Can ecological fiscal transfers contribute to conservation and well-being? An examination of local interactions in the Atlantic forest region of Brazil.

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This thesis is presented for the degree of Doctor of Philosophy of The University of Western Australia

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Thesis declaration

I, Gracie Verde Selva, certify that:

This thesis has been substantially accomplished during enrolment in the degree. This thesis does not contain material which has been submitted for the award of any other degree or diploma in my name, in any university or other tertiary institution.

No part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of The University of Western Australia and where applicable, any partner institution responsible for the joint-award of this degree.

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The research involving human data reported in this thesis was assessed and approved by The University of Western Australia Human Research Ethics Committee, approval RA/4/1/7929. Approvals were obtained prior to commencing the relevant work described in this thesis from: Brazil's National System of Ethics in Research and the Technical-Scientific Commission of the Forest Institute of São Paulo.

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Abstract

This research examines the Brazilian Ecological ICMS (ICMS-E), a government run payment for ecosystem services scheme, which compensates municipal governments for the local costs of conservation. The ICMS-E is thought to produce positive outcomes for local institutions, communities and the environment. This research tests these ideas through examining how the mechanism functions in localities that face challenges including limited institutional and technical capacity, entrenched poverty and environmental conflict. The two case studies in this research are Guaraqueçaba in Paraná state, and Cananéia in São Paulo state, both located within important remnant Atlantic forest. The legislation of the ICMS-E in these states has followed distinct trajectories, with different mechanisms and intended outcomes.

The research applied a qualitative approach. Data were collected through interviews with government and civil society stakeholders and supplemented by document analysis. The research addresses some critical questions which have not previously been asked of the ICMS-E; (1) How does the design of the ICMS-E, legislated at the state level, translate to the municipal context to achieve its intended outcomes and produce unintended outcomes? (2) Do payments influence local perceptions of exclusionary conservation and contribute towards the reconciliation of human-conservation conflicts? (3) How do local governance structures and power dynamics influence the distribution of the costs and benefits of environmental payments? (4) What are the main opportunities and barriers of EFTs in achieving integrated outcomes for conservation and development in regions of poverty?

Results suggest that the design of the ICMS-E mechanism greatly influences its local outcomes, with implications for conservation and local well-being. In neither case did the presence of monetary compensation positively influence the perception of protected areas or reduce environmental conflict. Local costs of conservation were considered extremely high, there was incomplete knowledge of the ICMS-E mechanism, and revenue was not explicitly linked to community benefits. The social and environmental outcomes of the ICMS-E were limited by the institutional capacity of local government that received the payment and the application of revenue
was influenced by local power dynamics. The incorporation of simple mechanisms to improve the visibility of the revenue and its local application may improve overall outcomes. The ICMS-E may have potential to produce positive outcomes for conservation and development, however in the context of poverty and environmental conflict, this may be achieved through its application to developing sustainable livelihoods for communities affected by land-use restrictions associated with conservation. The lessons from this research are relevant to the design and implementation of EFTs, as well as broader narratives on economic approaches to equitable conservation and sustainable development.
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This thesis contains work that has been prepared for publication.

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I, Natasha Pauli, certify that the student statements regarding their contribution to each of the works listed above are correct.
Means of access to the communities that comprised the case studies in this research. Access to island communities is limited by tides and weather conditions, whilst roads to inland communities are unpaved, in poor condition and subject to flooding and erosion.
CHAPTER 1: Introduction

1.1. Introduction

Maintaining and restoring natural systems poses a great policy challenge, particularly in regions of poverty where human well-being must also be prioritised. Despite continuous improvement in our collective understanding of the benefits provided to humans from natural systems, environmental degradation continues at an alarming rate. The rate of species decline is currently up to three orders of magnitude greater than background levels, whilst human activity has degraded over three quarters of the Earth’s land surface (IPBES 2018). The Millennium Ecosystem Assessment brought attention to the linkages between environmental condition and human condition, and the negative impacts and associated costs of environmental degradation have been examined (MEA 2005, Gallai, Salles et al. 2009, TEEB 2010). Societal benefits derived from natural systems are estimated at between 10-100 times the costs of maintaining them (TEEB 2009). Despite global increases in protected terrestrial and marine area and international mobilisation through initiatives such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC) and the Convention on Biological Diversity (CBD), environmental degradation is escalating. The dominant model of human existence is damaging the natural systems to which we belong, jeopardising the capacity that nature has to sustain itself and us along with it.

