

Blue Carbon Legal Reform in Indonesia: Institutionalizing Seagrass as a Critical Natural Capital

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Abstract. *Blue carbon governance through Presidential Regulation No. 98/2021 and Ministry of Marine Affairs and Fisheries Regulation No. 1/2025 positions seagrass beds as essential carbon sinks for meeting Nationally Determined Contribution (NDC) targets. However, seagrass bed emission baselines have not been standardized within the National Registry System (SRN PPI) due to overlapping regulatory mandates. This situation is exacerbated by a normative antinomy: conservation instruments are sidelined by spatial planning regulations (the Job Creation Law and Government Regulation No. 21/2021) that legalize the conversion of conservation zones for National Strategic Projects (PSN). Using a legal-normative approach, this study finds that these legal contradictions legitimize "Weak Sustainability," which assumes that natural capital is substitutable. This legal loophole triggers reversal risk, undermining the validity of NDC mitigation and enabling ocean grabbing. As a solution, this study recommends institutionalizing seagrass beds as Critical Natural Capital (CNC) at the statutory level to achieve Strong Sustainability. This status of being absolutely irreplaceable (non-substitutable) will tighten the requirements for PSN exemptions, necessitate cross-ministerial synchronization of Measurement, Reporting, and Verification (MRV) based on TACCC, and integrate High Quality Blue Carbon Principles through community-based conservation instruments (OECM) and Free, Prior, and Informed Consent (FPIC) to ensure the nation's ecological justice.*

Keywords: *Blue Carbon, Critical Natural Capital, Nationally Determined Contribution; Sustainability.*

1. Introduction

Indonesia plays a vital role in global climate change mitigation, as reflected in its Nationally Determined Contribution (NDC) commitments to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. As an archipelagic nation, Indonesia can leverage coastal ecosystems, particularly

seagrass beds, as a national asset for climate mitigation. Seagrass beds are coastal ecosystems consisting of expanses of flowering plants that thrive on the seabed in shallow waters. Given that they are predominantly located in coastal areas, these ecosystems fall entirely under the management authority of the Ministry of Marine Affairs and Fisheries (KKP). This ecosystem can store up to 600 tons of carbon per hectare, absorbing carbon 30–50 times faster than terrestrial forests (Alongi et al., 2016; Kwan et al., 2025). Currently, Indonesia holds approximately 17% of the world's blue carbon reserves, making it the most significant marine carbon sink globally (Indonesia Ocean Justice Initiative [IOJI], 2023).

To optimize this potential, the government must implement a Measurement, Reporting, and Verification (MRV) mechanism. MRV is a fundamental system for measuring, reporting, and verifying data on greenhouse gas (GHG) emissions reductions and increased carbon sequestration, transparently and accurately, to avoid double-counting. However, the integration of seagrass meadows into this MRV system remains severely lagging. To date, seagrass meadows lack nationally recognized baseline emission data and are not yet recorded in the National Registry System for Climate Change Mitigation (SRN PPI) (Sidik et al., 2023).

Furthermore, only about 34% of Indonesia's total seagrass meadow area is currently located within Conservation Zones (Estradivari et al., 2022). The remainder lies outside protected areas and is highly vulnerable to land-use conversion. Nevertheless, seagrass meadows outside these protected areas can, in principle, still be protected through Other Effective Area-based Conservation Measures (OECMs).

This vulnerability is exacerbated by the fact that seagrass coverage at 37 sites declined by 19% over just 3 years, primarily due to infrastructure projects and extractive activities (Global Green Growth Institute [GGGI], 2025; Rifai et al., 2023). Policies in the marine sector, such as the Ministry of Marine Affairs and Fisheries Regulation No. 1 of 2025 (Permen KP 1/2025), have sought to protect the role of seagrass meadows within the Carbon Economic Value mechanism. However, its implementation creates textual conflicts of norms. Government Regulation No. 21 of 2021 on Spatial Planning and the Job Creation Law contains an exception clause that permits the rezoning of core conservation areas for National Strategic Projects (PSN).

