

Nature finance: we need (some) offsets

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Summary

Nature offsets – mechanisms that allow for negative environmental impacts (e.g. biodiversity loss, greenhouse gas emissions) to be fully compensated for and neutralized – are extremely widespread, but have become increasingly controversial, to the extent they are now starting to be precluded from new environmental policy developments. In turn, leaders are becoming more reticent about their strategic use to support sustainability goals. I discuss here why it is paramount that this trend is reversed. Firstly, major international agreements like the Global Biodiversity Framework necessitate offsetting – conceptually, and explicitly – which seems to be glossed over by detractors. Second, offsetting is both (a) a substantial source of funding for nature and (b) a strong incentive to reduce negative impacts, internalizing environmental externalities; so, without offsetting, there would be a considerable hole in nature finance. Thirdly, without robust nature offsets, and in the absence of something equivalent, we risk regressing to a time when environmental impacts and corresponding compensation were not quantified, and thus almost certainly fell short. In sum – though their use should be limited – we need at least some offsets. Leaders must resist calls to exclude them entirely from environmental policy.

Main text

There is a major conflict brewing at the heart of current environmental policy, surrounding the important concept of offsets for harm. ‘Nature offsets’ – e.g. offsets for greenhouse gas emissions, or biodiversity loss – are activities intended to fully and physically compensate for negative environmental impacts. Though offsets have always been somewhat controversial, the emerging conflict arises because some actors still consider offsets necessary, while others have now started to exclude them from consideration outright. Yet, this direct contradiction in paradigms is one that few seem willing to explicitly acknowledge, and address head on. This must be corrected: if offsets continue to be excluded from policy, the well-developed technical foundations for some of our major global agreements will be dramatically undermined.

Firstly, how did we get here? Again, there has always been a healthy level of cynicism about the practice of offsetting (carbon offsets, biodiversity offsets, or otherwise); in terms of concerns about their effectiveness, from a moral perspective, and so on (1). But at the start of 2023, The Guardian newspaper published a bombshell investigative article, building on wider research (2-4), that suggested many carbon offsets were worthless. Though there has subsequently been much debate about the findings, one of the undeniable results was a precipitous drop in the value of the global voluntary carbon market, from \$1.9bn in 2022 to \$0.7bn in 2023 (5). The concept of offsets that give rise to nature markets, having already been somewhat controversial, has become heavily tarnished, to the extent that many are now refusing to engage with it at all.

For instance, the EU Taxonomy Regulations have been developed to define what is meant by ‘environmentally sustainable economic activities’, in support of e.g. the European Green Deal. In 2023, the EU Commission set out technical screening criteria concerning protection and restoration of biodiversity and ecosystems, which explicitly preclude biodiversity offsetting as an option; a position reinforced by an official notice in 2025 (Notice C/2025/1373). Internationally, a highly influential standard on organizational greenhouse gas emissions is that established by the Science Based Targets Initiative (SBTi); in the SBTi standard, carbon offsetting is excluded (“companies should...ensure that [carbon offsets] are not counted towards the progress of their science-based targets”; SBTi Corporate Net-Zero Standard v1.3, 2025), and the organization has pushed back decisions about allowance of some offsets following high-profile rows. Meanwhile, the Science-Based Targets for Nature (SBTN) organization which seeks to establish analogous standards on nature and biodiversity, has very clearly stated its position: “A key requirement under SBTN is that biodiversity offsets will not

be accepted as compliant with a science-based target” (SBTN Technical Guidance v1.0, 2024). As another regulatory example, from May – July 2025 the UK Government held a consultation on new Biodiversity Net Gain requirements; which, under the Environment Act 2024, legislate for a 10% uplift in ‘biodiversity’ alongside most development activities. The current regulations do allow offsetting, but result in a very limited number of offsets (~7% of required biodiversity units; 6), typically on small sites. Measures originally proposed under the consultation would have included considerably raising the spatial threshold for inclusion of sites; a move which would have swept away demand for off-site biodiversity offsets.

With ‘offset’ now a forbidden word, policymakers and industry leaders are tying themselves in knots trying to develop environmental strategies that make no mention of the term, whilst explaining how we are to meet global environmental goals. I discuss three reasons why it is paramount that this trend is reversed, and nature offsets remain an accepted environmental policy mechanism.

1. The Global Biodiversity Framework

Consider the current global paradigm for nature conservation, set by the Kunming-Montreal Global Biodiversity Framework (GBF), which contains a 2030 mission for Parties “to take urgent action to halt and reverse biodiversity loss to put nature on a path to recovery” (see <https://www.cbd.int/>). Note that for the remainder of the article, I chiefly consider biodiversity offsetting, although my arguments relate to offsetting more generally.

Though the emphasis of the GBF is rightly on preventing negative impacts on biodiversity in the first place, nonetheless, human actions will continue to have at least partially negative impacts on biodiversity. As such, achieving the 2030 mission and onwards will require a combination of (i) robustly mitigating negative biodiversity impacts and (ii) proactively implementing nature conservation/restoration actions. The first part, mitigation of biodiversity impacts, is widely conceptualized as being achieved through a so-called ‘mitigation hierarchy’ of various preventative and compensatory actions necessarily including offsets (7). In turn, this makes the GBF a ‘net outcomes’ framework, such that the technical foundation for the GBF requires any residual negative impacts to be quantified and fully mitigated, with ‘halting and reversing’ biodiversity loss being the aggregate result.

