International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

Evaluating the Economic and Environmental Efficacy of Global Carbon Offset Markets: Perspectives from the Global South

Aarav Kumar

Inventure Academy

DOI: 10.46609/IJSSER.2026.v11i06.015 URL: https://doi.org/10.46609/IJSSER.2026.v11i06.015

Received: 10 June 2025 / Accepted: 24 June 2026 / Published: 28 June 2026

ABSTRACT

As climate change intensifies, governments and corporations are turning to carbon offset markets and nature-based solutions to meet emission targets. Yet critics argue these mechanisms allow wealthy nations and firms to "buy their way out" of real reductions, while creating new inequities for developing economies. This paper evaluates the economic and environmental effectiveness of carbon offset markets as a tool for reducing global emissions. By analyzing market design flaws including additionality, leakage, and permanence, this study demonstrates that baseline over-crediting and geographic emission shifting undermine market integrity. Furthermore, the economic dynamics of "carbon Dutch disease" and "green grabbing" expose developing resource-rich nations to severe macroeconomic vulnerabilities. This paper argues that carbon offsets must not substitute for direct domestic decarbonization. It concludes by proposing a framework of structural policies—including an International Baseline Registry under Article 6.4 of the Paris Agreement, a tiered additionality rating system, and localized developmental safeguards—to transition offsets into a credible, secondary pillar reserved strictly for residual emissions.

Keywords: Additionality, Carbon Offsets, Environmental Economics, Global South Development, Market Leakage

1. Introduction

Carbon offset markets began as a technical fix. They are now a multi-billion-dollar industry that allows entities with high mitigation costs the flexibility of offloading them by purchasing emissions reductions generated in regions with lower costs, particularly in the Global South. On one hand, supporters of this mechanism frame this as a pragmatic solution: it enables global cooperation and gives institutions the ability to channel financial capital into effective, nature-based solutions such as regenerative agriculture and reforestation. On the other hand, critics

ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

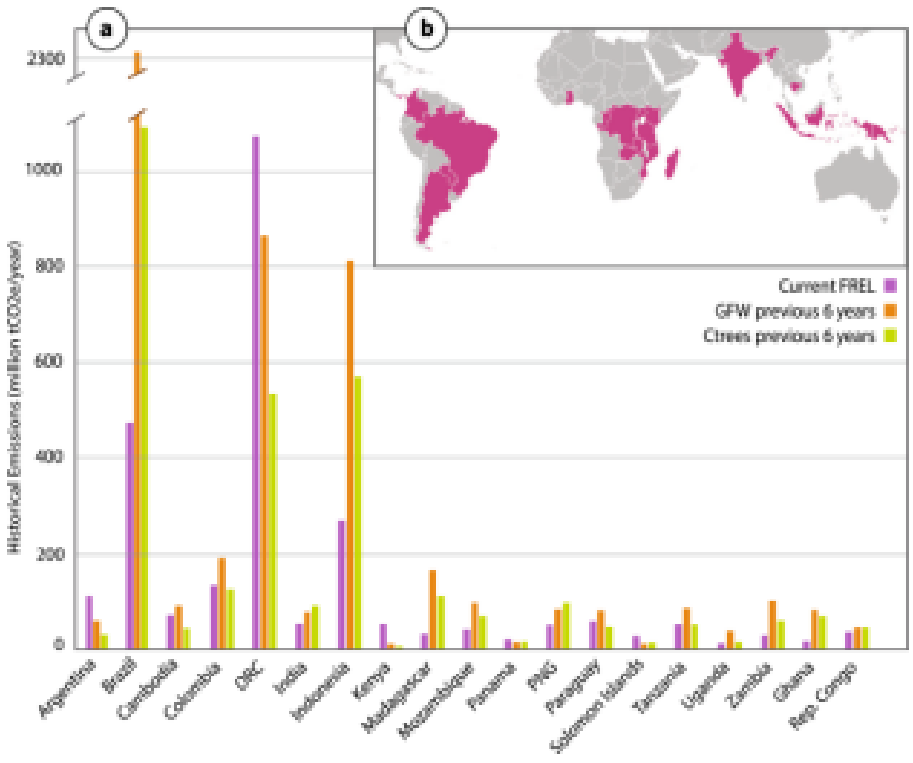
counter that a system built on “compensation” risks deepening existing inequities and delays the change necessary for a net-zero economy. This essay evaluates the economic and environmental effectiveness of carbon offset markets and argues that offsets can complement—but never substitute for—direct emissions reductions.

