

Indonesia's Forest Carbon Role in Navigating Nature-based Credit

Mahdia Amalia

Summary

Countries worldwide are committed to achieving net zero emissions and playing a role in encouraging carbon market growth. One of these countries is Indonesia, which launched the Indonesia Carbon Exchange (IDX Carbon). This study explores Indonesia's entry into the carbon market through the launch of IDX Carbon, which recognises the immense value of forests as carbon sinks, offering opportunities through the monetisation of carbon credits from sustainable forestry practices for Indonesia's sustainable and resilient future. The forestry sector is currently directed to undergo emission reduction projects through nature-based credit schemes, an indubitably critical mission considering Indonesia's status as one of the countries with the highest deforestation rate in the world (578.5 thousand Ha/year). Indonesia needs to prevent and reduce deforestation to play an optimal role in absorbing GHG emissions up to 17.4% of the 31.89 GHG emissions reduction through the Business as Usual (BAU) scheme and 25.4% of the 43.20% GHG emissions reduction through international assistance. Therefore, it is essential to recognise the enormous value of environmental services and place our forests as a crucial sector in the carbon market. Hence, there is an urgency to implement IDX Carbon to gain Indonesia's potential to exchange carbon worth IDR 8,000 trillion.

Keywords: IDX Carbon, forestry and other land use sector, carbon market, nature-based credit, climate change mitigation

Introduction

In the global carbon market, countries' commitments to achieve net-zero emissions have significantly driven the market to grow (World Bank, 2023). Indonesia, recognising the urgency of climate action, has made significant steps by launching IDX Carbon to contribute to the global fight against climate change. Despite challenges like primary forest loss, Indonesia's vast tropical rainforests, mangroves, and peatlands engender it as a crucial player in carbon absorption. Forestry and Other Land Use (FOLU) sector is essential to Indonesia's climate commitments and is anticipated to act as a carbon net sink by 2030. This study explores Indonesia's entry into the carbon market through the launch of IDX Carbon, which recognises the immense value of forests as carbon sinks, offering opportunities through the monetisation of carbon credits from sustainable forestry practices for Indonesia's sustainable and

Forestry Sector Opportunities in the Global Carbon Market

According to the World Bank (2023), a growing focus has been placed on nature-based solutions, including emissions reductions from agriculture, forestry, and land use activities. Ecosystem Marketplace reports that in 2022, 54% of new project registrations were for forestry and land use activities, indicating a potential substantial expansion of supply in the future (World Bank, 2023). In 2022, the prices for nature-based credit experienced an all-time decline, dropping from approximately USD 16 to under USD 5 at the end of the year. However, it is expected that the prices will rebound in the next two years, indicated by the futures contracts on the Chicago Mercantile Exchange (CME) that are set to be delivered in December 2024, estimating a price increment for nature-based credits from their current level of around USD 2 to USD 4.5 (CME Group, 2023; World Bank, 2023).

This optimistic projection implies that there could be a renewed interest or increased value for nature-based credits in the market.

Indonesia's Carbon Market

At present, there is a growing number of countries that are exploring ways to establish domestic crediting mechanisms, frequently in conjunction with an emissions trading system (ETS) or carbon tax, which would serve as a demand source for credits (World Bank, 2023). The President of Indonesia requested that Indonesia immediately enter the international carbon market (Saptowalyono & Susilo, 2023), further emphasizing the global significance of its carbon market initiatives. As a result, the IDX Carbon was officially launched on September 26th, 2023, by the President of the Republic of Indonesia, marking the beginning of carbon trading in Indonesia. The launch of IDX Carbon is Indonesia's tangible contribution to joining the global fight against the climate crisis.

The voluntary carbon trading activity, also known as the carbon offset market on September 26th, 2023, involves balancing a certain amount of carbon emissions generated from specific activities by purchasing carbon credits originating from greenhouse gas (GHG) reduction or removal activities elsewhere, such as forest restoration. Business entities can purchase carbon units to achieve emission reduction targets and fulfil the commitment to carbon-neutral or net-zero emissions.

