Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

Stockholm University

2020-02-13

# Unravelling the social and ecological implications of policy instruments for biodiversity governance

Niak Sian Koh

Licentiate thesis in Sustainability Science
Stockholm Resilience Centre
Stockholm University
February 2020
ISBN:
Cover pictures: *Visitors observing the kangaroos in a protected area surrounded by farmland in Mount Eliza, Mornington Peninsula, Australia. Photo by N.S. Koh.*

Stockholm University

Stockholm Resilience Centre
Kräftriket 2B, Stockholm, SE 10691

info@stockholmresilience.su.se
www.stockholmresilience.su.se

A PARTNER WITH

Beijer Institute OF ECOLOGICAL ECONOMICS

KUNGL. VETENSKAPS-AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES

## Abstract

Biodiversity losses are occurring at an unprecedented rate, with ongoing environmental degradation at the expense of expanding economic activities. A transformative change is needed away from business-as-usual development and towards prioritizing the conservation and sustainable use of biodiversity. For the effective governance of biodiversity, a well-designed mix of policy instruments are needed that are suited to the local context. This PhD project examines the social-ecological implications of policy instruments for biodiversity governance, with an emphasis on biodiversity offsets. Offsets are a policy instrument where actions are taken to compensate for negative impacts to biodiversity caused by developments. I discuss how such policy instruments must be carefully designed and implemented to ensure positive outcomes for people and biodiversity.

In **Paper I**, I examined how biodiversity offset policies, which have been commonly misunderstood as a market-based mechanism, can be designed with various levels of involvement from market and state. I presented an ideal-typical typology based on the institutions from which biodiversity offsets are organised: *Public Agency*, *Mandatory Market* and *Voluntary Offset*. I identified the institutional arrangements of six offset policies using cross-case comparison and stakeholder mapping to analyse how the biodiversity losses and conservation measures are decided. Based on these results, I determined how the six policies relate to the ideal types. The results found that the government plays a key role not just in enforcing mandatory policies but also in controlling the supply and demand of biodiversity units, supervising the matching of biodiversity values or granting legitimacy to the offset. The paper concluded that commensurability of natural capital is restricted in offsets (biodiversity is always exchanged with biodiversity), while different degrees of commodification are possible depending on the policy design and role of price signals when trading credits.

In **Paper II**, I examined the implementation gap of the Convention on Biological Diversity's (CBD) objectives and global biodiversity targets at a (sub)national level. I identified obstacles to achieving the Aichi Biodiversity Targets and challenges faced in interpreting the CBD guidelines through a content analysis of biodiversity policy documents, participant observation as well as semi-structured interviews with experts at the 14$^{th}$ meeting of the Conference of the Parties to the CBD. As compliance was found as a key challenge in the CBD, I presented insights for fostering the implementation and enforcement of biodiversity policies by drawing from concepts in international human rights law. In particular, I examined review mechanisms of human rights law and biodiversity agreements to determine the strategies used for compliance. The paper concluded that recognising the synergies between human rights and biodiversity can help strengthen review mechanisms for implementing the objectives of the CBD.

The findings from **Paper I** provided a foundation for understanding the institutional design of national and local offset policies. In **Paper II**, I then broadened out to discuss the challenges faced in interpreting and implementing global biodiversity targets into national regulatory frameworks. Together, both papers analysed the institutional design and implementation of policy instruments, and examined their contributions to a transformation for the sustainable use of biodiversity.



**Keywords:** biodiversity offsets, commensurability, commodification, Convention on Biological Diversity, human rights.

## List of Papers

### Paper I

**Koh, N. S.**, Hahn, T., & Boonstra, W. J. (2019). How much of a market is involved in a biodiversity offset? A typology of biodiversity offset policies. *Journal of Environmental Management*, *232*, 679–691. https://doi.org/10.1016/j.jenvman.2018.11.080

### Paper II

**Koh, N. S.,** Ituarte-Lima, C., & Hahn, T. The implementation (gap) of the Convention on Biological Diversity: Encouraging compliance with insights from international human rights law.

Manuscript to be submitted to Transnational Environmental Law.

### Contributions

For **Paper I,** I contributed to developing the research idea. I collected the data and co-analyzed the results. I was responsible for leading the writing of the paper.

For **Paper II,** I contributed to developing the research idea. I collected the data and co-analyzed the results. I was responsible for leading the writing of the paper.

**Additional Publication** (based on MSc thesis)

**Koh, N. S.**, Hahn, T., & Ituarte-Lima, C. (2017). Safeguards for enhancing ecological compensation in Sweden. *Land Use Policy*, *64*, 186–199. https://doi.org/10.1016/j.landusepol.2017.02.035

# Contents

1. Introduction ..... 1
1.1 Background ..... 1
1.2 Biodiversity offsets ..... 2
1.3 Conceptual framework and papers ..... 5
2. Theoretical background ..... 8
2.1 Global environmental governance ..... 8
2.2 Transformative change ..... 8
2.3 Safeguards for biodiversity and people's livelihoods ..... 10
2.4 Offsets: Strong or weak sustainability? ..... 12
3. Methods ..... 13
3.1 Paper I: Offsets ..... 13
3.2 Paper II: CBD ..... 13
4. Results ..... 14
4.1 Paper I: Offsets ..... 14
A typology of offset policies ..... 14
The spectrum of commensurability of nature ..... 16
4.2 Paper II: CBD ..... 18
Review mechanisms from biodiversity and human rights law ..... 18
Countries' national reports to the CBD ..... 19
Interviews at CBD COP14 with insights from review mechanisms ..... 20
5. Discussion ..... 23
5.1 Paper I: Commensurability versus Commodification ..... 23
5.2 Paper II: Compliance strategies of human rights and biodiversity review mechanisms ..... 24
5.3 The discourse of policy goals ..... 25
5.4 A transformative change with policy instruments for social-ecological sustainability? ..... 26
6. Ways forward ..... 27
6.1 Paper III: Weaving social values into offsets ..... 28
6.2 Paper IV: Evaluating additionality in conservation outcomes ..... 29
7. Concluding remarks ..... 30
Acknowledgements ..... 32
References ..... 33
Appendix 1 ..... 42
Appendix 2 ..... 47

## Glossary

**Additionality:** Whether a project or activity has had a positive benefit against an established baseline, compared to what would have occurred in the absence of the project or activity.

**Aichi Biodiversity Targets:** A set of 20 global targets under the Convention on Biological Diversity's Strategic Plan for Biodiversity 2011-2020.

**Biodiversity financing mechanisms:** Economic instruments for increasing conservation funding, as noted in Goal 4 of the CBD's Strategy of Resource Mobilisation (COP9 Decision IX/11). Examples include biodiversity offsets and payments for ecosystem services.

**Biodiversity offset ("offset"):** A policy instrument where actions are taken to compensate fully for the residual impacts of development, following the quantitative assessment of biodiversity losses. Conservation actions must be of equivalent or greater ecological value to losses.

**Business and Biodiversity Offsets Programme (BBOP):** A multi-stakeholder advisory group to develop best practices related to offsets.

**BBOP principles:** A framework consisting of 12 principles for designing and implementing biodiversity offsets.

**Compliance strategy:** Strategies for emphasizing cooperation rather than confrontation in international agreements.

**Commensurability:** Transforming different qualities into a common metric to enable comparison.

**Commodification:** Assigning a monetary value to things.

**Convention on Biological Diversity (CBD):** A global agreement with a framework character aimed at the conservation and sustainable use of biological diversity.

**Ecological compensation:** Measures to compensate for biodiversity losses from developments without necessarily having a strict measurable goal.

**Mainstreaming biodiversity:** Integrating the conservation and sustainable use of biodiversity into all sectoral policies, plans, programs, strategies and practices.

**Mitigation hierarchy:** A framework for mitigating biodiversity losses from development by sequentially avoiding biodiversity impacts wherever possible, minimizing impacts where impacts are unavoidable, restoring following the impact if impacts are time bound, and finally offsetting any residual impacts to biodiversity.

**No Net Loss (NNL):** A target for achieving a minimum of no net loss in biodiversity across all development impacts. NNL policies are often operationalized in practice through application of the mitigation hierarchy.

**Policy instrument:** Structured activities aimed at changing other activities or behavior in society towards predefined objectives.

**Review mechanism:** A structured and on-going process of review to examine how conventions and protocols are being put into practice.

**Safeguards:** Policies and tools for maximizing the protection of biodiversity and people's livelihoods.

# 1. Introduction

## 1.1 Background

In 1992, the United Nations Earth Summit in Rio brought together over 178 States to discuss environmental issues, resulting in the largest intergovernmental gathering in history and an important innovation in global environmental governance (McGraw, 2002). Three Conventions were established from this meeting on: Biological Diversity, Climate Change, and Desertification. These conventions contribute towards a global platform for decision-making on natural resource use, leading to numerous multilateral environmental agreements. The Aichi Biodiversity Targets to 2020 are one such example of global environmental governance from the Convention on Biological Diversity (CBD), which are universal goals for biodiversity with a flexible framework that allows Parties to take into account their own national priorities and needs.

Despite a multitude of international environmental agreements being signed over the past three decades, biodiversity has continued to decline steeply (IPBES, 2019; UNEP, 2019). Halting biodiversity loss has been recognized as one of the most pressing sustainability challenges of the twenty-first century (Cardinale et al., 2012; Steffen et al., 2015). The CBD Secretariat is currently reviewing its strategic plan from 2011-2020, noting that based on the assessment of Parties' national reports, more than half of the Parties are not on track to achieve any given Aichi Biodiversity Target (CBD/COP/14/5/Add.2). Of the world's estimated 5.9 million land-based species, more than 500,000 species have insufficient habitat for long-term survival (IPBES, 2019). These species may become extinct unless their habitats are restored.

The toolbox of policy instruments[1] for biodiversity conservation comprises of four main categories: legal, economic, social and rights-based instruments (IPBES, 2018). While legal instruments remain central to conservation, a policy mix of economic, social and rights-based instruments can create incentives for protecting and encouraging a sustainable use of biodiversity. Legal and regulatory instruments are the backbone of environmental policies, which includes protected areas, land-use management standards and zoning regulations (Ring & Schröter-Schlaack, 2011).

Outside of protected areas, "mainstreaming biodiversity" represents one approach to tackle direct drivers of land use change across all extractive and productive sectors. Mainstreaming entails integrating the conservation and sustainable use of biodiversity and the sustained provision of nature's contributions to people into all sectoral policies, plans, programmes, strategies and practices (IPBES, 2018). Aichi Biodiversity Targets 6-8 are an example of mainstreaming as they call for the fishery, agriculture and forestry sectors as well as for pollution to be managed sustainably within ecological limits (Zinngrebe, 2018). Recognized as the theme of the 2016 CBD COP13, the international community has made significant efforts to improve environmental policy integration within and across sectoral policies (GEF, 2016; BBOP, 2018).

However, protected areas and other legal approaches have faced difficulties with enforcing regulations due to insufficient financial resources. Over the past three decades, economic instruments have emerged as an environmental governance trend that provides resources for conservation by penalizing activities that negatively affect the environment (OECD, 2016; Biermann & Pattberg, 2008). Conventional economic policy instruments include pollution taxes, user fees and certification schemes (OECD, 1993), while other innovative incentives

[1] 'Policy instruments' are understood as structured activities aimed at changing other activities or behavior in society towards predefined objectives (Huppes, 2001).

have developed such as payments for ecosystem services and biodiversity offsets (Hrabanski, 2015). The CBD (2008) has also encouraged the use of "biodiversity financing mechanisms" to incentivize and mobilize resources for conservation, that includes biodiversity offsets, payments for ecosystems services, environmental taxes, and climate financing with co-benefits to biodiversity.

## 1.2 Biodiversity offsets

Mainstreaming biodiversity requires dealing with the pressures of land use changes across all sectors. New policy instruments such as biodiversity offsets are being explored for mainstreaming biodiversity. Biodiversity offsets (hereafter "offsets") are an economic policy instrument that requires measurable conservation actions to compensate for the residual biodiversity losses from development projects (e.g. infrastructure, resource extraction or urban development). The project developer is required to fund the costs of conserving a similar ecosystem. Offsets are conducted either through establishing a protected area, ecological restoration, or a combination of the two. Figure 1 presents an example of an offset in urban development.

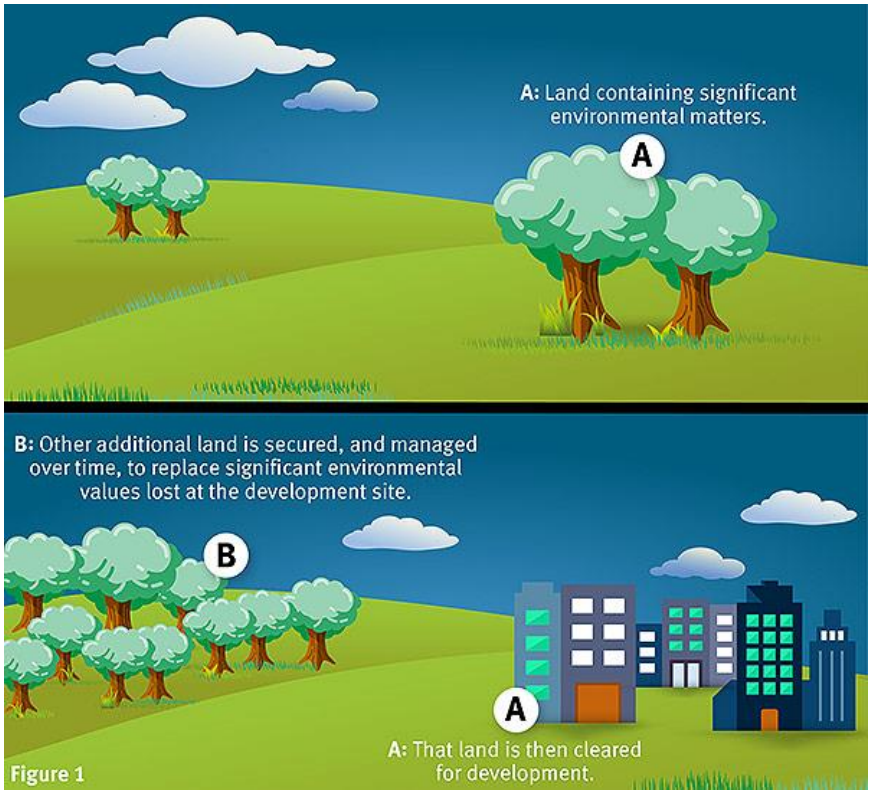



*Figure 1. An illustration of a biodiversity offset. As tree clearing has been permitted for urban development (A), the biodiversity values lost are offset by protecting and restoring similar values elsewhere (B). Source: Queensland Government (2019).*

Significant development projects that require permission are often subject to an environmental impact assessment (EIA), which is an important tool for mainstreaming biodiversity into economic decision-making (Brownlie et al., 2013). During the EIA process, most national environmental policies require the mitigation hierarchy to be applied. The mitigation hierarchy consists of Avoiding, Minimising, and Restoring on-site. Figure 2 presents how each step of the mitigation hierarchy should be conducted in a step-wise manner to address all impacts on biodiversity, while Figure 3 illustrates activities for implementing each stage. After these three stages of the hierarchy have been exhausted, offsetting can then be applied as a last-resort

compensatory measure. Hence, in an idealized model, offsets build on and improves the EIA, and therefore can only result in benefits to biodiversity.

