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Research article

Using offsets to mitigate environmental impacts of major projects: A stakeholder analysis

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A B S T R A C T

Global patterns of development suggest that as more projects are initiated, business will need to find acceptable measures to conserve biodiversity. The application of environmental offsets allows firms to combine their economic interests with the environment and society. This article presents the results of a multi-stakeholder analysis related to the design of offsets principles, policies, and regulatory processes, using a large infrastructure projects context. The results indicate that business was primarily interested in using direct offsets and other compensatory measures, known internationally as indirect offsets, to acquit their environmental management obligations. In contrast, the environmental sector argued that highly principled and scientifically robust offsets programs should be implemented and maintained for enduring environmental protection. Stakeholder consensus stressed the importance of offsets registers with commensurate monitoring and enforcement. Our findings provide instructive insights into the countervailing views of offsets policy stakeholders.

1. Introduction

Projected global economic growth is set to reach 3.7% per annum by end 2016 (IMF, 2015). Broadly, this indicates the initiating of many infrastructure projects in future years, thus placing further pressure to prioritize development over the environment (Reid, 2011). Consequently, firms will need to equitably advance development projects, having regard to the environmental consequences for the site (Jones et al., 2014). In addressing this balance, firms may be required to implement a package of environmental offsets (Gibbons and Lindenmayer, 2007; Kiesecker et al., 2009) that are 'the measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken' (BBOP, 2012b; Bull et al., 2013; Coggan et al., 2013). As an example, a firm may undertake an ecological protection measure to offset the biodiversity impacts of projects (BBOP, 2012b). In contrast, the mitigation hierarchy outlines the alternatives to offsets as avoidance, minimization (e.g. design electricity wiring to reduce species death, build a wildlife escape path across roads) and rehabilitation/restoration (e.g. plant trees to stabilise bare soil, stop erosion) (CSBI, 2015).

Given the growth in offsets policies, their wide use in infrastructure projects, and the contentious nature of their efficacy, it would appear sensible to examine offsets program principles, policies and lifecycle processes (Bull et al., 2013). Accordingly, in this study we address two research questions. First, having regard to offsets principles, policies, and programs, what are the barriers and opportunities associated with improving environmental offsets delivery? Studies show that environmental offsets may suffer from policy shortcomings, including deficiencies in equivalence, time lags, and faulty offsets currency determinations (McKenney and Kiesecker, 2010; Burgin, 2011; Maron et al., 2012). Hence, in this article, we seize the opportunity to examine problem areas from differing stakeholder viewpoints (Bull et al., 2013). Second, what regulatory enhancements would enable better outcomes when assessing and implementing environmental offsets? Thus, we seek to determine where the weight of stakeholder opinion is strongest and expose adjustments to regulatory processes that may result in improved outcomes (BBOP, 2012b; Bull et al., 2013; Alvarado-Quesada et al., 2014). In this respect, the study makes an academic and practitioner contribution in the area of environmental

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The article will discuss the background, problems and opportunities associated with environmental offsets, including a summary of environmental impacts and offsets strategies proposed in five large infrastructure projects in Australia (a country with comparatively advanced offsets policies) (Miller et al., 2015). Also, we outline the stakeholder analysis, data sourcing and results presentation methodology used to generate the results and discuss findings. The article will conclude with final observations of the tensions that surround offsets packages, and commend areas for policy and legislative improvement.

1.1. Offsets literature

Early studies of environmental offsets were positive and asserted the importance of investing in conservation measures that addressed biodiversity and societal benefits (Hardner et al., 2000). However, there were also studies of offsets problems, such as packaging equivalence, time lagged delivery, equitable currency determinations, 'no net loss' (NNL) of biodiversity, and offsets risk (Gibbons and Lindenmayer, 2007; Hayes and Morrison-Saunders, 2007; Moilanen et al., 2009; Maron et al., 2012; Gardner et al., 2013; Curran et al., 2014), coupled with moderate offsets successes (Burgin, 2010).

As an example, Bull et al. (2013) identified several key issues associated with offsets. Quantitatively, the valuation of the impacts to be offset, and the guiding principle of NNL of biodiversity, present as problems for practitioners (Brownlie and Botha, 2009; Maron et al., 2010; BBOP, 2012a; Bull et al., 2014). In particular, the combination of complex factors (e.g. offset land area, comparable biodiversity condition) (Latimer and Hill, 2007; Norton, 2009; McKenney and Kiesecker, 2010; Sherren et al., 2012; Gardner et al., 2013) and net present value calculations (e.g. discount rates vary from 2 to 14% depending on scope and risk factors) for multi-year offsets projects (Overton et al., 2013; Gibbons et al., 2015), challenges consistent and precise valuations. That said, we acknowledge that other quantification methods, such as the economic value attached to ecosystems services, may also assist offsets valuation (e.g. offsets may deliver provisioning services where benefits such as drinking water for human consumption may result; or regulating services where ecosystem processes may offer benefits such as pollination or water purification) (Blignaut et al., 2013, 2014; Costanza et al., 2014). In addition, the analyses of the positive relationships between humans and ecosystems reinforces the benefits of individual and societal wellbeing in spiritual, recreational, reflective and cognitive dimensions, thereby accentuating the value of offsets (Hassan et al., 2005; Hegmann and Yarranton, 2011).

