Not Sacrificing Forests for Socio-Economic Development: Vietnam Chooses a Harmonious, Ecologically Balanced Approach

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— No utility compares to that of escaping an illicit dream, alive and better off, still intact!

In "The Philosophy of Awakening"; *The Kingfisher Story Collection* (2022)

Abstract

Forests play fundamental roles in the Earth's ecosystems. With the great capability of carbon sequestration, tropical forests are expected to contribute substantially to reducing the CO2 in Earth's atmosphere. However, global tropical forest areas have declined drastically over the last few decades due to pressures from socio-economic development pursuit. The current essay aims to demonstrate the ongoing global deforestation crisis and its underlying drivers and discuss the vital roles of tropical forests in the socio-economic development in the face of climate change when developed countries start to tighten the carbon emission control regulations (e.g., European Union's Carbon Border Adjustment Mechanism). It suggests why developing countries in tropical regions, particularly Vietnam, should not sacrifice forests for short- and medium-term socio-economic goals but capitalize on them to leverage long-term development. Moreover, evidence of Vietnamese political leaders' commitment to forest protection and sustainable development is also provided.

Keywords: developing countries; agricultural production; industrial production; carbon regulation; sustainable development;

1. Global deforestation crisis

Forests are an incredibly crucial part of Earth's ecosystem and human life. They make up 75% of the Earth's total primary productivity and contain 80% of the Earth's plant biomass. Primary forest production is estimated at 21.9 gigatons (GT) of biomass annually in tropical forests, 8.1 GT in temperate forests, and 2.6 GT in boreal forests (Pan, Birdsey, Phillips, & Jackson, 2013). Land and forests have an intrinsic relationship. Over millions of years, the land has provided the necessary foundation for the development of forest ecosystems. Conversely, forests ensure the fertility of the land, allowing plants to continue growing and thriving, creating conditions for agricultural production.

Of the 14.9 billion hectares of land on Earth, only about 10.6 billion hectares (71% of the total area) are suitable for human habitation. According to Ritchie (2021), forests occupied 57% of the suitable land area ten millennia ago (around 6 billion hectares), with the remaining 42% being wild grasslands and shrublands. While deforestation has been carried out by humans for thousands of years to expand agricultural land and provide wood for energy needs, by 1700, forested areas had only decreased by about 10% compared to ten millennia ago. By 2018, forested areas only accounted for 38% of suitable land area (about 4 billion hectares), while land used for livestock (~3.2 billion hectares, 31%), agriculture (~1.6 billion hectares, 15%), and urbanization (~0.06 billion hectares, less than 1%) had significantly increased (Ritchie, 2021).

The severe reduction in forested areas is driven by the rapid global population growth, leading to increasing demands for food, consumption, and housing. The conversion of land

use to meet these needs, primarily through deforestation, is one of the main factors contributing to the rising greenhouse gas levels in the atmosphere, accounting for about 12-20% in 2020 (Watson & Schalatek, 2020). This significantly exacerbates the existential threat that humanity must confront by climate change.

Despite numerous international community efforts to combat deforestation, the situation remains far from optimistic. At the COP26 climate summit in Glasgow in 2021, leaders from 145 nations committed to enhancing efforts to combat deforestation with the goal of halting and reversing deforestation trends by 2030. Global deforestation must be reduced by 10% annually to achieve this goal. However, the current reality is moving opposite to the pledged goal, particularly in tropical forest regions.

On a global scale estimate for tropical regions, 17% of tropical forests have disappeared since 1990, with just over 1 billion hectares remaining in 2019, of which 10% are experiencing degradation. Without reducing the current disruption rates, intact tropical forests are projected to vanish completely by 2050 (Vancutsem et al., 2021). Data from the Global Forest Watch (GFW) organization also shows that the tropical regions lost approximately 4.1 million hectares of primary forest in 2022, up from 3.75 million hectares in 2021. Among these, Brazil, the Democratic Republic of Congo, Indonesia, and Peru are the top five countries with the largest areas of primary forest destruction (Jong, 2023).