Within the legal hierarchy established by Article 7 of Law No. 12 of 2011 on the Formation of Regulatory Instruments, Ministerial Regulations rank lower. Consequently, sectoral protection measures under the Ministerial Regulation can be easily overridden by higher-ranking regulations. This demonstrates that Indonesia's positive legal framework remains dominated by the Weak Sustainability paradigm. The Weak Sustainability paradigm views natural capital as

a substitute commodity that can be replaced by human-made capital, such as technology, infrastructure, or financial compensation (Hajiyev, 2021; Pan, 2023).

As a concrete example of the Weak Sustainability paradigm in action, the issuance of nickel mining permits on Wawonii Island continues to be prioritized for investment purposes, disregarding ecological functions and threatening coastal sustainability. In fact, Article 35(k) of Law No. 27 of 2007 on the Management of Coastal Areas and Small Islands (PWP3K Law) explicitly prohibits mineral mining that, from a technical, ecological, social, and/or cultural perspective, causes environmental damage. This fragile legal protection creates a fatal "permanence risk." Damage to seagrass beds will release stored carbon back into the atmosphere, directly contradicting Article 4(13) of the Paris Agreement, which mandates integrity, transparency, and accuracy in emissions reporting (Kwan et al., 2025).

To mitigate the risk of NDC failure, an absolute shift toward the Strong Sustainability paradigm is required. This paradigm affirms that nature possesses essential, non-substitutable life-support functions. This aligns with Article 33, Paragraph (4) of the 1945 Constitution (UUD), which mandates that the national economy be organized based on the principles of sustainability and environmental awareness. The core concept of Strong Sustainability is the designation of specific natural elements as Critical Natural Capital (CNC). It is important to understand that not all seagrass beds automatically qualify as CNC. The state, through its authority under Article 33, paragraph (3), of the 1945 Constitution, designates CNC status only for ecosystems that meet scientific criteria such as healthy cover, high carbon stock, and threat level.

The CNC concept has been mentioned in several previous studies (IOJI, 2023). However, this study offers novelty because no prior literature has specifically analyzed the legal implications of the issuance of Ministry of Marine Affairs and Fisheries Regulation No. 1/2025 in the context of normative antinomy regarding spatial planning exceptions. Therefore, this study examines the legal urgency of institutionalizing the CNC status for seagrass beds as a guarantee of absolute protection, to resolve overlapping jurisdictions and accelerate the standardization of Indonesia's MRV NDC.

2. Research Methods

This study is a prescriptive, normative legal study proposing reforms to Blue Carbon governance in Indonesia. The study focuses on resolving the normative antinomy between seagrass bed protection regulations and national strategic development policies. This study employs four approaches: the statutory approach to examine the hierarchy of norms; the conceptual approach to develop a Strong Sustainability framework; the comparative approach by reviewing best

practices in Ecuador, Australia, the United Kingdom, and the United States; and the policy approach.

3. Result and Discussion

3.1 Inconsistencies in Seagrass Protection Laws: Analysis of Normative Conflicts and Risks to NDC Permanence

Seagrass beds are a strategic climate asset that plays a central role in Indonesia's Blue Carbon development (Ekaptiningrum, 2023). To realize this potential, the Ministry of Marine Affairs and Fisheries issued Regulation No. 1/2025 as the legal foundation for the Carbon Economic Value (CEV) framework in the marine sector. This regulation serves as the legal foundation for the Seagrass Bed Carbon Economic Value (CEV) framework while reflecting the marine sector's commitment to the NDC mitigation agenda. Furthermore, Indonesia's Second Nationally Determined Contribution (SNDC) 2025 has explicitly integrated Blue Carbon ecosystems into the national mitigation agenda, demonstrating the state's formal recognition of the strategic value of these ecosystems in achieving global climate targets.

However, these normative protection efforts face structural challenges due to inconsistencies in the hierarchy of national laws and regulations. A conflict of norms (antinomy) arises from the existence of exemption clauses in higher-level regulations, such as the Job Creation Law and Government Regulation No. 21 of 2021 (Indonesia Ocean Justice Initiative, 2023). The following table illustrates how these higher-level norms conflict with one another, creating gaps in environmental protection.