In addressing NNL, dynamic changes in natural systems means that net losses and gains must be framed against fixed or variable biodiversity baselines so as to stop policy manipulation, and identify damage unable to be offset (Kiesecker et al., 2009; Ruhl and Salzman, 2011; Gardner et al., 2013; Gordon et al., 2015; Maron et al., 2015, 2016). Subsequently, experts have called for better estimation of NNL and net gain, including clarity around the scale of the loss/gain (i.e. project, landscape, region) (Brownlie and Botha, 2009; Virah-Sawmy et al., 2014). Others argued that offsets should provide additional contributions to conservation (i.e. 'additionality') (McKenney and Kiesecker, 2010; Rajvanshi et al., 2011; Pickett et al., 2013), with other quantitative problems including the offsets program length, lags between impacts and outcomes, and offsets risk estimates (Gordon et al., 2011; Maron et al., 2012; Curran et al., 2014). Some suggest that offsets delivery risks might be lessened using longer agreements and staged contracts (Doole et al., 2014).

Qualitative problems include demonstrating package equivalence, defining the reversibility of biodiversity losses, and establishing thresholds beyond which impacts cannot be compensated (i.e. irreversible loss) (Norton, 2009; Gardner et al., 2013; Regnery et al., 2013). As an example, while offsets are meant to reverse project impacts (Morrison-Saunders and Pope, 2013), this may not occur in practice with resulting irreversible losses (Morrison-Saunders and Therivel, 2006; Bull et al., 2013). Also, the concept of equivalence has raised complex questions over proposed in-kind or out-of-kind exchanges (e.g. trading flora loss for fauna gain) (Walker et al., 2009; Bekessy et al., 2010; Burgin, 2010; Bull et al., 2013), and the relative value of direct offsets (e.g. site based environmental conservation) versus Other Compensatory Measures (OCMs) (e.g. biodiversity research funding) (Bekessy et al., 2010; Overton et al., 2013; Miller et al., 2015). Readers should note that the Australian government created 'other compensatory measures' or 'OCM' as a specific offsets policy term that enfolds all the indirect measures that are typically specified under the internationally recognized 'indirect offsets' classification (i.e. in Australian offsets policy, OCM are indirect offsets). Hence, these variations may see stakeholders provide differing opinions as to how these problems might be addressed.

Arguably, despite these problems, offsets have an important role to play in future sustainable developments (Dietz and Adger, 2003) with opportunities to apply offsets principles, criterion and indicators in policies (BBOP, 2012b); expand offsets usage (Bayon and Jenkins, 2010; Alvarado-Quesada et al., 2014; Doole et al., 2014); and, potentially increase private and public investment for environmental conservation (Kiesecker et al., 2009; Kumaraswamy and Udayakumar, 2011; Quintero and Mathur, 2011). Collectively, these directions present as potential opportunities for developing offsets policies and programs.

1.2. Research background

This study is based on data collected during a public inquiry into the application of environmental offsets in project approvals granted by the Australian government under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (Commonwealth of Australia, 2012, 2014b). Australia employs three tiers of government (e.g., federal, state/territory, and local), with the federal government regulating impacts on a specific set of environmental values (i.e. protected matters) through the EPBC Act 1999. State/territory and local governments have responsibilities for implementing environmental policies within their jurisdiction under the Intergovernmental Agreement on the Environment (1992) (Commonwealth of Australia, 1992). The federal policy and offsets assessment guide were launched in 2012 and include operating principles, development guidelines and a computational assessment guide (quantity, quality, risk). A policy history and review can be found in Miller et al. (2015). The public inquiry provided an excellent site for crowdsourced data collection with a full and searching examination of federal offsets programs.

During the inquiry, ninety-seven individuals and organizations (business, government and non-government) offered a wide range of written discourse on the federal government's implementation of environmental offsets. In particular, the government encouraged project shareholders and stakeholders to provide statements in the context of five major infrastructure projects that impact biodiversity and the broader environment (see Fig. S1). As of early 2014, these five projects account for around 31,500 ha of cleared land and disturbed habitats, with proposed offsets exceeding 75,500 ha of habitat conservation. Accordingly, the data analysis draws together broader policy and program issues, with context-specific statements and discussion related to major projects.