 p-ISSN: 2548-9267 | e-ISSN : 2549-2365, Open Access at : *http://unramlawreview.unram.ac.id/index.php/ulrev*

Rethinking Blue Carbon: Between Climate Finance and Social Equity in Coastal Communities

Nikmah Mentari
Hang Tuah University
Nikmah.mentari@hangtuah.ac.id

Ilham Dwi Rafiqi
Hang Tuah University
ilham.rafiqi@hangtuah.ac.id

Putu Narayana Mahagotra
Hang Tuah University
Mahagotra.fh22@hangtuah.ac.id

ABSTRACT

Blue carbon ecosystems—such as mangroves, seagrasses, and tidal marshes—are increasingly recognized as vital natural carbon sinks in global climate change mitigation efforts. This recognition has triggered a surge in climate finance initiatives targeting coastal areas, promising both ecological restoration and economic benefits. However, the implementation of blue carbon investment schemes often reveals a paradox: while these projects are framed as climate solutions, they frequently marginalize coastal communities, restrict access to traditional resources, and concentrate benefits among powerful stakeholders. This article critically examines the intersection of blue carbon finance and social equity, with a specific focus on legal and policy frameworks in Indonesia, complemented by comparative insights from global practices. Using a normative legal research, the study analyzes the gaps in existing regulatory instruments, the limitations of community participation, and the risks of "carbon colonialism" embedded in current investment models. This article uses a conceptual approach and a statutory approach. This research focuses on blue carbon management as one of the investment products in the carbon exchange with the type of SPE-GRK. It argues that for blue carbon to serve as a tool for climate justice, reforms must ensure fair benefit-sharing, community-driven governance, and legal safeguards that protect the rights of coastal populations. The article concludes by proposing a rights-based and inclusive framework for blue carbon policies that aligns environmental goals with social equity imperatives.

Keywords: *blue carbon; SPE-GRK; climate finance; social equity; coastal communities.*

INTRODUCTION

The coastal ecosystems of mangroves, tidal marshes, and seagrass meadows provide numerous benefits and services that are essential for climate change adaptation along coasts globally, including protection from storms and sea level rise, prevention of shoreline erosion, regulation of coastal water quality, provision of habitat for commercially important fisheries and endangered marine species, and food security for many coastal communities.[1] Additionally, these ecosystems sequester and store significant amounts of coastal blue carbon from the atmosphere and ocean and hence are now recognized for their role in mitigating climate change. Blue Carbon refers to CO^2 stored in coastal ecosystems, notably, mangroves, tidal marshes

DOI: https://doi.org/10.29303/ulrev.v9i2.447

and seagrass meadows.[2] Despite these benefits and services, coastal blue carbon ecosystems are some of the most threatened ecosystems on Earth, with an estimated 340,000 to 980,000 hectares being destroyed each year. It is estimated that up to 67% and at least 35% and 29% of the global coverage of mangroves tidal marshes and seagrass meadows respectively have been lost[3]. If these trends continue at current rates, a further 30–40% of tidal marshes and seagrasses and nearly all unprotected mangroves could be lost in the next 100 years. When degraded or lost, these ecosystems can become significant sources of the greenhouse gas carbon dioxide.[4]

Actions implemented in blue carbon ecosystems are particularly suitable for nature-based solutions and they can address climate change in three ways.[5]

1. Decrease greenhouse gas emissions related to deforestation and land-use changes
2. Capture and store carbon dioxide from the atmosphere
3. Enhance resilience of ecosystems, and as such support societies to adapt to climate hazards such as flooding, sea-level rise, and more frequent and intense droughts, floods and heatwaves.

Indonesia's mangroves are also one of the world's carbon-rich forests.[6] Mangrove forests store four times more carbon per hectare than upland tropical forests based on Indonesian Agency for Marine and Fisheries Research and Development.[7] Alongi stated Mangroves contribute 10-15% of coastal sediment carbon storage while global coastal areas only contribute 0.5%. Murdiyarso et al Indonesia's mangroves store 3.14 billion metric tons of carbon (PgC)., 2015). Based on Pendleton et.al research, this amount includes one-third of global coastal carbon stocks.[8] Carbon can be a driver for realizing greater Nationally Determined Contribution (NDC) ambitions, as seen in Article 6 of the Paris Agreement, which encourages cooperation.[9] In their NDCs, countries communicate actions they will take to reduce their greenhouse gas emissions in order to reach the goals of the Paris Agreement. Countries also communicate in their NDCs actions they will take to build resilience to adapt to the impacts of climate change.[10] Additionally, the cost effectiveness of carbon markets can provide incentives to the private sector and help remove political barriers to strengthening commitments.[11]