Table 1. Normative Conflicts in Legislation

1.	Law No. 6 of 2023 (Job Creation) amends Law No. 26 of 2007 (Spatial Planning)	Art. 34A	PSN projects may still proceed even if not yet incorporated into spatial or zoning plans.	The zoning that establishes seagrass areas as conservation zones can be set aside for the implementation of the PSN.
2.	Government Regulation No. 21 of 2021 concerning Spatial Planning	Art. 127 paragraph (6) letter a	Activities in the Core Conservation Area are exempt from those of national strategic importance.	Seagrass located in the core conservation zone loses legal protection if affected by PSN.
3.	Ministerial Regulation No. 1 of 2025 concerning the Conduct of Carbon Economy in the Marine Sector	Art. 4 paragraph (2)	Mandates blue carbon management, including land management to maintain the area and increase ecosystem diversity.	This regulation is weak because it is hierarchically overridden by exemption clauses in the above Government Regulations and Laws.

Table 1. illustrates the inconsistencies in Indonesia's spatial planning and environmental legal system. Although Ministerial Regulation No. 1/2025 seeks to protect seagrass beds from damage, its mandate is rendered ineffective by Article 34A of the Job Creation Law and Article 127 (6) of Government Regulation No. 21/2021. Consequently, this regulatory framework legally facilitates and justifies the conversion of core zones within coastal conservation areas, including seagrass beds. This legal loophole allows infrastructure and extractive interests to override conservation priorities (Sagala et al., 2021).

Given that coastal ecosystems are highly vulnerable, the existence of this exemption clause also disregards Supreme Court Decision No. 57 P/HUM/2022. That decision explicitly classifies mining in coastal areas as highly dangerous (abnormally dangerous) activities. Furthermore, the clause exempting the use of Spatial Planning for PSN also undermines environmental carrying capacity. It violates the constitutional right to a good and healthy environment as guaranteed in Article 28H of the 1945 Constitution.

The application of legal exemptions for this development project underscores the strong grip of the "Weak Sustainability" paradigm within Indonesia's positive law. With only 43% of "healthy" seagrass beds remaining in Indonesia, the perspective of this substitution is highly dangerous for ecological stability (Supriyadi et al., 2018). Legalizing damage to the remaining healthy ecosystems is tantamount to creating a permanent ecological deficit.

The regulatory inconsistencies that legalize this land-use conversion directly increase the risk of carbon reversal (permanence risk). Within the NDC climate mitigation framework, permanence is an absolute requirement, requiring that ecosystems sequester carbon for 25 to 100 years (Fatimah, 2024). However, when seagrass beds are converted or damaged for the National Strategic Projects (PSN), these ecosystems undergo a functional reversal. From initially functioning as carbon sinks, they become massive sources of greenhouse gas emissions. Estimates indicate that seagrass damage triggers the release of carbon back into the atmosphere, with releases ranging from 5.62 to 8.40 tons of carbon per hectare per year (Wahyudi et al., 2020; Kwan et al., 2025).

These carbon releases resulting from overlapping regulations directly undermine Indonesia's mitigation claims. Unfortunately, regulatory harmonization is not feasible; therefore, higher-level regulatory revisions are necessary. Without revisions to laws or government regulations that lock in protected status, Indonesia's climate change commitments will remain in the shadow of failure. Furthermore, the integrity of Indonesia's climate change commitments can be salvaged by shifting the paradigm toward Strong Sustainability through institutionalizing the status of seagrass meadows as an absolutely protected asset.

3.2 Absence of Critical Natural Capital (CNC) Status: Philosophical Implications for Blue Carbon Governance

The fundamental problem underpinning the fragility of seagrass meadow protection in Indonesia is the lack of recognition of Critical Natural Capital (CNC) status within the positive legal system. As a biological justification for the absolute protection of seagrass meadows, their extremely high ecological vulnerability must be emphasized. Although seagrass meadows can be restored, damage to their functions is not easily reversed (irreversible).

The absence of this absolute protection is exacerbated by the status of Conservation Zones, which currently serve only as administrative spatial protections that the government can alter or exempt. In contrast, CNC status constitutes absolute protection inherent to the physical ecosystem itself. Pursuant to Article 33 (3) of the 1945 Constitution, the state has the authority to designate Seagrass Meadows that meet strict scientific criteria, such as healthy extent and high carbon stocks, as CNC areas. Recognition of this CNC status gives rise to clear legal consequences, namely a ban on the issuance of any land-use conversion permits and the application of Strict Liability for parties that damage it.

