ALIGN

Advancing Land-based Investment Governance

Columbia Center on Sustainable Investment
A JOINT CENTER OF COLUMBIA LAW SCHOOL AND COLUMBIA CLIMATE SCHOOL

Nature-Based Insetting: A Harmful Distraction from Corporate Decarbonization

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This commentary was produced in March 2023 by CCSI and funded with UKAid from the UK Government as part of the ALIGN project. ALIGN supports governments, civil society, communities and peoples, and other relevant actors in strengthening the governance of land-based investments. The project is implemented by a consortium led by the International Institute for Environment and Development, CCSI, and Namati. The views expressed in this commentary do not necessarily reflect the official views or policies of ALIGN partners or the UK Government.

Carbon offsetting is used worldwide on a massive scale,[1] purportedly to mitigate climate change by capturing atmospheric carbon or by increasing or protecting carbon storage.[2] Yet, in recent years, offsetting has been increasingly criticized as a strategy that can harm Indigenous peoples and local communities, exacerbate land inequality, and, paradoxically, worsen the global climate crisis.[3] "Carbon insetting" has emerged as an alternative approach to offsetting that localizes nature-based solutions projects and other greenhouse gas removal activities within company value chains and has been adopted by major global brands such as Nestlé,[4] PepsiCo,[5] and Burberry.[6] This commentary takes a deep dive into insetting projects that employ nature-based solutions,[7] finds that they are likely to suffer from many of the same shortcomings as nature-based offsetting, and argues that corporate reliance on insetting should be treated with extreme skepticism.

Introduction

Companies around the globe have pledged to reach net-zero greenhouse gas (GHG) emissions over the course of the coming decades. Because corporate value chains are responsible for the vast majority of human-caused greenhouse gas emissions annually, expert consensus is that any viable path to decarbonization should adhere to a "greenhouse gas mitigation hierarchy" that prioritizes the actual reduction and avoidance of carbon emissions.[8] Yet many companies have taken the opposite tack, eschewing the hard work of reducing emissions in favor of carbon offsetting schemes that purport to contribute to global decarbonization even if the companies' own emissions continue to grow. These offset schemes often look to compensate for carbon emissions with initiatives that remove carbon from the atmosphere through various "nature-based" means, such as the planting or protection of trees.

Carbon offsetting has been rightly criticized by academics, human rights and environmental justice organizations, and investigative journalists on three grounds. First, it distracts from the real work of emissions reduction and avoidance that companies and governments need to prioritize to prevent the worst impacts of climate catastrophe. Second, the purported benefits of many carbon offset schemes are dubious and very difficult to verify. Third, carbon offset programs' ravenous appetite for land can lead to harm to Indigenous peoples and local communities,[9] loss of biodiversity,[10] or both.

Partly in response to these criticisms, some companies are now pivoting to an approach called "carbon insetting" that they hail as a better path forward. In reality, it is not a new or necessarily better approach to reaching net zero.[11] Instead, "insetting" was coined to favorably distinguish itself from offsetting[12] and mostly centers around efforts to embed nature-based solutions (NbS) projects and other offsetting schemes within a company's own value chain.[13] Insetting proponents argue that the programs can be designed in ways that channel real development benefits to peoples and communities that need them, thus strengthening the resilience of companies' supply chains. Only recently has the rise in corporate insetting begun to face significant public scrutiny, including in a February 2023 report by the NewClimate Institute.[14]

This commentary analyzes the purported benefits of nature-based insetting and concludes that any near-term emphasis on such projects is at best a dangerous distraction. We articulate three main reasons for this conclusion:

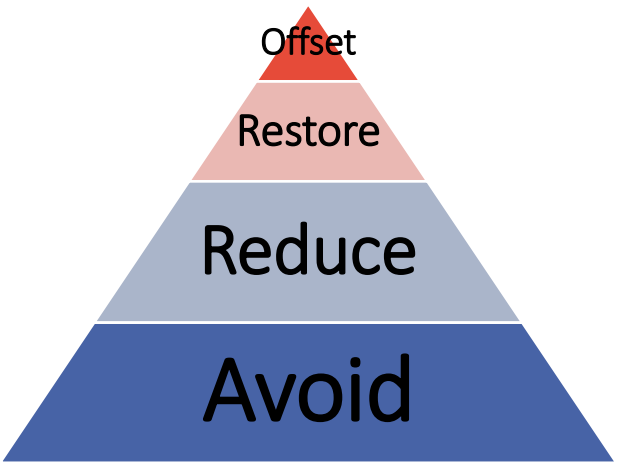
1. Nature-based insetting is **out of line with the mitigation hierarchy**.
2. Such insetting approaches suffer from the same core **ecological and credibility problems** as the offsetting programs they supposedly improve upon.
3. The purported benefits of insetting programs for local communities and peoples are uncertain, while the **risk of harms to their human rights and land rights** remains real.

Accordingly, companies should not distract from the real imperatives of climate action. They need to focus on targeted efforts to reduce and avoid emissions across their value chains, not compensating for those emissions before endeavoring to rein them in. As presently conceived, nature-based insetting does not offer a real path forward towards this goal, and companies should not tout it as a centerpiece of their climate strategies.

1 Nature-Based Insetting is Out of Line With the Mitigation Hierarchy

According to the greenhouse gas mitigation hierarchy, to meaningfully contribute to meeting global climate goals, companies must prioritize strategies that reduce their own generation of emissions (see Figure 1 and Box 1). This is achieved through emissions avoidance, efficiency improvements to reduce existing emissions, increased electrification through renewable power generation, and use of green fuels when electrification cannot cover all energy needs. Carbon removals are necessary, but to the extent they are used to offset or inset companies' emissions, they should be pursued as last resort measures and should only neutralize hard-to-abate emissions once all other options have been exhausted. Instead, companies must urgently prioritize strategies to reduce the levels of GHG output in their own operations and value chains.

