduces a licensing regime for project developers and operators, with provisions for safety monitoring, environmental oversight, and long-term storage verification. In contrast to land-based carbon projects, CCUS is now legally supported by a structured permitting system, creating a clearer investment pathway for industrial decarbonisation.

However, several legal and technical uncertainties remain. The Act does not yet clarify:

1. How long CO_2 must remain underground to be considered "permanently stored";
2. Who holds post-closure liability if leakage occurs decades later; and
3. Ownership rights over carbon storage "pore space" — whether it belongs to the state, private landowners, or license holders.

These gaps raise important concerns over enforceability and investor protection. Experts from University Malaya and MGTC have urged policymakers to address these ambiguities before full-scale implementation. Furthermore, while the Act represents progress in industrial carbon governance, land-based carbon storage — including forest and peatland initiatives still lacks any comparable statutory framework. For instance, where the CCUS Act outlines licensing, registry, and permanence obligations for industrial CO_2 storage, similar provisions could be adapted into land laws such as the National Land Code or the National Forestry Act to support forest-based carbon governance.

This contrast shows the urgency of extending legal recognition to carbon stored in global ecosystems. Lessons from the CCUS Act such as the need for clear definitions, liability rules, and registry systems should inform future legislation on land-based carbon management.

Comparative Legal Models: Australia and New Zealand

Both Australia and New Zealand have implemented comprehensive legal frameworks for carbon storage and emissions reduction, particularly through forestry and land use. These frameworks recognise carbon rights as legally enforceable interests in land, supported by measurement, verification, and registry systems. In contrast to Malaysia's fragmented administration, these countries offer models of how carbon storage can be effectively integrated into environmental, property, and planning law.

Australia: Carbon Farming and Legal Certainty

Australia's Carbon Credits (Carbon Farming Initiative) Act 2011 (CFI Act) is the foundation of its land-based climate governance. It establishes a statutory scheme for generating Australian Carbon Credit Units (ACCUs) through approved activities such as reforestation, soil carbon enhancement, and avoided deforestation. One of the Act's key features is the recognition of carbon as a proprietary right, separable from the underlying land (Geroe, 2022). Section 87 of the CFI Act enables landholders or project developers to register legal interests in carbon capture, and those interests can be transferred, assigned, or used to generate tradeable credits. It is similar to how a land title works. Once a project is verified and approved, a government authority or regulator issues a certificate or registers carbon units to the project owner. These credits can then be sold or traded, just like shares or land parcels, through a national carbon registry. The Act also orders compliance with permanence obligations, requiring carbon to be stored for at least 25 or 100 years, depending on the project category. These obligations are legally enforceable by the Clean Energy Regulator.

Australia also developed a public emissions registry to track carbon units and ensure transparency. The system integrates MRV protocols into statute, reducing the risk of double counting or unverifiable offsets (Durrant, 2011). In contrast, Malaysia lacks a central authority with statutory power to certify or enforce permanence of carbon storage. Moreover, Australian case law and statutory practice have evolved to include carbon covenants on land titles, allowing carbon interests to be preserved across land transfers. This explains land tenure for investors and forest-dependent communities. In short, Australia's model demonstrates how legal certainty, enforceable rights, and technical verification can be organized into environmental law.

New Zealand: Forest Carbon and Emissions Integration

In New Zealand, forest carbon is also treated as a legal asset. Under the Climate Change Response Act 2002, landowners with eligible forests are allocated New Zealand Units (NZUs), which are issued and tracked through the national Emissions Trading Register. These units represent the amount of carbon stored and can be sold or surrendered under the national emissions trading scheme (Leining, Kerr, & Bruce-Brand, 2020).

The NZ ETS covers both pre-1990 and post-1989 forests, providing incentives for forest retention and reforestation. One innovative feature is that it allows forest carbon owners to trade credits while ensuring liability for reversals, that is, if the carbon is later released due to deforestation, the owner must return or replace the credits. This creates a strong legal basis for permanence.

Carbon rights in New Zealand are registrable under the Land Transfer Act 2017, enabling separation of carbon rights from other land uses. Additionally, the Environmental Protection Authority (EPA) plays a central regulatory role by reviewing and approving carbon storage projects, verifying that the carbon captured is accurately measured, and managing the national carbon registry. This registry tracks the issuance, ownership, and withdrawal of carbon units to ensure transparency and prevent double counting.

New Zealand's legislative clarity has promoted strong private-sector engagement and transparency. Legal scholars have praised its model for blending environmental regulation with property law principles, ensuring that carbon projects are not weakened by unclear land tenure or administrative uncertainty (Chaplow, 2022; Johnston & France-Hudson, 2019).