There is clear evidence that degradation and species loss is occurring. What remains unclear is the best approach to halt and eventually reverse these impacts, whilst simultaneously improving the living standards of the global poor. There is a distinct spatial overlap between biodiversity and human poverty (Fisher and Christopher 2007). The 25 biodiversity hotspots that have been identified as crucial for conservation globally are home to over 20 per cent of the world’s population and occur mostly in developing countries (Williams 2011). The protection of nature and human development are linked problems and it is widely accepted that they should be tackled together (Adams, Aveling et al. 2004, Cernea and Schmidt-Soltau 2006, Sunderland, Ehringhaus et al. 2007).
Policy instruments that intend to achieve integrated outcomes for both conservation and development are considered as ‘lofty’ by some, who argue that interventions should be considered a success as long as achieve “Pareto improvement”, that is, achieve conservation without imposing suffering on the poor, or improve human well-being without compromising ecosystem function (Barrett, Bulte et al. 2013, p9). However, even under this weak condition many policy interventions would not be considered a success. The limited effectiveness of policy action is partly due to the extremely complex nature of environmental problems.

The term ‘wicked’ has been used to describe environmental issues as large-scale, long-term problems with no single solution. Environmental issues cross governance boundaries and can be understood in different ways leading to conflicting approaches to managing them. Environmental problems can be characterised by chronic policy failure and thus become intractable (Balint, Stewart et al. 2011). However environmental problems may also be characterised as existing within complex socio-ecological systems (Akamani, Holzmueller et al. 2016), requiring an approach that is multi-scale, holistic, collaborative and adaptive (Berkes 2007, Armitage, Plummer et al. 2009, Akamani, Holzmueller et al. 2016, Mehring and Hummel 2017). Humanity must endeavour to increase the sophistication of our understanding of and responses to complex socio-environmental problems by examining initiatives that may hold clues for success.

The concept of ecosystem services is increasingly informing policy responses to problems of environmental degradation (Costanza, de Groot et al. 2017). Ecosystem services are the indirect or direct benefits that humans derive from nature and impact on well-being in a variety of ways (Figure 1) (MEA 2005). The concept of ecosystem services has generated polarised debate. Some argue it can be used to commodify nature (McAfee 2012), whilst others warn that focusing narrowly on ecosystem services may limit conservation efforts to only specific aspects of nature deemed useful by humans (Redford and Adams 2009). The ecosystem services concept has been criticised as a utilitarian approach, where nature exists only to service humans, without acknowledging its intrinsic value (McCauley 2006, Miller, Soulé et al. 2014). However, others rebut that ecosystem services highlight the interdependence of humans and nature, taking a whole system view of human society as being embedded in nature (Costanza, de Groot et al. 2017).
Ecosystem services appeals to a broad public, even those who would not normally be interested in environmental issues, by demonstrating the benefits of nature to humans (Marvier 2014). Conservation projects that incorporate the concept of ecosystem services attract funding from a more diverse range of actors than those that focus only on biodiversity (Goldman, Tallis et al. 2008).

![Diagram of ecosystem services and human well-being](image)

**Figure 1.** Linkages among biodiversity, ecosystem service and human well-being. Adapted from MEA 2005, p.28.

Global initiatives such as The Economics of Ecosystems and Biodiversity (TEEB) are developing tools and methodologies that attempt to place an economic value on the contribution that ecosystems services make to human society. Whilst valuation of these services is a complex undertaking, particularly with regard to cultural and other non-use values, the concept of ecosystem services makes a critical contribution by enabling a clear understanding of human dependency on nature (Costanza 2014). Knowledge and recognition of the contribution of nature to human processes can inform decision-making and help negotiate trade-offs. Even without valuation, the explicit acknowledgement of the contribution of ecosystem services can raise awareness, enabling better incorporation of nature into policy and planning decisions (Costanza 2014).
A number of economic instruments for conservation are being developed according to this understanding.