Figure 1. The Greenhouse Gas Emissions Mitigation Hierarchy



BOX 1: WHAT IS THE GREENHOUSE GAS MITIGATION HIERARCHY?

The greenhouse gas mitigation hierarchy outlines the actions that corporations can pursue to reduce their climate impact, and provides a ranking of these actions based on their ability to produce the best outcomes for people and nature (with avoidance as the first priority and offsetting as the last).[15] According to the World Wide Fund for Nature (WWF), the practices within the mitigation hierarchy are defined as follows:

1. Avoid: measures taken to avoid creating impacts from the outset or set aside key conservation areas;
2. Reduce: measures taken to reduce the intensity and/or extent of impacts that cannot be completely avoided;
3. Restore: measures taken to restore degraded ecosystems or capture some energy/material benefit; [...]
4. Offset: a type of compensation measure [...] used to combine with an impact to produce a "net" or "neutral" outcome.[16]

Aligning with the mitigation hierarchy, various global standards and frameworks have guided companies to avoid an overreliance on offsetting. For instance:

- In October 2021, the **Science-Based Targets initiative (SBTi)**, an organization that defines and verifies corporate net-zero targets, warned of an overreliance on offsets before other measures are exhausted and concluded that: "science-based net-zero targets will require long-term deep decarbonization targets of 90–95% across all scopes[17] before 2050. When a company reaches its net-zero target, only a very limited amount of residual emissions can be neutralized with high quality carbon removals, [and] this will be no more than 5–10%."[18] In support of this prioritization, SBTi also cites the "problems around land use, equity, fairness and climate justice" posed by an overreliance on carbon offsets in net-zero targets (discussed in section 3 of this commentary).[19]
- In September 2022, the **International Standardization Organization (ISO)**, a global federation of national standards bodies that develops its own standards, included in its Net Zero Guidelines that companies should "exclusively use removals (including removal-based offsets) to counterbalance residual emissions at net zero." It adds that "[o]ffsets should only be used when there are no alternatives available" and should not be used towards achievement of interim targets.[20]
- In November 2022, the **High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities** convened by the UN Secretary-General published a set of recommendations that included: "Non-state actors must prioritise urgent and deep reduction of emissions across their value chain. High integrity carbon credits in voluntary markets should be used for beyond value chain mitigation but cannot be counted toward a non-state actor's interim emissions reductions required by its net zero pathway."[21]

While they recognize the need to minimize the use of offsets, some standards and frameworks have recently produced tailored provisions for insetting that may allow it to play a more prominent role in contemporary corporate climate strategies:

- **SBTi**'s 2021 net-zero standard says it allows insetting to count towards targets on a case-by-case basis during its validation process, but says it "may not approve their use," citing the lack of "standardization of the term."[22] Its 2022 forest, land, and agriculture [FLAG] guidance explicitly allows removals within a company's supply chain to count towards meeting their targets on FLAG emissions.[23]
- In its 2022 draft land sector and removals guidance, **GHG Protocol**,[24] an organization that creates standardized frameworks to measure and manage GHG emissions, allows companies to account for scope 3 removals through an inventory accounting approach. The draft guidance states that "[inset] credits cannot be used toward compensation targets" nor "to adjust scope 3 emissions or removals (e.g., by subtracting credits from reported emissions), but can be used as a tool for ensuring that actions in the value chain are properly accounted for in the scope 3 inventory using an inventory accounting approach."[25]

By opening the door to counting insetting projects towards net-zero targets or to otherwise benefitting from "properly account[ing]" for them, these provisions risk incentivizing companies to expand the use of NbS as a climate strategy. This is of particular concern as leading proponents of insetting, such as the International Platform for Insetting (IPI), push for its use as a contemporary strategy to reach net zero. In discussing insetting and NbS, IPI states that "in the next 10–15 years, these nature-based solutions can provide more than a third of the emissions reductions required to meet the 1.5°C goal."[26] Relying heavily on NbS, particularly to the scale that IPI is advocating, would contravene the mitigation hierarchy and therefore pose a profound risk to the success of global decarbonization.[27]

2 Insetting Has the Same Core Ecological and Credibility Problems as Offsetting

Even putting aside the misalignment of offsetting and insetting with the mitigation hierarchy, there is ample evidence that nature-based offsets have failed to live up to their promised emissions removals. NbS, which made up approximately 40% of retired voluntary carbon credits in 2021,[28] have dramatic shortcomings that undermine their climate mitigation potential, including issues surrounding additionality, permanence, unintended environmental impacts, and transparency and verification.[29]

For NbS projects to contribute meaningfully to achieving global net-zero targets, they must demonstrate **additionality**. A project is additional if the GHG reductions or removals linked to the activity would not have occurred in the absence of the project.[30] In practice, many nature-based offsetting projects fail to reliably demonstrate additionality.[31] In particular, avoidance projects, which are designed to protect existing carbon sinks by avoiding deforestation and environmental degradation, are abundant and often significantly overstate their climate impact due to their lack of additionality.[32]

While both avoidance and removal strategies may be beneficial for biodiversity preservation if implemented with great care, what matters for the climate and the quality of the credits representing each project is guaranteed long-term carbon sequestration. In the absence of reliable sequestration, the accreditation of these projects and the sale of carbon credits has no tangible positive effect on the climate crisis. The issues relating to **permanence**[33] are only exacerbated by intensifying climate change.

Global forest health is declining on our rapidly warming planet as severe forest fires, drought, disease, and other threats are on the rise.[34] Can an NbS project really guarantee that a forest it counts on will thrive or even survive in the long term? Some NbS projects establish "buffer pools" to provide additional sequestered carbon should something happen to their carbon stocks.[35] However, while buffer pool's land-intensity can exacerbate the impacts of NbS on nature and communities, they may at the same time not be sufficient to counteract losses from climate-related devastation.[36]

Research also shows that NbS can result in **unintended environmental impacts**, such as biodiversity loss and higher atmospheric carbon dioxide concentrations. These outcomes may occur, for instance, as a result of NbS projects that lead to planting monocultures of fast-growing trees, clear cutting forests to make way for new seedlings, or planting trees in ecosystems where they do not belong, such as grasslands or savannas.[37] The long-lasting success of an NbS project in terms of carbon sequestration and biodiversity conservation relies on a deep understanding of the ecosystem within which the project is implemented.

