# Achieving social *and* environmental justice: a call to integrate the human and the more-than-human in spatial decision making

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Globally, the fastest growing land cover type is urban - a rate of buildout that is contributing significantly to the 'nature emergency' (1). The social and economic consequences are serious: species extinctions and habitat degradation mean the loss of critical ecosystem functions that are needed to sustain human society (2). The UK is now one of the most nature-depleted countries on earth, ranking in the bottom 10% globally on the Biodiversity Intactness Index. One in six of our species are at risk of extinction, and only 14% of our rivers and 7% of our woodlands are in good ecological health (3). We are already feeling the economic impacts: research suggests that UK GDP may decline by 5-12% in the next decade due to biodiversity loss (4).

'No Net Loss' (NNL) and 'Net Gain' (NG) policies require development projects to calculate and mitigate negative impacts on biodiversity on a site-by-site basis. In England, No Net Loss was introduced by the 2006 NERC Act, while Biodiversity Net Gain (BNG) became mandatory in spring 2024. Together, these policies mean that habitat destruction must be compensated for on a like-for-like basis, after which an additional 10% uplift must be achieved, either via the creation or enhancement of areas on the development site itself or offsite (on

additional land set aside for conservation; or via purchase of government credits). Early evidence from pilots shows that a high proportion of developments, perhaps up to 95%, are locating BNG onsite (5).

These policies sit within the planning system, but they are slightly separate from its discretionary process. Assessments are carried out by trained ecologists and recorded in a set of professional and technical documents which require specialist knowledge to understand. This approach has tended to isolate ecology from other elements of the planning system and its deliberative process. As a result, the view and valuation of nature within the metric is very difficult for communities to challenge.

From a theoretical standpoint, this 'black boxing' of ecology is old-fashioned. Philosophically, we have moved on from the dualistic view that society and nature are separate spheres, towards a position where the two are seen as deeply intertwined. Instead, many leading contemporary thinkers operate within a 'one world' framework, in which human activities impact ecosystems, and healthy natural environments are vital not just to our health and wellbeing, but to our very survival as a species. A planning approach that continues to isolate the ecological and the social therefore risks missing the connections between the human and more-than-human worlds - and the social justice implications of ecological policy.

Take the recent proposal from the government for a 'brownfield exemption'. This would allow developments on parcels of previously developed land that are smaller than 2.5 hectares to sidestep requirements for ecological mitigation. The questionable underlying assumption is that brownfield sites have negligible biodiversity value. From the perspective of housing delivery pressures, this might sound like a solution to the headache and expense of delivering green spaces on these tricky sites. But our research suggests that this target-oriented approach has significant social implications.

At the Planning for Nature project, based at the University of Sheffield, we used a dataset of 235 BNG applications to model the impacts of a brownfield exemption on deprived areas. We located 26 brownfield planning applications (sites with >75% urban land cover pre-development, a definition proposed in the consultation) in a wide range of Local Planning Authorities (LPAs). We matched each to a non-brownfield application of a similar size from the same LPA, and used a statistical method called the Wilcoxon signed-rank test to assess whether the Index of Multiple Deprivation (IMD) LSOA rank differed significantly between the two groups.

We found that the IMD rank of brownfield sites was significantly lower than non-brownfield developments ($W = 461$, $P = 0.025$; Figure 1). Across the entire dataset of 235 developments, 89% of BNG units are delivered onsite via the creation of green spaces. The proportion for brownfield was even higher: our sample contained 26 brownfield sites, with 100% of BNG units delivered onsite. This means that exempting brownfield sites from development would likely lead to a loss of green space provision in more deprived areas.

The brownfield exemption would therefore have wider implications for health and wellbeing, and not just in terms of access to nature, which is now widely recognised to have mental and physical benefits. Deprived areas have also been shown to be significantly more affected by air pollution (6) and urban heat stress (7) and an absence of green spaces to mitigate this could lead to increased respiratory and heat-related health issues, transferring costs onto an already overburdened NHS (8).