Indonesia's blue carbon potential has yet to be technically realized in the context of carbon trading. Blue carbon can contribute to reducing greenhouse gas (GHG) emissions, but the economic factor in blue carbon management has not been a concern for the government. Therefore, the Minister of Maritime Affairs and Fisheries Regulation No. 1 of 2025 on the Procedures for Implementing the Economic Value of Carbon in the Marine Sector was issued. Meanwhile, Indonesia already has a carbon exchange that was launched in 2023 under the name Indonesia Carbon Exchange (IDX Carbon) as a medium for carbon trading in order to fulfill the national emission reduction target. Since its launch, through several IDX Circular Letters regarding the Standardization of Carbon Unit Grouping, the project criteria carried out are in the form of SPE-GRK. The product in this market is the Certificate of Emission Reduction - Greenhouse Gas, commonly known as "carbon offset". Offset Market is a scheme where businesses trade carbon units resulting from GHG reduction or removal by certain businesses and/or other climate change mitigation actions. Businesses can purchase carbon units to achieve emission reduction targets and fulfill their commitment to carbon neutral or net-zero.[12]

However, the sectors are related to Agriculture, Forestry, and Land-Used (AFOLU) or included in the agriculture and forestry sector, the energy sector other than renewable energy, industrial processes and product use and others. So far, the marine sector has not been the object of trading projects in the carbon exchange. Indonesia does not have a blue carbon trading platform, but it can be solved by Indonesia Carbon Exchange (idx carbon) to connect suppliers and buyers and giving efficiency in the transmission of supply and demand. Making blue

[12] Idxcarbon.co.id accessed in 30 August 2025.

carbon part of a portfolio product in the capital market will improve blue carbon management in coastal areas. This could have a real impact not only on the environment globally but also on coastal communities themselves, while coastal communities are the most vulnerable group affected by climate change. If blue carbon trading is more intensively carried out like green carbon, then slowly social justice for coastal communities will also be realized.

METHOD

This research uses normative juridical research with a conceptual approach, namely the concept of blue carbon funding through carbon exchanges in the type of SPE-GRK and the concept of social justice for coastal communities affected by blue carbon management. The legislative approach relates to carbon trading regulations and regulations for the welfare of coastal communities

ANALYSIS AND DISCUSSION

Blue Carbon as Part of Climate Finance

Climate finance refers to financial resources and instruments that are used to support action on climate change.[13] Climate finance pertains to local, national, or international funding—sourced from public, private, and alternative financial avenues—that aims to facilitate mitigation and adaptation measures to combat climate change. Parties with more financial resources are required by the Convention, Kyoto Protocol, and Paris Agreement to provide financial support to those that are less wealthy and more vulnerable. Blue carbon projects, therefore, are likely to become an important generator of Article 6 mitigation outcomes, and thus national climate progress claims, in the years to come. [14]

This acknowledges that nations' contributions to climate change, as well as their ability to stop it and deal with its effects, differ greatly. Since substantial investments are needed to drastically cut emissions, climate finance is necessary for mitigation. Since substantial financial resources are required to adapt to the negative effects and lessen the repercussions of a changing climate, climate finance is equally vital for adaptation.[15]

According to the Sustainable Finance Roadmap Phase II (2021-2025) by OJK, OJK creates an ecosystem with seven elements. Policy, product, market infrastructure, ministry/institutional coordination, nongovernmental support, human resources, and awareness are the seven elements.[16] Establishing elements of the sustainable finance ecosystem demonstrates OJK's dedication to developing clear rules, fostering collaboration with other ministries and institutions, and enhancing the capacity of the financial sector. Both the supply and demand sides will be impacted by the ecosystem that develops. OJK will create the necessary infrastructure on the supply side, including funding and investment products, information and technology, incentives, and the financial industry's human resource capabilities. In order to boost demand

[13]UNDP.(2023). *What Is Climate Finance And Why Do We Need More Of It?.* Available From *:* https://climatepromise.undp.org/news-and-stories/what-climate-finance-and-why-do-we-need-more-it [Accessed in 30 August 2025

[14]Adam D. Orford, (2024), Blue Carbon, Red Statesm and Paris Agreement Article 6, Frontiers in Climate, p.1, DOI: 10.3389/fclim.2024.1355224

[15]United Nations Climate Change. *Introduction To Climate Finance.* Available From : https://unfccc.int/topics/introduction-to-climate-finance . [Accessed in 30 August 2025]

[16]Sustainable Finance Indonesia. (2025). *About- Sustainable Finance Roadmap.* Available From : https://keuanganberkelanjutan.ojk.go.id/keuanganberkelanjutan/en/about/read/3305/sustainable-finance-roadmap-phase-ii . [Accessed in 30 August 2025]

for financial products and services, the market must be transformed. This must be backed by genuine initiatives, the growth of related sectors, and "green" certification.[17]

The Roadmap still focuses on green finance, not yet on blue finance. However, the beginning of blue finance with a focus on carbon began with Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Economic Value for Achieving Nationally Determined Contribution Targets and Controlling Greenhouse Gas Emissions in National Development (Perpres NEK). Article 47 states that the implementation of NEK is carried out through the Carbon Trading mechanism, which is a market-based mechanism to reduce greenhouse gas emissions through the sale and purchase of Carbon Units.