Where NbS may be suitable, the risk of such adverse outcomes can be minimized by centering Indigenous peoples and customary communities in conservation management approaches.[38] As a result of their multi-generational knowledge and deep familiarity with their lands, Indigenous-driven land management successfully utilizes carbon sequestration techniques such as forest management and wildfire mitigation using controlled burns.[39]

While the challenges with additionality, permanence, and unintended biological outcomes have primarily been identified and researched in connection to nature-based offsetting projects, these projects' inherent similarities to nature-based insetting suggests the same concerns would be faced by insetting providers attempting to credibly create long-lasting carbon sequestration.

Insetting will also likely face similar, or even more significant, challenges to offsetting when it comes to **transparency and verification**. For years, disclosure of offsetting practices has been entirely voluntary, leading to disclosures of uneven quality and reliability.[40] While recent criticism and controversies have led to more clearly defined globally agreed voluntary standards for offsetting disclosure, there are still substantial faults in the certification schemes that underpin the offsetting system.[41] Not even standardized definitions[42] nor required certifications exist for insetting,[43] let alone a truly credible independent verification system that addresses the gaps in offset schemes.[44]

The voluntary nature of offsetting disclosures and certifications may soon change in some jurisdictions, such as the United States, where offsetting disclosures may become mandatory,[45] and the European Union, where a more rigorous certification process for

carbon removals is under development.[46] However, there is a risk that some companies will seek to skirt these requirements for offsetting by claiming that a connection to the value chain should redefine their offsets as "insets," something else entirely.

Under these circumstances, companies may increasingly turn to insetting to avoid the reputational risks and stricter requirements and regulation of offsetting. Insetting allows companies to keep their interventions closer to their chests, dispersed within their own value chains, where civil society organizations, journalists, and others are less able to reach or investigate them.

3 For Peoples and Communities, Purported Benefits Are Uncertain and Risks Remain Real

3.1 Purported Benefits

A key aspect of insetting providers' narrative is the promise of socio-economic benefits for local peoples and communities. IPI states that the primary beneficiaries of insetting projects are local farmers or farming communities, who may receive technical support, direct payments, and other indirect benefits, such as increased agricultural productivity or a more sustainable watershed.[47] Yet the benefits that are realized are often unclear. Will benefits extend beyond traditional benefit sharing? Will local peoples and communities obtain all rights to sell their activities as credits to any buyer, and will they retain autonomy over how they implement their activities? Will they benefit if the value of credits they sell later skyrocket in value?[48] Questions remain about how benefits for peoples and communities will be realized in a way that improves upon the persistent problems with nature-based offsetting projects discussed below.

Where payments are made to peoples and communities, NbS projects must pay enough to replace other economic activity that the land could be used for over the (often multi-decade long) duration of the activity, otherwise the long-term success of the project may be jeopardized. Yet in practice, companies or intermediaries may strategically buy offsets from community members as a one-off transaction, at a discount, or when their value is at its lowest. Such scenarios see communities left with insufficient funds to sustain their activities and livelihoods (see Box 2), while some often-faraway financial actors speculate on the carbon credits produced and may sell them at many times their earlier value.[49]

BOX 2: EXAMPLES OF UNDERPRICED OFFSETS

Payments to peoples and communities for carbon credits are often insufficient, endangering both their livelihoods and the climate benefits of the intervention. For example, as part of a project in eastern Mexico, BP reportedly paid community members who dedicated land to a nature-based offset project only USD 4 per offset, less than half their market value.[50] Likewise, carbon offsets for the Kariba mega project in Zimbabwe were reportedly bought for less than EUR 1, but later had a selling price of over EUR 20.[51]

Peoples' and communities' ability to benefit from NbS projects is also impaired by a lack of legal recognition of their rights to the underlying carbon in such projects. For instance, a 2021 Rights and Resources Initiative study found that most countries with vast tropical forest resources that are attractive to the carbon market lack laws protecting the rights of Indigenous peoples, local communities, and Afro-descendent peoples to the carbon in their territories.[52] Without comprehensive, clear, and respected regulations protecting vulnerable populations' carbon rights, insetting risks exacerbating existing injustices and inequalities.

If a nature-based offsetting or insetting project is to be implemented properly, it requires large-scale coordination, thorough planning, coverage of material and personnel costs, continuous monitoring, and stringent verification. Third Millennium Alliance criticizes the practice of producing cheap offsets, as it invariably leads to corner-cutting and poor results when it comes to carbon absorption, remuneration, and verification.[53] Thus, not only are the purported benefits to communities not guaranteed, but the quality of NbS projects, and therefore the extent to which they can positively impact the climate crisis, is severely limited.

3.2 Risks to Human Rights and Land Rights

In addition to the unreliability of promised community benefits, NbS projects carry considerable risks of harm to Indigenous peoples' and local communities' human rights linked to these projects' land-intensity.[54] All companies have a responsibility to respect human rights in their operations and value chains, and any human rights harms cannot be offset by positive contributions.[55] Regardless of their climate or community benefits, the severity and likelihood of NbS projects' human rights risks should raise red flags about the expansion of these projects.