The vast forests of Indonesia have the potential to generate a great amount of carbon credits that can be traded globally. According to the Press Release from the Coordinating Minister for Economic Affairs (2022), if Indonesia were to sell carbon credits at USD 5 per ton of CO₂, the country could achieve USD 565.9 billion in revenue or the equivalent of IDR 8,000 trillion through carbon trading from tropical forests, mangroves, and peatlands. Therefore, Indonesia's entry into the carbon market is expected to have

far-reaching impacts, including increased global recognition, economic opportunities, and alignment with climate objectives.

Indonesia's Forest Potential in Climate Change Mitigation

Forest ecosystem plays an important role as the primary carbon sink in the terrestrial environment (Hui et al., 2016; Indrajaya et al., 2022), absorbing large amounts of carbon dioxide from the atmosphere and storing it within the living and dead biomass as well as in the soil (Whitehead, 2011; Indrajaya et al., 2022). The carbon storage capacity in forest ecosystems is 20-100 times higher per unit area compared to agricultural land (Kibria, 2013; Indrajaya et al., 2022). Maintaining and preserving forest ecosystems are essential for carbon sequestration and conservation efforts to address global carbon balance and climate change.

Unfortunately, Indonesia experiences one of the highest rates of primary forest loss in tropical regions (Global Forest Assessment, 2020; Climate Transparency, 2022). From 2015 to 2020, Indonesia lost 578.5 thousand hectares of forest area annually. Deforestation and degradation lead to a decline in carbon stocks, with the conversion of primary forest to secondary forest potentially reducing carbon stocks by 80% in dryland forests, 89% in peat swamp forests, and 71% in mangrove forest (Krisnawati et al., 2014; Indrajaya et al., 2022). Indonesia's third Biennial Update Report (BUR), reported an increase in emission level to 1,845 GtCO₂-eq in 2019, which was dominated by emissions from Land Use Change and Forestry (LUCF), better known as Forestry and Other Land Uses (FOLU), including peat fires (50.13%) followed by energy (34.49%), waste (6.52%), and Industrial Process and Product Uses (IPPU) (3.15%) (Ministry of Environment and Forestry, 2022).

However, suppose the situation above can be stopped or even reversed, Indonesia has the opportunity to

become a powerful force in climate change mitigation, with 64% of its total land area, or 120.26 million hectares, designated as a State Forest Area (see Table 1) (Nurbaya et al., 2022).

The country’s forest ecosystem includes various types of forests, such as lowland tropical rainforests, upland forests, monsoon forests, savannas, peat swamp forests, and mangrove forests (Kartawinata et al., 2013; Indrajaya et al., 2022). In addition, Indonesia has a total of 24.7 million hectares of tropical peatland ecosystems, with approximately 13.43 million hectares of peatland identified in 2019 (BBSDL, 2019; Nurbaya et al., 2022). Peatlands in Indonesia hold a significant potential for carbon storage, with an estimated range from 13.6 to 55 Gigatons (Jaenicke et al., 2008; Warren et al., 2017; Nurbaya et al., 2022), emphasising the environmental importance and carbon sequestration capacity of Indonesia’s peatland ecosystems.

Table 1. The Extent of Land Cover in Indonesia in 2020

No	Land Cover	Forest Area (million hectares)						
		Permanent Forest					HPK	Total
		HK	HL	HPT	HP	Total		
1	Forested	17.49	24.16	21.75	18.59	81.99	6.42	88.41
	a. Primary Forest	12.56	16.10	9.76	4.57	42.99	2.53	45.52
	b. Secondary Forest	4.82	7.79	11.58	10.06	34.25	3.85	38.10
	c. Plantation Forest	0.11	0.28	0.41	3.96	4.76	0.04	4.80
2	Non-Forested	4.39	5.40	5.05	10.64	25.48	6.37	31.85
	Total	21.87	29.56	26.80	29.23	107.47	12.79	120.26

Notes: HK = Conservation Forest, HL = Protection Forest, HPT = Limited Production Forest, HP = Production Forest, HPK = Convertible Production Forest.