2. Main Body

2.1 Environmental and Structural Flaws of Offset Markets

The effectiveness of carbon offsets rests on a promise: each credit represents a real additional reduction in emissions. Accordingly, additionality focuses on whether a project would have occurred without the incentive of carbon offsets. Economically, an offset is valid only if there is a clear reduction in emissions below a credible baseline. In practice, this is difficult to ascertain: a 2023 analysis of Verra-certified REDD+ projects found over-crediting by up to 400% because baseline deforestation rates were higher than they should have been. Hence, when baselines are chosen without verification, carbon offsets just generate “hot air”: credits with financial value but no real environmental benefit.

Figure 1: Comparison of projected baselines and observed



ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

Once additionality weakens, the market's vulnerabilities aggravate. Even if a project reduces emissions locally, it may simply displace those emissions to another area. This is the issue of leakage. Forest conservation projects, in particular, illustrate this problem: protecting a region in the Amazon may push logging to neighbouring jurisdictions or districts with weaker enforcement. When situations like this occur, the equivalence between a credit purchased and a tonne of avoided emissions is eroded. The market no longer fails only at the margin; it fails systemically. Rather than being wholly eradicated, emissions simply shift across borders–pushed elsewhere, not eliminated.

Permanence deepens this fragility further. Permanence–the durability of stored carbon–illustrates the economic debility of offsets. Any nature-based solution will have an inherent risk of reversal: forests may burn, soil carbon may oxidize, and trees can degrade. If sequestered carbon only re-enters the atmosphere years later, then the value of the original credit should retroactively lose its value. Therefore, to make economic sense, these offsets must be priced with risk accounted for, similar to risk-adjusted investments. However, many markets fail to account for this permanence effectively. The result? Systemic overvaluation.

Moreover, this problem is only compounded by high monitoring and verification costs, especially in regions with low technical capacity. When reversals go undetected, data gaps will form, and low-quality credits will circulate in the same circles as high-value ones, eroding trust and market integrity. What is meant to be an efficient mechanism ends up resembling a system held together by assumption rather than fact.

2.2 Theoretical Gains vs. Institutional Realities

Theoretically, though, carbon offsets are said to have economic advantages. Offset markets can exploit global variation in marginal abatement costs (MACs): when high-cost abaters in developed markets fund low-cost mitigation in developing markets, global emissions can fall at a lower total cost. In theory, this can be Pareto-efficient. Offsets can mobilize private finance for conservation at a scale that traditional aid mechanisms, such as public budgets or charity efforts, cannot match.

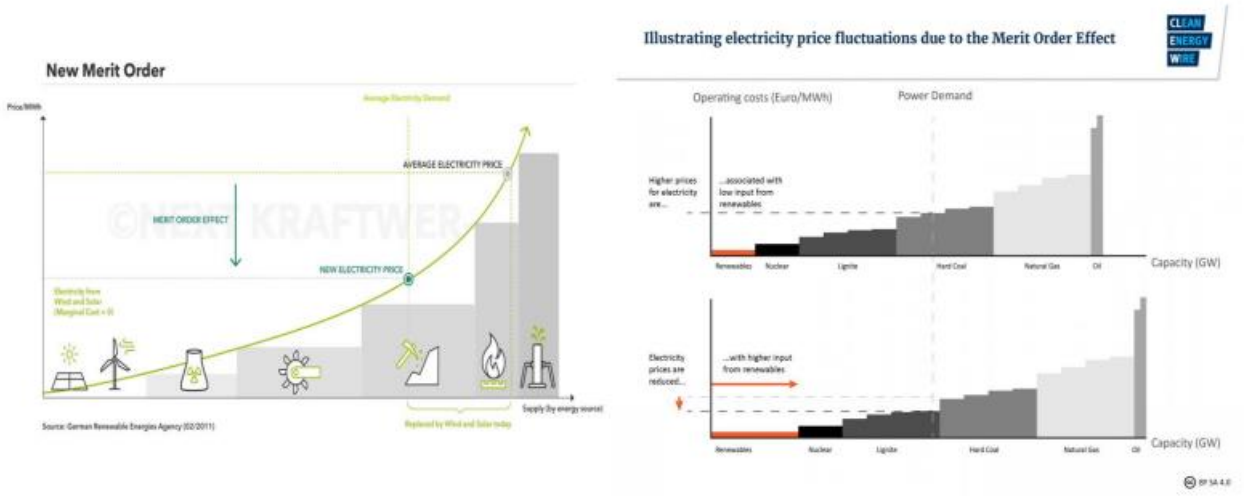
In practice, however, these theoretical gains depend on institutional conditions that rarely hold. To begin with, offsets can displace, rather than complement, domestic abatement. When firms rely on cheap credits outside of their national economy, they delay innovation in renewable energy and the substitution of fossil fuels. This moral hazard effect is particularly concerning in industries that have existing alternative renewable pathways, such as the transport sector. Offsets can lower carbon prices in cap-and-trade systems by adding large volumes of low-integrity credits, reducing the incentive for decarbonization. The EU faced this problem before 2013,

ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

when an influx of offset credits- generated under the Clean Development Mechanism- contributed to an oversupply of allowances and depressed EUA prices.