The absence of this CNC status triggers various legal and institutional implications, which can be outlined as follows:

a. Review of the Paris Agreement and International Tribunal for the Law of the Sea (ITLOS) Advisory Opinion 2024

A philosophical void in national law not only affects the domestic level but also has the potential to undermine Indonesia's international obligations. The international legal regime, through Article 5, paragraph (1), of the Paris Agreement mandates that countries conserve carbon sinks, including marine ecosystems. This provision transforms the Blue Carbon protection status from a voluntary policy into a legally binding obligation.

The importance of the CNC concept has become increasingly relevant and urgent following the ITLOS Advisory Opinion in Case No. 31 of 2024. The Court affirmed that greenhouse gas (GHG) emissions from human activities are now considered marine pollution. Consequently, states bear a strict legal duty (due diligence) to prevent all adverse impacts of climate change. If Indonesia does not immediately secure CNC status to protect seagrass beds fully, the country risks being found in breach of international law for allowing this climate-protection asset to be sacrificed to development.

Technically, the Intergovernmental Panel on Climate Change (IPCC) has provided standard guidelines for GHG inventories through the 2013 Wetlands Supplement (Schindler Murray et al., 2023). Unfortunately, national policies that still rely on

the "Weak Sustainability" paradigm often prioritize short-term economic gains over ecological value (Mulya et al., 2025). Therefore, implementing the CNC status is key to aligning carbon governance with global standards, ensuring that Indonesia's emission-reduction claims in its NDC remain valid and accountable.

b. Fragmentation of Authority and Institutional Failure

The lack of recognition of Seagrass Meadows as CNC directly exacerbates the complexity and overlap of regulatory mandates governing authority in Blue Carbon governance. The position of blue carbon ecosystems at the land-sea interface creates overlapping mandates between the Ministry of Environment (KLH) and the Ministry of Marine Affairs and Fisheries (KKP). KKP holds the mandate for managing marine space and coastal resources. At the same time, KLH leads the national GHG emissions inventory (SRN PPI) and holds authority over the 2030 FOLU Net Sink target.

Without a CNC status framework that unifies protection standards within a higher regulatory hierarchy, both ministries are forced to operate sectorally under their respective regulatory mandates. This overlap has a detrimental impact on the standardization of Measurement, Reporting, and Verification (MRV) methods for seagrass meadows. Consequently, baseline data on seagrass carbon sequestration is often left blank or not yet recognized in a unified manner within the National Climate Change Control Registry System (SRN PPI). The institutionalization of the CNC is crucial to resolving this disparity, as this status will compel the synchronization of data and a single-point MRV methodology between the Ministry of Environment and Forestry (KLH) and the Ministry of Marine Affairs and Fisheries (KKP) to align with the Transparency, Accuracy, Consistency, Completeness, and Comparability (TACCC) standards mandated by the IPCC.

c. Mangrove Case Study: Evidence of Weak Sectoral Protection

The fragility of sector-based protection is evident in the case of mangrove ecosystems. Indonesia possesses the world's largest mangrove forests, spanning 3.4 million hectares, equivalent to 20% of the global mangrove total. Mangrove protection has, in fact, been addressed through various established instruments, including Law No. 41 of 1999 on Forestry, Law No. 27 of 2007, as amended by the PWP3K Law, and the establishment of the Peatland and Mangrove Restoration Agency (BRGM).

Despite existing regulations, mangrove ecosystems continue to fall victim to legal loopholes. The case of the Tanjung Sauh Special Economic Zone (SEZ) development in Batam demonstrates this, where industrial reclamation activities legally destroyed approximately 10 hectares of carbon-absorbing mangrove forest and damaged the surrounding waters. This destruction disrupts the ecological chain,

directly displacing the Sea Nomads and traditional fishermen who have lost their fishing grounds.

A similar pattern is evident in the Centre Point of Indonesia (CPI) reclamation case in Makassar, an empirical example of "Ocean Grabbing," in which the seizure of coastal communities' marine spaces is legitimized by state law for commercial land-use planning. If mangrove ecosystems, which already have an institutional protection framework (BRGM) and are included in the national climate scheme, can still be sacrificed for the sake of strategic project exemptions, then the existence of seagrass beds, whose specific protection remains minimal, will be far more threatened without the institutionalization of CNC status.