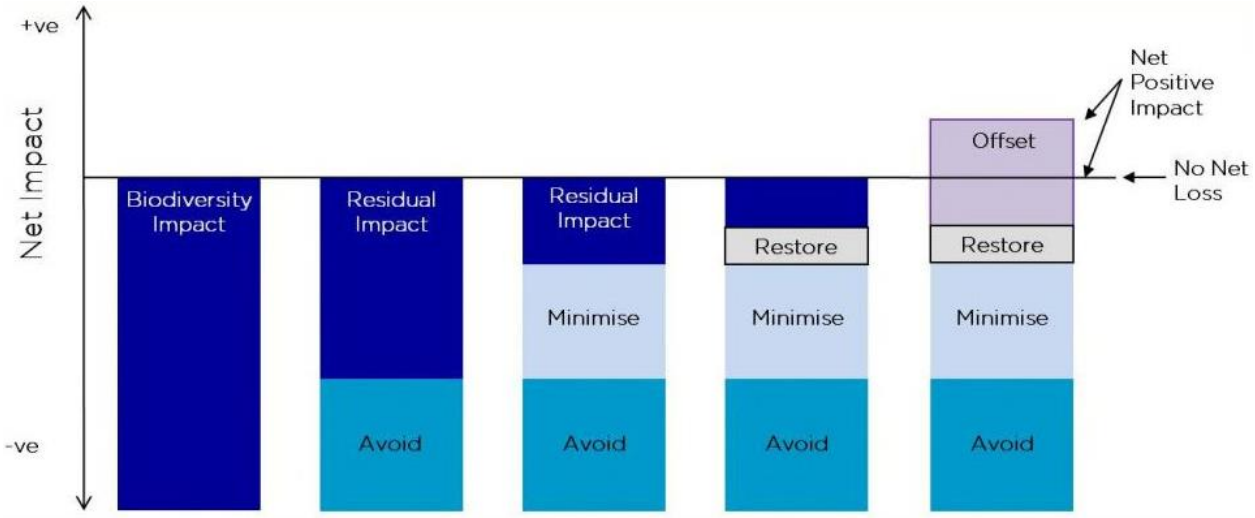
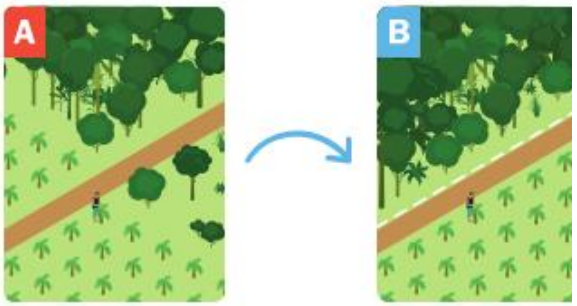
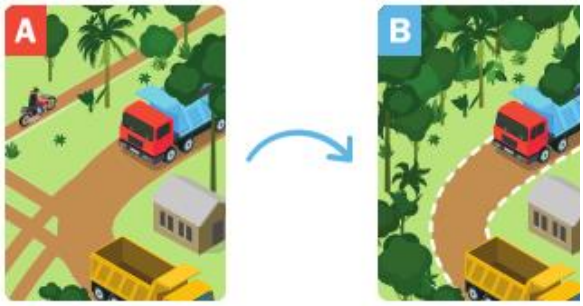


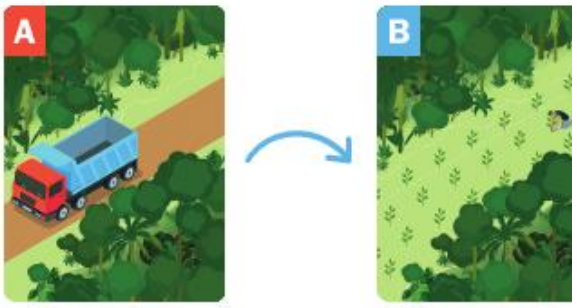

*Figure 2. The mitigation hierarchy for managing biodiversity impacts, which is commonly required by environmental impact assessments. The hierarchy requires biodiversity impacts to be first quantified, then Avoided, Minimized and Restored before Offsetting the residual losses. Source: IUCN (2015).*



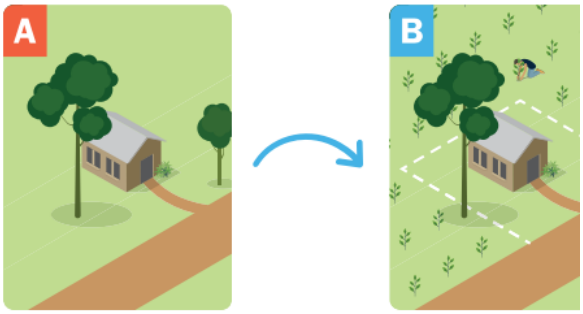

***Step 1. Avoid** deforesting areas of high biodiversity value by placing the impact site in the least damaging of options*




***Step 2. Minimize** spatial extent & duration of impacts.*




***Step 3. Restore** degraded ecosystems at impact site.*




***Step 4. Offset** by restoring a degraded area or protecting an area with similar biodiversity values somewhere else.*

*Figure 3. An illustration of the mitigation hierarchy in practice. (A) represents the negative environmental impacts from an example of oil palm monocultures, and (B) represents ways to address these impacts through the mitigation hierarchy. Steps 1-3 occur at the impact site, while Step 4 occurs away from the impact site. Source: Arlidge et al. (2018).*

Nonetheless, adhering to the mitigation hierarchy has been difficult to ensure because the first three steps tend to be overlooked when the focus is shifted to offsetting (Hough & Robertson, 2009). If the mitigation hierarchy is not adhered to strictly, offsets risk creating a "license-to-trash", where the existence of a compensation project renders authorities to approve a development that they would not have approved otherwise. Certain groups oppose offsetting because they argue that it is being used to greenwash planning applications and fast track development permits through the planning system (FERN, 2014; Friends of the Earth Europe, 2014).

The use of offsetting has been encouraged by the CBD and government regulations such as the European Commission (2011), as well as financial lender requirements like the International Finance Corporation (2012) and the Inter-American Development Bank (2015) through their environmental safeguards. Specific compensation policies exist in at least 33 countries, with the US, Germany, Australia and South Africa having some of the most well-established offset policies for impacts on habitats and species (Bull & Strange, 2018). The most widely known policy is wetland mitigation banking in the United States, where states and private banks acquire rights to land, restore wetlands, quantify conservation actions into credits and sell these credits to developers looking to meet their compensation requirements.

In 2004, the Business and Biodiversity Offsets Program (BBOP) was created by a non-profit organization as a multi-stakeholder advisory group to develop best practices related to offsets. The advisory group was a collaboration of 130 members spanning companies (21), financial institutions (9), government agencies (28), conservation and civil society organizations (34) as well as service providers (38).[2] The BBOP (2012) principles on offsets with its 'No Net Loss of biodiversity' goal have since become an industry standard.

In this thesis, the terms 'offsets' are used interchangeably with 'compensation' for ease of reading, although there is a difference between them. This distinction is relevant as both terms have inherently different ambitions and outcomes, which are exemplified in Table 1. Offsetting implies that biodiversity losses are quantified and matched to measurable conservation actions, while compensation entails more general measures to recompense without necessarily having a strict measurable goal (Bennett et al., 2017).

*Table 1. Clarifying terminology between offsets and compensation. Source: own elaboration.*

| | **Biodiversity offsets** | **Ecological compensation** |
|---|---|---|
| **Actions** | • Ambition of BBOP principles<br>• Quantifies biodiversity losses and conservation actions<br>• Matching of biodiversity losses to conservation actions, aspires for ecological equivalence<br>• Aims to achieve No Net Loss or Net Positive Gain of biodiversity | • No explicit ambition of BBOP principles<br>• No explicit quantification of biodiversity<br>• Aims to make a "reasonable" compensation according to legal requirements<br>• Flexibility in options for conservation actions |

[2] From the 34 organizations representing conservation and civil society interests, there were just two groups focused on indigenous rights. This raises questions as to whether indigenous rights have been adequately represented in deliberating the use of biodiversity offsets.

| | | |
|---|---|---|
| **Example** | Mertainen mine in Kiruna developed its own "Habitat hectares" (Hha), a Quality × Quantity metric to quantify biodiversity value.<br><br>➢ *Impact:* 450 Hha of primary forest was lost by the mine<br>➢ *Offset:* Protecting 424 Hha of a similar forest and restoring 64 Hha through increasing dead wood and controlled burning (Koh et al., 2017). | The E12 highway in Umeå used a qualitative reasoning approach to compensation.<br><br>➢ *Impact:* A highway was built passing through 13 ha of arable land that provided habitat for several bird species.<br>➢ *Compensation:* The compensation land was then 12 ha, where conservation measures consisted of creating habitat for birds and small biotopes, improving the water quality of an existing stream and creating a recreation area (Koh et al., 2017). |

The complexities and implementation of biodiversity offsets have led to fierce debates amongst practitioners, civil society and academics. Firstly, the ecological outcomes of offsets have been contested, due to reasons such as a lack of meeting ecological goals (Brown & Veneman, 2001); uncertainty of habitat restoration (Curran et al., 2014) and overestimating averted loss (Gibbons et al., 2017). Determining how biodiversity values can be exchanged across different habitats types (Carver & Sullivan, 2017), or the 'commensurability of nature', has also been a difficulty.

Secondly, social risks are also faced as communities may lose access to nature and livelihoods if compensation land is located far away or its access restricted (FERN, 2014; Bidaud et al., 2017). Offsets use a scientific equivalence of biodiversity to facilitate the displacement of nature, but this can overlook value equivalence (Ives & Bekessy, 2015). People assign a range of values to biodiversity; this invokes questions such as *which* biodiversity values are considered relevant and *whose* values are taken into account?

Thirdly, in academia offsets are frequently criticized for its 'commodification of nature' (Hahn et al., 2015), i.e. the assumption that conservation goals can be met with methods of the market economy (Sullivan & Hannis, 2015). Critics are concerned that a market approach to conservation may undermine environmental values, where environmental degradation can be justified by the premise of those who can simply afford to pay for conservation elsewhere. Thus, the use of offsets poses research challenges that cross cuts the environment, society and economy.

## 1.3 Conceptual framework and papers

The aim of this PhD project is to provide a better understanding of policy instruments for biodiversity, determining under which circumstances they can contribute to positive outcomes for people and nature. I place emphasis on economic instruments in **Paper I** and rights-based instruments in **Paper II,** although the four policy instrument categories are not mutually exclusive[3]. Within economic instruments, I focus on biodiversity offsets as its use has resulted in questionable ecological and social outcomes despite being advocated for by governments and companies.

[3] For instance, offsets are categorized as an economic instrument by IPBES (2018) but its policy design is influenced by the national legislation (Legal instrument), its implementation can be part of a company's corporate social responsibility strategy (Social instrument) and it should be planned in accordance with the norms and institutions of indigenous peoples and local communities (Rights-based instrument).

The overarching research question of this PhD project is:

*How can policy instruments for biodiversity be designed and implemented to foster effective and equitable outcomes for people and nature?*

This licentiate thesis explores the former part of the overarching research question, the policy design and implementation, with the following questions:

| | |
|---|---|
| **Paper I** (Offsets paper) | • *How do biodiversity offsets relate to the commensurability and commodification of nature?*<br>• *To what extent do offset policies represent a market-based mechanism?* |
| **Paper II** (CBD paper**)** | • *What review mechanisms are used in international human rights law and biodiversity agreements to encourage compliance?*<br>• *Why are the majority of the Aichi Biodiversity Targets not fulfilled, despite the fact that States set targets for themselves and several guidelines exist for implementation?*<br>• *What insights can the CBD draw from international human rights law to foster implementation and enforcement of the Convention?* |

Figure 4 presents the conceptual framing of the PhD project and the four papers. Two units of analysis are used: (1) the scope from policy design to outcome, and (2) the scale spanning global, national to local. The scope fits the overarching research question of how policies can be designed and implemented for effective and equitable outcomes. I then apply a multilevel approach to examining governance, since conservation problems are highly influenced by scales (e.g. space, institutional level).

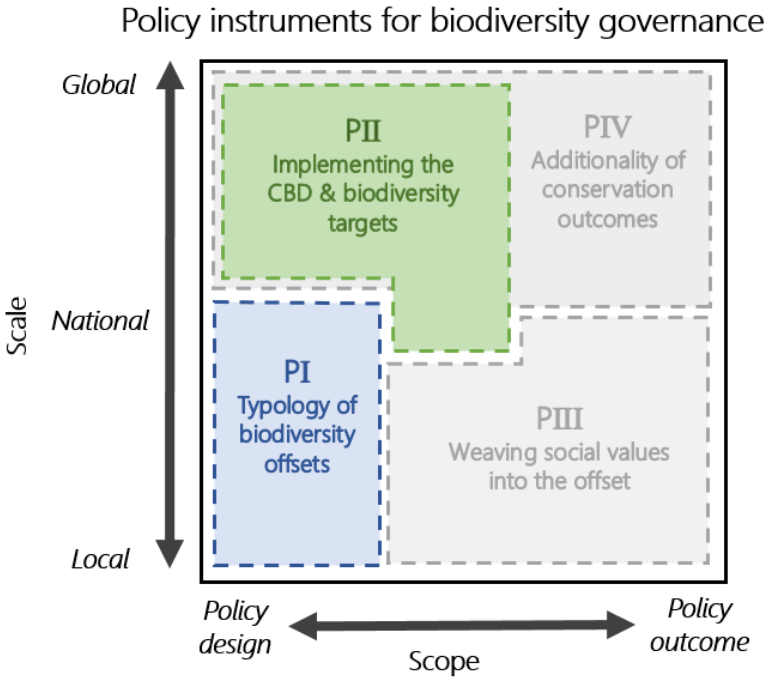



*Figure 4. Conceptual framework of the PhD project consisting of four papers, with scope and scale as the units of analysis. The scope of the papers span policy design to outcome, with scales from local, national to global. Papers 3 and 4 are greyed out as they remain for the next steps.*

Papers I and II focus on the design and implementation of policy instruments for biodiversity, at local-national and national-global scales respectively. **Paper I** examines how biodiversity offset policies, which has been commonly misunderstood as a market-based mechanism, can be designed with high or low levels of involvement from market and state. **Paper II** uses a discusses the implementation gap of the Convention on Biological Diversity's objectives and global biodiversity targets at a (sub)national level. Figure 5 below illustrates the connections between Papers I and II and their differences in scope.

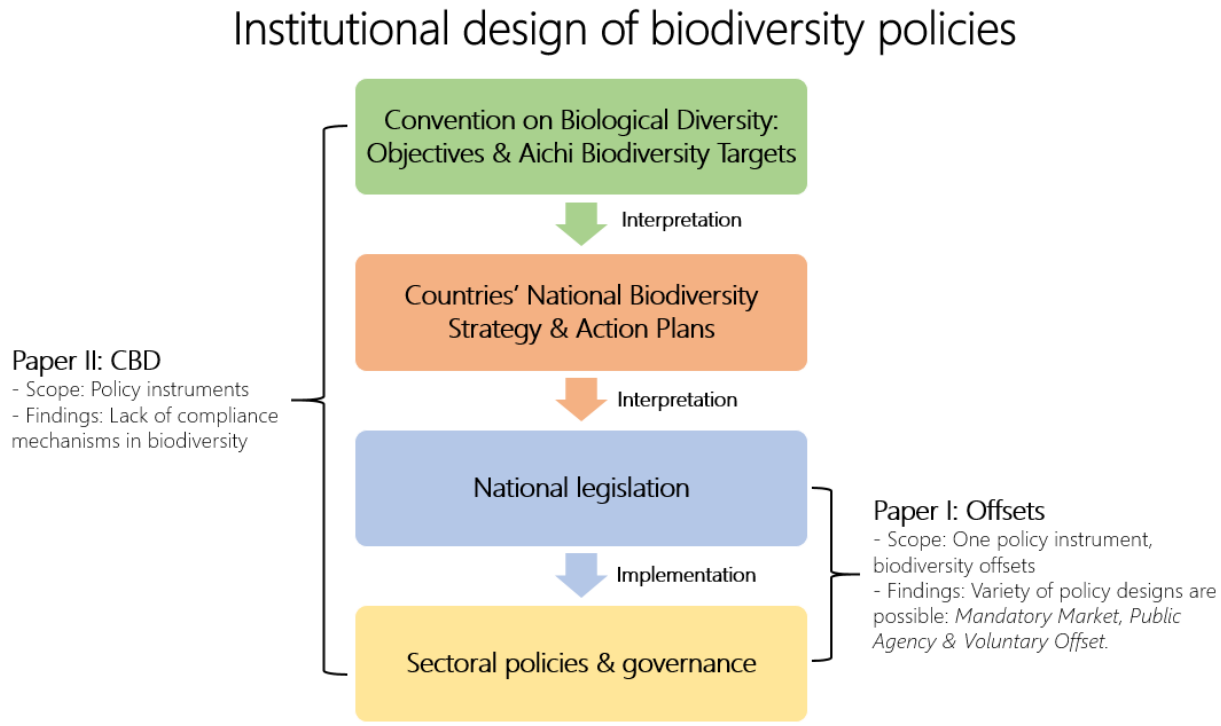



*Figure. 5. The first half of the PhD focuses on the institutional design of biodiversity policies, marked with the scopes of Papers I and II.*

**Paper I** contributes to the academic debate on the commensuration of nature with an empirical cross-case comparison of (sub)national offset policies. Offsets are often classified as 'market-based instruments' both by proponents and critics, but this representation fails to capture the varieties of how offset policies actually operate. Unlike the role of markets in payments for ecosystem services, there is little scientific literature analyzing whether existing offset policies are based on market logic or if they are more like government regulations defining liability rules. Most information on how offsets actually work in practice is scattered in the grey literature. Thus, this paper is one of the first in the scientific literature that provides an empirical description and comparative analysis of diverse offset policies from the global North and South. A typology of offset policies is then proposed based on the institutions from which biodiversity offsets are organised: *Public Agency*, *Mandatory Market* and *Voluntary Offset*.

**Paper II** explores the implementation gap of global biodiversity targets at a national level and discusses the underlying challenge of compliance within the CBD. The CBD has three main objectives: the conservation of biodiversity; sustainable use of its components; and equitable benefit-sharing from the utilization of genetic resources. Several assessments of the Aichi targets show that Parties have yet to comply with their own self-determined commitments (Tittensor et al., 2014; COP14/5/Add.2; IPBES, 2019). Concerns on failure to comply with commitments to safeguard biodiversity and healthy ecosystems have not only been raised at biodiversity fora but also at the UN Human Rights Council. Human rights can play an important

role in mediating the human-environment interface (Knox, 2018a). Revealing insights from compliance mechanisms under human rights law can contribute to address key gaps in CBD implementation. To foster implementation and enforcement of the CBD, I analysed existing review mechanisms from international human rights law. Understanding why the Aichi targets fell short is vital so that these issues can be addressed as we move towards the adoption of the post-2020 biodiversity framework.

## 2. Theoretical background

My thesis builds on theories of global environmental governance and the need for a transformative change of our biodiversity governance through a mix of policy instruments. Safeguards are then discussed to ensure that if these policy instruments are used, their implementation would be adapted to local social and biodiversity concerns. Lastly, I discuss offsets as an economic policy instrument and how its use relates to strong sustainability.

### 2.1 Global environmental governance

The focus of this PhD project is on environmental governance, which refers to "the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes" (Lemos & Agrawal, 2006, p. 298). Governance considers the actions of the state, as well as other actors like communities, the private sector, and non-government organizations. An underlying theme of environmental governance is the role of the state with other actors. Although top-down hierarchical governance is still the dominant mode of governance in conservation, collaborative and participatory approaches to solving environmental problems has become more widespread (Ansell & Gash, 2006). The term 'global environmental governance' in turn refers to environmental politics at a global scale that are no longer confined to just nation states, but is characterized by increasing participation of non-state actors (Biermann & Pattberg, 2008). This includes private actors, civil society, as well as inter-governmental organizations and international courts.