Source: Ministry of Environment and Forestry, (2021); Nurbaya et al., (2022)

In 2020, the total global area of mangroves was estimated at 14.8 million hectares; approximately 19% of the area globally is in Indonesia (FAO, 2020). In 2021, national mangrove mapping indicated that Indonesia’s mangrove ecosystem encompasses a total area of 4,12 million hectares (see Table 2), with existing mangroves covering 3,364,080 hectares and a potential habitat area of 756,183 hectares (Ministry of Environment and Forestry, 2021).

Mangroves can absorb an average of 892 tons/ha of carbon (Wahyudi et al., 2018; Indrajaya et al., 2022).

Table 2. Existing Mangrove Area And Potential Mangrove Habitat Inside and Outside the Forest Area

No	Area Function	Existing Mangroves (ha)	Mangrove Habitat Potential (ha)	Total (ha)
1	Protection Forest	911,397	83,737	995,134
2	Conservation Forest	748,271	48,837	797,108
3	Production Forest	1,001,614	142,961	1,148,575
4	Other Use Areas	702,798	480,648	1,183,446
	Total	3,364,080	756,183	4,120,263

Source: Ministry of Environment and Forestry, 2021

Indonesia has the potential to absorb a significant amount of GHG emissions because of its extensive forest, which is capable of storing carbon with exceptional capacity. It is no wonder that the FOLU sector is considered to play a crucial role in fulfilling over half of Indonesia’s climate commitments in the Enhanced Nationally Determined Contribution (ENDC). This sector accounts for 17.4% of the 31.89% reduction in GHG emission compared to the Business-as-Usual (BaU) trajectory intended to be achieved independently by 2030 and 25.4% of the 43.20% reduction with international assistance (Ministry of Environment and Forestry, 2022). Moreover, the FOLU sector is anticipated to function as a carbon sink by 2030 (FOLU Net Sink 2030), achieving a net sink with sequestration starting at 140 Mton CO2e and progressively increasing to 304 Mton CO2e (Nurbaya, et al., 2022). The sector considerably impacts the emissions offset of other sectors, especially the energy sector, which faces challenges in reducing its emissions (Nurbaya et al., 2022). In order to meet the FOLU net sink goal, systematic actions will be implemented, including forest and land rehabilitation. Carbon crediting markets play a supportive role in this endeavour by providing payments for emission reduction through initiatives targeting deforestation and forest degradation, as well as improving forestry management, collectively known as REDD+ (World Bank, 2023).

With a potential carbon credit value of IDR 8000 trillion, the launch of the Indonesian carbon exchange acknowledges the immense value of this environmental service and positions our forests as key players in the carbon market. Valuing and monetising the carbon credits generated through sustainable forestry practices can contribute to the environment and job creation, increase government revenue, and enhance export earnings. This condition will lead to a sustainable and resilient economy.

Conclusion

The global carbon market, driven by corporate zero-carbon commitments, is undergoing a transformative shift towards nature-based solutions. A record 54% of new project registrations are for forestry and land use activities. Indonesia contributes through IDX Carbon with the potential to reach IDR 8,000 trillion with a potential FOLU of 120.26 million ha for an emissions reduction of 17.4% from 31.89% in the Business as Usual scheme and 25.4% of an emissions reduction of 43.20 % with international assistance. In the long run, the valuation and monetisation of carbon credits generated through the FOLU sector will contribute to the environment, job creation, government revenue, and export revenue, leading to a sustainable and resilient economy.

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Author

Mahdia Amalia

Universitas Gadjah Mada

Supervisor

Ilham Setiawan Noer

EAFOR Program Officer

Resilience Development Initiative

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