The negative impacts on communities of NbS projects include:

- **Harms to human rights, including through physical violence and impacts on food security, water, and land rights**. In a 2021 report on the negative impacts of reliance on land-based removal methods,[56] Oxfam found that the land required for planned NbS projects could be equivalent to the land mass used for farmland globally. This potential "explosion in demand for land" puts food and water security and many other human rights linked to land and resource access at risk (see Box 3). Peoples' and communities' legitimate tenure rights,[57] which are often not yet documented, will also face increased threats as NbS-related demand for land increases. In other cases, NbS and conservation projects have led to physical and sexual violence, including by ecoguards.[58]

BOX 3: EXAMPLE OF SEVERE HUMAN RIGHTS IMPACTS LINKED TO AN NBS PROJECT

To offset its new cruise ships, Disney relies on an NbS program in Alto Mayo, an area of protected forest in northern Peru where few residents have legal rights to live despite living there for decades. The company touts the program as a massive success.[59] However, the park has been increasingly militarized, with conservation authorities initiating raids, destroying the homes of residents, forcibly evicting them, and exposing them to associated violence.[60]

- **The disregard for the needs and perspectives of local peoples and communities**. NbS projects risk breaching the rights to free, prior, and informed consent (FPIC) and public participation when their implementers fail to adequately consult with relevant Indigenous peoples and local communities on an ongoing basis. For instance, local communities were effectively excluded from a 2018 Ugandan carbon forestry project's design and implementation and had little negotiating power; instead, access to the project's contracts was reportedly limited to wealthier people with surplus land and the capacity to engage.[61]
- **Inequitable economic outcomes for women.** Land-intensive NbS projects can create additional economic pressures that disproportionately disadvantage women. In Africa, for instance, women already own less than 10% of community lands; as NbS projects contribute to increases in land values, women may face more obstacles in acquiring and owning land.[62] Consequently, any NbS scheme should prioritize taking a gender-sensitive approach and work to safeguard women's right to freely manage their land.

Insetting advocates promise to improve upon offsetting by localizing efforts within company value chains, which they claim improves engagement with, and "creates positive impacts" for, farmers, communities, landscapes, and ecosystems.[63] While this emphasis may succeed in assuaging some stakeholders' concerns about proposed NbS projects, it fails to demonstrate improved management of the risks to human rights and land rights long linked to NbS. Insetting's lack of transparency and verification (discussed in Section 2) also hinder the credibility of any claimed mitigation of these risks. Given the wide array of real-world examples of nature-based offsetting projects harming peoples and communities, and examples of purported benefits not accruing to them, claims that nature-based insetting projects universally benefit peoples and communities deserve to be treated with suspicion.

Conclusion

Regardless of whether they are structured to inset or offset emissions, NbS projects pose serious efficacy, credibility, and rights concerns and should not be lauded as a strategy for companies to achieve net-zero emissions. While criticisms of offsetting are becoming ubiquitous, growing references to insetting in global frameworks like GHG Protocol and SBTi in the past year may signal – or invite – a shift of even more companies towards NbS.

There is no silver-bullet solution to decelerate global warming. Only diverse and effective solutions dispersed throughout the global economy in accordance with the mitigation hierarchy can achieve the emissions reductions that are so desperately needed. Preventing companies from relying on offsetting and insetting to reach climate goals can guide them to reprioritize more effective decarbonization strategies. They can also help prevent and mitigate the negative impacts that Indigenous peoples and local communities experience from rapid surges in demand for land for NbS projects, in conjunction with broader measures to protect legitimate tenure rights and human rights.

As a fundamental step, governments and policymakers should develop stricter rules to improve the integrity and transparency of carbon credits, and to make sure that carbon removals are not used as a substitute for critical, direct emissions reductions by businesses. To curb companies' unsustainable reliance on NbS, all mandatory and voluntary frameworks should explicitly disallow both the counting and the reporting of emissions reductions resulting from nature-based insetting and offsetting. To the extent companies continue to undertake and support NbS without the incentives of credits and accounting, they must respect human rights and prioritize projects centered on Indigenous-driven land restoration and protection.

Acknowledgements

The Advancing Land-based Investment Governance (ALIGN) project supports governments, civil society, communities and peoples, and other relevant actors in strengthening the governance of land-based investments. The project is implemented by a consortium led by the International Institute for Environment and Development (IIED), the Columbia Center on Sustainable Investment (CCSI) and Namati, and is funded with UK aid from the UK government.

The authors are grateful to Kruthi Venkatesh for her thorough research to kickstart this project, Reet Chaterjee for his style and design support, as well as Sam Szoke-Burke, Martin Dietrich Brauch, Perrine Toledano, and Chris Albin-Lackey for their review.