Global environmental governance is organized in different ways, through e.g. international agreements, national policies and local decision-making structures, but also non-organizational institutional mechanisms such as market incentives (e.g. eco-certification) and self-regulatory processes (e.g. corporate social responsibility) (Biermann & Pattberg, 2008). Two main trends have shaped global environmental governance over the past few decades: economic incentive-based mechanisms (Gómez-Baggethun & Muradian, 2015) and the participation of non-state actors (Bäckstrand et al., 2017). Both of these trends are examined in this licentiate thesis. A multilevel governance lens is used to identify which actors make decisions, how those decisions are made as well as the interactions between multiple levels of state and non-state actors (Bache & Flinders, 2004).

### 2.2 Transformative change

The IPBES (2019) Global Assessment reported that most of the Aichi Biodiversity Targets will likely not be achieved because the drivers of biodiversity loss (e.g. land use change) are not sufficiently addressed in our governance systems. A transformative change is needed if we are to restore biodiversity to such levels that can achieving the Aichi targets, or relevant Sustainable Development Goals (Mace et al., 2018; IPBES, 2019). As institutions – norms and rules (North, 1990) – play a role in preventing or enabling transformation, we need to transform our global and national institutions from a pattern that allows environmental degradation to one that favors long-term sustainability (Westley et al., 2011).

Several conceptual frameworks are used for studying sustainability transformations. One framework for understanding social-ecological transformations suggests that an intentional

transformation can be triggered by a deliberate change in the key elements of the system (Moore et al., 2014). Actors may purposefully try to disrupt a dominant state, often seen in social movements where marginalized groups organize themselves to protest against more powerful actors. Extinction Rebellion and Fridays for Future are some recent examples of civil society organizations disrupting the status quo and changing the discourse to highlight political inaction on climate issues.

Within the transformations literature, reference is often made to abrupt versus incremental strategies for change (Pelling, 2011; Elmqvist et al., 2019). Scholars highlight the transformative capacity of abrupt strategies with an example of a large-scale change occurring in the U.S. during the 1970's where a combination of public concern, political mobilization and legislative consensus led to a rapid succession of environmental laws being passed (Olsson et al., 2010). However, abrupt changes to a dominant system may face resistance from certain 'path dependencies', such as the 'lock in' of prior investments in technology or infrastructure (Berkhout, 2002). This is seen in the energy industry's dependency on fossil fuels.

Moreover, abrupt and incremental changes are not mutually exclusive. In order to achieve radical change, incremental steps are required to get there although transition processes are by no means smooth. Another framework for analyzing transformations suggests a 'radical incremental transformation' (Göpel, 2016). A radically new purpose could inform which multiple and diversified incremental interventions are needed to unlock path dependencies in the old dynamics of a system. This can occur from new ideas that create a shift in mindsets at an individual and societal level, which then feeds gradually into institutional changes and eventually challenges the dominant paradigm (Göpel, 2016).

In the context of climate change, an example of a radical incremental transformation is the mindset shift of rethinking the way we travel. Since 2017, there has been an increasing societal awareness in Sweden of the carbon footprint of travelling through the "flight shame" movement [flygskam] (Hook, 2019). Passenger numbers at Swedish airports subsequently decreased 4% from 2018-2019, amidst changing consumer preferences in travel as well as other factors including an aviation tax and a weak local currency (Swedavia, 2019; BBC, 2020). This mindset shift to lower-carbon travels is creating institutional changes, as the increasing demand for train travels has led to night trains being revived all over Europe (Abend, 2019).

In this PhD project, I build on the idea of a radical incremental transformation in the context of biodiversity governance. A mindset shift could entail how environmental degradation is often permitted under the premise of economic development activities. Development activities such as extractive industries, transportation infrastructure and urbanization have resulted in significant land use changes; humanity's footprint has affected three quarters of the terrestrial world (Venter et al., 2016). There is a need for policy interventions for biodiversity that addresses direct drivers of land use change, as well as a long-term systemic change of questioning the economic growth paradigm that is one of the main indirect drivers of biodiversity loss (Fletcher, 2010; IPBES, 2019). In this thesis, I focus on examining the former. This thesis defines transformative change as a change in biodiversity governance to move away from business-as-usual development approaches and towards prioritizing the conservation and sustainable use of biodiversity.

With the aim of the transformation determined, the next question is whether the existing policy instruments for biodiversity facilitate incremental changes towards this transition? There is no single prescribed route for transformative change, several pathways are possible in the shift towards a new sustainability regime. The IPBES report (2019, see D2) identified certain levers (governance interventions) and leverage points (points of intervention) for creating sustainable

pathways. One lever noted the importance of shifting incentive structures, while one leverage point was for justice and inclusion in conservation decisions to address power imbalances. Policy mixes with both positive and negative incentives are needed. Economic incentives must have a better consideration for ecological, economic and social outcomes; they have generally favored expanding economic activity over environmental protection (IPBES, 2019).

Economic policy instruments, of which biodiversity offsets are a subset, are one example of restructuring incentives for environmental responsibility. The intent with offsets is to create incentives for ecosystem service management that triggers sufficient behavioral change to contribute to a transformation towards sustainable development (Remig, 2014). Legally required offsets can play a potentially significant role in internalizing environmental externalities, enabling developers to take environmental responsibility and contribute to new social norms. Just as the energy sector subscribes to the Polluter-Pays Principle (OECD, 1972), sectors involving land use change must be accountable for their environmental impacts.

However, to facilitate a transformation, policy instruments must have a sufficiently ambitious design. Policy instruments, e.g. carbon tax, REDD+, biodiversity offsets or payment for ecosystem services, can be a part of a transformative change or maintain business-as-usual; it depends on the discourse (which problems are the instrument supposed to solve) and their implementation. For example, REDD+ can perpetuate business-as-usual if it is embedded in an ecological modernization discourse emphasizing its role as a global solution to climate change (Di Gregorio et al. 2015). Similarly, biodiversity offsets can be part of business-as-usual if the policy discourse emphasizes its role in supporting current development trajectories so long as the biodiversity losses are compensated by some (uncertain) conservation measures elsewhere.

While the focus of this PhD is on policy instruments for biodiversity governance, it is important to note that they are just one action in a range of options in the long-term transition to a more sustainable society that prioritizes biodiversity. It is the synergy of several approaches, increasing protected areas, reducing overconsumption, sustainable use of resources, shifting beyond standard economic indicators, reforming tax systems etc., that are needed for transformative change that addresses the drivers of biodiversity loss. Assessing whether offsets represent a transition in a larger systemic transformation that emphasizes the conservation and sustainable use of biodiversity (within biophysical limits, e.g. Steffen et al., 2015) remains for the next stage of this PhD.

## 2.3 Safeguards for biodiversity and people's livelihoods

Within the CBD discussions, biodiversity financing mechanisms (of which offsets are a subset), were recommended by the CBD (COP9 Decision IX/11) to create new opportunities for conservation funding from both public and private sectors. However, concerns exist on the social and environmental risks that can occur from the use of these mechanisms. This created a significant conflict at the subsequent COP10 in 2012 where Parties did not reach consensus and the proposed text was completely deleted.[4] The introduction of BFMs to the CBD (and the subsequent pushback from several stakeholder groups) can be perceived as a disruption to the existing system of the convention. Multi-actor dialogues (Schultz et al., 2018) and safeguards

[4] Parties could not reach agreement due to a lack of trust and dialogue between stakeholders with different political views. The conflict concerned issues such as monetary valuation of nature and whether instruments such as PES and biodiversity offsets can, or should, be used to protect biodiversity. The conflict also included the role of the private sector, and not least the role of the financial sector in resource mobilization for biodiversity. See Schultz et al., 2018 for details on the conflict. For the decision that was subsequently accepted, see UNEP/CBD/WG-RI/4/L.7, 11 May 2012, Agenda Item 6: Review of Implementation of the Strategy for Resource Mobilization, Draft recommendation submitted by the Chair, the Ad Hoc Open-Ended Working Group on Review of Implementation of the Convention, www.cbd.int/doc/meetings/wgri/wgri-04/in-session/wgri-04-L-07-en.doc

in biodiversity financing mechanisms (Ituarte et al., 2018) have since helped to resolve the conflict. Safeguards then emerged to ensure that if these policy instruments were used, their implementation would be embedded in local social and biodiversity contexts.

To make sure these policy instruments do not simply perpetuate existing power structures, safeguards can be used to facilitate a careful design and implementation. Safeguards can play a key role in addressing environmental and social risks of policy instruments. This ensures that concerns of ethics and equity are deliberated and taken into account, from the choice of suitable policy instruments to their implementation and monitoring. Safeguards refer to measures for maximizing the protection of biodiversity and people's livelihoods (Ituarte-Lima et al., 2018). It is useful to distinguish between substantive and procedural dimensions of safeguards; certain safeguards are already embedded in existing legal frameworks. Substantive safeguards define the rights and duties, while procedural safeguards entail the processes for enforcing those rights and duties (Ituarte-Lima et al., 2018; Koh et al., 2017).

Substantive safeguards enshrined in international law and national constitutions can be used to address environmental concerns that affect human livelihoods such as the right to life, right to property, and right to health. In particular, substantive safeguards are associated with the equitable distribution of tenure or property rights, over both tangible (e.g. land rights) and intangible resources (e.g. knowledge and innovations).

Procedural safeguards refer to the opportunities and abilities to exercise environmental-related rights, including duties to provide information, facilitate public participation in decision-making and provide access to remedies. The Environmental Impact Assessment (EIA), which is a common requirement of most national environmental policies, is one example of a procedural safeguard for biodiversity. Procedural safeguards are also noted in safeguard policies of projects funded from international organizations such as the International Finance Corporation (2012), World Bank (2017) and Asian Development Bank (2009). Nonetheless, substantive and procedural safeguards are inherently interlinked. Procedural guarantees of access to information and public participation, can only effectively protect the environment if coupled with substantive regulation (Shelton, 1991).

Concerns about failure to comply with commitments to safeguard biodiversity and healthy ecosystems have not only been raised at biodiversity fora but also at the UN Human Rights Council. Human rights can play an important role in mediating the human-environment interface. There has been an ongoing cross-fertilization of ideas amongst human rights and biodiversity mechanisms (Ituarte-Lima et al., 2018; Morgera & Tsioumani, 2010). Knox (2018a) identified a clear link between human rights and environmental harm; highlighting that Nation states have obligations under human rights law to protect against such harm.

Recognizing the right to a healthy environment can contribute to an improved implementation and enforcement of environmental laws as well as increased government and corporate accountability (Knox, 2018b). In at least eighty nations where the right to a healthy environment has gained constitutional status, laws were amended to include procedural safeguards of environmental rights like access to information, participation in decision making and access to justice (Boyd, 2018). The procedural elements of this right has also empowered citizens and led to an increasing public involvement in environmental governance. Linking social and ecological safeguards to existing human rights obligations, such as Economic, Social and Cultural Rights (UNCESCR, 2009) provides an institutionalized pathway for claimants to seek enforcement of their rights (Savaresi, 2013).

## 2.4 Offsets: Strong or weak sustainability?

The continuing decline of biodiversity and ecosystems occurring alongside an increase in global economic growth suggests that inappropriate tradeoffs are being made with gains in some areas (e.g. global gross domestic product) taking place at the expense of biodiversity. A principle consideration here is the balance between different types of capital: financial, natural, and human capital (Adolphson, 2004). In environmental economics, sustaining the total sum of capital with full substitutability among different capital types, which is often referred to as "weak sustainability", while ecological economics holds the notion that natural capital should be sustained but with partial or no substitutability, which is referred to as "strong sustainability" (Daly, 1990).

Offsets have been described as a neoliberal approach to conservation (Robertson, 2004), where natural habitats or ecological functions are traded as commodities. This approach of market solutions to environmental problems, or "Selling nature to save it" (McAfee, 1999), has led to significant criticism of offsets in the academic discourse (Apostolopoulou & Adams, 2019; Dempsey & Suarez, 2016; Sullivan & Hannis, 2015).

However, scholars have begun to unpack the notion of sustainability in offsets. Vaissière et al. (2017) suggest that the way that countries decide to implement offsets influences the possibility to reach strong sustainability. They argue that strict biodiversity offsets that prioritize ecological equivalence are in fact rooted in strong sustainability, as different types of capital are not substitutable. To understand the relation of offsets to sustainability, we need to examine how natural capital and financial capital are treated. Hence, it is important to distinguish between two concepts in offsets: Commensuration and Commodification.

The act of commensuration involves transforming different qualities into a common metric to enable comparison (Espeland & Stevens, 1998). In offsets, commensurability concerns ecological equivalency or in other words the matching of biodiversity losses to conservation measures (Fig. 6).

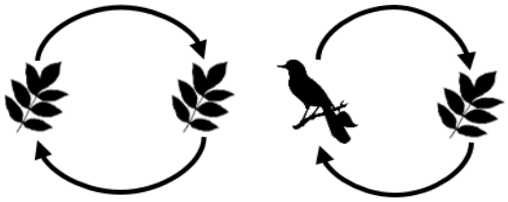


*Figure 6. Commensurability: The matching of biodiversity losses to conservation measures*

Commodification entails assigning a monetary value to things such as biodiversity and ecosystem services (Hahn et al., 2015), which suggest the expansion of the market economy into the domain of nature. In offsets, commodification entails the trading of conservation measures for a monetary value (Fig. 7).


*Figure 7. Commodification: The exchange of biodiversity credits with money*

Although the use of economic instruments for biodiversity has grown in popularity, its effectiveness on social and ecological outcomes is mixed (Gibbons et al., 2017; Bidaud et al., 2017; Ituarte-Lima et al., 2018). There is a long tradition of thought that emphasises how the commodification implicit within economic instruments can undermine social morality and public benefits (see Hirschman [1986] for a historical overview). The underlying idea is that economic valuation methods and market principles are not ideologically neutral; they embody an individualistic, competitive logic that incentivises self-regarding behaviour (Gómez-Baggethun et al., 2009). These policy instruments should therefore be designed and applied carefully to avoid perverse effects (IPBES, 2019, sections 5.4.2.1, 6.3.2.2 & 6.3.2.5).

# 3. Methods

As this thesis seeks to understand biodiversity governance through the design of policy instruments and stakeholders' experiences in implementing those policies, various qualitative methods have been employed: content analysis, cross-case comparison, stakeholder mapping and semi-structured interviews.

## 3.1 Paper I: Offsets

In **Paper I,** I developed an ideal-typical typology to analyse the institutional arrangements of biodiversity offset policies, consisting of: *Public Agency*, *Mandatory Market* and *Voluntary Offset* (see Appendix 1, Table A1). This was done with a deductive reasoning approach, based on the three institutional domains commonly used to understand modern societies: The *State*, *Market* and *Community* (Wolfe, 1989; Streeck & Schmitter, 1985). These ideal types relate to the guiding principle of interaction and allocation that characterises these institutions: Public Agency denotes the State's hierarchical control, Mandatory Market denotes the Market's dispersed competition while Voluntary Offset specifies corporations as the Community and their social responsibility (Streeck & Schmitter, 1985).

A cross-case comparative analysis was then conducted using six (sub-)national offset policies as case studies (Yin, 1994; Fidel, 1984) from Australia, England, Germany, Madagascar, South Africa, and the United States. The selection of cases was influenced by the availability of policy documents, scientific literature, industry publications and grey literature. The US and Germany's compensation policies are well-established with over two decades of experience, Australia's policy has been in use for a decade, whilst England, South Africa and Madagascar's policies are currently in their pilot stages. Madagascar represents a voluntary project, whereas the other five countries have regulatory requirements for offsets. Despite the difference in geographic regions, experience levels and jurisdiction, all these offset policies have comparable policy designs that coordinate institutions and actors to conduct the matching of biodiversity losses with conservation gains. Together, these six case studies provide a substantial representation of the global diversity of offset policies.

## 3.2 Paper II: CBD

In **Paper II,** an inductive approach was used consisting of content analysis of policy documents, participant observation and semi-structured interviews with experts. I assessed the implementation gap of the Convention through two elements: (i) obstacles to achieving the Aichi Biodiversity Targets; and (ii) challenges faced in interpreting the principles and guidelines developed under the Convention.

First, a content analysis of review mechanisms from international human rights law and biodiversity agreements was conducted. A scoping of the review mechanisms of international human rights law identified two mechanisms as highly relevant to the CBD due to their similar procedural obligations and focus on dialogue: The Universal Periodic Review and Special

Procedures of the Human Rights Council. I contrasted these human rights mechanisms with an emerging review mechanism from the CBD, the Voluntary Peer Review. Insights from all three review mechanisms were developed through analyzing their processes to identify their similarities and differences, which was then supplemented with a review of policy documents or journal articles.

Next, I carried out a policy analysis consisting of CBD documentation and 21 countries' fifth (or most recent) national reports to determine the obstacles faced in implementing national biodiversity policies.[5] The selection of national reports was based on four criteria: (i) representation from each of the five different CBD regional clusters; (ii) representation from low, middle and high-income countries; (iii) countries who had been visited by the Special Rapporteur on human rights and the environment; and (iv) countries who had participated in the pilot review of the CBD Voluntary Peer Review.

