



No net loss of what, for whom?

Stakeholder perspectives on Biodiversity Offsetting in England

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Stakeholder perspectives on Biodiversity Offsetting in England

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ABSTRACT

Market-based instruments (MBIs) have emerged as a popular approach to balance development and conservation objectives. However, their ability to accomplish this is often hindered by poor implementation. There is a widening gap between, on the one hand, the relatively rapid rate of policy development and implementation of MBIs, and the sluggish pace of research and evaluation on their design and impact on stakeholders. This paper presents and analyses the perspectives of multiple stakeholders on the adoption in England of Biodiversity Offsetting, an instrument designed to enable biodiversity losses in one place to be compensated through conservation improvements in other nearby sites. The analysis reveals several doubts and challenges associated with social and ecological compensation of biodiversity loss. The findings suggest that issues of distributive justice, access to nature, and the status of ownership over sites of common heritage need to be given broader consideration when accounting for biodiversity loss and compensation in relation to MBIs. This message is salient to both the UK context and the burgeoning international practice of Biodiversity Offsetting.

Keywords: Biodiversity Offsetting; MBIs; No Net Loss; social justice

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ABBREVIATIONS

AR	Academic researcher
CO	Certified offsetter
EC	Environmental campaigner
LPA	Local planning authority
NGO	Non-governmental organization

1. INTRODUCTION

Markets are increasingly seen as both part of the problem and part of the solution in relation to contemporary environmental challenges. The emergence of markets in water quality, biodiversity and carbon sequestration are indicative of nature being subsumed within prevailing systems of commodity production and exchange (Robertson 2012). Such is the pace of this change that nature, people, and their relationships are increasingly caught between the balance sheets of national accounting systems and the yardstick of the market (Robertson 2000; Robertson 2004). The former try to package nature into neat categories and functional units while the latter helps to translate these values into a price that can be understood and traded by markets across geographical space (Dempsey and Suarez 2016). In the process, a lot of nuance is lost and multiple problems can emerge. Even so, the policy, business and scientific communities increasingly accept it as a necessary approach to marry economic development and environmental protection. Many now believe that creating markets of environmental good and services has tremendous potential for maximizing the protection of ecosystems and biodiversity (Balmford 2002; Sutherland et al. 2006; TEEB 2008; Kettunen and Vihervaara 2012).

Within the context of biodiversity loss and ecosystem degradation, market-based instruments (MBIs) have emerged as a way to reconcile development needs and conservation objectives (Gómez-Baggethun et al. 2010; Reid 2011). The appetite for MBIs has risen in response to growing disillusionment with prevailing, non-market based approaches to conservation (Redford and William 2009). Traditional forms of command-and-control regulation, which adopt a prescriptive and top-down approach to conservation, are viewed as inherently inefficient and inflexible, costly to enforce and prone to regulatory capture (Mol et al. 2009; Pautz and Wamsley 2012). Conversely, community-based conservation, which integrates social development goals with conservation objectives, despite good intentions, has hitherto played a trivial role when viewed in the context of the rapid rate of biodiversity loss (Kellert et al. 2000; Barrett et al. 2001; Kiss 2004; Berkes 2007).

However, MBIs for conservation have attracted growing criticism on several fronts. Notably, many argue that the process of measuring ecosystems and biodiversity against abstract functional classifications often overlooks broader values associated with nature (Braun and Castree 1998; Dempsey and Robertson 2012; Sullivan and Hannis 2015). As Robertson (2006) notes, what is captured by such systems represents only “the nature that capital can see”. Furthermore, there are growing tensions between the articulation of science and capital within the process of marketizing nature, as is indicated by the inability of scientists to provide information about ecosystem services and biodiversity in uncontroversial ways. This presents a major challenge to the scaling-up of MBIs for conservation which rely on nature being amenable to uniform classification (Robertson 2006; Furlong and Bakker 2010).

The emergence of MBIs for conservation is indicative of a more fundamental restructuring of environmental politics under neoliberal hegemony (McCarthy and Prudham 2004). Interest in MBIs for conservation has grown as conservation funding has become increasingly challenging, with practitioners expected to deliver adequate protection of ecosystems in an epoch of austerity and dwindling financial resources (Comerford et al. 2010; Corson 2010; McCarthy et al. 2012; Apostolopoulou et al. 2014). It is assumed that non-state actors and private investors will help bridge the shortfall between government provision of public goods and that which is socially optimal (Reid 2011; Young 2015). This form of alternative service delivery often silos complex issues, such as redistributive justice and sustainability, placing them in the problem space of organizations (Furlong and Bakker 2010), outside the purview of broader governance processes. In turn, communities increasingly become exposed to

powerful corporate interests, weakening their ability to resist developments (McCarthy and Prudham 2004; Igoe and Brockington 2007).

The widening gap between the rate of policy development of MBIs for conservation and the maturity of critical scholarship on their theoretical and practical implications increases the likelihood of ineffective and harmful policy interventions (Reid 2011; Roth and Dressler 2012). The modest achievements of projects on payment for ecosystem services (Landell-Mills et al. 2002; McAfee 2012; Pokorny et al. 2013; Hejnowicz et al. 2014) and carbon offsetting schemes (Corbera and Brown 2010; Knox-Hayes 2010; Cavanagh and Benjaminsen 2014; Klinsky 2015) are symptomatic of this. There is currently poor articulation of the economic, institutional and ecological conditions in which MBIs for conservation are most effective (Robinson 2006; Gómez-Baggethun et al. 2010; Wissel and Wätzold 2010). There are also very few shared characteristics between different instruments, limiting their reproducibility across space (Pirard 2012). Extrapolating the success of one instrument or study site to another, in lieu of contextual information, often results in uneven success and implementation of approaches (Helm and Hepburn 2014; Landell-Mills et al. 2002). Exploring the entanglement of conservation in neoliberal discourses in conceptual generalizations fails to illuminate the complex interplay between neoliberal projects, politics and environmental change; an empirical, case-specific inquiry is key in this regard (McCarthy and Prudham 2004).