Endnotes

[1] "VCM Reaches Towards $2 Billion in 2021: New Market Analysis Published from Ecosystem Marketplace," *Ecosystem Marketplace,* The EM Insights Team, 2022, https://www.ecosystemmarketplace.com/articles/the-art-of-integrity-state-of-the-voluntary-carbon-markets-q3-2022/.
[2] "Carbon Offset Guide," Greenhouse Gas Management Institute and the Stockholm Environment Institute, https://www.offsetguide.org/.
[3] Aditi Sen and Nafkote Dabi, *Tightening the Net: Net Zero Climate Targets – Implications for Land and Food Equity* (Oxford: Oxfam GB, August 2021), https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621205/bp-net-zero-land-food-equity-030821-en.pdf?sequence=1; Patrick Greenfield, "Revealed: More Than 90% of Rainforest Carbon Offsets By Biggest Certifier Are Worthless, Analysis Shows," *The Guardian,* January 18, 2023, https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe; Bart Crezee and Ties Gijzel, "Showcase Project By the World's Biggest Carbon Trader Actually Resulted in More Carbon Emissions," *Follow the Money,* January 27, 2023, https://www.ftm.eu/articles/south-pole-kariba-carbon-emission?share=gj2jCwFvKUGah0xwM2SS4qGdaKNduufxepiiOqQAqnO33g6SpZh5UZB4FsbG6MM%3D.
[4] *Nestlé's Insetting Framework* (Geneva: Nestlé Global, 2021), https://www.nestle.com/sites/default/files/2022-02/nestle-insetting-framework.pdf.
[5] *PepsiCo's Climate Action Strategy*, September 23, 2022, https://www.pepsico.com/docs/default-source/sustainability-and-esg-topics/pepsico's-climate-action-strategy.pdf; "Inset Business Travel," PepsiCo, https://www.sustainable-markets.org/terra-carta-impact-report/case-studies/inset-business-travel/.
[6] "Burberry Introduces Carbon Insetting and Autumn/Winter 2020 Runway Show Certified Carbon Neutral," Burberry PLC, February 17, 2020, https://www.burberryplc.com/en/news/corporate/2020/burberry-introduces-carbon-insetting-and-autumn-winter-2020-runw.html.
[7] Note: there is no universally accepted definition of insetting, but this commentary relies on the definitions used by prominent insetting project providers. International Platform for Insetting, "What is Insetting?," International Platform for Insetting, https://www.insettingplatform.com/insetting-explained/#1600200707322-bc52c021-32b4; "What's Insetting?," Pur Projet, http://accounts.purprojet.net/en/insetting-definition. This commentary focuses on a prominent form of insetting, which employs nature-based solutions in company value chains, while some other examples of insetting relate to emissions avoidance or reductions, or have a tenuous connection to a company's value chain.
[8] The greenhouse gas mitigation hierarchy is derived from the general mitigation hierarchy theory. As explained in WWF's discussion paper on the history of mitigation hierarchies, "[they] have been used for over a century in natural resource management and include prioritized steps that lead to the best outcomes for people and nature. These steps are generally avoid, reduce, restore, compensate/offset, adapted for the system to which they are applied." Martha Stevenson and Chris Weber, "First Things First: Avoid, Reduce … and only after that–Compensate," *World Wide Fund For Nature,* April 27, 2020, https://wwf.panda.org/wwf_news/?362819/First-Things-First-Avoid-Reduce--and-only-after-thatCompensate; *Goal 3 Assessment: Technical Annex to the Five-Year Assessment Report* (New York: Forest Declaration Platform, September 2019), https://forestdeclaration.org/wp-content/uploads/2020/11/2019NYDFGoal3.pdf. This "mitigation hierarchy" holds that economies and companies should first pursue emissions avoidance, followed by improvements in efficiency, followed by an increase in electrification and renewable energy, and finally, when all other strategies have been fully exhausted, carbon dioxide removal (CDR) projects to address "hard-to-abate residual emissions." Intergovernmental Panel on Climate Change, Climate Change 2022: Mitigation of Climate Change: Summary for Policymakers, AR6 WG III, 2022 (IPCC), https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf. The IPCC defines CDR as a "key element in [decarbonization] scenarios that likely limit warming to 2°C or 1.5°C by 2100." Intergovernmental Panel on Climate Change, Climate Change 2022: Mitigation of Climate Change, AR6 WG III, 2022 (IPCC), https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Full_Report.pdf.
[9] Sen and Dabi, *Tightening the Net*.
[10] Bonnie Waring, "There aren't enough trees in the world to offset society's carbon emissions – and there never will be," *The Conversation,* April 23, 2021, https://theconversation.com/there-arent-enough-trees-in-the-world-to-offset-societys-carbon-emissions-and-there-never-will-be-158181.
[11] Richard Tipper, N. Coad, and J. Wesley Burnett, *"Is 'Insetting' the New 'Offsetting'?,"* (London: Ecometrica Press, April 2009), https://ecometrica.com/assets/insetting_offsetting_technical.pdf.
[12] "As the name suggests, the term insetting derives from the concept of carbon offsetting." "What is Insetting?," International Platform for Insetting. "The concept of carbon insetting is an extension of the concept of Carbon Offsetting. The location of the carbon offset is what differentiates the two concepts. Offsetting refers to carbon credits purchased from carbon reduction projects that are unrelated to the purchaser, whereas, in the case of insetting, the location of the carbon offset project is within the company's own supply chain and supply chain communities." "Inset or Insetting," The Chancery Lane Project, December 22, 2022, https://glossary.chancerylaneproject.org/term/Inset_or_Insetting. "In carbon offsetting projects, the purchaser and the offset provider are normally discrete entities, while carbon in-setting projects are a collaborative activity among the developer and the stakeholders of one or more businesses." Jennifer Cooper, "Carbon Insetting: What It Is & How It Works," *Native* (blog), January 3, 2018, https://native.eco/2018/01/carbon-insetting-what-it-is-how-it-works/.
[13] Though not all insetting projects necessarily employ nature-based solutions in theory, in practice most projects tend to focus on reforestation, agroforestry, or regenerative agriculture. Sandra Brandt and Tilmann Silber, *A Practical Guide to Insetting: 10 Lessons Learnt and 5 Opportunities to Scale from a Decade of Corporate Insetting Practice* (Paris: International Platform for Insetting, March 2022), https://www.insettingplatform.com/wp-content/uploads/2022/03/IPI-Insetting-Guide.pdf; "What is Insetting?," International Platform for Insetting.
[14] Thomas Day, Silke Mooldijk, Frederic Hans, Sybrig Smit, Eduardo Posada, Reena Skribbe, Santiago Woollands, Harry

Fearnehough, Takeshi Kuramochi, Carsten Warnecke, Aki Kachi, and Niklas Höhne, *Corporate Climate Responsibility Monitor 2023*, (Berlin: NewClimate Institute, February 2023), https://newclimate.org/sites/default/files/2023-02/NewClimate_CorporateClimateResponsibilityMonitor2023_Feb23.pdf.