As a comparison, Malaysia's experience with the CCUS Act could enlighten the structure of a future Carbon Storage Act for land-based offsets. Consistent regulatory frameworks for both ecological and natural carbon

storage are important to ensure consistency in enforcement and credit integrity. As both Australia and New Zealand have established strong legal administrations that integrate carbon rights into land, environmental, and climate legislation, their experiences offer valuable lessons for legal reform of carbon storage development in Malaysia.

Adopting Australia & New Zealand's Models in Malaysia

As a common law country, Malaysia stands to benefit significantly by adopting the legal frameworks in Australia and New Zealand as regards carbon storage and emission reductions. As discussed above, both countries have successfully integrated carbon rights into their environmental, property, and planning laws, offering a coherent and enforceable system for land-based climate governance. The persuasive authority of laws from common law jurisdictions like Australia and New Zealand was upheld in *Commonwealth of Australia v Midford (Malaysia) Sdn Bhd* [1990] 1 MLJ 475. The Court referred to common law principle post cutoff date of 7 April 1956 and observed that common law and rules of equity as applied in this country must not remain static and do not develop. Thus, in areas where domestic law remains underdeveloped like in carbon storage and emissions reduction, reference to the Australian and New Zealand's frameworks could provide a valuable blueprint for reform in Malaysian environmental law.

Despite the persuasive value of the models and their sophisticated environmental governance, Malaysia could face several challenges in adopting them. One major barrier is the absence of a unified carbon registry which may hamper transparency and accountability in carbon credit issuance and trading. Besides, unclear land tenure systems particularly in indigenous and forested areas also would complicate the registration and enforcement of carbon rights. Besides, the limited legal recognition of carbon as proprietary interest and the lack of mechanism to separate carbon rights from land ownership, it would restrict the development of a robust carbon market. The fragmented regulatory oversight with Sarawak having its own Land (Carbon Storage) Rules 2022 and Sabah with its Climate Change and Carbon Governance Enactment 2025 may complicate the legal system. A lack of unified framework in West and East Malaysia may create inconsistencies in enforcement and hampers private sector investment.

Another snag is the enforceability of carbon contracts in Malaysia which is still a developing area of law. Although the CCUS Act 2025 provides a legal framework for industrial carbon storage, it does not yet extend to land-based carbon rights or offset agreements. This legal gap raises concerns about the enforceability of carbon contracts, especially where land tenure is unclear or where carbon rights are not formally recognised under the National Land Code. Without statutory recognition, contractual obligations related to carbon sequestration, such as permanence, reversibility, and credit ownership, may be difficult to enforce in court, undermining investor confidence and long-term project viability.

In term of community participation in carbon projects, it may face challenges especially in rural and indigenous areas. While Malaysia has committed to inclusive climate action through initiatives like the Kuala Lumpur Sustainability Summit (KLSS), local communities often lack access to legal, financial, and technical resources needed to engage meaningfully in carbon offset schemes. This is compounded by the absence of benefit-sharing mechanisms and statutory safeguards for indigenous land rights, which can result in exclusion or exploitation (Malaysian Green Technology and Climate Change Corporation, 2025).

Besides, private land rights are governed by National Land Code 1965 in Peninsular Malaysia, Land Ordinance (Sabah Cap. 68) 1950 and Sarawak Land Code (Cap. 81) 1958. Meanwhile, land acquisition of land is covered under the Land Acquisition Act 1960, Land Acquisition Ordinance (Sabah Cap. 69) 1950, and Part IV of the Sarawak Land Code (Cap. 81) 1958 (Valuation and Property Services Department, n.d.). Although the land acquisition statutes allow for compulsory land acquisition, they do not yet accommodate carbon-related land use classifications.

To ensure effective implementation, Malaysia must address cross-jurisdictional coordination, enhance technical and legal capacity, and develop clear guidelines for carbon rights registration and transfer. Drawing from the legal certainty and integrated governance seen in Australia and New Zealand, Malaysia can build a credible and functional carbon storage regime. The adoption of these models, supported by the persuasive

authority of Commonwealth legal systems under the Civil Law Act 1956, offers a promising pathway for reform in Malaysia's environmental and property law landscape.