Lastly, I held semi-structured interviews on the challenges faced in interpreting CBD guidelines and principles with 18 participants at the fourteenth meeting of the Conference of the Parties to the CBD (COP14) in Egypt, November 2018. Snowball sampling was used to identify interviewees, beginning with previous participants of multi-actor-dialogues on biodiversity with relevant connections with human rights including the issue of safeguards in biodiversity financing mechanisms (Farooqui & Schultz, 2012; Ituarte-Lima et al., 2018). The 18 respondents selected were experts from governments and organizations involved in biodiversity and human rights issues; spanning country delegates, donors, international organizations, civil society organizations, environmental non-governmental organizations, independent consultants, as well as youth and indigenous groups. Care was taken to ensure that the respondents represented the five CBD regional clusters so that the respondents' cumulative experiences would reflect geographical diversity. The interviews were recorded, transcribed, and then coded using qualitative data analysis software Atlas.ti. Secondary data sources were then used to complement findings from the interviews, including CBD and United Nations General Assembly documentation, scientific articles and policy reports.

This triangulation of methods enables an understanding of how international human rights law can be used to enhance implementation and compliance of the CBD.

# 4. Results

## 4.1 Paper I: Offsets

**Paper I** has two main contributions: an empirical cross-case comparison of offset policies and a theoretical framework of the spectrum of commensurability of nature.

### A typology of offset policies

First, the paper provides an empirical contribution with a cross-case comparison illustrating the diversity of offset policy designs. From the three basic institutional domains for understanding modern societies, the *State*, *Market* and *Community* (Wolfe, 1989; Streeck & Schmitter, 1985), I developed a typology that describes the various mechanisms through which BO policies are realized - *Public Agency*, *Mandatory Market* and *Voluntary Offset* (see Appendix 1, Table A1 for the properties of each ideal type).

These ideal types relate to the guiding principle of interaction and allocation that characterises these institutions: *Public Agency* denotes the State's hierarchical control, *Mandatory Market*

[5] The 21 countries whose national reports were assessed are Brazil, Canada, Egypt, Estonia, Ethiopia, Fiji, India, Kenya, Lao People's Democratic Republic, Madagascar, Malaysia, Mongolia, Montenegro, Norway, Papua New Guinea, South Africa, South Sudan, Seychelles, Sri Lanka, Sweden, and the United Kingdom.

denotes the Market's dispersed competition and *Voluntary Offset* denotes the Community's spontaneous solidarity (Streeck & Schmitter, 1985). *Public Agency* and *Mandatory Market* are ideal types that stem from liability rules where the developer is legally required to conduct compensation, while *Voluntary Offset* describes the absence of such requirements but the developer compensates anyway.

Guided by the properties of each ideal type, the institutional arrangements of those six policies were examined by mapping their stakeholders and listing the decision-making process in a stepwise order (See Appendix 1, Figures A1-A6 for stakeholder maps). The six offset policies were analysed and matched to their best fit of an ideal type, which was plotted into the Venn diagram in Figure 8. For details on how each policy performed in relation to the ideal types, see Appendix 1, Table A2.

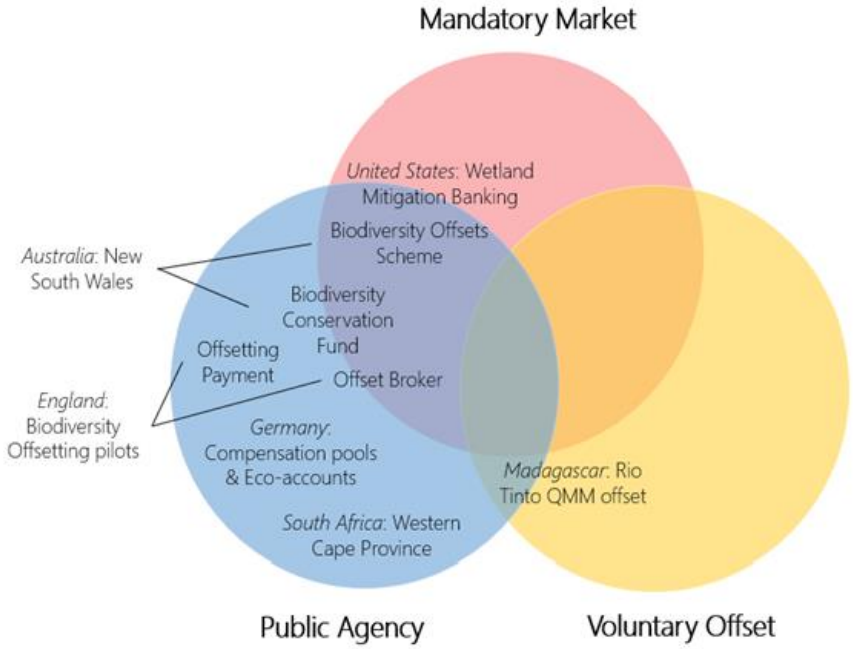



*Figure 8. Venn diagram of biodiversity offset policies and their ideal type interactions.*

The results determined that the *Voluntary Offset* ideal type related mostly to the Rio Tinto QMM offset project in Madagascar, since the country does not currently have any explicit legal offset requirements. This case demonstrated the difficulty of developing a comprehensive biodiversity valuation metric that compensates for both social and environmental losses, and that voluntary offset projects can risk being perceived as greenwashing instead of a sign of corporate social responsibility.

In the *Public Agency* ideal type, I noted how an offset can be used to facilitate public biodiversity conservation priorities. This is seen in Germany, South Africa and England where there is a strong state involvement in selecting the compensation site location and integrating green infrastructure planning.

The *Mandatory Market* ideal type was defined by: (1) developers' freedom to choose a compensation provider and (2) the price mechanism. A gradient was detected in the *Mandatory Market-Public Agency* hybrid types, with the US Wetland Mitigation Banking, Australian NSW Offset Scheme and Conservation Fund as well as the English Offset Broker system. Table 2 clarifies the gradient between the hybrid offset policies.

*Table 2. Hybrid offset policies on a scale from free market to government regulations: US Wetland mitigation banking and the dual systems of Australia and England.*

| | Criteria | Biodiversity Offset Policy | | | | |
|---|---|---|---|---|---|---|
| | | **US, Wetland mitigation banking** | **Australia, Biodiversity Offsets Scheme** | **Australia, Biodiversity Conservation Fund** | **England, Offset broker** | **England, Offset payment** |
| Free Market | Developer has full freedom of choice in compensation provider | ✗ | ✗ | ✗ | ✗ | ✗ |
| | Market determines credit demand | ✗ | ✗ | ✗ | ✗ | ✗ |
| | Market negotiates credit supply | ✗ | ✗ | ✗ | ✗ | ✗ |
| | The matching of biodiversity losses and gains is done by the developer | ✓ | ✓ | ✗ | ✓ | ✗ |
| Government Regulations | The (credit) price for compensation is negotiated by buyer and seller, not only based on cost estimates | ✓ | ✓ | ✓ | ✗ | ✗ |

The US wetland banking fits mostly within the *Mandatory Market* type but also sits close to *Public Agency*, due to the strong state involvement in restricting developer's choices for offset to certain habitat types and localities. Even in offset policies that best match the *Mandatory Market* type, I found that ecological trading is very restricted and complex to carry out. Ecological factors are accounted for by regulators setting geographical trading limits and designating different types of wetland credits based on their biophysical nature (e.g. palustrine emergent credits, estuarine credits). Regulators determine the number of credits allocated to banks and required by developers to purchase.

The results indicated that the government, contrary to received wisdom, plays a key role not just in enforcing mandatory policies but also in determining the supply and demand of biodiversity units, supervising the transaction or granting legitimacy to the compensation site. Mandatory offset policies can be anything from pure government regulations defining industry liabilities to liability-driven markets where choice sets for trading credits are constrained and biodiversity credit prices are negotiated under state supervision. A diversity of institutional designs of biodiversity offset policies exists from strongly restricted markets for biodiversity to government-led liability procedures with no market aspects and purely voluntary offset policies.

### The spectrum of commensurability of nature

The paper also provides a theoretical contribution on the relation of offsets to sustainability and commensurability. The notion of strong sustainability in offsets (Vaissière et al., 2017) can be further unpacked and I do this by suggesting a spectrum of commensurability corresponding to sustainability. The four modes of commensurability are: *Full*, *Flexible*, *Restricted* and *No commensurability (Incommensurable)*, as seen in Figure 9.

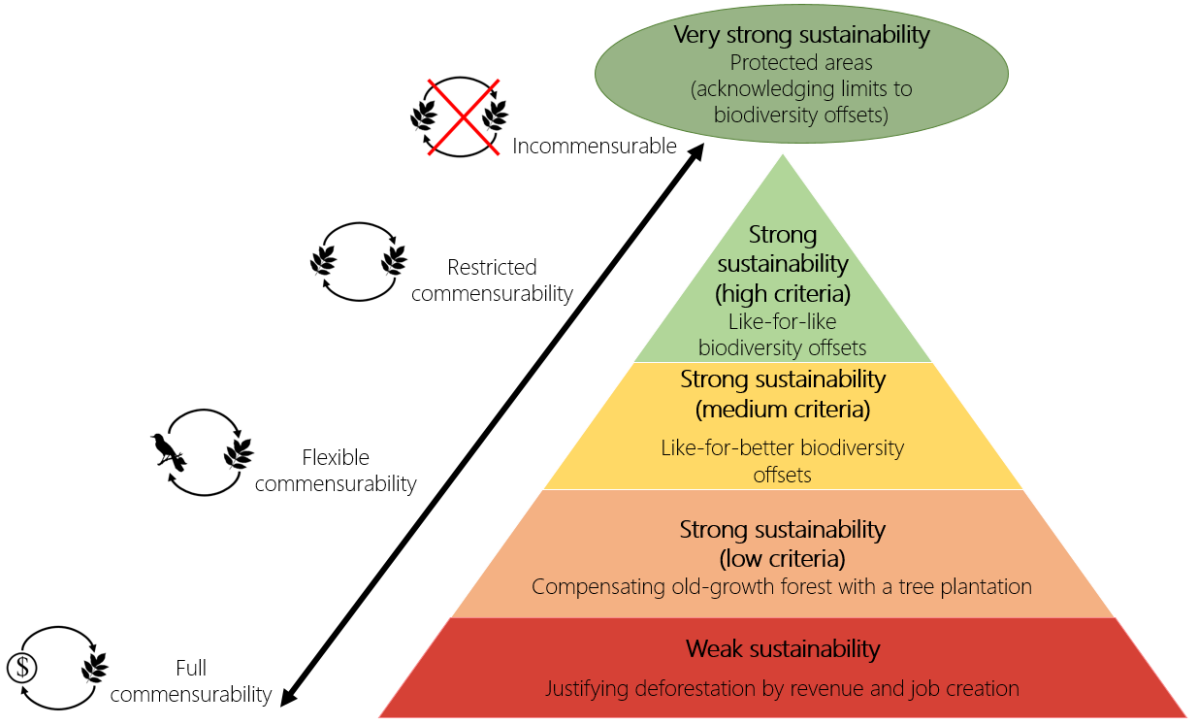



*Figure 9. The spectrum of commensurability of nature, with four modes corresponding to strengths of sustainability: Full, Flexible, Restricted and No commensurability (Incommensurable).*

*Incommensurability of nature* refers to *very* strong sustainability, where nature is regarded as non-substitutable and cannot be perceived as capital. Habitat is protected from development activities, which is also noted during the "avoidance" step of the mitigation hierarchy.

*Restricted commensurability* refers to strong sustainability (high criteria), where distinct types of natural capital can be substituted only with equivalent natural capital. "No net loss of biodiversity and ecosystem services" has become the international standard for offset policies (BBOP, 2012; European Commission, 2011; Eftec et al., 2010). Offsets accept commensurability only within biodiversity, not between biodiversity and, say, carbon dioxide. Moreover, a certain habitat type can be replaced only by the same habitat type, as seen in policy documents that often recommend offsets to be 'like-for-like' (e.g. Tucker et al., 2014; BBOP, 2012).

*Flexible commensurability* consists of strong sustainability with both medium and low criteria. Strong sustainability (medium criteria) allows a habitat to be replaced by a different habitat that is considered to have a higher conservation priority ('like-for-better'). This allows the benefits of more threatened habitats to be conserved, but the difficulty lies in deciding how flexible the offset policy should be (Bull et al., 2015). In certain cases, a higher mode of commensurability may be beneficial for conservation ecology but commensurating across different habitat types requires policy-makers to establish clear exchange rules (e.g. habitat condition, area size, distance between impact and offset sites).

By its design, biodiversity offsets only allow for flexible or restricted commensurability (high or medium criteria in Fig. 9) due to its 'like-for-like' and 'like-for-better' requirements. Replacing a biodiverse habitat with a tree plantation that increases carbon sequestration may be

considered Strong sustainability with low criteria (Ekins, 2003), but to our knowledge this is not accepted by any offset policy.[6]

*Full commensurability* of nature refers to weak sustainability where natural capital is substitutable with other capital types such as financial or physical capital (Pearce & Atkinson, 1993). Commodification is therefore one dimension within full commensurability, but it does not represent the full spectrum of commensuration.

With respect to the case studies, four policies (US, Australia, England and Germany) were strictly designed to favor restricted commensurability, through an expressed preference for like-for-like offsetting. In contrast, the policies of Madagascar and South Africa are more flexible (strong sustainability, medium criteria in Fig. 9), where like-for-better offsets were more commonly applied.

## 4.2 Paper II: CBD

**Paper II** has three main empirical contributions: (i) an analysis of compliance strategies used by review mechanisms in human rights and biodiversity law; (ii) obstacles for achieving the Aichi Targets identified from countries' national reports; and (iii) obstacles to implementing the convention determined from interviews with participants at CBD COP 14 with insights from review mechanisms to address them.

The findings from the national reports represent countries' self-assessments of obstacles they face in achieving the Aichi targets, while the interviews with COP14 participants provides a multi-stakeholder perspective of issues faced when interpreting the CBD principles and guidelines. The data sets are complementary, as together they set the scene of the overall implementation challenges of the convention.

### Review mechanisms from biodiversity and human rights law

First, the challenge of compliance within the CBD has been a recurrent topic in COP discussions and the development of the post-2020 global biodiversity framework (COP12/DEC/XII/1; COP13/DEC/XIII/3; COP14/INF/16). To understand how other international agreements have dealt with compliance, I examined the review strategies of human rights law as there has been an ongoing cross-fertilization of ideas amongst human rights and biodiversity mechanisms (Ituarte-Lima et al., 2018; Morgera & Tsioumani, 2010).

While there have been advances in localizing global standards for human rights through establishing systems at a regional level,[7] this paper focuses on review mechanisms at the international level because the CBD is a global treaty. At the international level, the Human Rights Council is the inter-governmental body within the United Nations system responsible for the promotion and protection of human rights globally. The Human Rights Council's review mechanisms that have similar procedural obligations as the CBD are the Universal Periodic Review and Special Procedures.

[6] The commensurability of nature and its relation to sustainability in Fig. 9 can also be applied to carbon emissions. *Incommensurability* entails leaving fossil carbon in the ground. *Restricted commensurability* could be bio-energy with carbon capture and storage (BECCS), a mitigation technology that involves placing the carbon back into the ground. *Flexible commensurability* (strong sustainability, medium criteria) would be to compensate emissions of carbon dioxide with reduced emissions compared to a baseline from other greenhouse gases like methane, according to the averted loss logic. *Flexible commensurability* (strong sustainability, low criteria) allows compensating greenhouse gas emissions with afforestation or other land use, land-use change, and forestry (LULUCF) measures. Finally, paying a carbon tax exemplifies *Full commensurability*.

[7] Three of the most well-established regional systems for human rights are the European Human Rights System; Inter-American Human Rights system; and the African Court on Human and Peoples' Rights (Buergenthal, 2006).

From an overview of the mechanisms, it is apparent that a mix of strategies were used to foster compliance. Compliance strategies emphasize cooperation rather than confrontation, focusing on repair and results instead of coercion or retribution (Gunningham, 2017). Each review mechanism was analysed to identify the compliance strategies used and contrasted in Table 3.

*Table 3: Comparison of strategies for compliance used by the review mechanisms from the Human Rights Council and the Convention on Biological Diversity.*

| **Strategy for compliance** | **Review mechanisms of human rights and biodiversity** | | |
|---|---|---|---|
| | **HRC Universal Periodic Review (UPR)** | **HRC Special Procedures (SP)** | **CBD Voluntary Peer Review (VPR)** |
| Universality | ✓ | ✓ | Still at a voluntary pilot stage |
| Country under review conducts a self-assessment | ✓ | × | ✓ |
| Peer-review by thematic experts | × | ✓ | ✓ |
| Peer-review by all states | ✓ | × | × |
| Engagement of civil society | ✓ | ✓ | Subject to approval of state under review |
| Country visit | × | ✓ | ✓ |
| Formal follow up mechanism with posed recommendations | ✓ | × | × |

All three review mechanisms enable universal involvement of members and offer opportunities for peer learning. The UPR was found to have the most comprehensive approach, with formal cycles for follow up with recommendations and where civil society is able to engage critically and independently through shadow reports. However, the peer review is not conducted by thematic experts and the process is subject to international diplomacy.

Special Procedures benefit from a flexible mandate where independent experts are able to respond to changing needs in specific problem areas. SPs also hold a unique role where they can actively engage with civil society, as they act as an entry point for the public into the larger UN human rights system spanning treaty bodies, political resolutions and the Office of the High Commissioner for Human Rights.

### Countries' national reports to the CBD

Second, a selection of 21 countries' national reports was reviewed to identify three main obstacles faced in achieving the Aichi Biodiversity Targets:

(i) Poor monitoring with insufficient biodiversity data;

Several national reports noted the poor documentation status on their existing quality of habitats or species distribution. The lack of existing biodiversity data makes it problematic to evaluate the outcome of conservation and sustainable use activities. Difficulties in monitoring has also been exacerbated by previous NBSAPs that did not define biodiversity indicators for measuring progress.