Therefore, for seagrass beds located outside Conservation Zones (currently, only 34% are within conservation areas), the institutionalization of CNC must be accompanied by Other Effective Area-based Conservation Measures (OECMs). Through the integration of co-management and the principle of Free, Prior, and Informed Consent (FPIC), local communities are recognized as having management rights, thereby enabling them to block Ocean Grabbing and ensure that the protection of coastal ecosystems proceeds hand in hand with social justice.

3.3 Legal Solution: Institutionalizing the CNC Status of Seagrass for NDC Accountability

Integrating the seagrass meadow ecosystem into Indonesia's NDC commitments requires legal reforms that go beyond mere economic valuation, as stipulated in the Ministry of Marine Affairs and Fisheries Regulation No. 1/2025. Structural reforms are needed to strengthen the status of the seagrass bed ecosystem as an essential national asset. The absence of absolute protection leaves seagrass beds vulnerable to exemptions from spatial planning in the name of development. Therefore, based on comparative analysis and domestic urgency, this legal solution is formulated into four strategic steps:

a. Country Comparison: Paradigm Shift Towards Strong Sustainability

Currently, Indonesia is only at the stage of market-oriented carbon governance (Ministerial Regulation No. 1/2025), but it lags in essential ecological safeguarding mechanisms. As a reference for reform to achieve Strong Sustainability, Indonesia needs to adopt constitutional and regulatory approaches from the following countries:

1) Ecuador

Ecuador and Indonesia share fundamental similarities as developing countries organized as unitary states whose economies remain heavily dependent on the exploitation and extraction of natural resources (extractive industries/mining).

However, unlike Indonesia, Ecuador has adopted a "Strong Sustainability" approach by boldly recognizing the Rights of Nature in its constitution. Articles 406 and 407 of the 2008 Ecuadorian Constitution explicitly prohibit the extraction of non-renewable natural resources in fragile ecosystems such as mangroves and coastal marine ecosystems. Exceptions to this prohibition on land-use conversion are permitted only if declared a "matter of national interest" by the National Assembly (DPR) and must undergo a public referendum. This system ensures that nature protection is constitutionally enshrined and is extremely difficult to override for short-term political interests (Indonesia Ocean Justice Initiative [IOJI], 2023).

As a model for national legal systems, Ecuador's approach sets an important precedent for limiting government discretion. In Indonesia, the conversion of coastal areas is often implemented unilaterally (top-down) through the designation of National Strategic Projects (PSN) by the executive branch. Therefore, Indonesia needs to strengthen seagrass protection by revising the Law on the Management of Coastal Areas and Small Islands (PWP3K Law) or the Spatial Planning Law. This update requires that any revocation of the protected status of seagrass areas is legally invalid without extraordinary approval at the legislative level (DPR RI), to ensure the principles of transparency and public accountability (checks and balances) are upheld.

2) Australia

Australia and Indonesia are two giant coastal/island nations that collectively dominate the world's blue carbon reserves, with Indonesia holding 17% of global reserves and Australia approximately 12% (Alongi et al., 2016; Schindler Murray et al., 2023). Although it does not use the CNC nomenclature, Australia has explicitly included its coastal wetland ecosystems in the National Greenhouse Gas Inventory and the Emissions Reduction Fund, in accordance with IPCC guidelines. This status provides de facto protection because ecosystems are economically valued as vital national assets, meaning their degradation is considered a real national loss.

In Indonesia, carbon sequestration from seagrass beds is often not fully recorded in the National Registry System (SRN PPI). Adapting Australia's approach, Indonesian law needs to legitimize seagrass bed inventory data as legally binding national assets. Thus, damage to this ecosystem is not merely viewed as a zoning violation but can be prosecuted as an act that harms the nation's strategic and financial assets. However, to optimally realize this marine data synchronization, Indonesia first requires technological investment and international assistance.

3) United Kingdom

Both the UK and Indonesia are archipelagic nations vulnerable to rising sea levels and in need of strict coastal zoning. The UK employs the Natural Capital Asset and

Risk Register approach through the Environment Act 2021. This policy not only catalogs natural assets but also clearly distinguishes between assets that may be converted through a compensation scheme (Biodiversity Net Gain) and high-risk critical assets that are absolutely prohibited from conversion (Hooper et al., 2024).