CONCLUSION & RECOMMENDATIONS

A. Conclusion

As Malaysia strengthens its role in global climate negotiations and seeks to grow its domestic carbon market, the legal system must advance to provide certainty, clarity, and enforcement capacity. Currently, carbon storage remains a legally undefined activity, creating risks for landholders, investors, and regulators alike. The recent introduction of the CCUS Act 2025 represents a significant milestone in Malaysia's efforts to regulate industrial carbon emissions. However, it also highlights the urgent need for equally strong and effective legislation for land-based carbon storage—such as forest conservation and peatland protection—to avoid regulatory imbalance and to ensure that all forms of carbon mitigation are supported by clear, enforceable legal frameworks.

An effective legal regime is urgently needed that integrates climate, land, forestry, and planning laws under a unified legal and institutional platform. Applying lessons from Australia and New Zealand, Malaysia should consider immediate legal reforms that:

1. Define carbon rights and enable registration,
2. Create binding MRV frameworks,
3. Align land use classifications with climate goals,
4. Expand forestry law to recognise carbon productivity, and
5. Establish a statutory national carbon registry.

Without such reforms, Malaysia's striving emissions targets and forest-based mitigation strategies may risk being compromised by administrative inconsistencies, legal uncertainty, and policy fragmentation. Legal reform is no longer optional; it is essential for credible climate governance.

Thus, it is clear that in addition to their land-based frameworks, both Australia and New Zealand have also advanced statutory regimes for industrial carbon storage. Australia regulates geological storage through the Offshore Petroleum and Greenhouse Gas Storage Act 2006, while New Zealand provides guidance under its Climate Change Response Act 2002. These legal instruments define storage rights, licensing, and liability for underground CO_2 storage—like Malaysia's newly enacted CCUS Act 2025. Drawing from these jurisdictions, Malaysia's CCUS model could evolve further to ensure long-term environmental safeguards and concurrently inspire legal clarity for land-based carbon governance.

B. Recommendations

Malaysia's current statutory landscape is underdeveloped in relation to carbon storage activities. Despite its commitments under the Paris Agreement and the formulation of Nationally Determined Contributions (NDCs), the legal basis for recognising carbon as a land-related interest or environmental asset remains absent. The following recommendations are proposed to build a credible legal framework that supports Malaysia's climate and development goals.

Recognising Carbon as a Legal Interest in Land

One of the most pressing legal gaps is the absence of recognition for carbon rights. In countries like Australia and New Zealand, the law defines sequestered carbon as a proprietary or registrable right that can be separated from landownership, traded, and monitored. In Malaysia, however, carbon particularly land-based carbon is not legally recognised as an interest or output, even in protected areas or peatlands.

This is significant as without legal recognition, carbon storage projects cannot be protected under land law or enforced through contractual or administrative mechanisms. For instance, land leased for conservation could be revoked or rezoned without legal recourse. Introducing carbon rights either through amendment to the NLC or via a standalone Carbon Rights Act would be a critical step. This would allow for registration of carbon interests, assignment of responsibility, and attraction of private investment. As prescribed under Australia's Carbon Farming Initiative Act 2011, it allows carbon rights to be registered and attached to land titles, even if separate from the owner which Malaysia should consider applying (Geroe, 2022).

Establishing a Legal Framework for Monitoring and Verification (MRV)

Currently, Malaysia lacks statutory MRV requirements for carbon offsets. Although Bursa Malaysia has launched the Bursa Carbon Exchange (BCX), participation is voluntary and lacks comprehensive government oversight. There are no laws directing carbon durability, independent verification, or reversal liability in case of forest loss or project failure. To ensure legitimacy, MRV protocols must be legally addressed. This could be done through an amendment to the Environmental Quality Act 1974, by empowering the Department of Environment to certify projects, set monitoring guidelines, and ensure reporting consistency. Australia and New Zealand provide clear statutory MRV regimes. In the absence of such a framework, Malaysia may face both credibility challenges and regulatory ambiguity in its carbon market efforts.

Clarifying Land Use Classifications for Carbon Activities

Under Malaysia's NLC and TCPA, land uses are limited to fixed categories such as agriculture, residential, industrial, commercial, and forestry. There is no formal recognition of land set aside for environmental use, in particular for carbon storage, forest conservation, or emissions offsetting. This leads to legal ambiguity when projects attempt to reclassify agricultural or state land for conservation. In order to address this issue, amendments to the NLC is vital. Such amendments may include introducing a new land use category for environmental use or carbon storage. Or alternatively, to create a sub-category under the existing category such as "Agricultural – Forest Carbon Conservation". Another option would be, to allow the State Authority to impose a special condition or express condition on the land title by permitting the land to be used for carbon sequestration use. Planning legislation should be revised to allow local and structure plans to designate "climate mitigation zones" or "carbon reserve lands", particularly for forest-rich states such as Pahang, Kelantan, or Johor. Amendments to the TCPA would give local governments statutory authority to protect areas for carbon value, as how development zones are protected for commercial value.