For a long time, Brazil, which contains about 60% of the Amazon rainforest in tropical forests, has been widely recognized as one of the world's largest annual deforestation hotspots. According to preliminary satellite imagery analysis released by Brazil's National Institute for Space Research (INPE) on November 30, 2022, an area of forest roughly equivalent to the size of Qatar, approximately 1.16 million hectares, was cleared entirely from August 1, 2021, to July 31, 2022. Although annual deforestation in Brazil's Amazon rainforest decreased by 11.27% compared to the previous year, deforestation remains a significant issue (Mendes, 2022).

Bolivia, a South American nation bordering Brazil, also ranks among the countries with the highest deforestation rates in tropical forests in 2022. Remarkably, deforestation in Bolivia is happening at an alarming rate. The deforested area in 2022 increased by 32% compared to 2021, propelling Bolivia to the third position globally in terms of deforestation "achievement," only trailing behind Brazil and the Democratic Republic of Congo. When adjusted for the country's population, Bolivia's deforestation rate surpasses Brazil's by a significant margin, being four times higher (Graham, 2023).

2.   The underlying drivers of deforestation

Scientists and forestry practitioners have extensively studied the driving forces behind deforestation trends in the past 3-4 decades and believe that deforestation, particularly in tropical forests, results from multiple factors acting simultaneously rather than a single

cause. These factors include but are not limited to livestock farming, legal and illegal logging, fuelwood collection, charcoal production, land expansion for timber extraction, oil palm cultivation, surface mining, urban development, infrastructure expansion, wildfires, or other natural disasters (DeFries, Rudel, Uriarte, & Hansen, 2010). The impacts of these factors on deforestation are complex and vary by region, but they are primarily related to changes in land use and human-induced pressures (Busch & Ferretti-Gallon, 2017; Ferrer Velasco, Köthke, Lippe, & Günter, 2020).

So, what drives changes in land use and increased pressure from human activities? Alongside a growing global population, rapid urbanization, and global trade driven by economic development goals, there is an increasing demand for agricultural and industrial products. As a result, forests can easily become sacrificial objects to ensure the growth and income of a nation. Research by DeFries et al. (2010), using satellite data from 41 countries in humid tropical regions, has shown a positive correlation between the loss of forested land and urban population growth and agricultural exports but not with rural population growth.

The majority of deforested areas in Brazil are used for livestock farming, specifically cattle ranching. Since the beginning of the 21st century, approximately 70% of previously forested land in the Amazonian ecological region and 91% of forested land have been converted into pastureland since 1970 (Steinfeld, 2006). From 2005 to 2013 alone, of the 2.1 million hectares of tropical forest deforested annually for meat production, Brazil contributed nearly 60%, with 1.2 million hectares of forest being cleared annually (Pendrill, Persson, Godar, & Kastner, 2019). The driving force behind Brazil's deforestation for cattle ranching comes not only from domestic demand but also from export requirements. Besides being the second-largest consumer of beef globally, Brazil is also the world's largest beef exporter (Research and Markets, 2023).

In the case of Bolivia, soybean cultivation is the primary driver of deforestation. In 2022, soybeans and related products were Bolivia's third-largest export, generating over $2 billion in revenue. Moreover, research by Trase, which analyzes supply chains, indicated that Bolivia's soybean production is significantly linked to high deforestation rates compared to neighboring soybean-producing countries like Brazil, Argentina, and Paraguay (Reis, Croft, Titley, & Tyldesley, 2023).

Apart from agricultural production purposes, forests are also cleared for industrial projects, mining activities, essential infrastructure, and, most recently, environmental conservation efforts, as seen in the case of Indonesia. Indonesia is one of the world's leading nickel producers, alongside Australia. Nickel is a widely used metal in the production of industrial machinery considered suitable for sustainable development, such as rechargeable batteries, wind turbine components, photovoltaic solar cell technology, bioenergy plant components, carbon capture and storage equipment, nuclear power plants, modern environmentally sustainable construction projects, etc.

Despite nickel's potential for sustainable development, its mining, processing, refining, and extraction come at a price – the large-scale clearing of forests. Published data reveals that at least 76,300 hectares of tropical forests in Indonesia, equivalent to the size of New York, have been cleared in 329 concession areas. Approximately 23,000 hectares began to be cleared in 2019 as demand for electric vehicles and nickel-charged batteries surged. US Geological Survey data shows that in 2022, Indonesia alone supplied nearly 50% of the world's nickel ore (Ruehl & Dempsey, 2023).