Furthermore, the Ministry of Maritime Affairs and Fisheries has issued KKP Regulation No. 1 of 2025 concerning the Procedures for Implementing Carbon Economic Value in the Marine Sector. The regulation also regulates carbon trading based on carbon exchanges that provide two schemes, namely in the form of GHG Emission Reduction Certificates (SPE-GRK) and Technical Approval of Emission Upper Limits (PTBAE). The implementation of NEK (Carbon Economic Value) on carbon exchange according to Article 4 paragraph (1) Permen KKP 1/2025 in the marine sector includes: blue carbon management; fishing; fish farming; processing and marketing of marine and fishery products; and other activities in accordance with the development of science and technology. Article 5 Permen KKP 2025, that cross-sector carbon trading is in the form of SPE-GRK. SPE-GRK as referred to in paragraph (1) represents a reduction in GHG emissions or an increase in GHG absorption in the marine sector equivalent to 1 (one) ton of carbon dioxide equivalent (CO2e).

In the context of financial services, the issuance of Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector (P2SK Law) became a major momentum for the start of carbon trading through the Indonesian exchange. The law comprehensively not only amends the legislation of the financial services sector, but in Part Three of the P2SK Law, Article 23 paragraph (2) states that securities in the carbon exchange are in the form of Carbon Units. Given the P2SK Law's mandate for carbon trading to fall under the authority and supervision of the OJK, Financial Services Authority Regulation No. 14 of 2023 on Carbon Trading Through Carbon Exchanges was issued. Furthermore, Circular Letter of the Financial Services Authority 12/SEJK.04/2023 was issued regarding the Procedures for Implementing Carbon Trading through the Carbon Exchange. [18]

Blue Carbon is a term for carbon sequestered and stored in coastal and marine ecosystems. This carbon is stored in the form of sediments, such as those stored in mangroves trees, tidal marsh shrubs and seagrass. Coastal ecosystems containing mangroves, tidal marshes and seagrass beds provide impacts and benefits to climate change mitigation and adaptation along the coast globally. Coastal plays a role in providing protection from coastal abrasion, protection from storms and sea level rise, prevention of tidal flooding, regulating coastal water and air quality, providing coastal biodiversity habitat and providing food sources for coastal communities.[19] Blue carbon is a key factor in human survival through its role in reducing greenhouse gas emissions, carbon sequestration and conservation, and economic and social benefits.[20]

Blue carbon has been defined by the Intergovernmental Panel on Climate Change (IPCC) as the capacity of marine and coastal ecosystems to store organic carbon over centuries or even

[17]*Ibid.*

[18]Nikmah Mentari, Ilham Dwi Rafiqi, Tiara Zein, (2024) "Implementasi Pengaturan Perdagangan Karbon di Indonesia" *Jatiswara*, 39 (3) : 290.

[19]Kasta Rosyada, Trismadi, Abdul Rivai Ras. (2021). "Potensi Blue Carbon dalam Penanganan Perubahan Iklim Guna Menunjang Keamanan Maritim Indonesia" *Jurnal Maritim Indonesia*, 9(3) : 306.

[20]Jinsu Jang dan Wiwiek Awiati. (2023). "Karbon Biru di Indonesia: Memahami Pentingnya Konservasi dan Restorasi untuk Mencapai Netralitas Karbon".*Selisik*, .9(1): 31.

millennia. Such ecosystems include mangroves, salt marshes, and seagrass beds, and potentially in the future pelagic ecosystems that compose the biological carbon pump. According to the French National Research Institute (2023), more than 120 million people, mainly women, depend on these biodiversity hotspots to live, eat or earn money. However, most of these ecosystems are threatened by human activities: ever-increasing urbanization, intensive fishing and aquaculture, widespread pollution, among others.[21]

Blue carbon refers to the carbon sequestered and stored by the Earth's ocean and coastal ecosystems, particularly by mangroves, salt marshes and seagrass meadows. These ecosystems have an important function in the carbon sequestration process, serving as important carbon reservoirs and helping to reduce the impacts of climate change. Indonesia is the world's richest country in terms of coastal blue carbon ecosystems with approximately 3 million hectares of mangrove forests and 0.3 million hectares of seagrass meadows.[22] Blue carbon potential is huge, at 3.4 Giga Tons, equivalent to 17% of the world's carbon stock.[23]

Blue carbon is not only of high environmental value. From an economic perspective, blue carbon is related to the blue economy. The integration of social dimensions in the blue economy is necessary to ensure that sectors of the maritime economy contribute to the achievement of sustainable development goals.[24] High-quality blue carbon projects can preserve, protect and restore lost and degraded coastal ecosystems. In doing so, they can improve livelihoods, protect cultural heritage, maintain food security, and provide coastal protection for local communities. In addition, healthy coastal ecosystems improve water quality, serve as nursery grounds for fisheries, and capture and store carbon.[25]