Reforming the National Forestry Act 1984

Although forests are central to Malaysia's NDCs, the National Forestry Act 1984 does not define carbon as a forest service or product. The Act focuses on timber licensing and reserve boundaries, not on ecosystem services. This is inconsistent with the National Forestry Policy 2020, which identifies forest carbon as a climate asset. A clear amendment is needed to include:

1. Definition of forest carbon as a measurable and reportable output,
2. Guidelines for revenue-sharing from carbon projects (especially involving Orang Asli and rural communities),
3. Statutory integration of REDD+ or voluntary carbon market protocols, including safeguards and reversibility measures.

Such reforms would ensure fair arrangement between forest law and climate finance, as well as strengthen community participation.

Establishing a Centralised Carbon Registry

Malaysia currently lacks a national statutory carbon registry. A central registry is crucial for avoiding double-counting, enabling project verification, and ensuring market transparency. Ideally, this registry should be

administered by an independent regulator potentially under the Ministry of Natural Resources and Environmental Sustainability (NRES) and arranged through legislation, not only Bursa Malaysia. In New Zealand, it's Emissions Trading Scheme operates with a statutory registry under the Environmental Protection Authority, where all carbon units and ownership records are maintained. Introducing a similar system would enhance the legal credibility and transparency of Carbon reduction initiatives in Malaysia.

Aligning Land-Based and Geological Carbon Governance

The recent enactment of the CCUS Act in 2025 provides a statutory framework for industrial carbon storage, including licensing, monitoring, and post-closure liability. While this is a milestone in regulating geological carbon storage, it risks creating an imbalance if land-based carbon initiatives remain legally undefined. Malaysia should ensure that land-sector improvements particularly on carbon rights, MRV, and credit registries. They should be aligned with the structure introduced under the CCUS Act. A harmonised legal approach would strengthen both policy coherence and investor confidence across all carbon mitigation strategies.

Model Legal Provisions

Pursuant to the above recommendations, the following model legal provisions are suggested:

Table 1: Model Provisions for Carbon Governance in Malaysia

Suggested amendment	Model provision	Recommended legislative instrument
Recognition of carbon as a legal interest in land	(1) A "carbon right" shall be deemed a registrable proprietary interest in the sequestration, storage, or avoidance of carbon emissions associated with land. (2) Such right may be created, transferred, assigned, or registered independently of land ownership. (3) The Registrar shall enter carbon rights in the land register, binding on successors in title.	Amend National Land Code (NLC) or enact a Carbon Rights Act
Introduction of framework for monitoring and verification (MRV)	(1) All carbon offset projects shall comply with MRV protocols prescribed by the Director General of Environment. (2) The Department shall certify MRV entities and issue guidelines for verification, permanence, and reversal liability. (3) Non-compliance shall render the project ineligible for credit issuance and subject to penalties of RMXXXXXX	Amend Environmental Quality Act 1974
Clarification of land use classification for carbon activities	(1) Land may be classified or reclassified for carbon sequestration or environmental conservation. (2) The State Authority may impose a special condition permitting carbon storage use. (3) Local plans may designate "Carbon Reserve Lands" or "Climate Mitigation	Amend NLC and Town and Country Planning Act 1976

	Zones" as protected uses.	
Recognition of forest carbon	(1) Forest carbon shall be recognised as a measurable and reportable forest output. (2) Guidelines shall be issued for licensing, monitoring, and benefit-sharing with indigenous communities. (3) Regulations may prescribe REDD+ integration and safeguards for voluntary carbon markets.	Amend National Forestry Act 1984
Centralised carbon registry	(1) A National Carbon Registry shall be established under the Ministry of NRES. (2) The Registry shall record issuance, ownership, transfer, and retirement of carbon credits. (3) Only credits registered herein shall be recognised for trading or compliance.	Enact a Carbon Registry Act
Aligning Land-Based and Geological Carbon Governance	(1) All laws and regulations governing land-based carbon sequestration shall be interpreted and applied in a manner consistent with the Carbon Capture, Utilisation and Storage Act 2025. (2) It shall include alignment of licensing procedures, monitoring and verification standards, permanence obligations, and liability provisions. (3) The Minister shall issue consolidated guidelines to ensure coherence between geological and land-based carbon governance, which shall be binding on relevant authorities and project developers.	Amend CCUS Act 2025

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