Figure 2: Merit-order curves for electricity generation under varying carbon prices, showing how carbon pricing raises the marginal cost of fossil



Additionally, the environmental effectiveness of offsets depends on governance, which differs greatly from country to country. Weak oversight and inconsistent reporting standards can make it difficult to ensure that credits accurately reflect emissions reductions. Moreover, the variation introduces a systemic credibility problem: if buyers cannot distinguish between high- and low-quality offsets, the market risks a "lemons" equilibrium, ensuring the prominence of low-integrity credits.

2.3 Impacts on International Trade, Investment, and Development

As offsets expand, their impact extends beyond emissions into trade and investment. Nature-based offsets have become the de facto export commodity for countries rich in natural resources, such as forests and mangroves. These countries receive investment that contributes to the financialization of ecosystems and the creation of long-term carbon revenue streams, as well as supporting rural incomes and sustaining livelihoods. Kenya, for example, has emerged as a hub for soil carbon farmers, integrating smallholder farmers into carbon value chains–illustrating the potential these markets have.

At the same time, however, dependence on carbon exports creates new vulnerabilities. Heavy reliance on carbon revenue can produce a form of "carbon Dutch disease", where governments prioritize carbon revenue over economic diversification, leaving the economy's developmental

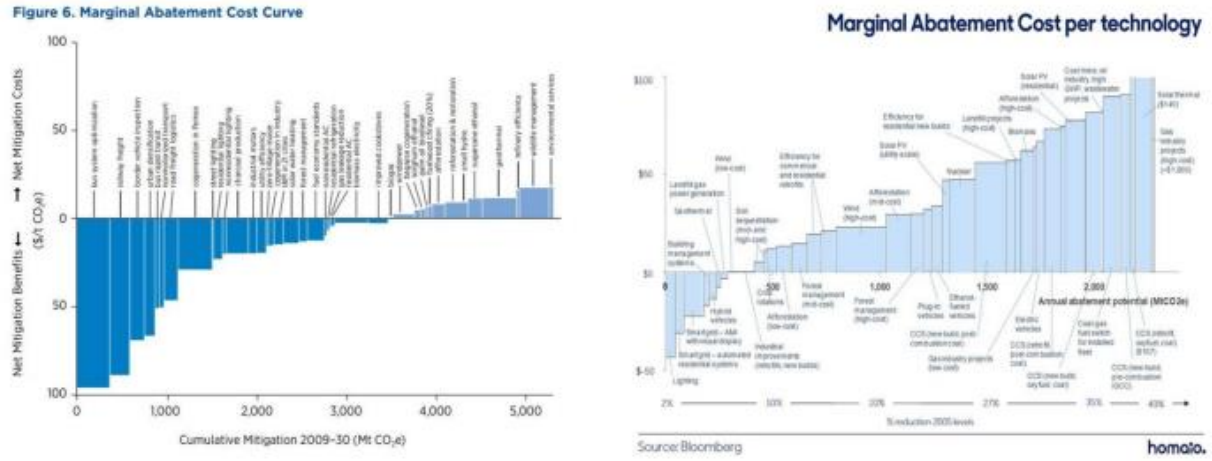
ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

trajectories exposed to volatile carbon prices and policy shifts in buyer countries. Additionally, land inequality may worsen as corporations and intermediaries consolidate control over large areas to secure carbon rights. There are documented cases of "green grabbing" across Africa and Southeast Asia, illustrating how communities can lose access to land when ecosystems are treated as mere financial assets. Without robust safeguards, local populations risk displacement and exclusion from decision-making regarding their own land.

Offsets also reshape international market dynamics. In a repeated-game framework, the Global North prefers offsets that are cheaper and provide inexpensive abatement costs, while the Global South benefits from higher prices that accurately reflect the value of the ecosystem. These clashing incentives result in disputes over baselines, verification standards, and crediting periods. Moreover, this can incentivise competition to supply the lowest-cost credits while overstating their true value, thereby undermining market credibility.