Blue carbon projects therefore aim to value these areas based on how much carbon they can capture and store and open them up for investment that - it is assumed - will ensure protection. This will in turn give the investor (e.g. governments, transnational corporations etc.) an amount of carbon credits corresponding to the stored and expected capture of carbon, which in theory 'offsets' carbon emissions elsewhere. In other words, according to this scheme, a business activity that pollutes in one location is portrayed as being able to make up for this harm by "investing" in activities deemed carbon capturing in another location. These carbon credits would ideally be traded through carbon markets in the future. And, not least, these Blue Carbon Projects should involve 'win-win' mitigation strategies where the investment to protect the area also "promotes business, jobs and coastal development opportunities[26]

Blue carbon projects can be a new source of income for communities from carbon financing in addition to providing other ecological and economic benefits that are needed by organisations [27] Sales of blue carbon credits can be made through various mechanisms, at the international level

[21]French National Research Institute. (2023). "Blue Carbon Credits: a Lot of Promises but Even More Uncertainties for the Global South", *Policy Brief*, COP208 UAE. https://www.ird.fr/sites/ird_fr/files/2023-11/Policy_Brief_COP28_Cr%C3%A-9dits_carbone_bleu_VDef.pdf

[22]Murdiyarso, D., Sukara, E., Supriatna, J. et al. (2018). "Creating Blue Carbon Opportunities in the Maritime Archipelagi Indonesia", Policy Brief No. 3, Bogor, Indonesia: Center for International Forestry Research (CIFOR). https://doi.org/10.17528/cifor/007058

[23]Departemen Manajemen Sumberdaya Perairan IPB. (2022). "Policy Brief Karbon Biru: Maind Streaming Blue Carbon National Determaind Contribution (NDC)". https://msp.ipb.ac.id/wp-content/uploads/2023/09/Policy-Brief-04.pdf

[24]Andrés M. Cisneros-Montemayor, (2019), et.al, Social equity and benefits as the nexus of a transformative Blue Economy: A sectoral review of implications, Marine Policy, Vol.109. November, 103702 https://doi.org/10.1016/j.marpol.2019.103702

[25]Prinsip dan Panduan Karbon Biru Berkualitas Tinggi: Investasi Dengan Tiga anfaat Bagi Masyarakat, Alam dan Iklim, , p.6.

[26]Nelleman, C., Corcoran, E., Duarte, C.M., Valdés, L., De Young, C., Fonseca, L., Grimsditch, G. (Eds). (2009). Blue Carbon. A Rapid Response Assessment. United Nations Environment Programme. GRID-Arendal, www.grida.no, p.69.

[27]Vanderklift M A, Gorman D and Steven A D L, (2019), *Blue carbon in the Indian Ocean*: a review and research agenda *J. Indian Ocean Reg.* **15**, 2 p. 129–138; C.C. Pricillia, M.P Patria, and H. Herdiansyah, Social Consideration for Blue Carbon Management, IOP Conf. Series : Earth and Environmental Science 755 (2021) 012025, IOP Publishing, doi:10.1088/1755-1315/755/1/012025.

under the UNFCCC there are Clean Development Mechanism (CDM), Joint Implementation Mechanism (JI), and Reducing Emissions from Deforestation and Forest Degradation (REDD +). Also, there are independent carbon crediting mechanisms or better known as voluntary carbon markets such as PlanVivo, Verified Carbon Standard (VCS) and Gold Standard.[28]

The value of the carbon savings provided by the activities can be validated and sold as credits through the voluntary carbon market. Those credits can then be sold to buyers who are looking to reduce their carbon footprint. Access to voluntary carbon market finance represents an opportunity to provide regular, predictable funding to projects that can support the long-term management and protection of ecosystems with multiple additional benefits to local communities.[29]

In the Indonesian carbon market, there are two types of products: SPE-GRK and PTBAERPU. The product in this market is Certificate of Emission Reduction - Greenhouse Gas (SPE-GRK) which is commonly known as "carbon offset". Offset Market is a scheme where businesses trade carbon units resulting from GHG reduction or removal by certain businesses and/or other climate change mitigation actions. Businesses can purchase carbon units to achieve emission reduction targets and fulfill their commitment to carbon neutral or net-zero. Based on Article 1 point 4 of POJK Number 14 of 2023 concerning Carbon Trading through the Carbon Exchange. Meanwhile, according to Article 1 point 5 of POJK 14/2023, Technical Approval of Emission Upper Limits for Business Actors, hereinafter referred to as PTBAE-PU, is the determination of GHG emission upper limits for business actors and/or the determination of emission quotas within a certain compliance period for each business actor.[30]

Based on the Carbon Unit Registration Regulation at the Carbon Exchange Operator Number Kep-00295/BEI/09-2023, the project owner is a business entity that makes the first sale or a party that has the right to make the first sale of SPE-GRK on the Carbon Exchange. Greenhouse Gas Emission Reduction Certificate, hereinafter abbreviated as SPE-GRK, is a letter of proof of emission reduction by businesses and/or activities that have gone through measurement, reporting, and verification, and recorded in the National Registry System for Climate Change Control in the form of a registry number and/or code as stipulated in Article 1 number 4 Regulation of the Financial Services Authority Number 14 of 2023 concerning Carbon Trading Through the Carbon Exchange.