This paper examines how Biodiversity Offsetting, a nascent conservation MBI, is being conceptualized, negotiated and unpacked within UK environmental policy and practice as a potential remedy to the conservation-development dichotomy. It is based on in-depth interviews with key stakeholders in conservation practice in England. The study area reflected the fact that conservation practice in the UK is devolved within England, Scotland, Wales and Ireland. Responses were coded using a three-cycle approach to produce a conceptually rich understanding of the practical and theoretical challenges presented by Biodiversity Offsetting, which is currently lacking (Bull et al. 2013; Evans et al. 2015; Hackett 2016). Coding counts indicate that ecological compensation ($X = 604$) and social compensation ($X = 593$) are both important in the design and implementation of Biodiversity Offsetting. The poor treatment of social equity and justice issues within this context that it reveals represents an important contribution to Biodiversity Offsetting scholarship, offering a new avenue for understanding the limits of MBIs in English conservation practice.

1.1 Theoretical and practical challenges

In the last 50 years, England's ecological network has experienced mounting stress from human development (Lawton et al. 2010). Over this period, 60% of UK species have declined (Burns et al. 2013). Such a trend is particularly concerning given the link between biodiversity loss and degradation of ecosystem services which deliver cultural benefits (Fuller et al. 2007; Oliver et al. 2015; UK National Ecosystem Assessment 2014).

Biodiversity Offsetting has been promoted by the British Government as a tool to appease the longstanding conflict between economic development, human progress and biodiversity conservation. Offering developers the chance to purchase credits from actions with positive biodiversity outcomes in order to "offset" adverse biodiversity impacts from their own development activities (eftec et al. 2010), Biodiversity Offsets are designed to ensure there is no net loss (or a net gain) in ecological value (Parliamentary Office of Science and Technology 2011). Biodiversity Offsetting is often referred to in the context of the mitigation hierarchy, a sequence of abatement stages to reduce negative biodiversity impact during development. Assuming attempts are made to reduce biodiversity loss, by minimizing impacts or addressing damage done through restoration (BBOP 2013), Biodiversity Offsetting is intended to compensate for any residual biodiversity impact. The objective of achieving no

net loss in biodiversity following infrastructure development has emerged as a guiding principle in UK conservation practice (Defra, 2013a), EU legislation (European Commission, 2012) and in the international practice of environmental impact assessment (Apostolopoulou and Adams, 2015). The use of Biodiversity Offsetting – and the application of the no net loss principle – is seen to add most to conservation outcomes on sites that are not currently afforded any protection under existing legislation (BBOP, 2013). However, a review by Bull et al. (2016) found poor alignment between different no net loss accounting frameworks and the values they encompassed, highlighting the normative nature of compensation agreed under different Biodiversity Offsetting schemes. There is growing debate around how the term “no net loss” is being deployed in conservation practice and the extent to which it accounts (or misaccounts) for the diverse values associated with biodiversity and its loss.

In 2012, the UK Department for Environment, Food and Rural Affairs (Defra) established a series of pilot sites around England, in Devon, Doncaster, Essex, Greater Norwich, Nottinghamshire, Warwickshire and Coventry and Solihull. Running until Spring 2014, these pilots tested the efficacy of Biodiversity Offsetting to deliver infrastructure development and conservation commitments for England in tandem (Defra 2013b).

This paper examines stakeholder perspectives on the use of Biodiversity Offsetting in England in relation to Defra’s green paper *Biodiversity Offsetting in England* (Defra 2013b). The evolution of Biodiversity Offsetting in conservation policy and practice in England is particularly ripe for interrogation. The Conservative Party, which has been in government since 2015 – and advocated Biodiversity Offsetting in England between 2012 and 2014 – has passed a suite of policy measures which replace safeguarding of protected areas in England to infrastructure development (HM Government 2015). The recent UK referendum vote to leave the European Union is also likely to render the EU Habitats Directive (Council Directive 92/43/EEC) obsolete in the UK, opening up a large network of habitats previously protected within the Natura 2000 network to the potential use of Biodiversity Offsetting (European Commission 2008). Discussion of the practical challenges associated with Biodiversity Offsetting provides a useful context to the ensuing analysis.

From a temporal perspective, one major challenge Biodiversity Offsetting faces is permitting offsets where compensation for biodiversity loss occurs over an extended period (Bull et al. 2013), since processes such as soil formation, tree growth and the development of biophysical habitats are slow relative to human timeframes (Moilanen et al. 2009). Development of habitats is also inherently uncertain. To account for uncertainty and to satisfy no net loss criteria, offsets must be set at significantly higher ratios, in ecological terms, than the original sites destroyed (Moilanen et al. 2009; Pickett et al. 2013). Observations show existing Biodiversity Offsetting schemes seldom deliver compensation stipulated by no net loss (Kettlewell et al. 2008; Robertson and Hayden 2008). The time lag between development and offset also presents ambiguity in determining how long an offset should be maintained, by whom, and whether this commitment could diminish if the political and legal landscape changes (Bull et al. 2013).

The modest success of the US Mitigation Banking programme (see <https://www.epa.gov/cwa-404/mitigation-banking-factsheet>), the longest-running Biodiversity Offsetting scheme in existence, exemplifies the practical challenges associated with non-state actors mediating Biodiversity Offsetting. In the US state of Ohio, Kettlewell et al. (2008) found two-thirds of projects were unsuccessful in restoring the wetland area stipulated by their permit, and permits allowed different wetland types to be interchanged during compensation, resulting in net biodiversity loss. In Massachusetts, Robertson and Hayden (2008) found 21% of developers made no attempt at building the offset site, and schemes that were successful provided compensation at a lower overall ratio than non-bank forms of compensation.

Meanwhile, a quantitative functional assessment of 40 riparian mitigation projects in Orange County, California found none of the projects were “functionally successful”, as defined by the successful restoration of hydrology, biogeochemistry and habitats (Ambrose 2000). Laurance et al. (2015) assert that biodiversity offsets are far too often used as a crude form of damage control in response to poorly conducted environmental impact assessments. Furthermore, there are several instances in which biodiversity cannot meaningfully be replaced with no net loss in ecological value, leading to irreversible loss of biodiversity (BBOP 2013); this is particularly true for mitigation involving translocation of species (Pilgrim et al. 2013).

A further caveat of Biodiversity Offsetting is demonstrating “additionality”, the additional biodiversity gained from an offset site against a business-as-usual scenario (Maron et al. 2010; Bull et al. 2013). This requires appraisal of baseline biodiversity and ecosystem functioning to isolate the effect of the conservation intervention. However, detractors of Biodiversity Offsetting suggest that such evaluation is unfeasible based on the 20-minute site assessment recommended in the British Government guidance paper (Defra 2013b; Environmental Audit Committee 2013).