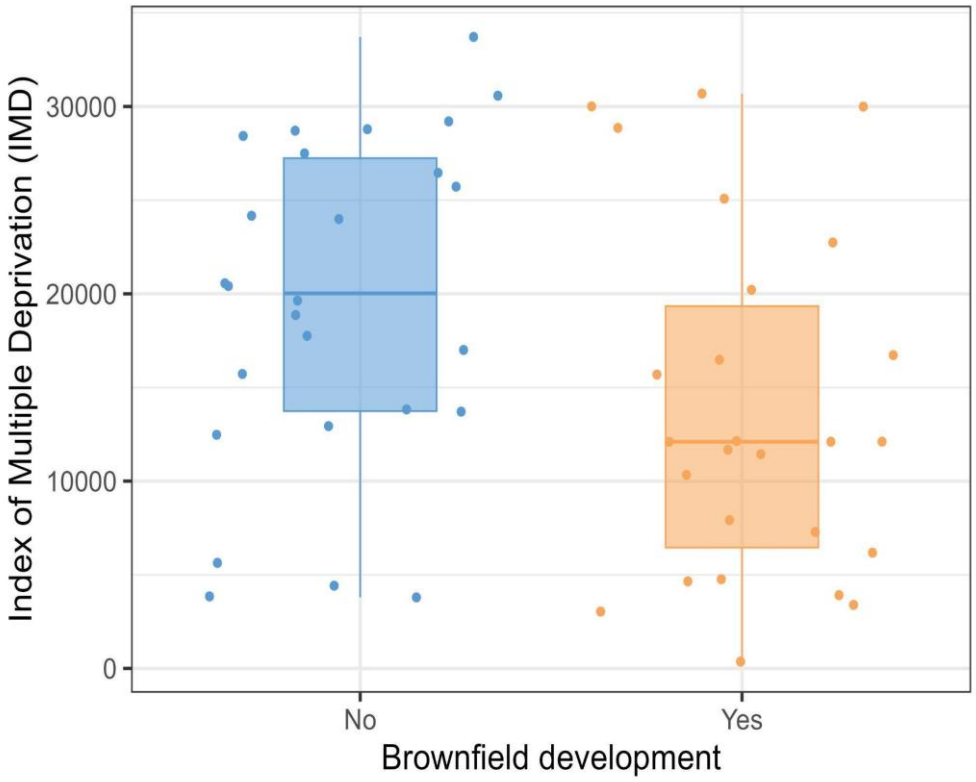



**Figure 1** Comparison of ranking values of Index of Multiple Deprivation (IMD) from 2025 between matched brownfield (orange) and non-brownfield (blue) developments. The IMD value of brownfield sites is significantly lower than non-brownfield sites, showing they are in more deprived areas. Box whisker plots show median (thick horizontal line), and interquartile (boxes) and 1.5 x interquartile ranges (vertical lines).

**Ecological implications**

Of course, the assumption that brownfield sites are of low ecological value is also questionable. Some are home to an ecosystem type called Open Mosaic Habitat, which is highly diverse, and particularly valuable to invertebrates (a group that BNG fails to explicitly consider). Open Mosaic is currently categorised as a priority habitat, and the brownfield exemption does not apply where priority habitats are impacted. However, the government has also proposed the introduction of a new habitat category: 'urban habitat of medium distinctiveness', which is not a priority habitat. If both policies were to be adopted, this would create a significant incentive for ecologists to misrecord Open Mosaic Habitat as 'urban habitat of medium distinctiveness'

to achieve exemption from BNG requirements, leading to the loss of priority habitat without compensation.

**Gaming the red-line boundary**

The consultation also proposes a new definition of brownfield land as sites where 75% or greater of the area has been previously developed. This assumes good faith from developers on such issues as the red line boundary, yet our research has uncovered a range of instances where BNG had already led to illogical drawing of site outlines in order to game the system, for example to avoid having to mitigate for watercourses or to reduce the number of biodiversity units required. The new definition of brownfield may exacerbate this problem. Again, this has social as well as ecological implications: it may hinder good design, prevent full integration of blue and green infrastructure into developments, and create awkward means of access and movement through sites. The result may be sites that are less accessible, and less safe for residents and other users of the space.