Based on SE Number SE-00001/BEI.PB/01.2025 regarding Standardization of Carbon Unit Grouping. That the Carbon Exchange Organizer establishes the Carbon Unit product with the following provisions:

1. Indonesia Nature Based Solution (IDNBS), Standard grouping of SPE-GRK for Greenhouse Gas emission reduction mitigation projects that are included in the nature-based solution (NBS) according to the criteria set by the Carbon Exchange Organizer in Indonesia. In the form of SPE-GRK; and 2.

   Included in the Agriculture, Forestry, and Landused (AFOLU) sector or included in the Agriculture and Forestry sector as stipulated in the Minister of Environment and Forestry Regulation No. 21 of 2022 concerning Procedures for the Application of Carbon Economic Value.
2. Based on SE Number SE-00001/BEI.PB/01.2025 regarding Standardization of Carbon Unit Grouping. That the Carbon Exchange Organizer establishes the Carbon Unit product with the following provisions:

[28]World Bank, 2020, State and Trends of Carbon Pricing October 2020, Washington DC. ; C.C. Pricillia, M.P Patria, and H. Herdiansyah, Social Consideration for Blue Carbon Management, IOP Conf. Series : Earth and Environmental Science 755 (2021) 012025, IOP Publishing, doi:10.1088/1755-1315/755/1/012025.

[29]UK Government, Blue Carbon: Insights Into Blue Carbon Finance, Blue Belt Programme, 2023, p. 5.

[30]Nikmah Mentari et., all, *Op.Cit,* p. 292.

1. Indonesia Nature Based Solution (IDNBS), Standard grouping of SPE-GRK for Greenhouse Gas emission reduction mitigation projects that are included in the nature-based solution (NBS) according to the criteria set by the Carbon Exchange Organizer in Indonesia. In the form of SPE-GRK; and 2. Included in the Agriculture, Forestry, and Landused (AFOLU) sector or included in the Agriculture and Forestry sector as stipulated in the Minister of Environment and Forestry Regulation No. 21 of 2022 concerning Procedures for the Application of Carbon Economic Value.

3. Indonesia Nature Based Solution International Standard (IDNBSI), Standard for grouping SPE-GRK for GHG emission reduction mitigation projects that fall under

nature-based solution (NBS) according to criteria set by the Carbon Exchange Operator in Indonesia and certified by an international certification body.

Project criteria: 1. In the form of SPE-GRK; 2. Included in the Agriculture, Forestry, and Land used (AFOLU) sector or included in the Agriculture and Forestry sector as stipulated in the Minister of Environment and Forestry Regulation Number 21 of 2022 concerning Procedures for Implementing Carbon Economic Value;

And 3. Has certification from SRN-PPI that meets the standards of an international certification body and/or has certification from an international certification body.

4. Indonesia Technology Based Solution (IDTBS), Standard for grouping SPE-GRK for GHG emission reduction mitigation projects that fall under technology-based solutions (TBS) other than renewable energy according to criteria set by the Carbon Exchange Operator in Indonesia.

Project criteria: 1. In the form of SPE-GRK; and 2. Included in sectors other than Agriculture, Forestry, and Land-used (AFOLU) or included in Energy other than renewable energy, Waste, and Industrial Processes and Product Use as stipulated in the Minister of Environment and Forestry Regulation No21 of 2022 concerning Procedures for Implementing Carbon Economic Value.

5. Indonesia Technology Based Solution Renewable Energy (IDTBS-RE), Standard for grouping SPE-GRK for Greenhouse Gas emission reduction mitigation projects that are included in technology-based solutions (TBS) in the form of renewable energy according to the criteria set by the Organizer of the Carbon Exchange in Indonesia.

Project Criteria: in the form of SPE-GRk; and 2 falls into the Energy sector as stipulated in the Regulation of the Minister of Environment and Forestry Number 21 of 2022 on the Procedure for the Application of Carbon Economic Value, in the form of renewable energy.

6. Indonesia Technology Based Solution Authorized (IDTBSA), Standard for grouping SPE-GRK for Greenhouse Gas emission reduction mitigation projects that fall under technology-based solutions (TBS) other than renewable energy according to criteria set by the Carbon Exchange Operator in Indonesia that has received authorization for overseas carbon trading from the Government of the Republic of Indonesia.