2. METHODS

2.1 Stakeholders

We could only find a limited inventory of published research examining Biodiversity Offsetting in the UK, or stakeholder perspectives on it. Therefore we conducted a series of stakeholder interviews after being granted ethics approval for this study from an ethics committee at the University of York. To identify interviewees we relied on extant literature, professional networks and a corpus of news articles and editorials on Biodiversity Offsetting.

Grey literature, which is more abundant than peer-reviewed literature on the topic of Biodiversity Offsetting, revealed two key stakeholder groups working at the interface of science, policy and business. The first of these is local planning authorities (LPA), which are responsible for overseeing legal compliance of Biodiversity Offsetting pilots in the UK. Participants in this group were well positioned to explain the protocols involved in Biodiversity Offsetting and the practical challenges they face in an institutional policy setting. The second group was certified offsetters (CO): organizations and individuals commissioned by developers to administer biodiversity offsets.

Using the search function of the LinkedIn online professional network (search term: “Biodiversity Offsetting”) we found a number of academic researchers (AR) with research expertise in the field of Biodiversity Offsetting and restorative ecology. Meanwhile, we identified two medium-sized (FERN and Save our Woods) and one international (Friends of the Earth) environmental and social justice organizations, all actively investigating the implications of Biodiversity Offsetting in England and the EU; this group we categorized as environmental campaigners (EC). In total, we interviewed 12 respondents, three in each of the four stakeholder groups (see Appendix A for a more detailed description of the participants).

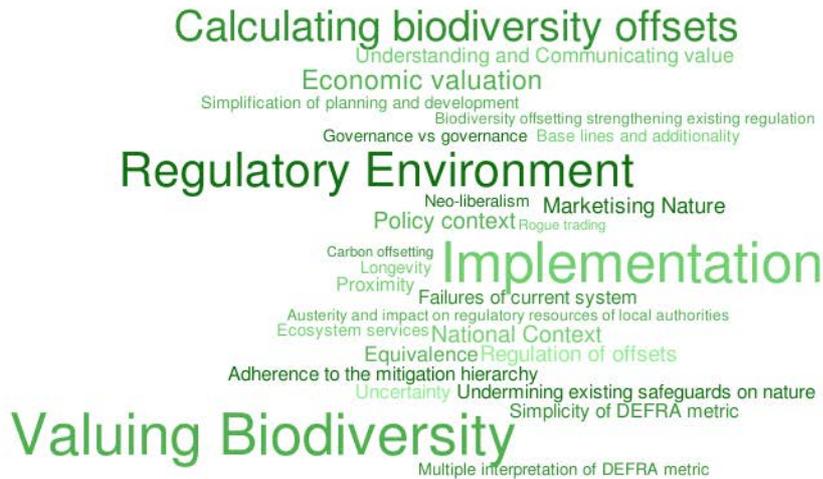


Figure 1: A “word cloud” representation of themes relating to ecological compensation. The text size indicates the frequency with which they featured in interview responses. The image was generated using WordItOut (worditout.com).

2.2 Interview structure

We used a combination of face-to-face and telephone interviews that were recorded with the permission of respondents and transcribed verbatim by the authors (see Supplementary Materials for full transcripts).¹ The interview protocol (see Supplementary Materials) featured a series of open-ended questions in the form of a semi-structured interview guide. This was based on a synthesis of the literature and ongoing discourse around Biodiversity Offsetting.

A key line of inquiry in interviews related to the “Defra metric” for Biodiversity Offsetting, composed of three criteria for calculating the level of ecological compensation (“biodiversity units”) between a development site and offset site, as outlined in the Government green paper (Defra 2013b): habitat type, condition and area. This metric was principally chosen for its simplicity to assess and fulfil ecological compensation required after infrastructure development, although the merits and limitations of such “bracketing” of compensation were discussed in the stakeholder interviews.

The interview guide for this study was amended after administering a pilot survey prior to the main round of interviews. We adapted the guide based on the expertise of different stakeholders using memo notes, and directed further questions to respondents to draw upon the experiences and concerns of stakeholders. We subjected the interview transcripts to three rounds of coding (open, axial and selective) in order to realize the full value of the data and the underlying meaning of the responses (Strauss and Corbin 1991; Glaser and Strauss 2009). To illustrate the significance of different concepts highlighted during the coding process, the number of occurrences of a specific concept within interviews was recorded, denoted by X = occurrence count.

¹ Full transcripts of all interviews conducted and a copy of the interview guide employed in the interviews can be found at: <https://dataverse.harvard.edu/dataverse/biodiversityoffsetting>.

3. RESULTS

Two central themes emerged from analysis of the interviews (See Appendix B for individual theme coding occurrence): ecological compensation, which reflects the theoretical and practical challenges associated with implementing Biodiversity Offsetting; and social compensation, which captures the social justice and equity issues surrounding Biodiversity Offsetting. Below we outline the steps followed to characterize the stakeholder interviews.

3.1 Ecological compensation

Stakeholder interviews identified challenges surrounding *implementation* ($X = 299$) and *valuing biodiversity* ($X = 305$) as most important to the level of ecological compensation delivered within a Biodiversity Offsetting scheme (see Figure 1 for a visualization). The theme of *implementation* considers the state of existing regulations safeguarding biodiversity in England, the regulatory environment surrounding Biodiversity Offsetting and how these were shaped in the UK policy context. The theme of *valuing biodiversity* relates to the treatment of ecological parameters within the Defra metric (see above; $X = 208$), and the benefits of and limitations to translating ecological complexity via economic evaluation of biodiversity and ecological losses and gains ($X = 97$).

Implementation

Respondents perceived lack of effective implementation, long-term monitoring and stakeholder participation as key barriers to achieving meaningful ecological compensation under Biodiversity Offsetting. The failure of the existing regulations within the planning system to adequately protect biodiversity was a recurring issue. However, each stakeholder group identified different causes behind the policy failure. Interviewee Local Planning Authority 1 (LPA1), for example, attributed the failure to a lack of “forward planning for biodiversity”, emphasizing the need to go

... through the mitigation hierarchy at the pre-site allocation stage of the plan so that any sensitive sites are knocked out before they even get in to the system for development.