[15] See: Stevenson and Weber, "First Things First: Avoid, Reduce … and only after that–Compensate"; "Greenhouse Gas Mitigation Hierarchy," Sustainable Columbia, Columbia University, https://sustainable.columbia.edu/content/greenhouse-gas-mitigation-hierarchy; American Forest Foundation, "When and How to Leverage Family Forest Carbon," *Family Forest Blog,* August 7, 2020, https://www.forestfoundation.org/why-we-do-it/family-forest-blog/when-and-how-to-leverage-family-forest-carbon/; *Beyond Value Chain Mitigation FAQ* (Berlin: Science Based Targets, October 2021), https://sciencebasedtargets.org/resources/files/Beyond-Value-Chain-Mitigation-FAQ.pdf; Alex Lawson and Patrick Greenfield, "Shell to Spend $450m on Carbon Offsetting as Fears Grow That Credits May Be Worthless," *The Guardian,* January 19, 2023, https://www.theguardian.com/environment/2023/jan/19/shell-to-spend-450m-on-carbon-offsetting-fears-grow-credits-worthless-aoe.

[16] Stevenson and Weber, "First Things First: Avoid, Reduce … and only after that–Compensate".

[17] "Scopes" refers to scope 1, 2, and 3 emissions. Scope 1 emissions are direct emissions, scope 2 emissions are indirect emissions related to the use of heat and power, and scope 3 emissions cover all remaining indirect emissions. "Briefing: What are Scope 3 emissions?" Carbon Trust, https://www.carbontrust.com/our-work-and-impact/guides-reports-and-tools/briefing-what-are-scope-3-emissions.

[18] Tom Dowdall, "Science-Based Net-Zero Targets: 'Less Net, more Zero'," *Science Based Targets* (blog), October 7, 2021, https://sciencebasedtargets.org/blog/science-based-net-zero-targets-less-net-more-zero.

[19] Dowdall, "Science-Based Net-Zero Targets: 'Less Net, more Zero'."

[20] The International Organization for Standardization, "Net Zero Guidelines," IWA 42:2022, September 2022, https://www.iso.org/obp/ui/en/#iso:std:iso:iwa:42:ed-1:v1:en.

[21] United Nations' High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, *Integrity Matters: Net Zero Commitments By Businesses, Financial Institutions, Cities And Regions* (Sharm-el Sheikh: COP27, November 2022), https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf.

[22] Emma Watson, Andres Chang, Alberto Carrillo Pineda, Christa Anderson, Cynthia Cummis, and Martha Stevenson, *SBTi Corporate Net-Zero Standard,* (Berlin: Science Based Targets, October 2021), 30, https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf.

[23] Christa Anderson, Tereza Bicalho, Elizabeth Wallace, Tim Letts, and Martha Stevenson, *Forest, Land and Agriculture Science Based Target-Setting Guidance* (Science Based Targets initiative), 28, https://sciencebasedtargets.org/resources/files/SBTiFLAGGuidance.pdf.

[24] "About Us," Greenhouse Gas Protocol, https://ghgprotocol.org/about-us#:~:text=What%20is%20GHG%20Protocol%3F,value%20chains%20and%20mitigation%20actions.

[25] Greenhouse Gas Protocol, *Land Sector and Removals Guidance: Supplement to the GHG Protocol Corporate Standard and Scope 3 Standard (Draft for Pilot Testing and Review, September 2022)*, (Greenhouse Gas Protocol, 2022), https://ghgprotocol.org/sites/default/files/standards_supporting/Land-Sector-and-Removals-Guidance-Pilot-Testing-and-Review-Draft-Part-1.pdf.

[26] "What is Insetting?," International Platform for Insetting.

[27] Intergovernmental Panel on Climate Change, Working Group III: Mitigation, (IPCC), Chapter 4.6.2, https://archive.ipcc.ch/ipccreports/tar/wg3/index.php?idp=174; Bonnie Waring, "There aren't enough trees in the world to offset society's carbon emissions – and there never will be"; Jenna Goodward and Alexia Kelly, *Fact Sheet: Bottom Line on Offsets* (Washington, D.C. World Resources Institute: August 2010), https://www.wri.org/research/bottom-line-offsets.

[28] Justin Adams, Emily Farnworth, Teresa Hartmann, Rebecca King, Dominic Kailash Nath Waughray, Daniel Aminetzah, Emily Birch, Julien Claes, Joshua Katz, Peter Manion, Dickon Pinner, Antoine Stevens, Sebastien Marlier, and Christopher Neill, *Consultation: Nature and Net Zero* (Geneva: World Economic Forum, January 2021), https://www.mckinsey.com/~/media/mckinsey/business%20functions/sustainability/our%20insights/why%20investing%20in%20nature%20is%20key%20to%20climate%20mitigation/nature-and-net-zero-vf.pdf.

[29] Greenfield, "Revealed: More Than 90% of Rainforest Carbon Offsets By Biggest Certifier Are Worthless, Analysis Shows."

[30] "What Makes a High-Quality Carbon Offset?: Additionality," Carbon Offset Guide, Greenhouse Gas Management Institute and the Stockholm Environment Institute, https://www.offsetguide.org/high-quality-offsets/additionality/; Michael Gillenwater, "How Do You Explain Additionality?" *Greenhouse Gas Management Institute* (blog), January 25, 2012, https://ghginstitute.org/2012/01/25/how-do-you-explain-additionality/.

[31] Greenfield, "Revealed: More Than 90% of Rainforest Carbon Offsets By Biggest Certifier Are Worthless, Analysis Shows."

[32] Greenfield, "Revealed: More Than 90% of Rainforest Carbon Offsets By Biggest Certifier Are Worthless, Analysis Shows." See also: Adams, Farnworth, Hartmann, King, Waughray, Aminetzah, Birch, Claes, Katz, Manion, Pinner, Stevens, Marlier, Neill, *Consultation: Nature and Net Zero*.

[33] "What Makes a High-Quality Carbon Offset?: Permanence," Carbon Offset Guide, Greenhouse Gas Management Institute and the Stockholm Environment Institute, https://www.offsetguide.org/high-quality-offsets/permanence/.