(ii) Lack of institutional capacity; and

Limited human resources and financial support for conservation was identified as an obstacle to implementation from countries across all income groups Poor coordination amongst government agencies was also cited, with unclear distribution of responsibilities between national and sub-national levels leading to a lack of ownership and accountability.

(iii) Difficulty integrating biodiversity policies into sectors.

Integrating environmental and biodiversity issues into sectoral policies has been an ongoing challenge listed in several national reports. Biodiversity concerns have yet to be adequately integrated into priority policy areas in development sectors such as mining, energy, housing and infrastructure.

### Interviews at CBD COP14 with insights from review mechanisms

Third, I conducted interviews with stakeholders at COP14 on what challenges are faced in interpreting the CBD guidelines. In the interview questions, the CBD principles and guidelines on safeguards in biodiversity financing mechanisms (COP14/INF/37) served as an entry point to discuss more broadly how global biodiversity guidelines were interpreted at national and local scales, and the obstacles faced throughout the implementation process (See Appendix 2, Box B1 for list of interview questions). Several respondents highlighted the usefulness of international guidelines, but noted a mismatch in scales since policy-making is often developed at a federal and state level while the interpretation and implementation is conducted at a municipal level. They expressed a need for sharing of case studies and best practices to address these issues.

An inductive coding process was conducted with the interview data. The first level coding used a combination of in vivo and descriptive methods, while the second level used a values method where similar patterns emerged from the interview data. This enabled us to identify four main challenges in interpreting the CBD guidelines described by the respondents. Table 4 presents a summary of the challenges that resulted from the interviews, along with an analysis of opportunities from the compliance strategies of biodiversity and human rights review mechanisms from the authors' own elaboration.

*Table 4: Challenges faced in interpreting CBD principles and guidelines, with corresponding quotes from respondents and opportunities from compliance mechanisms of biodiversity and human rights review systems. Source: Interviews with experts at CBD-COP14 and own elaboration.*

| **Challenges in interpreting CBD guidelines** | **Quote from respondents at CBD COP14 in Egypt, November 2018** | **Opportunities from compliance strategies of biodiversity & human rights review systems** |
|---|---|---|
| Lack of biodiversity policy integration across sectors | • "We need a massive expansion of existing safeguards into any business transaction and across many sectors. Any company listed on the stock exchange should have safeguards in place and be disclosing their biodiversity impact." *Respondent 15, Independent consultant.*<br>• "Safeguards need to be embedded within the project design for all sectors: agricultural, road and infrastructure, housing, even tourism. Instead of one set of safeguards that cuts across industries, we need tailored social and environmental safeguards for each and every sector." *Respondent 9, Government.* | • CBD VPR reviews mainstreaming and integration of biodiversity concerns across sectoral plans as well as identifies synergies with other UN Conventions.<br>• In the SP, regional multi-stakeholder consultations are held that can generate knowledge and case studies on specific thematic areas, such as assessments of environmental and human rights impacts in the design of transboundary development policies and projects. |
| Slow uptake of CBD guidelines with national legislation | • "It's important to see how CBD provisions are translated into national legislative and regulatory framework. There tends to be gaps between the CBD, the national legal framework, and what is legitimate for local communities whom are often not reflected in the law." *Respondent 18, Civil society organisation.*<br>• "There is very little information being shared on how safeguards have been implemented or whether it's effective. There are limited consequences for not complying with CBD decisions*." Respondent 15, Independent consultant*<br>• "Generating case studies and information about how safeguards work, translating it into simpler language for decision-makers would be useful. Safeguards are an important protection measure, but we want to see a drive towards regulatory environments. Safeguards are weakened by the fact that loan conditions are often temporal, so when that ends there are few ways to drive compliance. That's where the CBD can play an important role, assuming that governments actually take those recommendations and integrate them into their own policies." *Respondent 12, International organization.*<br>• "We need to clarify what safeguards mean and have more of a universal standard. Safeguards are often developed in industrialized countries where there is capacity for civil society organizations to monitor compliance, but this is lacking in most developing countries. There is little funding for actors to monitor safeguard compliance" *Respondent 2, Environmental NGO.* | • The CBD VPR has a peer review process that offers opportunities for mutual learning on how to interpret and implement global guidelines into national frameworks.<br>• In the UPR, civil society organizations are involved who can provide specific, timely and solution-oriented input.<br>• In SP, thematic studies can be conducted to evaluate the implementation of domestic laws and international standards to protect human rights, and the effectiveness of their application.<br>• SP can provide comments to governments on the adequacy of national legislation and policy developments in relation to international human rights standards. |

| | | |
|---|---|---|
| Questionable opportunities for effective participation of stakeholders | • "We should involve indigenous and local communities early in the process so they can discuss if the proposed policy would benefit them or whether other types of engagements would be preferred." *Respondent 7, Government.*<br>• "It's not only about appointing one person from a community or NGO in the consultation process. It's about making sure that they actually represent the stakeholders". *Respondent 15, Independent consultant.*<br>• "Many communities have never had to deal with this [development project] before. There's no outside source of funding to help them pay for technical and legal expertise to guide them, to know what to ask for during the resettlement process". *Respondent 1, NGO.*<br>• "There is little analysis about incentives built into consultation processes that can create a big disincentive for people to freely express their views. Power, disincentives and financial dependencies are often overlooked." *Respondent 2, Environmental NGO.*<br>• "There was a destructive dam being built in X financed by the Y government, that would imply the extinction of an endemic bird species. To stop the project, we turned to the human rights argument. There are indigenous peoples in the area, and their rights of Free, Prior and Informed Consent were not respected either so we took it to the Human Rights Commission, since the UN was evaluating Y's human rights record this year. We took that opportunity to express our concerns of not complying with the rights of indigenous peoples in this dam." *Respondent 3, Environmental NGO.* | • In the CBD VPR, the review team assesses the extensiveness of public participation and stakeholder engagement in the NBSAP and implementation process.<br>• In the UPR and SP, there is involvement of civil society organizations with consideration for power imbalances.<br>• In the UPR, there is space for dissenting views through the civil society organizations' shadow reports and an interactive dialogue where the country's assessment is presented.<br>• In Special Procedures, rapporteurs have freedom of movement to meet with victims of human rights violations and can draw international attention to individual cases.<br>• The SR on indigenous people's rights emphasizes that in consultations with indigenous peoples, international standards require engagement through the representatives determined by them and with due regard for their own decision-making processes. |
| Difficulties in establishing indicators for monitoring and review | • "There are no easy, clear metrics for companies to determine their impact on biodiversity. Even within the conservation community, we don't have a consensus yet on how to quantify impacts." *Respondent 1, NGO.*<br>• "With biodiversity, there is a big risk that the baseline is not clear. We have already degraded situations being taken as the baseline, which should instead be a natural ecosystem." *Respondent 2, Environmental NGO.*<br>• "Enhancing mainstreaming can only be measured if you have a defined baseline and strong indicators. It is difficult to find measurable indicators and to include them in a project. We try to do ex-post evaluations as much as possible, but it is difficult to assess if you haven't included indicators in the first place." *Respondent 5, Government.* | • In the CBD VPR, national biodiversity targets are examined to see if there are associated indicators and baseline data.<br>• In the UPR, involvement of civil society organizations enables them to provide expertise, collect data and facilitate community engagement for monitoring. |

# 5. Discussion

The findings from **Paper I** lay the foundation for understanding the institutional design of national and subnational offset policies. This provides a foundation to broaden out to **Paper II**, where I examine the challenges faced in interpreting and implementing global biodiversity targets into national regulatory frameworks. Both papers discuss the design and implementation of biodiversity policies at complementary jurisdictional scales spanning subnational to global.

In this section, I discuss the findings from both papers, reflect on their policy discourse and whether these policy instruments contribute to social-ecological sustainability.

## 5.1 Paper I: Commensurability versus Commodification

**Paper I** distinguishes between the concepts of commensurability and commodification in offsets by examining each of them in relation to empirical cases of offset policies. The commensurability of natural capital is restricted in all offset policies; biodiversity is always exchanged with biodiversity. The exchange of biodiversity values is often conducted by ecologists who apply ecological indicators of species or habitat quality (Quétier & Lavorel, 2011).

However, ecological equivalence does not necessarily correspond with the plurality of values, meaning and place attachment that nature entails. Commensurating biodiversity requires a deeper deliberation on the diversity of values in human-nature relations, with consideration for power imbalances amongst the stakeholders. The science-policy interface is currently furthering research on this, as IPBES has an ongoing assessment for conceptualizing the multiple values of nature (Christie et al., 2018). Approaches such as the 'Multiple Evidence Base' (Tengö et al., 2017) and the 'Multi-Actor Dialogue Seminars' (Schultz et al., 2018) highlight the importance of dialogue and engagement of diverse actors to reach a mutual understanding in policy-making for conservation. The process of deciding which biodiversity values are to be exchanged must be socially acceptable, inclusive and transparent.

Regarding commodification, different degrees are possible depending on the policy design and role of price signals in trading credits as seen in Table 2. In offset policies with a strong market component, units of biodiversity (biodiversity credits) are assigned a monetary value and traded within market-like conditions. This only occurs in the US and Australian offset scheme. Hahn et al. (2015) refer to this as the 5$^{th}$ degree of commodification (out of six degrees), comparing biodiversity offset to carbon markets and carbon offsets. The German, South African and English Offsetting payment cases belong to the 2$^{nd}$ degree of commodification, where government agencies do the matching of losses and gains, with no market trade of credits. Just like the price of payment for ecosystem services is most often based on opportunity costs of conservation and not the ecosystem services provided, biodiversity offsetting does not necessarily imply putting a price tag on nature because the biodiversity value is expressed in biophysical, not monetary terms.

Having clarified both concepts, I then argue that there is no commodification in relation to commensurability in offsets. In the cases I considered, biodiversity values are always replaced by and compared to similar biodiversity values. Restricted commensurability can co-exist with a low degree of commodification, as illustrated by the German case that uses a *Public Agency* approach to offsets. There is no role for price signals as the cost of compensation measures is determined by the municipalities with a pre-defined list of standard management measures and costs. On the contrary, restricted commensurability with a high degree of commodification is exemplified by the US case that is closest to a *Mandatory Market* as the price of a wetland credit is negotiable, subject

of the market forces of supply and demand. Even if the wetland credits are sold for dollars, this does not mean that the underlying biodiversity loss is commensurated with money. The biodiversity losses are only substitutable with similar biodiversity gains in wetland habitat types. Hence, commodification does not necessarily require commensurability and vice versa.

Differentiating between both concepts is beneficial for clearing up the misconception that conceives all offsets being a 'market solution' to conservation, which has led to deadlocks in the public deliberation of conservation policies (Sullivan & Hannis, 2015). Common criticisms of offsets are concerned with the use of 'economic' logic in the realm of nature conservation with the negative externalities this could entail (Igoe & Brockington, 2007), but the results showed that the State plays a key role in all offset policies and its involvement could be tailored to address such risks. Across all ideal types, public agencies were involved in either matching the biodiversity losses with conservation measures, setting up trading rules for biodiversity credits and monitoring transactions, or granting legitimacy to the compensation location. With the commodification concerns of offsets discussed, the scientific debate could then focus on the pros and cons of this policy tool with respect to its effectiveness in achieving conservation objectives.

### 5.2 Paper II: Compliance strategies of human rights and biodiversity review mechanisms

As signatories to the CBD, Parties' have agreed to implement the objectives of the CBD into national policies through their NBSAPs. Despite this flexibility to adapt global goals into a national context, **Paper II** found that Parties' are struggling to meet their own biodiversity targets, with mainstreaming biodiversity and fostering compliance noted as some of the key implementation challenges.

To address challenges with compliance, biodiversity and human rights were examined to draw lessons from their review mechanisms. The UPR, SP and VPR demonstrate that review mechanisms for international law utilize various strategies for encouraging compliance. As identified in Table 4, these compliance strategies include universality, self-assessment, peer review, engagement of civil society and more. Depending on the intent of the agreement, different compliance strategies can be employed.

Ultimately, there is an underlying tension as trade-offs exist between biodiversity conservation and the use of natural resources for economic benefits. Countries' NBSAPs often do not specify the concrete policy and legal measures needed for achieving mainstreaming goals and targets (Prip, 2018). Policy inconsistencies tend to occur in countries' national policies, such as a clash between nature conservation and mineral extraction (Koh et al., 2017). Policy sector regulations are determined by elected officials who are subject to lobbying from particular groups that oppose further environmental regulations due to certain economic interests (Sarkki et al., 2016). This hints at why many countries have yet to begin the political process of mainstreaming biodiversity across sectors and ministries. Nonetheless, achieving a sustainable economy requires embedding economic interests within the carrying capacity of the biosphere.

This paper argues for leveraging the linkages between human rights and biodiversity, as the cross-sectorial nature of human rights laws and policies make it relevant to support biodiversity mainstreaming. A human-rights approach can provide the institutional pressure to overcome industry resistance that may be hindering biodiversity policy integration. Knox (2017, p. 13) reports "*Through the Convention and other agreements, States have identified the steps necessary to conserve and sustainably use biodiversity. If implemented, these measures would protect*

*biodiversity and satisfy the joint obligation of States to cooperate to protect the human rights dependent upon biodiversity."* Hence, a rights-based approach to biodiversity governance provides important conceptual and political support for achieving the objectives of the CBD.

## 5.3 The discourse of policy goals

Net outcomes have been a buzz phrase in the offsets and conservation literature, with the goal of "No Net Loss of Biodiversity and Ecosystem Services" as the offsets policy goal of the European Commission (2011) and the industry standard from BBOP (2012). A recent emerging narrative is the "Net Positive Outcomes for nature", which calls for economic development activities to compensate more than fully so that overall, nature is retained or restored in net terms (Bull et al., 2019; Rainey et al., 2014). In the ongoing discussions of the Zero Draft of the Post-2020 Global Biodiversity Framework, the first draft goal is "*No net loss by 2030 in the area and integrity of freshwater, marine and terrestrial ecosystems"* (CBD/WG2020/2/3).

Nonetheless, a No Net Loss (NNL) policy must have a clear reference scenario to be operationalized – NNL compared to what? Ambiguous definitions and metrics create risks for conservation and accountability, as reference scenarios in conservation policies are often left unspecified (Maron et al., 2015; Bull et al., 2014). The choice of a fixed or dynamic counterfactual scenario has a significant difference in conservation outcomes.[8] A fixed reference scenario sets a cap on the amount of natural capital to be retained, while a dynamic scenario considers the background trend of changes in natural capital caused by other factors (Maron et al., 2018). If a declining biodiversity baseline is used, then NNL would serve to continuing biodiversity losses further (Virah-Sawmy et al., 2014).

Although a net outcomes approach is widespread in offsets, it equates the value of protecting existing ecosystems with the uncertainty of habitat restoration. This has parallels with the policy discussions on 'Net zero deforestation' versus 'Gross deforestation'. Net zero deforestation is the annual net change in forest area, taking into account both losses from deforestation and gains from forest regeneration (FAO, 2010). On the other hand, gross deforestation entails the loss of forest area caused by conversion of forest to non-forested land and maps tree plantations separately from native forests. A net zero deforestation approach does not differentiate between native forests and tree plantations since both fits within FAO's definition of forests, although this distinction has dramatically different implications for biodiversity and carbon storage (Sandra & Brown, 2013).

This highlights the importance of the discourse of which the policy instrument is embedded in. Offsets could be used to reinforce business-as-usual, where economic growth is allowed to continue with some uncertain conservation measures elsewhere. Alternatively, when offsets are emphasized as the last step of the mitigation hierarchy, this requires acknowledging that certain biodiversity values are irreplaceable and vulnerable. Impacts to such areas are not possible to compensate for, hence, strict adherence to the mitigation hierarchy would direct development away from ecologically significant areas and subsequently constrict development.

[8] Counterfactual: what would have happened in the absence of an intervention. See Maron, et al (2016). Taming a wicked problem: Resolving controversies in biodiversity offsetting. BioScience 66, 489–498.

## 5.4 A transformative change with policy instruments for social-ecological sustainability?

Innovative ideas can help trigger a mindset shift for the intentional transformation of large systems (Göpel, 2016), a new purpose could inform which incremental interventions are beneficial for a transformation that reduces gross biodiversity losses. A radical idea such as a global law of 'Ecocide' that proposes recognizing environmental harm as an international crime against peace (Higgins et al., 2013) is important as it challenges the dominant paradigm of permitting environmental degradation at the expense of economic growth.

With both the papers of my thesis, I demonstrate that policy instruments for biodiversity are incremental in design but they can have dramatic and transformative potential, if the ambition is sufficiently high. Incremental interventions are noted in ideas like the Developer-Pays Principle (Koh et al., 2017), which builds off the established Polluter-Pays Principle (OECD, 1972) to extend it from pollution to environmental restoration. The Polluter-Pays Principle obliges polluters to minimize their pollution and pay for the remaining damage after (i.e. pollution tax), while the Developer-Pays Principle obliges the developer to adhere to the mitigation hierarchy and offset the residual biodiversity losses. Just as a pollution tax is currently common practice, offsets could be an intervention facilitating a "biodiversity tax".

A mindset shift could be requiring all negative impacts on biodiversity to be compensated for in conservation measures. Legal policy instruments could seek to strengthen the application of EIAs and each step of the mitigation hierarchy, where rare or irreplaceable habitats are recognized as no-go areas for economic activities. **Paper I** demonstrates how economic policy instruments, with the case of offsets, can internalize the external costs of environmental degradation by requiring the costs of conservation measures to be included as a part of the construction project's budget. The way these policy instruments are implemented can help shape a new narrative that biodiversity will no longer play second fiddle to economic development activities; the economy must be constrained within the capacity of the biosphere.