Humanity has decades of experience in the quantitative mitigation of negative biodiversity impacts, using the mitigation hierarchy. Though the emphasis is on the prevention of negative

impacts in the first place, the hierarchy fundamentally necessitates at least some ecological compensation (i.e. biodiversity offsets) for residual impacts, in order for the biodiversity net outcome to be ‘no net loss or better’. Thus, offsets are by definition an integral component of the hierarchy; in turn, this makes them crucial to the GBF 2030 mission. But this is not simply my own interpretation; the GBF itself specifically states the need for “Stimulating innovative schemes such as ...biodiversity offsets” (Target 19(d)). This seems to have been missed or glossed over by many who are seeking to exclude offsets from policy, or campaigning against their use: no biodiversity offsets, no achievement of the GBF.

Arguably, the long-term 2050 vision under the GBF (that “biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services”) does indeed imagine a regenerative global economy that has moved beyond the need for offsetting; such that the aim could be for biodiversity offsets to be phased out in the transition from 2030–2050. But during this transition, the question is no longer ‘do we need offsets?’ – it is ‘how do we make them work?’.

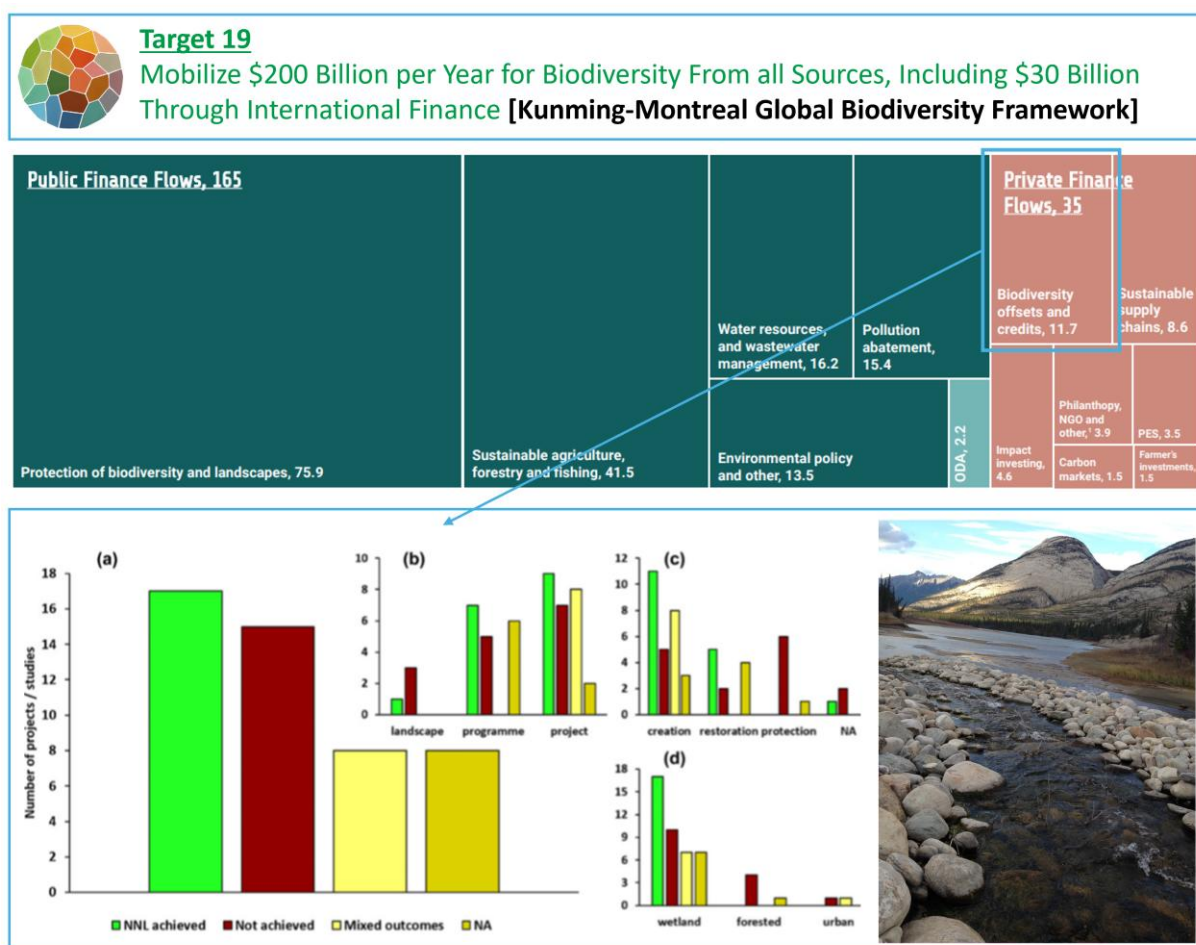
2. Nature Finance

Another major concern in the GBF is funding for nature conservation goals, expressed in terms of both reducing finance for activities that are harmful (Target 18) and proactively increasing finance for conservation and restoration (Target 19). Collectively, we can consider these efforts (often labelled greening finance and financing green, respectively) to fall under the banner of ‘nature finance’. So how do offsets feature in that picture?