1. In the form of SPE-GRK;
2. Entered into sectors other than Agriculture, Forestry, and Land-used (AFOLU) or entered into the Energy sector other than renewable energy, Waste, and Industrial Processes and Product Usage as stipulated in the Minister of Environment and Forestry Regulation Number 21 of 2022 concerning Procedures for Implementing Carbon Economic Value; and
3. Has received authorization for overseas carbon trading from the Government of the Republic of Indonesia.

7. Indonesia Technology Based Solution Authorized Renewable Energy (IDTBSA-RE), Standard for grouping SPE-GRK for Greenhouse Gas emission reduction mitigation projects that fall under technology-based solution (TBS) in the form of renewable energy according to the criteria set by the Carbon Exchange Operator in Indonesia that has received authorization for

overseas carbon trading from the Government of the Republic of Indonesia. Project criteria: In the form of SPE-GRK;

1. Entering the Energy sector as stipulated in the Minister of Environment and Forestry Regulation Number 21 of 2022 concerning Procedures for Implementing Carbon Economic Value, in the form of renewable energy; and
2. Has received authorization for overseas carbon trading from the Government of the Republic of Indonesia.

8. Indonesia Technology Based Solution International Standard (IDTBSI), Standard for grouping SPE-GRK for mitigation projects that reduce GHG emissions into technology-based solutions (TBS) according to the criteria set by the Carbon Exchange Organizer in Indonesia and certified by an international certification body. Project criteria: In the form of SPE-GRK;
   1. Entering into sectors other than Agriculture, Forestry, and Land-used (AFOLU) or entering into the Energy, Waste, and Industrial Processes and Product Use sectors as stipulated in the Minister of Environment and Forestry Regulation No. 21 of 2022 on the Procedures for Implementing Carbon Economic Value; and
   2. Have certification from SRN-PPI that meets the standards of international certification bodies and/or have certification from international certification bodies.

That the project in the implementation of blue carbon in Indonesia still does not get a place on the carbon exchange. So in this case, blue carbon can be included in the product Certificate of Emission Reduction - Greenhouse Gas (SPE-GRK), commonly known as Carbon Credit, which is a form of proof of emission reduction by businesses and / or activities that have gone through Measurement, Reporting, and Verification / Measurement, Reporting, and Verification, and recorded in the National Registry System for Climate Change Control in the form of registry numbers and / or codes. Companies may purchase carbon units for use in meeting emission reduction targets or fulfilling carbon neutral or net-zero emission commitments. Companies can carry out blue projects in coastal areas, not only doing CSR or TJSL mangrove planting, but making mangrove planting and management as a project as an SPE-GRK product. Considering that carbon trading in carbon exchanges is more towards green carbon or funding projects in the forest, this is a good option. Meanwhile, according to Carbon Market Principles, refer to managing or restoring working lands and natural ecosystems to remove carbon dioxide from the atmosphere, nature based terdiri dari forestry, soil/agriculture, oceans.[31] In practice, the Indonesian Carbon Exchange has not made blue carbon projects part of the projects that can be traded in carbon units, even though the potential for blue carbon trading in the capital market is very important.

Social Equity for Coastal Communities in Blue Carbon Initiatives

The concept of environmental justice relates to the protection of future generations to obtain the right to a decent and healthy environment. The concept of intergenerational justice has developed in the struggle of international law in general. This can be indicated in the preamble of the Universal Declaration of Human Rights which states, "Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world." The term "all members" used in the sentence is certainly not only limited to current conditions but is also forward thinking and the ideals of international law to be achieved.[32]

[31]JP Morgan Chase & Co,(2023), *Carbon Market Principles: Our Approach to Strengthening the voluntary carbon market to scale decarbonization solution*s, p. 14.

[32]Wilda Prihatiningtyas, Suparto Wijoyo, Indria Wahyuni, Zuhda Mila Fitriana, (2023) Perspektif Keadilan Dalam Kebijakan Perdagangan Karbon (Carbon Trading) di Indonesia Sebagai Upaya Mengatasi Perubahan Iklim, Refleksi Hukum,.7(2),: 168.

The correlation between environmental justice and social equity is that Equity refers to the distributive concept of justice and its absence (inequity), encompassing disproportionate environmental impacts on certain social groups. For example, poor and minority groups and other historically disempowered communities experience fewer environmental goods, more environmental bads, and less environmental protection. *Recognition* of environmental injustice includes the "why" and underlying causes of inequity, such as oppression, disrespect, and racism. *Capabilities* theory focuses on the basic need of individuals and communities to construct a well-functioning life, including health, bodily integrity, social basis of self-respect, control over one's environment, and basic political rights and liberties.[33]

Sohn and Weiss state that in the use of resources, each member of the current generation has an obligation (equitable duties) to ensure that his actions will not reduce future generations' access to the resource.[34] The concepts of justice that touch on intergenerational justice and intra-generational justice are complementary to each other in order to present a hypothesis that is interrelated with each other. There are at least three main hypotheses that describe the correlation between intergenerational justice and intra-generational justice, namely independence, facilitation and competition. The independence correlation between intergenerational justice and intra-generational justice is interpreted as a form of independence for each concept in achieving their respective goals. The implementation of intra-generational justice at this time will not eliminate the obligation and also fail to realize the goals desired by inter-generational justice.[35]