Despite proponents of Biodiversity Offsetting viewing it as a last resort to mitigating biodiversity loss (BBOP 2013), academic researchers and environmental campaigners warned that such an instrument could promote a lackadaisical approach in earlier stages of site mitigation, and that improving avoidance of biodiversity impacts was central to reducing biodiversity loss. As Dempsey (2013) notes, the practice of scoping helps in part to designate “no go” zones for business, but also helps appropriate “go zones” where developers can exercise less care over biodiversity issues.

According to certified offsetters, the difficulty of implementing Biodiversity Offsetting is rooted in the problems developers face in navigating the labyrinth of regulations, jargon and bureaucratic procedures within the existing planning system:

They're [businesses] inherently grappling with quite complex and challenging issues ... and have been bombarded with all this kind of stuff about green infrastructure and ecosystem services ... all these kind of clunky phrases that they don't really understand.
(EC1)

Meanwhile, there was disagreement over whether the implementation of Biodiversity Offsetting would strengthen or undermine existing regulations protecting the England's

ecological network. Local planning authorities and certified offsetters felt Biodiversity Offsetting would supplement existing legislation protecting habitats and species. However, environmental campaigners warned that Biodiversity Offsetting created

shades of grey, where there were not any before, over what can and cannot be developed on. (EC1)

Accordingly, EC2 cited a case where a previously rejected planning application was subsequently resubmitted, then granted, on the grounds that biodiversity loss could be offset elsewhere. Environmental campaigners also regarded “no loss” and “no net loss” policy goals as fundamentally different, with the latter assuming a far weaker sustainability paradigm,

because you don't get an offset site without a site being destroyed. (EC2)

Conversely, academic researchers were concerned by the widening gap between policy rhetoric surrounding Biodiversity Offsetting and the practical and theoretical evidence base. AR1 expressed concern over poor design of the UK Biodiversity Offsetting pilot schemes:

I can see on the ground, the things on the ground implemented for mitigation, there has been no research done on them at all as to whether they actually work . . . We've spent a lot of money and it's not ecologically delivering at all.

Similarly, AR3 alluded to a gap between corporate commitments to deliver no net loss or net gain biodiversity targets – a growing phenomenon (Rainey et al. 2015) – and the necessary knowledge and experience required to fulfill these. There was also disagreement between stakeholders on the purported benefits Biodiversity offsetting would deliver. While certified offsetters envisaged biodiversity offsetting would produce net gains to biodiversity, academic researchers and environmental campaigners challenged the ecological evidence of a non-net-loss goal:

If you put the footprint of a building down, I'm not convinced you're getting No Net Loss, however great your mitigation is. (AR1)

AR2 noted that:

Just thinking you can kind of create a similar habitat somewhere else immediately de novo is pretty naïve . . . for anything more complex like a woodland or a salt marsh, then you are probably being very optimistic, even heroic, in thinking you can do it.

Despite disagreement over the effectiveness of Biodiversity Offsetting, several respondents felt the tool should be made mandatory for businesses and infrastructure development if the government insisted on implementing it. AR1 recalled practical issues with the voluntary nature of Biodiversity Offsetting in pilot studies, recounting:

people on the ground involved in the pilots were saying we're having real trouble getting developers to sign up to this.

However, AR3 challenged the high status of Biodiversity Offsetting in recent conservation discourse in the UK:

This is the mistake I think we have made in the UK so far. I think there has been this immediate leap towards Biodiversity Offsetting which is a controversial mechanism and isn't a proven mechanism yet, even though it has had some success in some parts of the world. The focus should be on no net loss and I think people are starting to realize that now.

Similarly, LPA3 agreed with the use of a metric in principle, but was “not convinced offsetting itself should be made mandatory”.

With respect to regulation and enforcement, all stakeholders regarded the state as an important agent in mediating the implementation of Biodiversity Offsetting, although they recognized that ongoing budget cuts to government programmes and local authorities presented a major barrier to implementing, regulating and enforcing Biodiversity Offsetting. LPA1 commented:

look at the planning system at the moment, look at the flaws in it. The real lack of ecologists. The biodiversity duty just not being properly considered at all within many local authorities. It's a resource problem, it's massive cuts within local authorities.

Similarly, CO1 noted:

we've got a local council whose budget is being stripped every single year and they own a lot of biodiversity spots that they have no money to manage, no money to do anything.

These observations point to a broader rescaling of environmental governance often associated with neoliberal reforms, whereby devolution of state power is not met with a fair reallocation of resources to local authorities; the private sector and NGOs are expected to fill the vacuum in social provision of public goods left by the withdrawal of the state (Prudham 2004). Within this context, we note a clear division between respondents on the benefits of this rescaling of governance.

CO1 regarded the increasing role of market-orientated conservation as a

... solution to corporate commitment on sustainable development [and] an absolute god-send for most local authorities [whose] budgets are being slashed.

However, academic researchers and environmental campaigners viewed the increasing role of the private sector in conservation as an inadequate replacement for government provision of public goods. AR1 was concerned that money which is

meant to be additional to enhance areas or give additional land around SSSIs Sites of Special Scientific Interest] might creep into what should be the statutory duty of government to be funding.

These sentiments were echoed by EC1, who was sceptical of the role of the private sector to meaningfully supplement government provision of public goods. EC1 expressed concern with the move

towards a model, sadly in the UK where our environmental services or environmental management or the caretaking role is being potentially handed over to the private sector. [Private sector actors are] only going to provide money if they get something out of it and,

you know, that's something we haven't quite grappled with as environmentalists: . . . that they don't do anything for free.

Valuing nature

In addition to concerns around implementation, an additional perceived barrier related to valuation of biodiversity and ecosystems ($X = 305$). We discerned two distinct discussions around valuation of ecosystems and biodiversity. First, Economic Valuation ($X = 97$), which considers whether biodiversity and ecosystems could, or indeed should, be monetized. Second, the calculation of biodiversity offsets ($X = 208$), in which Environmental campaigners, academic researchers and local planning authorities highlighted several issues with the proposed method of evaluating biodiversity loss and compensation.