Figure 3: Marginal abatement cost curve illustrating the range of emissions reduction options across sectors, highlighting where direct abatement is technologically feasible and economically efficient



Given this, the question is not whether countries can rely on carbon offsets, but whether they should. They should not. Reducing direct emissions must be the primary pathway to decarbonization. While offsets can certainly complement domestic action to reduce emissions, they cannot replace it. Emissions caps aligned with 1.5°C pathways are essential precisely because they force structural change that cannot be outsourced internationally. Domestic marginal abatement cost curves make this clear: in sectors where abatement is technologically feasible and economically justified, intervention should occur directly. Sectors such as electricity generation, steel transport, and construction all have feasible pathways for decarbonization, and postponing these transitions simply delays inevitable adjustment.

ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

Offsets retain their value only in contexts where there are residual emissions that are genuinely impossible to eliminate, such as methane from agriculture, process emissions from cement, or certain aviation impacts. In these specific contexts, offsets can pair economic efficiency with environmental integrity, but only under stringent quality standards–otherwise, they risk expanding far beyond this acceptable role.

2.4 Policy Recommendations for Market Reform

For carbon offsets to function under a wider climate strategy, natural capital accounting frameworks must be integrated–such as those developed under TEEB (The Economics of Ecosystems and Biodiversity) and WAVES (Wealth Accounting and the Valuation of Ecosystem Services) initiatives – into crediting methodologies. This would ensure that the credits value biodiversity and ecosystem services, along with carbon sequestration. It would also reframe conservation as an economically grounded investment rather than a narrow carbon transaction.

Second, restoring credibility requires institutional coordination. An International Baseline Registry, under Article 6.4 of the Paris Agreement, should be formally created to harmonize methodologies and prevent double-counting.

Third, there should be a tiered additionality rating system to solve the problem of additionality. Analogous to ratings in financial markets, the system would grade projects based on empirical additionality, permanence risk, and monitoring quality, giving ratings of A+, A, B, or C. Buyers would then be required to pay premiums for high integrity credits, rewarding rigorous projects and eventually eliminating the supply of low-quality projects.

Fourth, there must be embedded developmental safeguards to protect local communities and lend them a voice in the processes. Policies should be in place that make sure offsets support local communities, while mandating free, prior, and informed consent (FPIC). Revenues should also be equitably distributed, with minimum shares directed to indigenous peoples and local communities who steward the ecosystems generating these credits.

Finally, national offset markets should be aligned with emerging Carbon Border Adjustment Mechanisms to ensure that high-integrity credits remain internationally competitive and embed accountability with trade.

3. Conclusion

These reforms transform offset markets from instruments of convenience into mechanisms capable of supporting genuine climate finance and sustainable development. Offsets therefore function best when embedded within a dual-pillar strategy: firm domestic emissions reductions

ISSN: 2455-8834

Volume:11, Issue:06 "June 2026"

where abatement is feasible, paired with high-integrity offsets reserved strictly for residual emissions. The future of the Global South depends on maintaining this structure. For a world in which offsets are not only economically but also morally viable, institutions must work towards building systems grounded in scientific accuracy and respect for communities that steward the world's most vital ecosystems.

References

[1] Brookings Institution, The Economics of Carbon Pricing. Washington, DC, 2023.

[2] Raphael Calel and Antoine Dechezleprêtre, "Environmental Policy and Directed Technological Change," Review of Economics and Statistics, vol. 98, no. 1, pp. 173–191, 2016.

[3] Erle C. Ellis, et al., "People Have Shaped Most of Terrestrial Nature for at Least 12,000 Years," PNAS, vol. 116, no. 17, pp. 7978–7985, 2019.

[4] Klaus Gugler, Akira Hashinuma and Michael Liebensteiner, "Carbon Pricing and the Merit Order Effect," Energy Economics, vol. 96, 2021.

[5] IPCC, AR6 Working Group III: Mitigation of Climate Change. Geneva, 2022.

[6] Richard Newell, William Pizer and Daniel Raimi, "Carbon Market Design, Stability, and Reform," Energy Policy, vol. 75, pp. 14–22, 2014.

[7] OECD, Making Carbon Markets Work. Paris, 2021.

[8] Lambert Schneider, et al., "Environmental Integrity of International Carbon Market Mechanisms," Climate Policy, vol. 19, no. 3, pp. 386–400, 2019.

[9] TEEB, The Economics of Ecosystems and Biodiversity. Geneva, 2018.

[10] UNEP, Emissions Gap Report. Nairobi, 2023.

[11] Verra, Independent Review of REDD+ Crediting. Washington, DC, 2023.

[12] World Bank, WAVES: Wealth Accounting and the Valuation of Ecosystem Services. Washington, DC, 2020.