With regard to this instrument, national prevention mechanisms, such as the Environmental Impact Analysis (EIA), must be reformed immediately by adopting the Risk Register model. Given that the EIA in Indonesia is often reduced to mere fulfillment of administrative formalities, integrating this concept will bind policymakers. Seagrass ecosystems that meet the criteria must be classified under the "Highest Ecological Risk" category (Critical Natural Capital), which would result in environmental feasibility recommendations absolutely not being issued to facilitate land conversion.

b. Institutionalizing the Status of Seagrass as CNC for the Principle of Strong Sustainability

Given the urgency of the absolute protection outlined above, the concrete step is to officially designate seagrass meadows as Critical Natural Capital (CNC) under legislative regulations, such as revisions to the PWP3K Law or the PPLH Law. The establishment of this ontological status embodies the mandate of Article 33, Paragraph (4) of the 1945 Constitution regarding an environmentally conscious and sustainable economy (Santosa, 2023; Constitutional Court Ruling, 2024).

The institutionalization of CNC will transform the status of seagrass beds from mere commodities into non-substitutable climate defense infrastructure. However, this designation is not made arbitrarily but must meet measurable scientific criteria, including:

- 1) Degree of Ecological Importance: Measuring the significance of habitat functions, the extent of healthy seagrass beds, and the magnitude of potential carbon stock.
- 2) Degree of Threat: Calculating the ecosystem's vulnerability to escalating anthropogenic destructive activities in its vicinity and its historical deforestation rate (De Groot et al., 2003; IOJI, 2023).

For ecosystems that have met the scientific criteria and have CNC status, regulations must impose very strict requirements on spatial planning exemption clauses. If there is a PSN interest claim that compels crossing of this area, the PSN cannot be immediately implemented through government discretion but must be assessed against three cumulative criteria:

- 1) It must involve a matter of public interest of the utmost urgency, and the construction site must be technically impossible to relocate to any alternative location (Mulya et al., 2025);

- 2) The fulfillment of obligations for ecological (non-monetary) compensation and restoration at another location of sufficient scale, with benefits far exceeding the resulting losses; and
- 3) It must go through a local community approval mechanism via Free, Prior, and Informed Consent (FPIC) (World Economic Forum et al., 2022).

c. Strengthening Institutional Synergy for Integrated Seagrass MRV Standards

The management of blue carbon ecosystems, particularly seagrass beds, is currently governed by various legal instruments that create overlapping regulatory mandates. On one hand, marine spatial planning and the Economic Value of Carbon (EVC) for the marine sector are mandated to the Ministry of Marine Affairs and Fisheries (KKP). On the other hand, the authority for recording and inventorying national greenhouse gas (GHG) emissions is managed by the Ministry of Environment and Forestry (KLHK) (Jang & Awiati, 2023). This situation is not an inter-institutional conflict, but rather a structural reality resulting from the absence of an overarching regulation that synchronizes these two mandates.

Therefore, a coordination and alignment mechanism is needed to address potential overlaps in these regulatory mandates. Such coordination could take the form of joint regulations or a joint roadmap between the two ministries. Institutional synergy is required, specifically encompassing:

1) GHG Inventory and Baseline

The Ministry of Environment and Forestry (KLH), as the UNFCCC National Focal Point and coordinator for setting national mitigation targets, needs to consolidate Blue Carbon Ecosystem data from the Ministry of Marine Affairs and Fisheries (KKP). KKP is responsible for providing GHG inventory data, emission factors, and carbon stocks for marine ecosystems. This authority is supported by Minister of Marine Affairs and Fisheries Decree No. 52 of 2024 on the Roadmap for Climate Change Mitigation in the Marine and Fisheries Sector and Minister of Marine Affairs and Fisheries Regulation No. 1/2025, which regulates the procedures for the National Emission Inventory (NEK) for the marine sector.

2) Standardization of Seagrass MRV

The Blue Carbon MRV system requires clarification of roles between the Ministry of Environment and Forestry (KLHK) and the Ministry of Marine Affairs and Fisheries (KKP), including their respective responsibilities regarding seagrass bed stock data, carbon sequestration, and emissions. The KKP's role encompasses the implementation of seagrass bed MRV in the field, while the KLHK

consolidates data for the national GHG inventory. Furthermore, this concept must ensure that MRV data complies with the TACCC principles (Transparency, Accuracy, Consistency, Completeness, and Comparability) as required by the IPCC and adopted in Article 60 of Presidential Regulation No. 98 of 2021, and ensure

the integration of seagrass bed data into the National Greenhouse Gas Inventory (SRN PPI) managed by KLHK (Murdiyarso et al., 2022).