**Paper II** demonstrates how insights from international human rights law could help to lift biodiversity issues up so that a state's compliance with environmental regulations is held to the same standards as human rights obligations. The failure to protect biodiversity has also implications for human rights. The full attainment of human rights depends on a healthy, sustainable environment, to which human well-being is inherently linked (Boyd, 2012). Transformations towards sustainability are more likely to occur with notions of environmental justice and inclusion in conservation, by acknowledging human rights in conservation decisions (IPBES, 2019, see 6.2.4).

While **Paper I** explores the commensurability between biodiversity values assumed by offsets, **Paper II** recognizes the incommensurability of human rights – the principle of indivisibility that is central to human rights, where rights (e.g. the right to a safe environment) cannot be exchanged at the expense of others (e.g. the right to an adequate livelihood). This juxtaposition is often seen in the tensions between economic development and biodiversity conservation. A human rights discourse rejects the formulation of one right versus another, calling instead for policies that address both human needs in tandem (Nicholson & Chong, 2011). Using a human rights framework as an analytical device helps to guide thinking on policies: which instruments should be pursued and how their outcomes can be evaluated.

As I reflect on the first half of my PhD, certain questions remain. If the goal is a transformation of the system for sustainable use of biodiversity and ecosystem services, do these policy instruments facilitate this transition? Do they effectively address the drivers of biodiversity loss? Do they contribute to a systemic change or are they reinforcing a flawed system? Under which circumstances and what conditions can this transformation be assessed by? I will attempt to answer these questions through Papers III and IV, which are described in the following section. In the next stage of the PhD, I will examine whether biodiversity offsets can be designed with strong safeguards for people and nature, as part of the transition towards the sustainable use of biodiversity.

## 6. Ways forward

So far, Papers I and II have focused on biodiversity policy designs and their implementation at national and global scales. Together, both papers set the scene of understanding the policy objectives and institutional context of biodiversity policies, which is important as these factors determine how outcome effectiveness is defined (Wong et al., 2017).

For the next steps of the PhD, I plan to examine the social and ecological outcomes of these policies. **Paper III** will focus on a specific offset project at a local scale to examine how social values were considered. **Paper IV** will investigate the environmental outcomes of an offset policy to determine whether additional conservation outcomes will be achieved, which is a key principle of offsetting (BBOP, 2012).

Collectively, the insights developed from the four papers in the PhD will shed light on how to improve policy design to secure effective and equitable outcomes. Table 5 presents a summary of the four thesis manuscripts.

*Table 5. Summary of the research questions, data, methods and (expected) results for the four thesis manuscripts.*

| | **Paper I: Offset typology** | **Paper II: Implementing the CBD** | **Paper III: Social values** | **Paper IV: Additionality in conservation outcomes** |
|---|---|---|---|---|
| **Research Questions** | • How do biodiversity offsets relate to commensurability and commodification?<br>• To what extent do offset policies represent a market-based mechanism? | • What review mechanisms are used in international human rights law and biodiversity agreements to encourage compliance?<br>• Why are the majority of the Aichi Biodiversity Targets not fulfilled, despite the fact that States set targets for themselves and several guidelines exist for implementation? | • How are social values considered in the offset design of the resource extraction industry?<br>• What are the local social and cultural costs of offsets?<br>• What changes are needed to safeguard social outcomes? | • To what extent do offset policies contribute to additional conservation outcomes over time?<br>• What potential is there for offsets to contribute to a transformation of sustainable use of biodiversity? |

| | | | | |
|---|---|---|---|---|
| | | • What insights can the CBD draw from international human rights law to foster implementation and enforcement of the Convention? | | |
| **Data** | Policy documents, industry publications, scientific literature | Countries' national biodiversity plans, interview transcripts Policy analysis, Semi-structured interviews | Policy documents, interview transcripts | IUCN biodiversity offset database, satellite images |
| **Method** | Literature review, Policy analysis, Cross-case comparison, Stakeholder mapping | Policy documents, interview transcripts, Content analysis of review mechanisms | Case study, Literature review, Legal review, Policy analysis, Interviews | Geographic Information Systems mapping of forest cover |
| **Results** | Typology of biodiversity offsets and level of market involvement | Overview of obstacles in implementing biodiversity targets, identifies opportunities of compliance strategies from human rights review mechanisms | Examines social impacts of offsets and suggests strategies for incorporating social values into the design | Evaluates how additionality can be measured with other policy measures to contribute to a transformation of biodiversity conservation |

## 6.1 Paper III: Weaving social values into offsets

Offsets facilitate the displacement of nature in one place with its conservation in another area. These changes in the spatial and temporal distribution of biodiversity has implications on the provision of ecosystem services, access to natural resources and livelihoods of local communities at both the impact and compensation sites. Offsetting tends to focus on scientific knowledge through technical methods for valuing biodiversity, which risks overlooking local knowledge and the consequences of offsetting for local people (Bidaud et al., 2018). Poorly planned offsets can exacerbate poverty and lead to social inequity (Griffiths et al., 2018). A review of 70 offset projects globally found that only 41% of projects consider ecosystem services in the project goals, while 34% of projects had displaced people and negatively affected livelihoods at impact sites (Sonter et al., 2018).

While the scientific research has focused on projects in North America, Europe and Australasia, the bulk of offset projects both numerically and by area are actually located in less industrialized and emerging economies (Bull & Strange, 2018). To address this gap in the literature, the selection criteria for a local place-based case study is an offset project in a middle-income country. The intention is to select an extreme case with relatively positive outcomes as a best practice example. Several papers have already assessed extreme cases of offsets with a poor social record, albeit most of them use the same case study in Madagascar (Bidaud et al., 2018; Huff, 2016; Seagle, 2011).

In **Paper III,** I propose to examine how social values can be incorporated into the design of an offset project. A literature review will first be carried out to shed light on the social impacts of existing offset projects and their effectiveness in meeting social outcomes. Resource extraction is a potential target industry, since mining companies have set the most No Net Loss goals compared to other industries (Rainey et al., 2015). Based on the global offset database (Bull & Strange, 2018), some potential cases are projects located in South Africa, Mexico, and Colombia. This literature review will then aid the selection of a local case study, where I will conduct a policy analysis to understand how the national legal context influences the implementation of the offset project. Research questions will consider how rights and power are currently distributed amongst the stakeholders of an offset project, and to what extent change is needed to meet social safeguards? Who is held accountable if outcomes are not achieved and to whom is accountability owed to? How can indigenous and local knowledge systems be integrated with scientific knowledge systems to design a socially equitable offset project?

Potential frameworks for analyzing the social impacts of offsets are the IUCN's No Net Loss for People and Biodiversity (Bull et al., 2018) or the Equity framework with Procedural, Distributive and Contextual dimensions (McDermott et al., 2013). Policy analysis of current offset design will be coupled with participatory research methods. Interviews (or some other participatory method) will be held with biodiversity consultants, governments, local and indigenous groups. The paper will explore how a socially equitable offset can be planned with the engagement of several actors. This paper aims to provide insights on participatory approaches to design an offset with equitable outcomes for people. Learnings from this local case study can then be used to inform the guidance for planning biodiversity offset policies in other emerging economies.

I am still in the process of selecting a case study, so any advice or contacts to people working with offset cases would be appreciated. I plan to do fieldwork in early 2020 and am open to collaborating with local researchers from the case study country.

### 6.2 Paper IV: Evaluating additionality in conservation outcomes

Additionality has been recognized as one of the key principles of biodiversity offsetting, where conservation outcomes should be additional to existing obligations (BBOP, 2012). In other words, for an offset project to have additional conservation value it should not be planned within an existing protected area but either create a new protected area or restore a degraded area.

Achieving additionality requires a 'leakage' assessment, of whether threats that have been abated at the offset site are simply diverted elsewhere. Leakage has been noted as a problem in carbon offset and REDD+ projects, with causal model frameworks developed to systematically identify risks (Olander & Ebeling, 2011), but this has yet to be done with biodiversity offsets (Virah-Sawmy et al., 2014). Moreover, the question of 'what leaks' is difficult to assess, as unlike carbon offsets, there is not one universal indicator for biodiversity. Some biodiversity offsets also allow for flexible outcomes where exchange rules are allowed in trading biodiversity (i.e. like-for-like versus like-for-better), which makes it more complicated to trace the causality between impact, offset and possible leakages.[9]

[9] Leakage can be categorized into 'direct' and 'indirect' forms. An example of direct leakage is reducing deforestation in one area that could then lead to an increased deforestation somewhere else within the region. Indirect leakage means that locally avoided losses displace to other administrative areas or spread around diffusely via market effects

In **Paper IV,** I propose to evaluate the ecological effectiveness of conservation outcomes by examining how additionality is addressed in biodiversity offset projects. From the IUCN global biodiversity offset database, I will select a few case studies of nation-wide offset projects (potentially Brazil, Costa Rica or Ecuador, depending on access to data and if the selected case from Paper 3 could be compatible). From the case studies, I will identify what are the offset policy's environmental goals, which biodiversity indicators are currently used to evaluate effectiveness and assess whether there is direct biodiversity leakage within a country. I will also examine frameworks that identify leakage in carbon offsets to identify potential crossovers for biodiversity offsets.

Potential methods to assess conservation outcomes are to use Geographic Information Systems software to map the spatial data at a national scale (e.g. natural land cover) before and after the introduction of an offset policy, then use statistical matching methods that compares offset sites with control sites (e.g. unprotected areas with similar biophysical and socioeconomic characteristics). Matched controls represent a counterfactual scenario against which differences in an outcome variable (e.g. biodiversity loss) can be determined (Sonter et al., 2019). The choice of method will be determined based on the type of data I can get access to. These findings will help to determine the conservation outcomes of offsets and to what extent they achieve additionality. Assessing additionality is key for understanding the role of offsets for contributing to a transformation of biodiversity conservation.

## 7. Concluding remarks

To address the biodiversity crisis occurring to our natural world, a mix of policy instruments are needed to mainstream biodiversity concerns across all sectors. In my thesis, I examined how policy instruments must be carefully designed and implemented with safeguards that ensure positive outcomes for people and biodiversity.

In **Paper I**, I focus on a local to national scale, demonstrating that a diversity of institutional designs of biodiversity offset policies exists from strongly restricted markets for biodiversity to government-led liability procedures with no market aspects and purely voluntary offset policies. Despite offsets often being characterised as a "market-based instrument", they are in fact very far from standard markets. Biodiversity offsets are based on the strong sustainability criterion and restricted commensurability, where losses in biodiversity values are compensated by similar types of biodiversity values. Governments considering to adopt biodiversity offsetting policies, as recommended by the CBD, can therefore design biodiversity offset policies with a high or low market involvement to match their political-economic culture.

In **Paper II**, I broaden to a national to global scale, arguing for fostering the implementation and enforcement of biodiversity policies by drawing from compliance strategies of review mechanisms in international human rights law. Issues of implementation and compliance are vital for achieving the CBD's substantive objectives of safeguarding life on Earth. Third-party review mechanisms evaluate progress and facilitate peer learning, which has been noted by the CBD as key elements needed in an enhanced review mechanism of the post-2020 biodiversity framework. Recognising

(Moilanen & Laitila, 2016). Overlooking indirect leakage at a spatial scale spanning countries and jurisdictions is a possibly fatal concern with biodiversity offsetting.

the synergies between human rights and biodiversity on compliance mechanisms can provide a procedural means of implementing the objectives of the CBD.

The findings of both papers set the scene of my PhD by identifying the policy objectives and analysing the institutional contexts of policy instruments for mainstreaming biodiversity. The next stage of the PhD will examine the social and ecological outcomes of offsets, which will help determine the factors needed for this instrument to be effective and equitable. Insights from the four papers will then shed light on whether (or not) these policy instruments facilitate a transformation of sustainable use of biodiversity and which circumstances can be used to assess this transition.

Thus far, I speculate that offsets are a necessary but not sufficient condition of this transformation. They act as an incentive to shift environmental degradation away from ecologically valuable areas that are costlier to compensate for. That being said, although offsets encourage responsibility and accountability for our impacts on nature, improving their outcome effectiveness is crucial or they could end up doing more harm than good. They represent one instrument in a toolbox of policies, an intervention that can applied now within a long-term transition to a more sustainable society that prioritizes the health of the biosphere.

To trigger a transformative shift in mind set for the sustainable use of biodiversity, we can draw inspiration from the natural world with species that have developed innate behaviors to protect their habitat from overexploitation. Just as blue jays and squirrels eat acorns but bury a multitude of them as they do so, they ensure that the trees can grow more efficiently with them than without them (Wohlleben, 2016). Perhaps claiming back land for nature by requiring biodiversity losses to be restored is not such a radical idea after all.

## Acknowledgements

To my supervisors, thank you all for your intellectual guidance, valuable advice, and always making time for me. Thank you Thomas, for sharing your knowledge, wisdom, warmth and enthusiasm on a diversity of topics. Thank you Claudia, for painting a bigger picture from research to policy, and guiding me through the links. Thank you Wijnand, for your insightful reflections and encouraging me to grow as a qualitative researcher. Working with all of you has been such a pleasure.

To Grace, thank you for the valuable feedback on the kappa and the much appreciated broader discussions on environmental justice.

To the PhD crew, thank you for such an exciting and supportive environment for both work and play. To my licentiate group, thanks Johanna, Sofia and Jen for reading my kappa and asking all of the right questions. Thank you Blanca, Yosr and Laura, for becoming an additional licentiate support group and being there for me during the process. Thanks to Matilda, Emma, Jessica, Luigi, Katja for taking over the attic and for the much needed long walks by the lake.

To Rodrigo and Hannah, thanks for being a life raft during the intense weeks of COP and for sharing breathtaking moments from the deserts of Cairo to the corals of Sharm el-Sheikh. Travelling with great company always make things more fun, even if there are bedbugs.

To Liz, Ashley, Miina, Ana Paula, and to many other lovely colleagues and friends, thank you for being yourselves and creating such a fantastic community at the SRC. All of you make coming to work such a joy, with an abundance of laughs, hugs and deep conversations.

And lastly, to my family and Jonas. Thank you for everything, but especially for making both Malaysia and Sweden feel like home.

# References


Adolphson, D.L. (2004). "A new perspective on ethics, ecology, and economics", Journal of Business Ethics, 54 (3): 203-216.

Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, *18*(4), 543–571.

Apostolopoulou, E., & Adams, W. M. (2019). Cutting nature to fit: Urbanization, neoliberalism and biodiversity offsetting in England. *Geoforum*.

Arlidge, W. N. S., Bull, J. W., Addison, P. F. E., Burgass, M. J., Gianuca, D., Gorham, T. M., … Milner-Gulland, E. J. (2018). A Global Mitigation Hierarchy for Nature Conservation. *BioScience*.

Asian Development Bank. (2009). Safeguard policy statement. https://www.adb.org/sites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf

Bache, I. & Flilnders, M. (2004). Multi-Level Governance, Oxford: Oxford University Press.

BBC News (2020). Sweden sees rare fall in air passengers, as flight-shaming takes off. Retrieved from https://www.bbc.com/news/world-europe-51067440

Bennett, G., Gallant, M., Ten Kate, K. (2017). State of Biodiversity Mitigation 2017 Markets and Compensation for Global Infrastructure Development. Forest Trends. https:// www.forest-trends.org/wp-content/uploads/2018/01/doc_5707.pdf

Berkhout, F. (2002). Technological regimes, path dependency and the environment. *Global Environmental Change*.

Bidaud, C., Schreckenberg, K., & Jones, J. P. G. (2018). The local costs of biodiversity offsets: Comparing standards, policy and practice. *Land Use Policy*, *77*, 43–50.

Biermann, F., & Pattberg, P. (2008). Global Environmental Governance: Taking Stock, Moving Forward. *Annual Review of Environment and Resources*, *33*(1), 277–294.

Boyd, D. (2018). Catalyst for Change. In J. Knox & R. Pejan (Eds.), The Human Right to a Healthy Environment (pp. 17-41). Cambridge: Cambridge University Press.

Boyd, D. R. (2012). The constitutional right to a healthy environment. *Environment*, *54*(4), 3–14.

Brownlie, S., King, N., & Treweek, J. (2013). Biodiversity tradeoffs and offsets in impact assessment and decision making: Can we stop the loss? *Impact Assessment and Project Appraisal*, *31*(1), 24–33.

Bull, J., Gordon, A., Law, E. A., Suttle, K. B., & Milner-Gulland, E. J. (2014). Importance of baseline specification in evaluating conservation interventions and achieving no net loss of biodiversity. *Conservation Biology*, *28*(3), 799–809.

Bull, J.W., Hardy, M.J., Moilanen, A., Gordon, A. (2015). Categories of flexibility in bio- diversity offsetting, and their implications for conservation. Biol. Conserv. 192, 522–532.

Bull, J. W., & Strange, N. (2018). The global extent of biodiversity offset implementation under no net loss policies. *Nature Sustainability*, *1*(12), 790–798.

Bull, J. W., Baker Julia, J., Griffiths, V., Jones, J. P., & Milner-Gulland, E. (2018). Ensuring No Net Loss for people and biodiversity: good practice principles. Oxford, UK. DOI: 10.31235/osf.io/4ygh7. 1

Bull, J. W., Milner-Gulland, E. J., Addison, P. F. E., Arlidge, W. N. S., Baker, J., Brooks, T. M., … Watson, J. E. M. (2019). Net positive outcomes for nature. *Nature Ecology and Evolution*.