[34] Matt McGrath, "Global warming and land use change to drive more extreme wildfires," *BBC News*, February 2022, https://www.bbc.com/news/science-environment-60483431; Craig Welch, "Polluters are using forests as 'carbon offsets.' Climate change has other plans.," *National Geographic*, May 2022, https://www.nationalgeographic.com/environment/article/forests-as-carbon-offsets-climate-change-has-other-plans.

[35] Sen and Dabi, *Tightening the Net*.

[36] Grayson Badgley, Freya Chay, Oriana S. Chegwidden, Joseph J. Hamman, Jeremy Freeman, and Danny Cullenward, "California's Forest Carbon Offsets Buffer Pool is Severely Undercapitalized," *Frontier in Forests and Global Change*, no. 5 (August 5, 2022), https://www.frontiersin.org/articles/10.3389/ffgc.2022.930426/full.

[37] Waring, "There aren't enough trees in the world to offset society's carbon emissions – and there never will be;" Max de Haldevang, "How Mexico's Vast Tree-Planting Program Ended Up Encouraging Deforestation," *Bloomberg Green*, March 2021, https://www.bloomberg.com/news/features/2021-03-08/a-tree-planting-program-in-mexico-may-encourage-deforestation; Joseph W. Veldman, Julie C. Aleman, Swanni T. Alvarado, T. Michael Anderson, Sally Archibald, William J. Bond, Thomas W. Boutton, Nina Buchmann, Elise Buisson, Josep G. Canadell, Michele de Sá Dechoum, Milton H. Diaz-

Toribio, Giselda Durigan, John J. Ewel, G. Wilson Fernandes, Alessandra Fidelis, Forrest Fleischmen, Stephen P. Good, Daniel M. Griffith, Julia-Maria Hermann, William A. Hoffmann, Soizig Le Stradic, Caroline E. R. Lehmann, Gregory Mahy, Ashish N. Nerlekar, Jesse B. Nippert, Reed F. Noss, Colin P. Osborne, Gerhard E. Overbeck, Catherine L. Parr, Juli G. Pausas, R. Toby Pennington, Michael P. Perring, Francis E. Putz, Jayashree Ratnam, Mahesh Sankaran, Isabel B. Schmidt, Christine B. Schmitt, Fernando A. O. Silveira, A. Carla Staver, Nicola Stevens, Christopher J. Still, Caroline A. E. Strömberg, Vicky M. Temperton, J. Morgan Varner, and Nicholas P. Zaloumis, "Comment on 'The Global Tree Restoration Potential,'" *Journal of Science Volume 366*, no. 6463 (2019), https://www.science.org/doi/10.1126/science.aay7976.

[38] Brennan Vogel, Lilia Yumagulova, Gordon McBean, and Kerry Ann Charles Norris, "Indigenous-Led Nature-Based Solutions for the Climate Crisis: Insights from Canada," *MDPI Sustainability Journal Volume 14,* no. 11 (2022), https://www.mdpi.com/2071-1050/14/11/6725; International Panel on Climate Change, *AR6 Synthesis Report: Climate Change 2023* (Geneva: IPCC, 2023), 73, https://www.ipcc.ch/report/ar6/syr.

[39] Daisee Francour, *Nature-Based Solutions are False Climate Change Solutions: Indigenous Peoples Hold the True Solutions to Climate Change* (Cambridge: Cultural Survival, March 2022), https://www.culturalsurvival.org/publications/cultural-survival-quarterly/nature-based-solutions-are-false-climate-change-solutions; Intergovernmental Panel on Climate Change, *Climate Change 2022: Impacts, Adaptation and Vulnerability, AR6 WG II, 2022* (Geneva: IPCC, 2022), 755, https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Chapter05.pdf.

[40] Thomas Hale, Stephen M. Smith, Richard Black, Kate Cullen, Byron Fay, John Lang & Saba Mahmood (2022) Assessing the rapidly-emerging landscape of net zero targets, Climate Policy, 22:1, 18-29, DOI: 10.1080/14693062.2021.2013155. https://www.tandfonline.com/doi/full/10.1080/14693062.2021.2013155?src=.

[41] "80 NGOs Ask the EU to Reject Carbon Offsets Following Scandal of Largest Voluntary Carbon Offset Certifier," *Fern*, https://www.fern.org/publications-insight/ngos-ask-the-eu-to-reject-carbon-offsets-following-scandal-of-largest-voluntary-carbon-offset-certifier.

[42] Watson, Chang, Carrillo Pineda, Anderson, Cummis, and Stevenson, *SBTi Corporate Net-Zero Standard, 30.*

[43] According to IPI, "Insetting currently does not require verification or certification against agreed global standards. Nevertheless, many insetting companies choose to work with an independent verifier or auditor to certify their results according to existing standards, as verification gives an insetting project more credibility. These standards are chosen by the company depending on the main results and impacts the intervention focuses on. Resources used are the standards from Gold Standard, Verra, Rainforest Alliance, Plan Vivo, the IPI's Insetting Program Standard and others." "What is Insetting?," International Platform for Insetting.

[44] The February 2023 NewClimate Institute report finds: "An apparent key difference between carbon dioxide removals under an 'insetting' approach, as opposed to carbon dioxide removals through certified offsets, is that the companies implementing an insetting approach may not seek independent measurement and verification of the carbon dioxide removals. Most carbon credit standards require projects to go through expert review, stakeholder consultation and independent verification to assess compliance with approved methodologies, and they have rules pertaining to defined crediting periods and the issuance of credits… By comparison, we do not see any evidence that companies claiming to inset their emissions are going through such processes. As such, this is simply a weaker variation of an already noncredible offsetting approach." Day, Mooldijk, Hans, Smit, Posada, Skribbe, Woollands, Fearnehough, Kuramochi, Warnecke, Kachi, and Höhne, *Corporate Climate Responsibility Monitor 2023*," 66.