Economic valuation: The notion of monetizing and marketing biodiversity offsets was criticized by academic researchers and environmental campaigners. A key theme in the academic researchers' critique was the limitations of using valuation as a tool for informing environmental management. AR1 suggested habitats that are "ecologically irreplaceable" should not be given an economic value since "they can't rebuild them in any reasonable time scale". AR1 also emphasized a more intangible imperative for protecting the environment, commenting:

If we get into a complete viewpoint where everything we can put a monetary value on it and all into economic terms and not consider our moral and almost spiritual need for nature then that's quite a depauperate way of viewing nature. So I think you can use those tools with caution. But you need to step outside that and recognize both the irreplaceable aspects of nature and moral, intrinsic aspects of nature you can't value.

Environmental campaigners offered a more critical perspective on this issue:

It's a really sensible tool if we're in an ideal, fluffy bunny world where everyone is out for the best, but unfortunately that isn't the way things are run . . . it's going to become a tool that enables the speeding through of development. (EC2)

Most respondents acknowledged economic valuation of ecosystems and biodiversity is important for agenda-building. Respondents agreed such exercises helped to elucidate the non-market benefits derived for towards conservation. CO1 also said environmental valuation was an invaluable communication tool in their work:

. . . using numbers to translate and communicate biodiversity to the business people has really transformed my work . . . it becomes so much more powerful in terms of getting them [businesses] engaged . . .

All stakeholders agreed a Biodiversity Offsetting "market" demanded tight, independent, regulation, with certified offsetters, academic researchers and environmental campaigners citing the operational failure of carbon offsetting, and the proliferation of "rogue traders" offering carbon credits, as clear justification for certification of offset providers. AR1 warned that, without appropriate rules, checks and balances, Biodiversity Offsetting could become ". . . a complete license to trash". Indeed, in the context of poor governance, several people have argued Biodiversity Offsetting would promote rent-seeking behaviour, whereby individuals use their property assets to profit from offset provision without creating "new" habitats, leading to a net loss in biodiversity (Walker et al. 2009; Bull et al. 2013). EC3 went so far as to condemn the overall role of Biodiversity Offsetting as a tool for conservation,

suggesting it offers developers “entitlements” to destroy nature, whereby the availability to purchase biodiversity credits assigns newfound rights to do so. Here, metrics of ecological value support the delineation of nature by usable and unusable space (Dempsey 2013).

Calculating biodiversity offsets: We detected divergence in respondents’ attitudes towards the measurement of biodiversity credits. CO1 believed the use of the current planning system provided local authorities and businesses with “no way of really quantifying and knowing how good their work is”. CO1 also suggested the Defra metric for measuring biodiversity units would address inconsistencies within the compensation process by tightening up the mitigation hierarchy and “casting a spotlight on it”. This standpoint was shared by LPA2, whose practical experience managing Biodiversity Offsetting pilot schemes was mostly positive.

CO2 expressed similar confidence in the proposed Biodiversity Offsetting framework, acknowledging that Biodiversity Offsetting is “not a perfect system” but “it is certainly better than what is being delivered at the moment”. CO2 went on to rationalize the use of Biodiversity Offsetting on the grounds that biodiversity loss is an existential crisis requiring immediate remedy:

We need to do something and we need to do it now and strive for perfection in the future.

The remaining stakeholders – the environmental campaigners, academic researchers and LPA1 – were more critical of the measurement procedures involved in calculating biodiversity units, viewing them as shortsighted and highlighting systemic flaws in the design and implementation of the proposed (Defra 2013b) metric for UK Biodiversity Offsetting.

AR2 distinguished between Biodiversity Offsetting as “a generic process” and Biodiversity Offsetting as proposed by the government green paper (Defra 2013b). They were confident that Biodiversity Offsetting “as a generic process” could certainly afford species greater protection, but despaired of the efficacy of the method proposed in the green paper:

Biodiversity Offsetting à la green paper is probably fundamentally flawed in any respect and may only help the planners. [It is] a dog’s breakfast of ill-defined stuff . . . a bit woolly and not very well put together and really talks about individual species and not ecological processes.

Similarly, LPA1 regarded the proposed habitat metric as “too simplistic and inadequate for what it should do”. AR3 made several observations on the weaknesses of the Defra metric. First they proposed a shift away from an “all-singing, all-dancing metric that can do all different types of habitats” and restricting it to certain habitat types where it has been shown to work. Second, they highlighted “baselines and counterfactuals” as a blind spot within the existing metric and recommended greater recognition of “background trends, a baseline and counterfactuals”, to demonstrate “proactive habitat creation”. Lastly, they criticized the lack of empirical evidence used to determine multipliers for compensating ecological value between a development site and offset site which they perceived to be “plucked out of the air”.

Referring to the calculation of biodiversity units attained under the Defra metric, AR1 noted:

. . . if people start thinking that this is a highly developed science then there is a risk . . . these numbers are broad representatives to try to do better than we do at the moment, but compared to some other schemes they are quite laughable in their simplicity.



Figure 2: A "word cloud" representation of themes relating to social compensation. The text size indicates the frequency with which they featured in interview responses. The image was generated using WordItOut (worditout.com).

Overall, local planning authorities, academic researchers and environmental campaigners felt that Biodiversity Offsetting according to the green paper would fail to achieve either social or ecological compensation, by overlooking issues of proximity, the irreplaceability of nature, ecosystem services, longevity and discounting in ecological compensation. Local planning authorities and AR1 raised concerns about the use of Biodiversity Offsetting within a market mechanism. These respondents all said that in their experience landowners show little interest in or demand for becoming “offset providers” – actors who earmark their land for wildlife conservation to provide offset credits to nearby developments (Environment Bank Ltd 2014). AR1 and LPA2 suggested landowners worked in short-term economic cycles of 3–5 years, so were reluctant to commit to permanent land use stipulated by 50–100-year Biodiversity Offsetting agreements. They also suggested farmers, a major focus group of Biodiversity Offsetting, may be averse to allocating land for non-agricultural use for cultural reasons. This view is substantiated by the UK National Farmers’ Union (2013) consultation response to Biodiversity Offsetting.

3.2 Social compensation

Analysis of stakeholder responses highlighted social compensation as an equally significant component of Biodiversity Offsetting to ecological compensation, denoted by the strong recurrence of two main themes in the responses: *stakeholder inclusion* ($X = 278$) and *social justice and equity* ($X = 315$). *Stakeholder inclusion* concerned the level of involvement of different conservation stakeholders in the design, development and delivery of Biodiversity Offsetting, how this was shaped by the prevailing expert/non-expert conservation paradigm, and the role of affected communities in defining the conditions of an offset and involvement in its implementation. Social justice and equity represented issues of community-related compensation associated with Biodiversity Offsetting: procedural and consequential justice ($X = 137$); access to nature ($X = 35$); inter-generational equity ($X = 18$); intra-generational equity ($X = 17$); and property rights ($X = 14$), and how these were treated within the proposed Defra metric (see the visualization in Figure 2).