BBOP (Business and Biodiversity Offsets Programme). (2012). *Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets*.

BBOP (Business and Biodiversity Offsets Programme). (2018). Working for Biodiversity Net Gain: An Overview of the Business and Biodiversity Offsets Programme (BBOP) 2004–2018. Washington, D.C. Available from https://www.forest-trends.org/bbop_pubs/overview2018

Bäckstrand, K., Kuyper, J., Linnér, B., & Lövbrand. E. (2017). Non-state actors in global climate governance: from Copenhagen to Paris and beyond. *Environmental Politics* 26:4, pp. 561-579.

Cardinale, B. J., Duffy, J. E., Gonzalez, A., Hooper, D. U., Perrings, C., Venail, P., … Naeem, S. (2012). Biodiversity loss and its impact on humanity. *Nature*, *486*(7401), 59–67.

Carver, L., & Sullivan, S. (2017). How economic contexts shape calculations of "yield" in biodiversity offsetting. *Conservation Biology*, *31*(5), 1053–1065.

CBD (Convention on Biological Diversity). (2008). *COP9 Decision IX/11*. https://www.cbd.int/decision/cop/default.shtml?id=11654

CBD. (2018). VOLUNTARY PEER REVIEW OF THE PREPARATION AND IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN OF MONTENEGRO. https://www.cbd.int/doc/c/bb97/7160/f56f31220ff16c1001feae34/cop-14-inf-19-en.pdf

Chandra, A., Idrisova, A., Chandra, A., & Idrisova, A. (2011). Convention on Biological Diversity: a review of national challenges and opportunities for implementation. *Biodivers Conserv*, *20*, 3295–3316.

Christie, M., Martín-López, B., Church, A., Siwicka, E., Szymonczyk, P., & Mena Sauterel, J. (2019). Understanding the diversity of values of "Nature's contributions to people": insights from the IPBES Assessment of Europe and Central Asia. Sustainability Science.

Curran, M., Hellweg, S., & Beck, J. (2014). Is there any empirical support for biodiversity offset policy? *Ecological Applications*, *24*(4), 617–632.

Daly, H.E. (1990). Sustainable development: from concept and theory to operational principles. Popul. Dev. Rev. 16, 25–43.

Dempsey, J., & Suarez, D. C. (2016). Arrested Development? The Promises and Paradoxes of "Selling Nature to Save It. *Annals of the American Association of Geographers*, *106*(3), 653–671.

Eftec, et al. (2010). The Use of Market-based Instruments for Biodiversity Protection - Habitat Banking-Appendix Case Studies. http://ec.europa.eu/environment/enveco/ pdf/eftec_habitat_case_study.pdf, Accessed date: 4 July 2018.

Ekins, P. (2003). Identifying critical natural capital: conclusions about critical natural capital. Ecol. Econ. 44 (2–3), 277–292.

Elmqvist, T., Andersson, E., Frantzeskaki, N., McPhearson, T., Olsson, P., Gaffney, O., … Folke, C. (2019). Sustainability and resilience for transformation in the urban century. *Nature Sustainability*.

Espeland, W.N., Stevens, M.L. (1998). Commensuration as a social process. Annu. Rev. Sociol. 24, 313–343.

European Commission. (2011). Our Life Insurance, Our Natural Capital: an EU Biodiversity Strategy to 2020. http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm#stra

FAO-FRA. (2010). "Global forest resources assessment 2010" (FAO forestry paper 163, FAO, Rome); www.fao.org/forestry/fra/fra2010/en

Farooqui, M.F. and Schultz, M. (2012). Co-chairs' Summary of Dialogue Seminar on Scaling up Biodiversity Finance, Quito 6-9 March 2012. Montreal: Secretariat of the Convention on Biological Diversity

FERN. (2014). What is biodiversity offsetting and why is it problematic? http://fern.org/sites/fern.org/files/Biodiversity2_EN.pdf, Accessed date: 4 July 2018

Fidel, R. (1984). The case study method: a case study. Libr. Res. 6 (3), 273–288.

Fletcher, R. (2010). Neoliberal Environmentality: Towards a Poststructuralist Political Ecology of the Conservation Debate. *Conservation and Society*, *8*(3), 171–181.

Friends of the Earth Europe. (2014). Nature is not for sale The dangers of commodifying our natural world. http://www.foeeurope.org/sites/default/files/foee_position_nature_is_not_for_sale.pdf

Gibbons, P., Macintosh, A., Constable, A. L., & Hayashi, K. (2017). Outcomes from 10 years of biodiversity offsetting. *Global Change Biology*, *24*(2), e643–e654.

GEF (Global Environment Facility). (2016). Biodiversity mainstreaming in practice: A review of GEF experience. https://www.thegef.org/sites/default/files/publications/GEF_MainstreamingBiod_11.28.16.pdf

Griffiths, V. F., Bull, J. W., Baker, J., & Milner-Gulland, E. J. (2018). No net loss for people and biodiversity. *Conservation Biology*, pp. 1–12.

Gujadhur, S., Limon, M. (2016). TOWARDS THE THIRD CYCLE OF THE UPR: STICK OR TWIST? Lessons learnt from the first ten years of the Universal Periodic Review. *Universal Rights Group.*

Gunningham, N. (2017). Compliance, deterrence and beyond. In *Compliance and Enforcement of Environmental Law* (pp. 63–73).

Gómez-Baggethun, E., de Groot, R., Lomas, P. L., & Montes, C. (2009). The history of ecosystem services in economic theory and practice: From early notions to markets and payment schemes. *Ecological Economics*, *69*(6), 1209–1218.

Gómez-Baggethun, E., & Muradian, R. (2015). In markets we trust? Setting the boundaries of Market-Based Instruments in ecosystem services governance. *Ecological Economics*, *117*, 217–224.

Göpel, M. (2016). *The Great Mindshift: How a New Economic Paradigm and Sustainability Transformations go Hand in Hand*. *The Great Mindshift: How a New Economic Paradigm and Sustainability Transformations go Hand in Hand*.

Hahn, T., Mcdermott, C., Ituarte-Lima, C., Schultz, M., Green, T., & Tuvendal, M. (2015). Purposes and degrees of commodification: Economic instruments for biodiversity and ecosystem services need not rely on markets or monetary valuation. *Ecosystem Services*, *16*, 74–82.

Harrop, S. R., & Pritchard, D. J. (2011). A hard instrument goes soft: The implications of the Convention on Biological Diversity's current trajectory. *Global Environmental Change*, *21*(2), 474–480.

Higgins, P., Short, D., & South, N. (2013). Protecting the planet: A proposal for a law of ecocide. *Crime, Law and Social Change*, *59*(3), 251–266.

Hirschman, A.O. (1986). Rival Views of Market Society and Other Recent Essays. Elisabeth Sifton Books: Viking, New York.

Hook, L. (2019). Year in a word: Flygskam. *Financial Times.* Retrieved from https://www.ft.com/content/5c635430-1dbc-11ea-97df-cc63de1d73f4

Hough, P., & Robertson, M. (2009). Mitigation under Section 404 of the Clean Water Act: Where it comes from, what it means. *Wetlands Ecology and Management*, *17*(1), 15–33.

Hrabanski, M. (2015). The biodiversity offsets as market-based instruments in global governance: Origins, success and controversies. *Ecosystem Services*, *15*, 143–151.

Huff, A. (2016). *Black Sands, Green Plans and Conflict: Structural Adjustment, Sectoral Reforms and the Mining–Conservation–Conflict Nexus in Southern Madagascar*. Institute of Development Studies.

Huppes G. (2001). Environmental policy instruments in a new era. WZB Discussion Paper, No. FS II 01–404.

Igoe, J., & Brockington, D. (2007). *Neoliberal Conservation: A Brief Introduction*. *Conservation and Society*, 5(4), 432-449.

IFC (International Finance Corporation). (2012). Performance Standard 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources. https://www.ifc.org/wps/wcm/connect/bff0a28049a790d6b835faa8c6a8312a/PS6

IUCN (International Union for Conservation of Nature). (2015). *No Net Loss and Net Positive Impact Approaches for Biodiversity: exploring the potential application of these approaches in the commercial agriculture and forestry sectors.* Retrieved from http://www.thebiodiversityconsultancy.com/wp-content/uploads/2015/06/IUCN-Agriculture-and-Forestry-final-report-April-2015.pdf

IPBES. (2018). The IPBES regional assessment report on biodiversity and ecosystem services for Europe and Central Asia. Rounsevell, M., Fischer, M., Torre-Marin Rando, A. and Mader, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 892 pages.

IPBES. (2019). *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science- Policy Platform on Biodiversity and Ecosystem Services*. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES Secretariat, Bonn, Germany.

Ituarte-Lima, C., Schultz, M., Hahn, T., McDermott, C., Martinez-Peña, R., and Cornell, S. (2018). CBD voluntary guidelines for safeguards: implementation pathways, Information Document for the 14th Conference of the Parties for the Convention on Biological Diversity, Sharm El-Sheikh, Egypt.

Ives, C., & Bekessy, S. A. (2015). The ethics of offsetting Nature. *Frontiers in Ecology and the Environment*, *13*(10), 568–573.

Knox, J. (2017). Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment. *Human Rights Council.* Report Number: A/HRC/34/49

Knox, J. (2018a). Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment. *Human Rights Council.* Report Number: A/HRC/37/59. Retrieved from http://srenvironment.org/wp-content/uploads/2018/02/A_HRC_37_59_AdvanceEditedVersion.pdf

Knox, J. (2018b). Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment. *United Nations General Assembly.* Report Number: A/73/188.

Koh, N. S., Hahn, T., & Ituarte-Lima, C. (2017). Safeguards for enhancing ecological compensation in Sweden. *Land Use Policy*, *64*, 186–199.

Lemos, M.C. & Agrawal, A. (2006). Environmental Governance. Annual Review of Environment and Resources. 31, 297–325.

Mace, G. M., Barrett, M., Burgess, N. D., Freeman, R., Cornell, S. E., Grooten, M., & Purvis, A. (2018). Aiming higher - bending the curve of biodiversity loss. *Nature Sustainability*, *1*, 448–451.

Maron, M., Brownlie, S., Bull, J., Evans, M. C., Von Hase, A., Quétier, F., … Gordon, A. (2018). The many meanings of no net loss in environmental policy. Nature Sustainability, 1(1), 19–27.

Maron, M., Bull, J., Evans, M. C., & Gordon, A. (2015). Locking in loss: Baselines of decline in Australian biodiversity offset policies. Biological Conservation, 192.

McAfee, K. (1999). Selling Nature to Save it? Biodiversity and the Rise of Green Capitalism. *Environment and Planning D: Environment and Space*, *17*(2), 133–154.

Mcdermott, M., Mahanty, S., & Schreckenberg, K. (2013). Examining equity: A multidimensional framework for assessing equity in payments for ecosystem services. *Environmental Science and Policy*, *33*, 416–427.

McGraw, D. M. (2002). The CBD - key characteristics and implications for implementation. *Review of European Community and International Environmental Law*, *11*(1), 17–28.

Moilanen, A., & Laitila, J. (2016). Indirect leakage leads to a failure of avoided loss biodiversity offsetting. *Journal of Applied Ecology*, *53*(1), 106–111.

Moore, M. L., Tjornbo, O., Enfors, E., Knapp, C., Hodbod, J., Baggio, J. A., … Biggs, D. (2014). Studying the complexity of change: Toward an analytical framework for understanding deliberate social-ecological transformations. Ecology and Society, 19(4).

Morgera, E., & Tsioumani, E. (2010). Yesterday, Today, and Tomorrow: Looking Afresh at the Convention on Biological Diversity. *Yearbook of International Environmental Law*, *21*(1), 3–40.

North, D.C. (1990). Institutions, institutional change and economic performance. Cambridge: University of Cambridge Press.

OECD. (1993). Economic instruments for environmental management in developing countries. OECD, Paris.

OECD. (1972). The Polluter Pays Principle. Organisation for Economic Co-operation and Development, Paris.

OECD. (2016). Biodiversity Offsets: Effective Design and Implementation, OECD Publishing, Paris.

Olander, J. & Ebeling, J. (2011) Building forest carbon projects: step-by-step overview and guide. Building Forest Carbon Projects (eds J. Ebeling & J. Olander), Forest Trends, Washington, DC.

Olsson, P., Ö. Bodin and C. Folke. (2010). Building transformative capacity for ecosystem stewardship in social-ecological systems. In: Armitage, D. and R. Plummer (editors). Adaptive Capacity and Environmental Governance. Chapter 13. Forthcoming on Springer, UK.

Pearce, D.W., Atkinson, G.D. (1993). Capital theory and the measurement of sustainable de- velopment: an indicator of "weak" sustainability. Ecol. Econ. 8, 103–108.

Pelling M. (2011). Adaptation to Climate Change: From Resilience to Transformation. Routledge.

Queensland Government. (2019). What is an environmental offset and when is it required? https://www.qld.gov.au/environment/pollution/management/offsets/what-when

Quétier, F., & Lavorel, S. (2011). Assessing ecological equivalence in biodiversity offset schemes: Key issues and solutions. Biological Conservation, 144(12), 2991–2999.

Rainey, H. J., Pollard, E. H. B., Dutson, G., Ekstrom, J. M. M., Livingstone, S. R., Temple, H. J., & Pilgrim, J. D. (2015). A review of corporate goals of No Net Loss and Net Positive Impact on biodiversity. *ORYX*, *49*(2), 232–238.

Remig, M. (2014). Ecosystem services through Polanyi's lens: from fictitious commodification to behavioral incentives for cultural ecosystem functions. Resilience 2014, Montpellier, France.

Ring, I., & Schröter-Schlaack, C. (2011). Instruments mixes for biodiversity policies. *Instrument Mixes for Biodiversity Policies. POLICYMIX Report 2/2011*, (2), 119–144. Retrieved from http://policymix.nina.no

Robertson, M. M. (2004). The neoliberalization of ecosystem services: wetland mitigation banking and problems in environmental governance. *Geoforum*, *35*, 361–373.

Savaresi, A. (2013). REDD+ and human rights: Addressing synergies between international regimes. *Ecology and Society*, *18*(3).

Schultz, M., Hahn, T., Ituarte-Lima, C., & Hällström, N. (2018). Deliberative multi-actor dialogues as opportunities for transformative social learning and conflict resolution in international environmental negotiations. International Environmental Agreements: Politics, Law and Economics, 18, 671–688.

Seagle, C. (2012). Inverting the impacts: Mining, conservation and sustainability claims near the Rio Tinto/QMM ilmenite mine in Southeast Madagascar. *Journal of Peasant Studies*, *39*(2), 447–477.

Shelton, D. (1991). Human rights, environmental rights and the right to environment. Stanford Journal of International Law, 28, 103.

Sonter, L. J., Gourevitch, J., Koh, I., Nicholson, C. C., Richardson, L. L., Schwartz, A. J., … Ricketts, T. H. (2018). Biodiversity offsets may miss opportunities to mitigate impacts on ecosystem services. *Frontiers in Ecology and the Environment*, *16*(3), 143–148.

Sonter, L. J., Barnes, M., Matthews, J. W., & Maron, M. (2019). Quantifying habitat losses and gains made by U.S. Species Conservation Banks to improve compensation policies and avoid perverse outcomes. *Conservation Letters*.

Streeck, W., Schmitter, P.C. (1985). Governance to Social Order Community, Community, market, state- and associations? The prospective contribution of interest governance to social order. Eur. Socio Rev. 1 (2), 119–138.

Sullivan, S. (2013). Banking Nature? The Spectacular Financialisation of Environmental Conservation. *Antipode*, *45*(1), 198–217.

Sullivan, S., & Hannis, M. (2015). Nets and frames, losses and gains: Value struggles in engagements with biodiversity offsetting policy in England. *Ecosystem Services*, *15*, 162–173.

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., et al. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 347, 1259855.

Swedavia. (2019). Swedavia's traffic statistics for November 2019. https://www.swedavia.com/about-swedavia/for-press/swedavias-traffic-statistics-for-november-2019/#gref

Tengö, M., Hill, R., Malmer, P., Raymond, C. M., Spierenburg, M., Danielsen, F., … Folke, C. (2017). Weaving knowledge systems in IPBES, CBD and beyond—lessons learned for sustainability. Current Opinion in Environmental Sustainability, 26–27(July), 17–25.

Abend, L. (2019). In Europe, the Movement to Give Up Air Travel Is Taking Off. Could the U.S. Be Next? *TIME*. Retrieved from https://time.com/5641390/europe-train-air-travel/

Tittensor, D.P., Walpole, M., Hill, S.L.L., Boyce, D.G., Britten, G.L., Burgess, N.D., et al. (2014). A mid-term analysis of progress toward international biodiversity targets. Science, 346(6206), 241–244.

Tucker, G., Allen, B., Conway, M., Dickie, I., Hart, K., Rayment, M., Schulp, C., van Teeffelen, A. (2014). Policy Options for an EU No Net Loss Initiative: Final Report- Annexes. Institute for European Environmental Policy, London.

Ulloa, A. M., Jax, K., & Karlsson-Vinkhuyzen, S. I. (2018). Enhancing implementation of the Convention on Biological Diversity: A novel peer-review mechanism aims to promote accountability and mutual learning. *Biological Conservation*, *217*, 371–376.