It is evident that consumers are the ultimate users of products linked to deforestation, whether agricultural or industrial. However, there are differences in consumer demand for such products among different segments of society, leading to uneven levels of deforestation caused by consumption. For example, consider beef consumption in the United States. Beef is the largest contributor to greenhouse gas emissions from livestock production, accounting for approximately 45% of total emissions (Xu et al., 2021). Despite this, the United States is the largest consumer of beef globally, and the market size is projected to continue growing in the coming years (Research and Markets, 2023). However, only a small percentage of Americans consume this vast amount of beef, roughly 12% of the population. Research by Willits-Smith, Odinga, O'Malley, and Rose (2023) revealed that over half of the beef consumed in the United States is consumed by a minority group, which makes up about 12% of the population. The study also found that men and individuals aged 50-65 tend to consume more beef. White individuals tend to consume more beef than other racial and ethnic groups, such as African Americans and Asians (Willits-Smith et al., 2023).

Furthermore, throughout the process, from forest clearance to the end consumer, businesses play a pivotal role as the primary beneficiaries. They are the ones reaping the most significant profits, if not the largest, and are also the main agents driving activities that exert pressure on forests and alter land use. For example, nickel mining projects in Indonesia receive support from well-known automobile companies with a focus on electric vehicle production, such as Ford (USA), Vale (Brazil), Tsingshan (China), and Jardine Matheson (Hong Kong) (Ruehl & Dempsey, 2023). Agricultural production and industrial mining activities also contribute to employment opportunities for local communities, who may have limited access to urban job markets due to various objective and subjective factors. In some cases, indigenous communities also engage in forest resource extraction primarily to meet their own and their families' livelihood needs while preserving traditional cultural values. However, the forest activities of local residents are unlikely to lead to large-scale deforestation, unlike businesses' activities.

In addition to economic incentive factors, there is a significant lack of awareness regarding the values of forest ecosystems and the detrimental effects of deforestation at the local, regional, and even global levels, such as carbon sequestration in the atmosphere (Vuong, 2020). Forest ecosystems provide a wide range of services and products that are crucial for maintaining human life, health, and socio-economic activities. These ecosystem services and

products include carbon sequestration, soil protection, land degradation and desertification prevention, water filtration and conservation, climate regulation, biodiversity conservation, risk reduction from disasters and epidemics, and many more. However, most of the ecosystem services and products provided by forests are not adequately considered in current economic and social development models, often seen as default. This leads to policies often overlooking the negative impacts of forest ecosystem deficits, which take time to manifest, and prioritizing short-term economic and social benefits that may not be as clear-cut (although, in reality, this is also not certain). From a cost-benefit perspective, without legal mechanisms and forest protection systems in place, the cost of deforestation is nearly zero because "trees just stand there and do not avoid the chopper" (Hoàng, Hoàng, & Phương, 2023).

Another critically important objective factor that cannot be overlooked is the current lack of mechanisms to transform the surplus ecological environment value into surplus economic value, thereby creating sustainable incentives for forest ecosystem protection (Nguyen & Jones, 2022; Vuong, 2021). Even the implementation of voluntary carbon markets remains a challenge for many countries worldwide, as they have not yet established consistent quality and international-scale transaction standards (Coy, 2023; Liu, Wang, & Su, 2016).

3. Can Vietnam approach this differently?

In Vietnam, forests play an extremely important role in creating livelihoods for people living in or near forests and in the mountainous regions of Vietnam. They help create jobs and improve livelihoods for about 25% of Vietnam's population living in the mountains (Luong, 2014). This was the case previously. As countries increasingly impose strict carbon taxes on imports, forests not only ensure livelihoods for mountainous people but also play a crucial role in securing the livelihoods of the entire nation.

On October 1, 2023, the European Union (EU) officially initiated the first phase of the Carbon Border Adjustment Mechanism (CBAM) for six sectors, including iron and steel, cement, aluminum, fertilizers, electricity, and hydrogen. This phase is the initial (or transitional) stage in a three-phase plan set out in the EU Green Deal to reduce the region's greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels and make the EU a 'climate-neutral bloc' by 2050. During this transitional phase, exporting businesses to the EU will only need to declare emissions without the obligation to purchase emission certificates. Phase 2, starting in 2026, will tighten requirements, making it mandatory for exporting businesses to purchase emission certificates, and may expand the scope of CBAM to include common consumer goods. In Phase 3, starting from 2030, CBAM will be fully applied to all products in the EU's emission trading market.