Stakeholder inclusion

Respondents identified stakeholder participation as an integral component to the successful design and implementation of any conservation intervention. Certified offsetters viewed Biodiversity Offsetting as a powerful tool for helping companies fulfill their commitments to mitigate biodiversity loss, regarding biodiversity as an evolving area of corporate responsibility:

Everyone's done carbon, they've done waste, there is this hunger for something new and exciting and now they can actually set a No Net Loss target or a net gain target and actually measure it. (CO1)

CO1 also emphasized the propensity of Biodiversity Offsetting to build cohesive relationships between companies and wildlife organizations, by involving conservation groups in implementing biodiversity strategies. Yet environmental campaigners felt the appeasement of businesses and wildlife organizations within the design and implementation of Biodiversity Offsetting was being achieved at the expense of marginalizing those local people most affected by development and biodiversity loss:

my biggest concern throughout this whole process is people haven't been consulted, civil society, has knew nothing about it . . . communities went to those NGOs expecting them to fight to protect local green space, only to then find out they were part of it and they are on their own. (EC2)

Dempsey (2013) suggests the growing alliance of environmental NGOs with private-sector actors, to encourage greater recognition of ecosystem and biodiversity dependence within corporate decision making, further distances NGOs from representing the issues and problems experienced by communities they set out to protect.

Environmental campaigner 1 argued “*communities are often the experts of the landscape*” and hold rich information regarding the management needs of their local environment, though felt this was being ignored by large wildlife organizations:

I'm always told by charities “oh people don't care”. I think that's rubbish, people do care and that's why there is always a campaign kicking off when somebody wants to cut down a tree. It's just they are not given a chance to express that other than when their landscape is threatened. So get them involved at the decision-making stage. Get them involved way before the decision making stage.

Although academic researchers acknowledged the importance of wider stakeholder participation, they highlighted significant barriers to social inclusion within the design and implementation of Biodiversity Offsetting. They asserted that councils lacked the financial resources to facilitate costly consultation processes (stakeholder forums and referendums) and were instead forced to operate within a consequentialist mindset: preoccupied by policy outcomes, not processes. Academic researchers emphasized a commensurate dearth of experience and knowledge within local planning to meaningfully include civil society within the formal apparatus of government policy-making. Instead, AR2 noted, power dynamics within government policy-making resulted in powerful individuals monopolizing the issue-attention cycle of local authorities, eclipsing the needs of other stakeholders. However, LPA1 disputed the importance of wider stakeholder participation, on the grounds that affected communities “don't have any ecological expertise”.

Social equity and justice

Several respondents raised concerns around the treatment of social equity and justice within the current apparatus of Biodiversity Offsetting. The majority of stakeholders agreed there was a poor articulation of equity issues within the existing UK Biodiversity Offsetting guidelines. AR2 emphasized that achieving no net loss in ecological value did not necessarily infer no net loss in distributive justice:

So you've got the habitat and, there is no-net loss [in ecological value], but the benefits are lost to those individual people, that's an equity issue, a social-justice issue the green paper fails to deal with.

LPA2 felt the omission of equity concerns from the formal Biodiversity Offsetting process would impose “cultural debts” on current and future generations, in the form of a loss in access to environmental amenities which possess significant cultural, educational and historical value to local people. Within the context of social remuneration under Biodiversity Offsetting, EC1 emphasized the importance of establishing free prior informed consent with communities in which development was occurring, suggesting that if this criterion is not satisfied:

We need to be humble enough to admit that that is not an offset; it's not even a compensation.

EC2 agreed that failure to consult those affected by Biodiversity Offsetting undermined the agency of affected communities:

It's the responsibility of the democratic structure that we are living in. If things are going to be changed in order to disable the rights of people in the community to have a say over what happens with their landscape, then that's a cut in democracy as far as I'm concerned.

Notably, EC1 suggested that power dynamics would govern the degree of social remuneration resulting from Biodiversity Offsetting and concluded that a large landowner would invariably have more influence over the planning process than the “people that have the council housing on the outskirts”. AR2 also suggested that poorer communities were more likely

to accept remuneration or buy-offs than perhaps richer communities which would have the luxury of saying no.

Similarly, AR3 expressed strong support for social compensation of affected communities within the framework of Biodiversity Offsetting and the mitigation hierarchy, highlighting the importance of access to nature in the UK vis-à-vis other nations, commenting:

We are a small island which is heavily developed with lots and lots of people living very close to each other. I think access to nature is a huge part of the value of the remaining biodiversity. So, I would say, actually yes, it is crucial that Biodiversity Offsetting incorporates considerations of affected communities and access to nature for those affected communities.

AR3 also noted the omission of social compensation within the Defra metric, and suggested its introduction via measurement of ecosystem service provision in the delivery of an offset, concluding the “utility value and access to nature or something like that could be made part of

the Defra process without too much difficulty”. AR3 went on to outline how a more holistic approach to compensation might deliver co-benefits for local communities as well as safeguarding natural habitats from development. The social-ecological compensation attached would make it prohibitively expensive to offset biodiversity impact retrospectively, driving “. . . the developers to look at more minimization or avoidance measures – which is kind of the point”.

EC3 cited the case of Germany’s infrastructure planning law whereby if you “destroy rights of way, you have to re-establish them”, suggesting this as a useful requirement for ensuring commensurate access to nature between a development site and offset site.

Despite recognizing the distinct importance of public access to nature within the UK, academic researchers and certified offsetters highlighted a potential conflict between, on the one hand providing a prosperous environment for biodiversity and ecosystems to thrive, and on the other providing a suitable environment for access to green space. To this end, certified offsetters were less inclined to support the inclusion of social compensation within the Defra metric, suggesting that such issues are, and would continue to be, dealt with implicitly during the scoping and application of offsets with local authorities and via other mechanisms surrounding green infrastructure.