The literature captures how biodiversity offsets have been implemented worldwide for decades, and there are now many thousands of offset projects already in existence, before even considering carbon offsets (8). Indeed, though estimates vary, this is to the extent that offsetting can now be considered the largest single source of private finance into nature conservation interventions (Fig. 1; 9). Given the global shortfall in nature conservation funding (*ibid*, and again see the GBF), moves to rule out offsetting would leave a substantial gap in current models for nature finance, with no clear replacement mechanism that is not simply offsets by another name. But more than that: the major issue in nature finance is actually the ‘greening finance’ part, such as removing financial incentives to carry out activities with detrimental impacts on biodiversity. Economists have long talked about the need to recognize environmental externalities, and offsets are able to do just that. This is because a huge part of the rationale for offsetting is that the requirement to offset under the mitigation hierarchy (for instance, up to

‘no net loss of biodiversity or better’, or a 10% net gain in biodiversity) should incentivize the avoidance of negative impacts in the first place (10). So – offsetting has a key role to play, on both sides of the coin, when it comes to financing nature recovery.

Fig. 1. A role for biodiversity offsets. Target 19 of the Global Biodiversity Framework calls for greater mobilization of funding for biodiversity, explicitly including ‘biodiversity offsets’. Biodiversity offsets (at ~\$11.7bn in 2022) are possibly the largest source of private financial flows into nature (9). Concerning efficacy, bar chart = number of assessed offset studies successfully enabling achievement of ‘no net loss’ of biodiversity (a) overall, (b) by scale, (c) by type, (d) by feature (12). Inset = photo of section of fish habitat restoration offset in Canada (8).



3. Robust impact and compensation estimates

A final consideration must be – what is the alternative? Any conservation actions that are implemented in relation to overcoming negative impacts on biodiversity (such as the GBF mission, or indeed the aforementioned SBTN), should be held to robust standards. To be robust,

these standards must involve at some point quantifying losses, and overcoming those, such that any gains are commensurate with losses, and an overall gain is assured. If they do so, then this effectively must involve offsets to some degree. If impacts and/or gains are not quantified, then there are no offsets, but then gains cannot therefore be sure to have mitigated residual impacts, meaning there is doubt over whether the outcome is ultimately positive for biodiversity.

So – to ensure robust outcomes – organisations want to quantify biodiversity losses and gains, but they do not want to call it offsetting. This conundrum is perhaps one motivator for the increased interest in ideas like biodiversity ‘insetting’ and biodiversity ‘credits’. Both require some measurable uplift in biodiversity, with rules around the situations in which they can be applied, and both are commonly carefully distinguished from offsets (e.g. 11). And rightly so; as there is a subtle distinction to be made. However, if organisations then seek to replace the necessary function of offsets with other closely related mechanisms like credits, in order to meet restrictive policy requirements that do not permit offsetting, this will confuse matters more and likely lead to less desirable outcomes for nature.

Key to all of this – and the motivation for the recently increased skepticism about offsets, as discussed in the opening paragraph – is the question of whether offsets actually work. Like any human endeavor, biodiversity offsetting has a mixed record historically; in terms of achieving the stated ecological goals (12,13). However, the evidence does show that it is possible to implement the mitigation hierarchy in a way that secures no net loss across landscapes (Fig. 1), or for very large single infrastructure projects (e.g. 14,15). Further, it is likely that offsetting practice has improved considerably over time, and will continue to do so as technical research into the topic from the early 2000s onwards is increasingly incorporated into practice.

Beyond technical challenges to the efficacy or misuse of biodiversity offsetting (both of which are genuine challenges, deserving of consideration and careful treatment), there are some who have always objected to biodiversity offsets on moral grounds. For example, some see it as enabling greater destruction, or a means for commodifying nature which raises fundamental ethical concerns. I happen to disagree with this characterization. But that issue is not debated here, as it is a subjective position and one that some actors will take irrespective of debate. Rather, my central point is that demonstrably financing and physically achieving the set of targets under the GBF requires acknowledging at least some ongoing negative impacts on biodiversity, and therefore reaching the 2030 mission (and on to the 2050 vision) will require those impacts to be mitigated. As stated simply by Maron et al. (1): “promising alternatives are scarce, so offsetting and offset-like mechanisms remain a necessary component of strategies”.

Conclusion

In sum, there is simply no achievement of our worldwide goal to ‘halt and reverse biodiversity loss’ without at least some, robust, biodiversity offsetting; just as there is no pathway towards net zero of greenhouse gas emissions without at least some carbon offsetting. The science on this is clear: though the use of offsets should be highly limited and closely scrutinised, offsets are a fundamental component of meeting global targets on biodiversity and climate change. We simply cannot rule them out entirely; and policymakers need to stop doing so.

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