3) Division of Roles in NEK Implementation

Ministry of Marine Affairs and Fisheries Regulation No. 1/2025 has established the procedures for NEK in the marine sector, including Blue Carbon management, through the mechanisms of Carbon Trading and Performance-Based Payments (PBK). In this context, the Ministry of Marine Affairs and Fisheries manages the registration and MRV of Blue Carbon projects in non-forest coastal areas. In contrast, the Ministry of Environment and Forestry manages the SRN PPI and projects in forest areas. Therefore, a PBP and carbon-trading framework involving the Environmental Fund Management Agency (BPD LH) is required to ensure that incentives are distributed fairly to blue carbon-dependent communities.

d. Adoption of High Quality Blue Carbon Principles and Guidelines

As a legal and technical guide, the adoption of the High Quality Blue Carbon Principles and Guidelines is necessary. Although these guidelines are voluntary, the High Quality Blue Carbon Principles and Guidelines serve as essential guidelines for optimizing outcomes for communities, nature, and the climate.

The adoption of the High Quality Blue Carbon Principles and Guidelines can be institutionalized through a Ministerial Regulation issued by the Ministry of Environment and Forestry (KLH) or the Ministry of Marine Affairs and Fisheries (KKP). These principles can bridge the gap between domestic policies and international integrity requirements. The principles that can be incorporated into Indonesian positive law include:

1) *Safeguard Nature*

Ensuring that all marine projects have the primary objective of maintaining the ecological integrity of seagrass beds as CNC, not to facilitate degradation.

2) *Empower People*

Making the involvement of local communities an absolute requirement. This principle requires recognition of co-management schemes through the instrument of Other Effective Area-based Conservation Measures (OECM). The integration of OECM, coupled with the FPIC principle, will grant traditional fishermen strong legal management rights, thereby preventing them from the threat of ocean grabbing (Barbesgaard, 2018).

3) *Employ Best Information*

Establish the obligation that baseline determination and carbon accounting be based on the best available scientific data and up-to-date local knowledge (World Economic Forum et al., 2022).

By adopting the High Quality Blue Carbon Principles and Guidelines, Indonesia can ensure that seagrass bed conservation efforts not only meet NDC targets

quantitatively but also meet the standards of transparency, integrity, and socio-environmental justice required to secure international recognition and funding.

4. Conclusion

The inconsistency between the conservation mandate in Minister of Marine Affairs and Fisheries Regulation No. 1 of 2025 and the spatial use exemption clauses within the spatial planning regime (the Job Creation Law and Government Regulation No. 21 of 2021) legitimizes the operation of the "Weak Sustainability" paradigm in Indonesia. Given that the Ministerial Regulation falls within a lower hierarchy under Article 7 of Law No. 12 of 2011, blue carbon conservation efforts can be easily sidelined in favor of implementing National Strategic Projects (PSN). This legal loophole not only allows the remaining seagrass ecosystems to be destroyed but also triggers a reversal risk, leading to the re-release of carbon into the atmosphere. This fundamentally undermines the permanence aspect of Indonesia's Nationally Determined Contribution (NDC) mitigation targets and compromises the integrity of Article 4(13) of the Paris Agreement. Therefore, institutionalizing seagrass as a CNC within the legal hierarchy is a legal imperative to shift the paradigm toward Strong Sustainability. Establishing CNC status serves as a legal guarantee that seagrass ecosystems cannot be substituted and compels institutional synergy between the Ministry of Marine Affairs and Fisheries (KKP) and the Ministry of Environment and Forestry (KLHK) in the standardization of integrated MRV. Furthermore, to prevent the risk of Ocean Grabbing, the institutionalization of CNC must implement a co-management mechanism integrated with the FPIC principle. This step ensures that Indonesia's NDC is strengthened not only by the validity of carbon data but also by the protection of coastal communities' management rights, as the primary guardians of these natural assets.

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