4. DISCUSSION AND CONCLUSIONS

This paper examines stakeholder perspectives towards the use of Biodiversity Offsetting as a tool for conservation practice in the UK. Responses highlighted a broad landscape of considerations surrounding the theoretical, practical and regulatory dimensions of the Defra metric (Defra 2013b) and the 2013 UK pilot projects. Foremost, this analysis provides further evidence that the requirements for achieving no net loss are poorly defined in UK conservation practice (Bull et al. 2013; Sullivan and Hannis 2015). The highly normative definitions of no net loss transcend simple ecological compensation criteria. Instead, findings redress the notion of “loss” within this context along both ecological and socio-cultural lines. This finding is symptomatic of the broader disjuncture between scholars and practitioners around defining what conservation actually means (Sandbrook 2015).

Conceptualizing the compensation involved in an offset remains poorly investigated, yet has significant implications for the compensation of biodiversity loss and communities dependent on nature (Bull et al. 2013; Gonçalves et al. 2015). At present no net loss is a misnomer for the actual costs associated with biodiversity loss. Our interviews with conservation stakeholders, highlighted ecological compensation and social compensation as equally important. However, at present, social compensation represents a major blind spot within the Defra offsetting metric, as illustrated in this study and as noted in an appraisal of the Biodiversity Offsetting projects in England:

The restricted range of ecosystem services valued also meant some of the potentially larger social and wellbeing benefits of access to nature were not fully considered. (Defra 2013a)

Ostensibly, the findings of this paper would suggest a greater mainstreaming of socio-ecological issues associated within biodiversity loss to be a sensible improvement to the Defra metric, which largely only considers habitat type and quality in compensating biodiversity loss. Indeed, as AR3 suggested, formal requirements to compensate community losses, such as access to nature, as part of the Defra metric could create a more robust safeguard for the protection of an ecological site in the first instance. Similarly, incorporating wider ecological parameters into the assessment and implementation of Biodiversity Offsetting to bolster

ecological compensation (around proximity, equivalence, ecosystem processes and longevity) would implicitly factor issues related to distributive and procedural justice into the offsetting equation, resulting in greater social compensation. Ignoring the social impacts of biodiversity loss entirely risks transforming sites of common heritage into gated ecological offset sites, compromising communal rights of access to land and ecosystem services.

On closer inspection, however, extending the balance sheet of no net loss to recognize and accommodate additional ecological parameters and social equity concerns in Biodiversity Offsetting is neither a workable solution nor a desirable outcome for conservation. Indeed, the Defra metric, as with other systems of classification in conservation offsets, captures only the “nature that capital can see” (Robertson 2006). Consideration of complex, spatially contingent issues linked to social and ecological compensation of biodiversity loss are simply incompatible with the goal of bundling nature into “biodiversity units” to facilitate its exchange. A key element to the consolidation of “capital”, featured in the notion of “accumulation by dispossession” (Harvey 1993), is the manner in which “those implicated in the accumulation of value are also those implicated in the attribution of value itself” (Fairhead et al. 2012).

The Environment Bank Ltd, a private company working to broker biodiversity compensation agreements for developers and landowner in England, will assume the role of defining the parameters of no net loss in the implementation of Biodiversity Offsetting in England. However, this duty is in direct conflict with the idea of integrating wider issues associated with biodiversity loss into compensation criteria. Even if attempts were made to integrate such issues, to appease local communities and the scientific community, they would invariably involve conflating, abstracting and equating complex issues within the assessment of biodiversity loss, placing them at greater risk of being misappropriated, traded off or crudely compensated, rather than legitimized. Supposing the recommendations of respondents were meaningfully reflected in conservation practice in England, the instrument(s) used to safeguard ecosystems, biodiversity and the nature-society relationship would be almost unrecognizable from Biodiversity Offsetting in its current, or improved form.

Biodiversity Offsetting is evolving in the vanguard of an international appetite for accounting-driven conservation, in which the use of indicators to measure trends in biodiversity loss can be seen across several policy agendas. The recently adopted Sustainable Development Goals explicitly use no net loss-style indicators to monitor trends in biodiversity; for example, Target 15.2 on sustainable forest management employs an indicator which monitors “Net permanent forest loss” (UN Economic and Social Council 2016).

The direction of the EU’s Biodiversity Strategy over the last 20 years also indicates an increased adoption of no net loss-style accounting to manage biodiversity loss (European Commission 1993; European Commission 2006; European Commission 2012). Quantitative assessment of conservation interventions needs to be complemented with qualitative evaluation and ground-truthing, drawing on practitioner and stakeholder surveys in order to identify and resolve issues associated with conservation programmes (Tittensor et al. 2014; Tallis and Lubchenco 2014). Such inquiries, as undertaken in this study, provides a crucial step in helping to unpack the underlying decisions, preferences and trade-offs involved in conservation activities, which are at risk of being veiled within “units of biodiversity” via the use of instruments such as Biodiversity Offsetting (Spash 2015).

In taking forward this agenda, we identify three immediate research gaps that require further investigation, set out below.

First, we recommend a similar qualitative inquiry into the attitudes of landowners to allocating land for offset sites, to help verify the mechanisms through which biodiversity offsets can operate effectively in England (Lawton et al. 2010). It has been widely reported that farmers have productivist or traditionalist mindsets and see land as the preserve of agricultural production (Howley 2015; Howley et al. 2015; McCracken et al. 2015).

Second, building on the UK Law Commission Conservation Covenants investigation (UK Law Commission 2014), we identify a clear need for research into the development of a uniform system of protecting offset sites via conservation covenants and the challenges presented by the seemingly disparate application of approaches to offsetting between different local authorities.

Third, future work around siting controversies needs to view the process of “accumulation by dispossession” in relation to the conversion of public commons to private land, between a development site and an offset site, but also as a process of dispossession at the offset site, particularly where poor property rights regimes give rise to land grabbing for so-called Fortress Conservation (Büscher 2016; Hackett 2016).

The analysis in this paper offers a rationale to reconnect the offsetting debate with a deeper understanding of the diverse socio-ecological values associated with biodiversity loss, which is long overdue. This message is also salient within the burgeoning international application of Biodiversity Offsetting, where treatment of social equity and justice issues remain at the peripheries of scholarship and practice.

Full transcripts of all interviews conducted and a copy of the interview guide employed in the interviews can be found online at <https://dataverse.harvard.edu/dataverse/biodiversityoffsetting>.