**Legal conflicts**

Finally, it is worth noting the confusion around the relationship between BNG and No Net Loss. While BNG was introduced in 2024, No Net Loss has been a requirement since the NERC Act of 2006, under which all public bodies have a statutory duty to conserve, restore and enhance biodiversity. Within the planning system, this means that LPAs must ensure that development does not lead to a net loss of habitat. Importantly, *No Net Loss applies even in the event of exemptions from BNG*.

The practical consequences of BNG exemptions would therefore be that LPAs would still be required to take decisions about necessary avoidance, mitigation, and enhancement in order to comply with the NERC Act, but would have to do so in the absence of the evidence

provided by a BNG metric. Subjective judgement - the very thing that BNG seeks to avoid - would be reintroduced.

**Ways forward**

The development industry is highly exposed to the risks of the nature and climate emergencies, thanks to a combination of factors, from global supply chains in raw materials to flood and fire risks that threaten to undermine established land and property valuations. The housebuilding industry urgently needs to recognise that current short-term profit-seeking behaviour threatens not only human health and wellbeing, but their own bottom line.

A situation as complex as this requires a multi-pronged solution. We must put in place a stronger, more proactive, and more strategic approach to biodiversity within the planning system, one that gives Local Nature Recovery Strategies greater and more binding weight in the development process. Commensurate funding (perhaps via an additional levy on developers) must be made available to secure green spaces for the community long term, beyond the 30-year horizon of BNG policies. Nature-friendly design standards to avoid gaming of red-line boundaries, and appropriate planning enforcement to ensure that plans are delivered on the ground, are also part of the solution.

In a more overarching sense, we need a holistic approach to development that explores the ecological and social consequences of policy, rather than viewing these in isolation from one another is necessary. There is not our world ‘over here’ and a natural world ‘over there’: there is one shared environment that the human and the more-than-human need to cohabit. Instead of thinking about ‘tradeoffs’ between social and environmental goals, or isolating ecology within a separate, non-deliberative policy, we need to think about routes to eco-flourishing. The social and the natural are coimbricated, and spatial decisionmakers need to ensure that they can thrive together.

Finally, the government must stop developing policy on the hoof and stop to consider the broader consequences of its actions. Any exemption to the rules of ecological mitigation needs to be considered from a social as well as an environmental perspective, particularly given the known correlation between more deprived urban areas and lower levels of nature access.

**References**


(1) Burns F, et al. (2016) Agricultural Management and Climatic Change Are the Major Drivers of Biodiversity Change in the UK. *PLoS ONE* 11(3): e0151595.

(2) Ranger, N. *et al.* (2023) *The green scorpion: The macro-criticality of nature for finance. Foundations for scenario-based analysis of complex and cascading physical nature-related financial risks*. Oxford-NGFS Occasional Paper. Oxford: University of Oxford.

(3) Burns, F., et al. (2023). *State of nature 2023*. The State of Nature Partnership

(4) Ranger, N and Oliver, T (2024) *Assessing the Materiality of Nature-Related Financial Risks for the UK.* Green Finance Institute and Environmental Change Institute, University of Oxford.

(5) Zu Ermgassen et al, (2021). Exploring the ecological outcomes of mandatory biodiversity net gain using evidence from early-adopter jurisdictions in England. *Con. Lett.*, 14:e12820.

(6) Gray et al, 2023. Deprivation based inequality in NOx emissions in England, Environ. Sci.: Adv., 2, 1261-1272.

(7) Lo et al, 2022.Space poverty driving heat stress vulnerability and the adaptive strategy of visiting urban parks. *Cities*, 127, 103740.

(8) Val Martin et al, 2026 Greenspace and air pollution disparities in urban Northern England, Jnl of Env Mgt, 399, 128493.