The principle of environmental justice as social justice calls for alternative economic systems that contribute to environmentally sustainable development, support the liberation of people politically, economically and culturally, promote policies based on mutual respect, justice for all, and without discrimination, promote the restoration of both urban and rural environments, respect the cultural integrity of communities and provide access for all people to the resources owned by the community.Environmental justice as a social justice is functionally and empirically linked to sustainable development. Sustainable development is development that meets the needs of the present generation without reducing the ability of future generations to meet their needs.[36]

Social equity here refers to: the recognition and fair treatment of all groups that would benefit from or be impacted by existing or nascent ocean industries; their inclusion in development plans and policies that would affect them, and; the achievement of a more just distribution of benefits and burdens from these industries. In practice, it is likely that the main focus for planning would be on procedural justice (a fair process of development and establishment for all those involved in or affected by marine industries) rather than distributional justice (a fair distribution of costs and benefits).[37] A social justice viewpoint helps demonstrate how politics, race, and class affect an area's quality of life and frames environmental justice as a component of the broader issues of racial, social, and economic justice.[38] Traditional environmentalism, with its more limited focus on wilderness preservation and the technical aspects of environmental management, stands in contrast to this wider societal approach.[39]

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[33]Michael D. Smith and Tadesse Wodajo, New Perspectives on Climate Equity and Environmental Justice, American Meteorological Society, Vol.103, Issue 6, 2022, p. 1522-1523, https://doi.org/10.1175/BAMS-D-22-0032.1

[34]Wilda Prihatiningtyas, *et.al, Op.Cit.*

[35]*Ibid*.

[36]Elly Kristiani Purwendah, (2019) Konsep Keadilan Ekologi dan Keadilan Sosial Dalam Sistem Hukum Indonesia Antara Idealisme dan Realitas, Jurnal Komunikasi Hukum, Universitas Pendidikan Ganesha,.5(2), : 146

[37]Andrés M. Cisneros-Montemayor, et.al, Social equity and benefits as the nexus of a transformative Blue Economy: A sectoral review of implications, Marine Policy, Vol.109. November 2019, 103702 https://doi.org/10.1016/j.marpol.2019.103702

[38]Robert R. Kuehn, A Taxonomy of Environmental Justice, Environmental Law Reporter, Vol.30, p.10681, 2000, p. 10699.

[39]*Ibid.*

In the context of the fulfillment of the right to the environment, environmental utilization activities that are carried out continuously but only produce benefits for a small number of parties, produce more impacts in the form of pollution and damage to the environment, and do not have a major impact on improving people's welfare show poor environmental management patterns. This shows that environmental injustice still occurs as well as evidence that the state has failed to fulfill human rights in the form of the right to a good and healthy environment that has been guaranteed by the constitution.[40]

The Constitution Article 28H (1) Every person has the right to live in physical and mental prosperity, to have a place to live, and to have a good living environment. It is a constitutional mandate that a good environment will provide social justice and welfare for the affected layers of society. The Ministry of Bappenas has conducted research related to the vulnerability of coastal areas in Indonesia due to climate change. According to Bappenas, the impact of climate change on coastal areas will cause two types of hazards, namely coastal inundation and coastal instability related to the process of abrasion/erosion and market accretion/sedimentation. Bappenas also calculated the Coastal Vulnerability Index (CVI) which is an index of coastal vulnerability in Indonesia. This index uses physical, oceanographic and geological parameters. From the results of the CVI calculation, along nearly 2 thousand kilometers of Indonesia's coastline has a very high vulnerability.[41] Sumatra and Nusa Tenggara are the two most vulnerable islands. The implications will cause losses both economically, socially and environmentally.[42]

Data from the Central Bureau of Statistics in 2021 noted that the poverty rate in coastal areas was 4.19 percent, this figure is higher than the national average. Of the extreme poor population of 10.86 million people, 12.5% or 1.3 million people are spread across 147 districts and cities in coastal areas.[43] By 2022, the number of poor people in Indonesia's coastal areas will reach 17.74 million. As many as 3.9 million of them are categorized as extreme poor. In relation to the impacts of climate change, 65% of Indonesians living in coastal areas will be directly affected, and there are 12,857 coastal villages that are threatened by climate disasters.[44] Indeed, coastal communities are classified as vulnerable and poor groups in this country. Their livelihoods depend on capture fisheries resources. Historically, they have often been treated with economic and political injustice.[45]

Coastal communities are facing an uncertain future. Whilst coastal ecosystems can offer substantive goods and services that support their societal needs, these ecosystems are under severe threat from over-exploitation and direct destruction due to escalating coastal development, pollution and climate-related impacts.[46] When discussing how large-scale coastal development impacts communities, equity is a major concern. Communities have a right to maintain their traditions and grow in ways that support their long-term goals and resilience. They are also crucial in managing and protecting coastal ecosystems. While many communities organize

[40]Muhamad Agil Aufa Afinnas, (2023) Telaah Taksonomi Keadilan Lingkungan dalam Pemenuhan Hak atas Lingkungan, Prosiding Seminar Hukum Aktual,, p.52.