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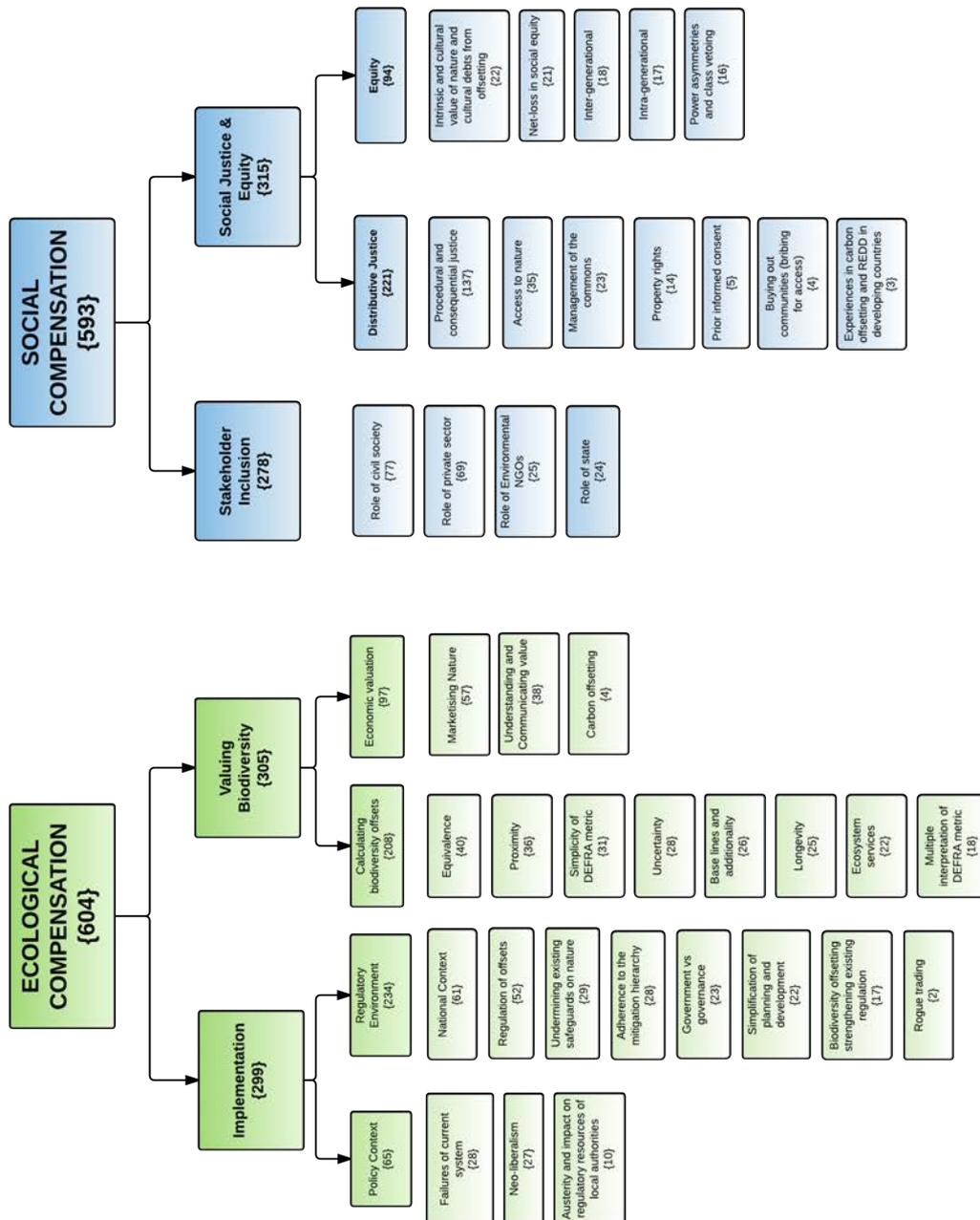
APPENDICES

APPENDIX A: STUDY RESPONDENTS

Position	Group	Relevant expertise
Professor of Ecology	Academic researchers	Provided input to UK Biodiversity Offsetting consultation. Experience working extensively on the relationships between biodiversity, and ecosystem services, functioning and policy
Engagement officer and researcher	Academic researchers	Conducted research on behalf of the UK Government on the merits and limitations of Biodiversity Offsetting
Lecturer on Biodiversity	Academic researchers	Expert in restorative ecology and has advised widely on the topic of Biodiversity Offsetting
Director of environmental campaigning organization	Environmental campaigners	Involvement in campaigning on Biodiversity Offsetting and sell-off of UK Forest Estate
Researcher and campaigner at major European environmental NGO	Environmental campaigners	Engagement with research and campaigning on Biodiversity Offsetting
Leader in International biodiversity policy at major global environmental NGO	Environmental campaigners	Coordinated response to EU No Net Loss consultation and has knowledge of implementation of Biodiversity Offsetting in France, Germany and the UK.
Principal ecologist from local authority in Warwickshire County Council	Local planning authorities	Responsible for implementing Biodiversity Offsetting pilot in Warwickshire
Senior practitioner in nature conservation, Nottinghamshire County Council	Local planning authorities	Responsible for implementing biodiversity pilot in Nottinghamshire
Senior practitioner in nature conservation, Devonshire County Council	Local planning authorities	Responsible for implementing biodiversity pilot in Devon
National Programme manager in private sector organization who has dealt with brokering deals between developers with landowners to achieve offsets	Certified offsetters	Involved in Essex Biodiversity Offsetting pilot. Previous experience as a "trader" in Australian BushBroker scheme and extensive experience scoping receptor sites for Biodiversity Offsetting.
Project manager in private sector organization who has dealt with brokering deals between developers with landowners to achieve offsets	Certified offsetters	Involved in Essex Biodiversity Offsetting pilot and liaising with planning teams at the county and borough planning authorities to calculate credit requirements of development proposals
Biodiversity leader at major planning, engineering and construction management organization	Certified offsetters	Experience of scoping Biodiversity Offsetting projects in the UK

APPENDIX B: DIAGRAM OF THEMES IN INTERVIEWS AND CODES

Numbers in brackets represent occurrence of the code.



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SEI is an independent, international research institute. It has been engaged in environment and development issues at local, national, regional and global policy levels for more than a quarter of a century. SEI supports decision making for sustainable development by bridging science and policy.

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