Economic instruments for conservation function by providing incentives that encourage particular types of activity that have benefits for nature, or disincentives to discourage activities which negatively impact on nature (Perman, Ma et al. 2003). Incentives can be combined with regulatory approaches, to create a bridge between command and control and economic approaches to conservation (Barrett, Bulte et al. 2013). The concept of ecosystem services has supported the development of instruments to regulate the use of natural resources such as environmental pricing, polluter pays taxation and, particularly, through payments for ecosystem services (PES).

The original concept of PES was based on a buyer-pays system, where those who benefit from the positive externalities of environmental protection pay those who maintain the environment that provides those services, in a voluntary and conditional system (Wunder 2005). Economic incentives through PES can compete with potential revenues arising from alternative uses of ecosystems and may therefore influence land-use decisions to promote conservation (Wunder 2005). PES was envisioned as an opportunity to maximize the efficiency of limited conservation funding, based on market principles, however most ecosystems services are public goods and markets cannot be relied upon to adequately supply them (Barrett, Bulte et al. 2013). As such almost no PES projects interact with real markets, and instead are mostly conducted within a public policy framework and funded by the state (Muradian and Gómez-Baggethun 2013, Gómez-Baggethun and Muradian 2015). Muradian et al. (2010, p. 1205) move away from linking PES to markets in their definition; “a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources”. This broader concept reflects more accurately the reality of most existing PES programmes and avoids the common critique that market mechanisms will be unable to solve environmental problems that were caused by those very markets (Büscher, Sullivan et al. 2012, McAfee 2012, Fletcher, Dressler et al. 2016, Fletcher and Büscher 2017).
Some argue that PES must be grounded in principles of natural science (Naeem, Ingram et al. 2015), however policy approaches that include both scientific and local knowledge may encourage a more nuanced understanding of the interrelations that exist between society and nature that impact on natural systems (Mehring and Hummel 2017). The meaning and implementation of policies are negotiated and transformed from their central design to their application at the level of resource use, meaning that consideration of local contexts is integral to understanding how outcomes are produced (Clement 2010). The socio-political context in which policy interventions occur, and the historical causes of environmental conflict and degradation should be considered (Kolinjivadi, Van Hecken et al. 2017). Social constructs, such as the institutional setting and power dynamics may be important determinants of outcomes (Muradian, Corbera et al. 2010, Vatn 2010, Van Hecken, Kolinjivadi et al. 2018). The way interventions interact and function within the existing policy landscape may also be important (Polski and Ostrom 1999).

Ecological fiscal transfers (EFTs) can be considered a kind of PES, however instead of depending on non-government organisations (NGOs) or government subsidies they work through the redistribution of tax revenue between government entities to compensate or incentivize environmental protection (Ring 2008). EFTs diverge from other types of PES in certain ways. PES often involve high transaction costs (Vatn, 2010), however EFTs introduce ecological criteria into a fiscal transfer system, building on existing institutions and administrative procedures which results in very low transactions costs (Ring, 2008; Droste et al., 2015). While PES schemes rarely have lasting sources of funding (Pagiola et al., 2007), EFT funding is stable and permanent, with the additional benefit of reducing the problem of finding new funding for local conservation (Droste et al., 2018). EFTs target local governance institutions, hence emphasizing social preference over individual preference; conversely, PES often focus on private land owners (Vatn, 2010). EFTs represent a gap in the policy-mix currently used for conservation, with only a few examples having been enacted worldwide (Santos, May et al. 2014, Droste, Ring et al. 2018).