[45] Securities and Exchange Commission (SEC), Proposed Rule: The Enhancement and Standardization of Climate-Related Disclosures for Investors, Nos. 33-11042, 2022, https://www.sec.gov/rules/proposed/2022/33-11042.pdf. The proposal states that, "if, as part of its net emissions reduction strategy, a registrant uses carbon offsets […], the proposed rule would require it to disclose the role that carbon offsets […] play in the registrant's climate-related business strategy." Securities and Exchange Commission (SEC), Proposed Rule: The Enhancement and Standardization of Climate-Related Disclosures for Investors, Nos. 33-11042, 2022, 77, https://www.sec.gov/rules/proposed/2022/33-11042.pdf.

[46] European Commission, "European Green Deal: Commission Proposes Certification of Carbon Removals to Help Reach Net Zero Emissions," press release no. 7156, November 30, 2022, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7156; European Commissions, *Delivering the European Green Deal: First EU Certification of Carbon Removals* (Brussels: European Commission, November 30, 2022), https://ec.europa.eu/commission/presscorner/detail/en/fs_22_7161.

[47] "Step-By-Step Insetting Guide for Corporate Action on Climate Change and Nature Loss," International Platform for Insetting, 2021, https://www.insettingplatform.com/insetting-guide/.

[48] Crezee and Gijzel, "Showcase Project by the World's Biggest Carbon Trader Actually Resulted in More Carbon Emissions."

[49] Crezee and Gijzel, "Showcase Project by the World's Biggest Carbon Trader Actually Resulted in More Carbon Emissions."

[50] Max De Haldevang, "BP Paid Rural Mexicans a 'Pittance' for Wall Street's Favorite Climate Solution," *Bloomberg,* June 27, 2022, https://www.bloomberg.com/features/2022-carbon-offset-credits-mexico-forest-bp/.

[51] Crezee and Gijzel, "Showcase Project by the World's Biggest Carbon Trader Actually Resulted in More Carbon Emissions."

[52] Rights and Resources Initiative and McGill University, "New Analysis Reveals Risks of Investment in Carbon Offsets Without Community Rights," *Rights and Resources Initiative,* (blog), February 6, 2021, https://rightsandresources.org/blog/new-analysis-reveals-risks-of-investment-in-carbon-offsets-without-community-rights/.

[53] "The Danger of Cheap Carbon Offsets," *Third Millennium Alliance,* (blog), June 18, 2021, https://www.tma.earth/2021/06/18/the-danger-of-cheap-carbon-offsets/.

[54] Josh Gabbatiss, "Shell says new 'Brazil-sized' forest would be needed to meet 1.5C climate goal," *Eco-Business*, February 17, 2021, https://www.eco-business.com/news/shell-says-new-brazil-sized-forest-would-be-needed-to-meet-15c-climate-goal/; Bronson W. Griscom, Justin Adams, Peter W. Ellis, Richard A. Houghton, Guy Lomax, Daniela A. Miteva, William H.

Schlesinger, David Shoch, Juha V. Siikamäki, Pete Smith, Peter Woodbury, Chris Zganjar, Allen Blackman, João Campari, Richard T. Conant, Christopher Delgado, Patricia Elias, Trisha Gopalakrishna, Marisa R. Hamsik, Mario Herrero, Joseph Kiesecker, Emily Landis, Lars Laestadius, Sara M. Leavitt, Susan Minnemeyer, Stephen Polasky, Peter Potapov, Francis E. Putz, Jonathan Sanderman, Marcel Silvius, Eva Wollenberg, and Joseph Fargione, "Natural Climate Solutions," *PNAS Volume 114,* no. 44, (2017): 11645-11650, https://www.pnas.org/doi/10.1073/pnas.1710465114.

[55] *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework* (New York and Geneva: United Nations Human Rights, 2011), https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf; See also the HLEG recommendations, which state: "Voluntary carbon markets need to be built on a rights-based approach, which fully respects, protects and takes into account the rights of Indigenous Peoples and local communities. This includes consultation with the Indigenous Peoples and local communities that are responsible for the stewardship of the forests and many other ecosystems used for offsetting projects." *Integrity Matters: Net Zero Commitments By Businesses, Financial Institutions, Cities and* Regions (New York and Geneva: United Nations), https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf.

[56] Sen and Dabi, *Tightening the Net*.

[57] Lorenzo Cotula and Rachel Knight, *Protecting Legitimate Tenure Rights: From Concepts to Practice,* (Rome: FAO, 2021), https://www.iied.org/20491x.

[58] "WWF in the DRC's Salonga National Park: Torture, Murder and Gang-Rape," *World Rainforest Movement,* May 14, 2019, https://www.wrm.org.uy/bulletin-articles/wwf-in-the-drcs-salonga-national-park-torture-murder-and-gang-rape.

[59] Zachary R. Mider and John Quigley, "Disney's Jungle Cruise," *Bloomberg*, June 9, 2020, https://www.bloomberg.com/graphics/2020-disney-peru-deforestation.

[60] Patrick Greenfield, "'Nowhere Else to Go': Forest Communities of Alto Mayo, Peru, at Centre of Offsetting Row," Guardian, January 18, 2023, https://www.theguardian.com/environment/2023/jan/18/forest-communities-alto-mayo-peru-carbon-offsetting-aoe; Mider and Quigley, "Disney's Jungle Cruise."

[61] J.A. Fisher, C.J. Cavanagh, T. Sikor, D.M. Mwayafu, "Linking notions of justice and project outcomes in carbon offset forestry projects: Insights from a comparative study in Uganda," Elsevier Land Use Policy 73 (2018): 259-268, https://www.sciencedirect.com/science/article/pii/S0264837716307621/pdf?isDTMRedir=true&download=true.

[62] Anastasia Mbatia, "Could Carbon Offset Schemes Become a Hindrance to Women's Land Rights in East Africa?" *Minority Africa,* July 28, 2022, https://minorityafrica.org/could-carbon-offset-schemes-become-a-hindrance-to-womens-land-rights-in-east-africa/.

[63] Brandt and Tilmann, *A Practical Guide to Insetting*.