UNEP (United Nations Environment Programme). (2018). *ENVIRONMENTAL RULE OF LAW First Global Report*. Retrieved from https://wedocs.unep.org/bitstream/handle/20.500.11822/27279/Environmental_rule_of_law.pdf?sequence=1&isAllowed=y

UN Committee on Economic, Social and Cultural Rights (UNCESCR). (2009). General comment no. 21, Right of everyone to take part in cultural life (art. 15, para. 1a of the Covenant on Economic, Social and Cultural Rights), E/C.12/GC/21, available at: https://www.refworld.org/docid/4ed35bae2.html [accessed 1 October 2019]

Vaissière, A. C., Levrel, H., & Scemama, P. (2017). Biodiversity offsetting: Clearing up misunderstandings between conservation and economics to take further action. *Biological Conservation*, *206*, 258–262.

Venter, O., Sanderson, E. W., Magrach, A., Allan, J. R., Beher, J., Jones, K. R., Possingham, H. P., Laurance, W. F., Wood, P., Fekete, B. M., Levy, M. A., & Watson, J. E. M. (2016). Global terrestrial Human Footprint maps for 1993 and 2009. Scientific Data, 3, 160067.

Virah-Sawmy, M., Ebeling, J., & Taplin, R. (2014). Mining and biodiversity offsets: A transparent and science-based approach to measure no-net-loss. *Journal of Environmental Management*, *143*, 61–70.

Westley, F., Olsson, P., Folke, C., Homer-Dixon, T., Vredenburg, H., Loorbach, D., … Van Der Leeuw, S. (2011). Tipping toward sustainability: Emerging pathways of transformation. In *Ambio* (Vol. 40, pp. 762–780).

Wolfe, A. (1989). Market, state, and society as codes of moral obligation. Acta Sociol. 32 (3), 221–236.

Wohlleben, P. (2016). The Hidden Life of Trees: What They Feel, How They Communicate.

Wong, G., Loft, L., Brockhaus, M., Yang, A. L., Pham, T. T., Assembe-Mvondo, S., & Luttrell, C. (2017). An Assessment Framework for Benefit Sharing Mechanisms to Reduce Emissions from Deforestation and Forest Degradation within a Forest Policy Mix. *Environmental Policy and Governance*, *27*(5), 436–452.

World Bank. (2017). The World Bank environmental and social framework. http://documents.worldbank.org/curated/en/383011492423734099/pdf/114278-WP-REVISED-PUBLIC-Environmental-and-Social-Framework.pdf , Accessed date: 4 July 2018.

Yin, R. (1994). Discovering the future of the case study method in evaluation research. Eval. Pract. 15 (3), 283–290.

Zinngrebe, Y. M. (2018). Mainstreaming across political sectors: Assessing biodiversity policy integration in Peru. *Environmental Policy and Governance*, *28*(3), 153–171.

# Appendix 1

*Table A1: Properties of mechanisms that characterise the biodiversity offset policy ideal types - 'Public Agency', 'Market' and 'Voluntary'. Adapted from Streeck & Schmitter, 1985.*

| | Public Agency | Mandatory Market | Voluntary Offset |
|---|---|---|---|
| **1. Guiding principle of coordination and allocation** | Legally mandatory, guided by bureaucratic order | Legally mandatory, guided by economic rationality and competition | Corporate social responsibility |
| **2. Predominant, modal, collective actor** | Municipalities and state agencies | Environmental consultants, brokers, habitat banks, private landowners | Developers, non-governmental organizations |
| **3. Principal medium of exchange** | Coercion | Money | Reciprocity |
| **4. Predominant resource** | Consistency in procedures | Entrepreneurship | Developer's reputation and status |
| **5. Principal decision-maker and rules** | State conducts matching of impact and compensation | Developer's preference and cost-effectiveness | Developer decides the scope of compensation project |
| **6. Predominant normative legal foundation** | Producer liability | Producer liability and rules set for trading | Corporate social responsibility |
| **7. Principal pay-offs and risks** | Equitable and predictable treatment in safeguarding ecological and social outcomes. Risks legitimacy of top-down policies. | Cost-effective conservation. Risks a 'license-to-trash'. | Developers buy a 'license to operate'. Risks being perceived as greenwashing. |

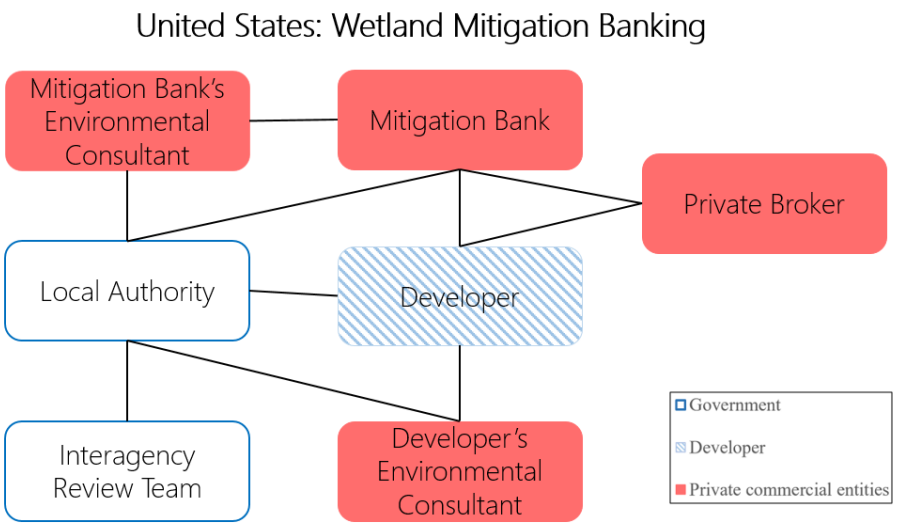



*Figure A1: Stakeholder mapping of the United States Wetland Mitigation Banking policy.*

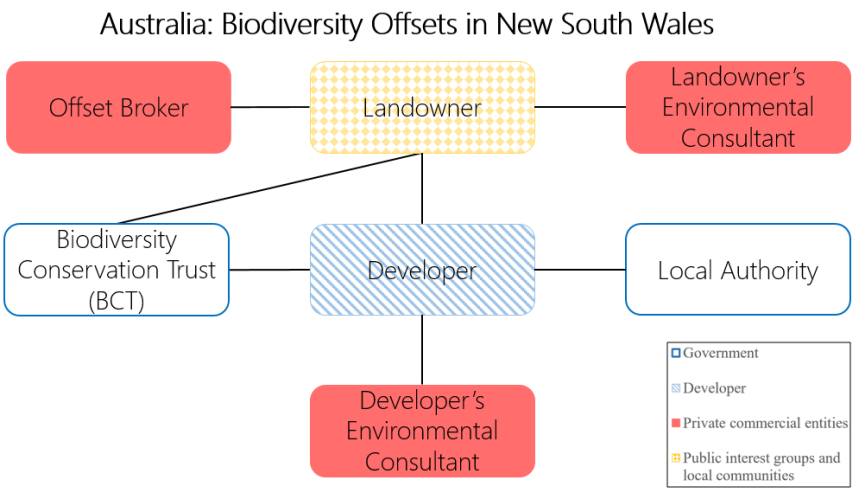



*Figure A2: Stakeholder mapping of the Australia New South Wales Biodiversity Offsets.*

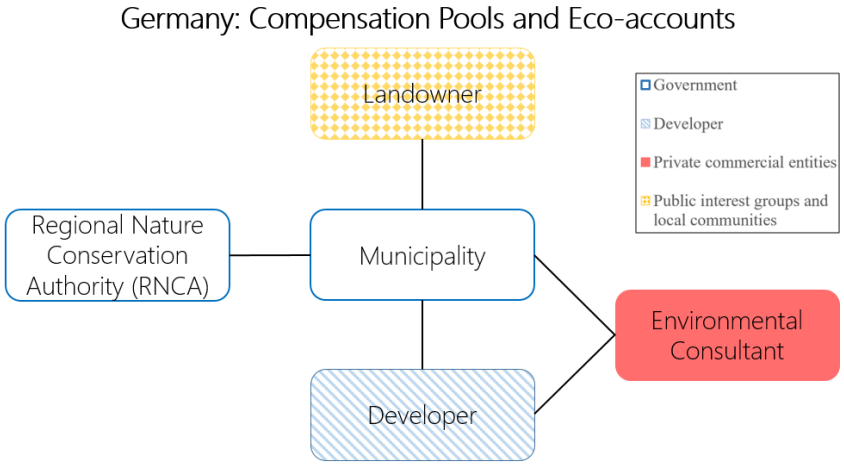



*Figure A3: Stakeholder mapping of the urban compensation policy in Germany.*

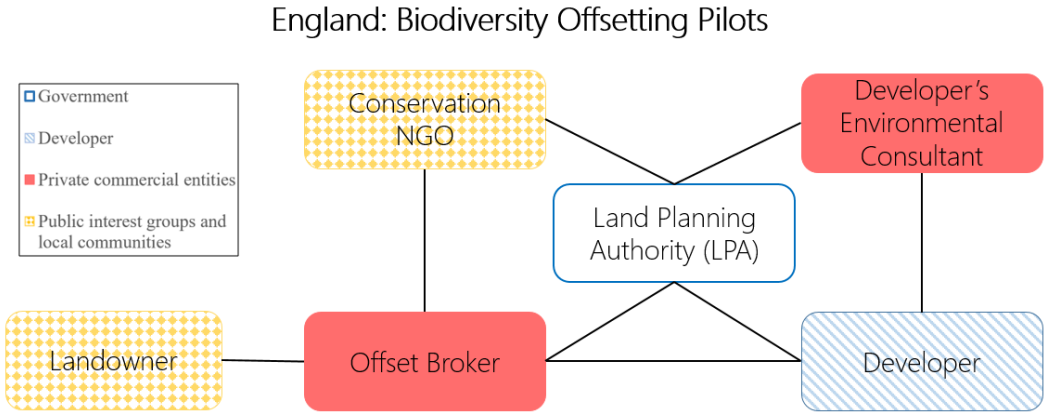


*Figure A4: Stakeholder mapping of the Coventry, Solihull and Warwickshire group in England's biodiversity offsetting pilots.*

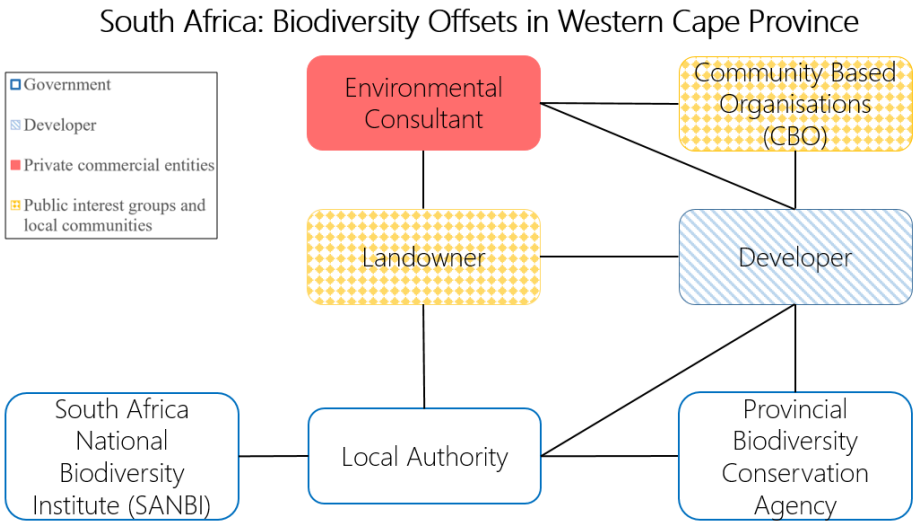



*Figure A5: Stakeholder mapping of biodiversity offsetting in the Western Cape Province, South Africa.*

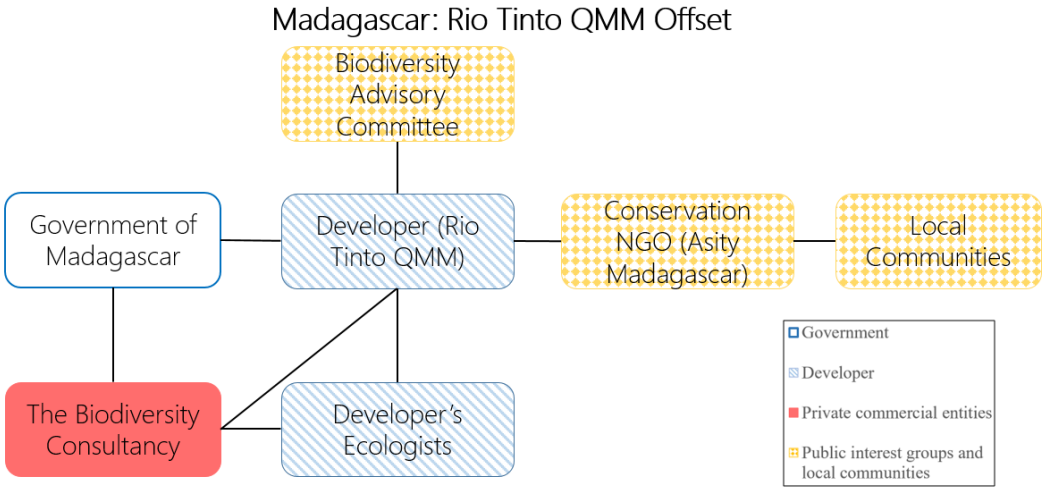



*Figure A6: Stakeholder mapping of the Rio Tinto QMM offset project in Madagascar.*

*Table A2. The six offset policies examined are analysed according to the properties defining the offset ideal types. The match of each offset policy with the ideal types is plotted into the Venn diagram in Figure 8.*

| **Biodiversity offset policy** | **Ideal types** | | | | **Ideal type best fit** |
|---|---|---|---|---|---|
| | **Public Agency** | **Mandatory Market** | | **Voluntary Offset** | |
| | *Does a state agency conduct matching of impact and compensation?* | *Can the developer choose freely between several compensation providers?* | *Is the price subject to market negotiation?* | *Does the developer offset voluntarily?* | |
| **US, Wetland mitigation banking** | No. Matching is done by developers and mitigation banks. However, the State negotiates credit supply and approves credit demand. | Partly. Developer can choose between several mitigation banks, but State restricts choice set. | Yes. Negotiation of market actors, assisted by broker. | No. State sets legal requirements for offsetting wetland impacts. | *Mandatory Market* |
| **Australia, Biodiversity offsets in New South Wales** | *Biodiversity Offsets Scheme.* No. Matching is done by developers and landowners. However, the State determines credit demand and approves credit calculations. | *Biodiversity Offsets Scheme.* Partly. Developer can choose between several individual landowners, but State restricts choice set. | *Biodiversity Offsets Scheme.* Partly. Negotiation of market actors, assisted by broker and based on management costs plus profit. | *Biodiversity Offsets Scheme.* No. State sets legal requirements for offsetting native vegetation and species impacts. | *Mandatory Market/ Public Agency* |
| | *Biodiversity Conservation Fund.* Yes. The state-run Biodiversity Conservation Trust (BCT) does the matching. | *Biodiversity Conservation Fund.* No. The developer pays to the BCT. | *Biodiversity Conservation Fund.* Partly. The developer pays into a fund, based on the estimated market price of a credit. BCT then negotiates price with landowner. | *Biodiversity Conservation Fund.* No. State sets legal requirements for offsetting native vegetation and species impacts. | *Mandatory Market/ Public Agency* |

| | | | | | |
|---|---|---|---|---|---|
| **Germany, Compensation pools & Eco-accounts** | Yes. In urban areas, municipalities conduct the matching. | No. Municipality runs the compensation pool and sells eco-points to developers. | No. Pre-defined list of costs set by municipality. | No. State sets legal requirements for compensating development impacts. | *Public Agency* |
| **England, Biodiversity offsetting pilots** | *Offset Broker.* Partly. The developer can choose but the Land Planning Authority (LPA) must approve compensation location. | *Offset Broker.* Partly. Developer can choose between several individual landowners, but State restricts choice set. | *Offset Broker.* No. Based on management costs set by landowner and broker. | *Offset Broker.* No. Guidelines released, national policy under discussion. | *Public Agency/ Mandatory Market* |
| | *Offsetting Payment.* Yes. LPA selects a suitable offset. | *Offsetting Payment.* No. The developer pays into the Biodiversity Offsetting Bank. | *Offsetting Payment.* No. Based on estimates of management costs. | *Offsetting Payment.* No. Guidelines released, national policy under discussion | *Public Agency* |
| **South Africa, Biodiversity offsets in Western Cape Province** | Partly. The developer and state agency consult on compensation location. | No. Developer finds a landowner with help of stakeholders and offset receiving areas. | No. Developer establishes stewardship agreement with landowner. | No. Guidelines released, national policy under discussion. | *Public Agency* |
| **Madagascar, RTQMM offset** | Partly. The developer and state agency consult on compensation location. | No. Developer found offset areas within their allotted mining areas or state-owned land. | No. Land access is obtained with government support. | Yes. Lack of legal requirements for compensation. | *Voluntary Offset/ Public Agency* |

# Appendix 2

**Box B1. Semi-structured interview guide with participants at CBD-COP14**

1. What is your understanding of safeguards within the context of the CBD?
2. How do you think the use of 'safeguards' in the CBD has changed over time?
3. Do you know of any examples of safeguards being used in response to biodiversity conservation policies? What about in the context of innovative financing mechanisms?
4. Have you been involved in a biodiversity conservation or sustainable use project that has used safeguards? What was your role?
5. How did the use of safeguards influence the project's impacts on protecting biodiversity or people's livelihoods? Was there any improvement on the outcomes?
6. What challenges were faced in implementing these safeguards?
7. What would you suggest as next steps for improving the use of safeguards?
8. Is there anything else you think the CBD discussions should focus on, besides safeguarding conventional conservation tools?

Stockholms universitet/Stockholm University

SE – 106 91 Stockholm

Telefon/Phone: 08 – 16 20 00

www.su.se