The original example of an EFT comes from Brazil, with origins dating back almost 30 years, whilst the second to be implemented was in Portugal, in 2007 (Santos, Ring et al. 2012). The Brazilian example functions in the context of extremely diverse and highly threatened natural
systems, often inhabited by poor communities. Its examination allows understanding of the long-term outcomes of an instrument that is at the vanguard of policy for conservation and development around the world. The Brazilian EFT is purported to have potential positive outcomes for biodiversity, local institutions and communities by aligning local and regional conservation interests, stimulating the local environmental agenda and supporting sustainable development (TNC n.d.).

1.2. Aims of the research
This research addresses some critical questions which have not previously been asked of the Brazilian EFT, addressing gaps in research which are developed and discussed in Chapter 2. The overarching goal of this research is to examine the Brazilian EFT within its social and political context in order to facilitate a nuanced understanding of its effectiveness in contributing to socially equitable conservation in a region of poverty. The answers to these questions may inform the development of other environmental payment schemes.

The first area of analysis is the design and implementation of the mechanism, guided by the research question,

1. How does the design of the EFT, legislated at the state level, translate to the municipal context to achieve its intended outcomes and produce unintended outcomes?

The second area of analysis focuses on social perceptions, asking,

2. Do payments influence local perceptions of exclusionary conservation and contribute towards the reconciliation of human-conservation conflicts?

The third area of analysis is social outcomes, to determine whether the EFT perpetuates the negative results sometimes associated with other PES schemes, asking,
3. How do local governance structures and power dynamics influence the distribution of the costs and benefits of environmental payments?

With consideration of all these aspects, the final research question is,

4. What are the main opportunities and barriers of EFTs in achieving integrated outcomes for conservation and development in regions of poverty?

This is a thesis by publication, with each of the results chapters (3, 4 and 5) prepared in the style of journal articles for submission to academic journals. As a thesis by publication, there is some degree of repetition, particularly with respect to methodology and case study descriptions. Some maps and figures presented in Chapter 2 are repeated in later results Chapters. Short prologues before each of the results chapters provide a sense of continuity and link each paper within the setting of the overall thesis.

Chapter 2 provides an overarching theoretical context to the research through an examination of how EFTs may contribute to improving the outcomes of protected areas as a strategy for conservation, and an elaboration of the research design. Chapter 3 develops the first research question, exploring how the design of the EFT legislation translates into the local setting to produce outcomes, thereby contributing to scholarship on the effective design of conservation payments. Chapter 4 addresses the second research question, focusing on whether monetary compensation contributes to the alleviation of environmental conflict, where traditional institutions for natural resource management have been replaced by regulatory institutions. Chapter 4 contributes to scholarship on the impact of economic mechanisms on perceptions of conservation and inclusive natural resource governance. Chapter 5 examines the third research question, looking at whether the EFT creates opportunities for good local governance that might improve the political representation of marginalised actors, or if payments are utilised in ways that reinforce existing inequalities. This contributes to scholarship on the social outcomes of environmental payments. Finally, Chapter 6 draws on the findings of all the results chapters to explore whether and how EFTs can contribute to solving some of the fundamental issues of conservation and human well-
being in regions of high biodiversity and entrenched poverty. The findings of all the chapters and contributions to theory are summarised and policy implications are examined, including policy recommendations.
1.3. References


Some of the varied natural assets of the municipalities examined in this research including Atlantic forest, mangroves and some of the birdlife that inhabit them.
CHAPTER 2: Theoretical context, research approach and design

2.1. Introduction
This chapter will outline the theoretical context in which this research is situated. The chapter begins with an analysis of the role of protected areas in achieving nature conservation and the need for conservation policy to also address human well-being. Addressing the welfare of those living in and around reserves can contribute to improving conservation outcomes, whilst accounting for ethical questions of conservation in regions of poverty. This scenario can be supported by environmental payments, which compensate the costs of conservation borne locally and may support local agendas for sustainable development. The policy mechanism examined in this thesis is then introduced and the research approach and design outlined.