[41]Ridwan Arif. (2023). *Keadilan Iklim Untuk Masyarakat Pesisir". Available from :* https://coaction.id/keadilan-iklim-untuk-masyarakat-pesisir/?utm_source=chatgpt.com [Accessed in 30 August 2025]

[42]*Ibid.*

[43]*Ibid.*

[44]Asmar Exwar, at.al, Seruang Jaring Nusa Kepada Pemerintah Indonesia Dalam Momentum Konferensi Tingkat Tinggi Perubahan Iklim atau COP ke-28; Masyarakat Pesisir di Kawasan Timur Indonesia Suarakan Keadilan Iklim, Fact Brief, Jaring Nusa, p.6.

[45]Muhamad Karim,(2022). *OPINI : Perubbahan Iklim dan Keadilan Masyarakat Pesisir.* Available From : https://ekonomi.bisnis.com/read/١٥٩٩٦٢٢/٤٤/٢٠٢٢١١١٨/opini-perubahan-iklim-dan-keadilan-masyarakat-pesisir?utm_source=chatgpt.com [Accessed in 30 August 2025]

[46]Louisa S. Evans, et.al, (2023) Putting coastal communities at the center of a sustainable blue economy: A review of risks, opportunities, and strategies , Frontiers in Political Science, 10.3389/fpos.2022.1032204 p.12.

their own conservation efforts, they often lack the funding to support these activities or to benefit from a sustainable blue economy.[47]

Furthermore, some communities are developing in ways that don't serve their own best interests. Modern fishing techniques, growing access to markets, and population increases are all adding pressure to already struggling ecosystems, which in turn reduces the availability of essential resources.[48] Continuing with the current approach is a lose-lose situation for everyone involved. To create a sustainable blue economy, it's vital to empower coastal communities so they can develop in ways that meet their long-term needs without harming the ecosystems they depend on. They must also be supported in their role as environmental stewards, which includes respecting their customary rights and practices and obtaining their consent before any projects are undertaken.[49] In reality, coastal communities are rarely deeply involved in communicating or understanding the regulations governing restoration and reclamation in coastal areas, particularly those linked to blue carbon initiatives. They still face limited access to small islands and coastal spaces. Additionally, the state's territorial authority over these areas is often perceived as centralized control.[50]

In blue carbon management, it is important to take into account the social dimensions of local communities, including livelihoods, land tenure, traditional knowledge, and community capacity.[51] Blue carbon projects can serve as an additional income stream for communities through carbon financing, while also delivering essential ecological and economic benefits valued by organizations.[52] Control of coastal areas remains contentious, as legal authority over them is tied to existing regulations. Efforts such as conservation, rehabilitation, and mangrove restoration are often perceived by local communities as central government encroachment, especially when linked to mining-focused permits that harm coastal ecosystems.[53]

Damage to coastal ecosystems reduces the income of nearby communities that depend on them for their livelihoods, particularly when mangrove forests are affected. To address this, various efforts such as rehabilitation, reclamation, and other restoration measures are undertaken to improve ecological conditions. However, these actions cannot fully restore the original environmental quality that has been lost due to ecological degradation.[54]

CONCLUSION

The significant role of blue carbon in climate finance underscores its suitability as a tradable asset within carbon exchanges, including through mechanisms such as the SPE-GRK. While blue carbon presents substantial opportunities for climate change mitigation, it also carries the risk of generating new forms of injustice if not governed equitably. Therefore, robust regulatory measures are essential to ensure that ecological objectives are aligned with principles of social justice. Social justice in coastal regions can only be achieved when local communities are treated as active subjects, rather than passive objects in the design, implementation, and benefit-sharing of blue carbon projects.

[47] *Ibid.*
[48] *Ibid.*
[49] *Ibid.*
[50] Muhammad Syaiful Anwar, Maya Ruhtiani dan Rani Hendriana. (2023) Blue Carbon: Integrative Management of Coastal Ecosystems Based on Regional Autonomy, Jambe Law Journal, 6 (2) : 189.
[51] C.C Pricillia , M.P Patria, and H. Herdiansyah, Social Consideration for Blue Carbon Management, IOP Conf. Series: Earth and Environmental Science 755, 2021, 012025, doi:10.1088/1755-1315/755/1/012025 , p. 5.
[52] Vanderklift M A, Gorman D and Steven A D L, 2019 Blue carbon in the Indian Ocean: a review and research agenda *J. Indian Ocean Reg.* **15**, 2 p. 129–138
[53] Muhammad Syaiful Anwar, et., all, *Op.cit.*
[54] *Ibid.*.

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