CBAM is a tool implemented to address carbon emission issues and ensure fairness for EU domestic businesses, where strict climate change policies increase domestic production costs and reduce competitiveness with imports from countries with lax climate regulations.

The CBAM mechanism will impose taxes on imported goods into the EU, with emissions during production and transportation exceeding EU standards. In other words, for each shipment exported to the EU, businesses will have to pay for the amount of carbon certificates needed to offset emissions exceeding EU regulations. The price for a carbon certificate for one ton of CO_2 emissions on the EU compliance market is €83.97.

Currently, the EU is Vietnam's third-largest export market, with Vietnam's export turnover to the EU reaching $46.8 billion, a 16.7% increase compared to 2021 (Thoa, 2023). Thanks to the European Union–Vietnam Free Trade Agreement (EVFTA) agreement, Vietnam's export turnover to the EU is expected to grow in the coming years. However, without adequate preparation for the carbon credit battle, Vietnam's competitive advantage may face significant challenges due to rapidly increasing costs of goods when paying additional carbon taxes. This is not just with the EU market; major markets like the USA, Japan, South Korea, China, etc., are planning to implement carbon adjustment mechanisms similar to CBAM.

The implementation of carbon border adjustment mechanisms by developed countries is a challenge but also an opportunity for export-dependent economies like Vietnam. Vietnam, a country with rich forest resources forming natural carbon sinks, will have many competitive tax advantages in the carbon credit battle. According to the Ministry of Agriculture and Rural Development, the country had 14,790,075 hectares of forest in 2022, including 10,134,082 hectares of natural forest and 4,655,933 hectares of planted forest (VNA, 2022). Without a suitable economic development model, the country will lose this natural advantage in the upcoming carbon credit battle. According to the Global Forest Watch organization, Vietnam lost 120,000 hectares of natural forest, equivalent to 66.6 million tons of CO_2 emissions (Global Forest Watch, 2023). Suppose Vietnam did not lose and had a proactive mechanism to convert the carbon isolation value of these 120,000 hectares of natural forest into carbon credits. Based on the EU compliance market price (€83.97/ton CO2), it would receive carbon credits worth over €5.5 billion, nearly 12% of Vietnam's total import-export turnover to EU countries in 2022.

Given the huge value that can be generated from the forest's ability to capture and store carbon, we need to be very cautious about hasty recommendations on transitioning the economic structure towards industrialization. For example, in the northern mountainous provinces, development will almost immediately focus on mining and mineral extraction. In such cases, the primary victim at risk of being sacrificed is the forest. If the extraction and production of goods do not ensure carbon neutrality (due to deforestation), it is highly likely that the goods produced will struggle to access (or access at a very high cost) markets with strict carbon neutrality regulations like the EU, and potentially in the future, the UK, USA, Japan, South Korea, and China. Therefore, implementing industrial projects not only risks being unprofitable but also could lead to investment losses or even bankruptcies. The risks are long-term, and rectifying them would require significant re-investment.

Reducing the natural forest area and compensating with planted forests also needs to be considered carefully and limited for several reasons.

First, natural forests can store more carbon than planted forests due to their complex structure and accumulation of carbon underground and on the forest floor. During photosynthesis and respiration, most organic carbon is respired back to CO_2 in the biosphere, but a small part escapes this process and is isolated underground through the formation of leaf litter (leaves, bark, branches, and ground cover), the life and death of the plant root system, and indirectly by transferring carbon-rich compounds from tree roots to bacteria living in the soil around the roots (Hemingway et al., 2019; Ontl & Schulte, 2012). This process forms carbon reservoirs lasting for decades to millennia. Even when the forest age exceeds 200 years, the total carbon in living plant biomass, coarse wood debris, and soil continues to increase (Pregitzer & Euskirchen, 2004).

Second, reducing the natural forest area and compensating with planted or replanted forests risks creating an unpayable 'carbon debt' situation. 'Carbon debt' refers to the amount of carbon released into the atmosphere that needs to be isolated before considering reducing atmospheric carbon from when the natural forest is destroyed. Specifically, the carbon isolated underground will gradually be lost due to the decomposition of organic matter when natural forests are destroyed. The main reasons for organic matter decomposition are the loss of continuous carbon replenishment from growing trees and increased soil temperatures when vegetation cover is lost. Soil contains more carbon than terrestrial plants and the atmosphere combined, so compensating for carbon loss through deforestation by replanting forests would take hundreds of years (Waring et al., 2020). Moreover, although forest planting generally positively impacts carbon accumulation in soil, in some cases, particularly on high-carbon soils like grasslands, meadows, and peatlands, planting trees can destroy natural carbon reservoirs (Chen et al., 2016; Richards et al., 2017; Waring et al., 2020).

Third, the ability to recover carbon through forest planting and reforestation projects may be further limited by cost constraints, logistical challenges, and physiological limitations (for example, scarce water resources will limit growth and increase tree mortality rates) (Vuong, 2018; Waring et al., 2020). Forest planting is most effective in carbon isolation when trees are planted in previously forested areas, but restoring the original state also requires significant human and material resources. If natural forests are destroyed for economic benefits, the costs of planting forests elsewhere can be paid by mining or agricultural production businesses. However, time is a significant obstacle to business promises of reforestation.

According to a study analyzing paleoecological records over the past 20,000 years, it takes more than 200 years to restore a tropical forest to 95% of its original state after devastation (Cole, Bhagwat, & Willis, 2014). This result shows that restoring carbon storage capacity

through reforestation takes a lot of time and requires consistent commitment from participants over a very long period, at least several decades, to see effectiveness. However, whether businesses themselves can maintain production activities over such a long period remains uncertain, as their operations depend heavily on market fluctuations and financial situations.

From the above discussion, we can see that the battle around the loss-benefit relationship of carbon credits is increasingly imminent and unavoidable. Clearly, in the face of major global shifts in environmental and climate change aspects, the pressure and challenges are immense. But with thorough analysis and assessment, this is also a tremendous, even breakthrough opportunity for the socio-economic development of Vietnam, especially for provinces and regions rich in ecological resources but not yet reaping corresponding socio-economic benefits from this precious resource. Therefore, Vietnam should not only be different but also differentiate itself from countries currently practicing the sacrifice of ecological resources, most notably forests, for short- and medium-term socio-economic goals. An economic model that considers ecological surplus alongside economic surplus will help Vietnam capitalize on ecological richness for sustainable development goals and demonstrate the conscience of a pioneering nation.

In the political-social realities of Vietnam, the leadership's attention from the Party and the State is especially significant for ensuring the sustainable success of major agendas closely related to food security, energy, and soon ecological security. It is known that the Permanent Member of the Secretariat, during her visit to the Bac Kan Provincial Party Committee on October 14, 2023, put forward guiding opinions, clearly expressing the strategic viewpoint on eco-economy and assessing the extremely important value of the environment for the country's sustainable development. The directive of the Permanent Member of the Secretariat emphasizes that with the highest forest coverage rate in the country, 73.35% of the province's area, sustainable forestry development, continuing to increase forest coverage, is indeed the strategic value that Party and State leaders desire to build. The directive particularly notes not sacrificing forests and ecological natural resources for the immediate economic benefit of local budget revenue. To successfully implement a development direction that harmoniously combines the economy with a sustainable environment, the important role of businesses and the sharing of benefits by localities within the overall economy will be needed. However, the economic role of businesses will need to be placed within a regulatory framework to limit the impact of market defects on environmental sustainability. At the same time, the development of mandatory and voluntary carbon credit markets will certainly play a crucial role, contributing to opening up economic exploitation based on the enhancement and development of ecological resources instead of having to sacrifice forests and the environment.

From a management perspective, the Prime Minister of Vietnam has also made a strong commitment to 'net zero' in the global sustainable development agenda. The consistency of

the major agenda, as evidenced by Party and State leaders' political determination, becomes the foundation for sustainable economic success in an era when humanity's conscience is turning towards the fight against climate change.

> "[…] climate change response and the restoration of nature must become the highest priority in all development decisions. They must form the highest ethical standards for all levels, sectors, businesses and citizens." — Excerpt from the United Nations Framework Convention on Climate Change (UNFCCC, 2021).

Once again, it can be affirmed that one of the main weapons in the battle against climate change is the tropical forest, a strength of Vietnam's ecosystems.

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