2.2. Theoretical context
For decades society has been warned of the damaging impact of human activity on natural systems (Carson 1962, Meadows, Randers et al. 1972, McKibben 1989), with critical concerns including the loss of biodiversity (Cardinale, Duffy et al. 2012), land degradation (IPBES 2018) and climate change (IPCC 2014). However, conservation efforts are frequently noted as not having the necessary effect and environmental degradation is accelerating (IPBES 2018). Policy approaches are still developing and responses must maintain pace with advancements, both in scientific knowledge of the natural world and in our understanding of the human-nature interrelationships of socio-ecological systems (Berkes 2004).

This research explores a Brazilian economic instrument that was developed as a response to the local difficulties associated with a government strategy of conservation through protected areas. It is within this socio-political and environmental context that the outcomes of the instrument play out. It is therefore necessary to first examine how the approach taken to designing and implementing protected areas can impact, in social and economic terms, local resident communities.
2.2.1. The protected area approach to conservation

Protected areas are a main strategy for the conservation of natural assets such as biodiversity, watersheds and soil (Gaston, Jackson et al. 2008, CBD 2014). In the Brazilian Amazon from 1988 to 2006 less than 1.5 per cent of the total protected area was deforested, pointing to the important role of protected areas in conservation (Barber, Cochrane et al. 2014). The ways in which protected areas have been envisioned and implemented have changed over time as the conception of the interrelationships between society, economy and environment have developed (Ghimire and Pimbert 1997).

Protected areas were originally proposed as a mechanism to preserve a pristine ‘wilderness’, where human access and inhabitation were prohibited or severely restricted (Gomez-Pompa and Kaus 1992). This protectionist approach was based on the notion that biodiversity is best maintained in isolation from human interaction (Blakie and Jeanrenaud 1997). Known as a ‘fortress’ or a ‘fences and fines’ approach, the implementation of protected area under this paradigm often entails the displacement of local populations based on the assumption that humans use natural resources in irrational ways, leading to environmental degradation (Brockington 2002, Cernea 2006). However, this does not reflect the reality of many places, where humans are integrated in ecological systems (Gomez-Pompa and Kaus 1992, Gadgil, Berkes et al. 1993). Dynamic interactions exist between societies and nature, meaning that simple conceptions such as ‘stressor’ or ‘manager’ may not accurately reflect the role of local peoples in protected areas (Berkes 2004). Where people have existed in an ecosystem for many generations, local knowledge and institutions developed over time may contribute to the maintenance of environmental condition (Berkes, Colding et al. 2000).

The recognition of humans’ role in natural systems and the need to address well-being has informed the development of conservation approaches such as integrated conservation and development projects (ICDPs) and community-based conservation (Kremen et al., 1994, Brown, 2002). This people-oriented paradigm shaped the conservation agenda throughout the 1990s and involved prioritising the participation of local communities in environmental conservation, with the objective of attaining simultaneous beneficial outcomes for human development and the environment (Gomez-Pompa & Kaus, 1992, Brown, 2002).
The extent to which these integrated outcomes can be delivered via protected areas has divided opinion. Human development and environmental conservation have often been considered fundamentally incompatible goals (Brandon, Redford et al. 1998, Terbough 1999, Barrett, Bulte et al. 2013). This perspective has been criticised as being based on incomplete reasoning, whilst also being operationally unrealistic and morally questionable (Wilshusen, Brechin et al. 2002).

Agrawal and Redford concluded that, “if conservation strategies distress human populations, especially those who are less powerful, politically marginalized, and poor, little that conservationists argue on behalf of biodiversity makes sense” (Agrawal and Redford 2009 p.1). Impassioned debate on approaches to conservation continues (Marvier 2014, Miller, Soulé et al. 2014).

Recent research suggests that the social and economic outcomes of protected areas for local inhabitants is a stronger predictor of conservation outcomes than the physical and management characteristics of the reserve (Oldekop, Holmes et al. 2016). Addressing the welfare of those who live in or near protected areas may be crucial to achieving conservation outcomes (Solorzano and Fleischman 2018). A review of 60 areas protecting tropical forests conducted by Laurance et al. (2012) showed that half were experiencing high rates of erosion of biodiversity and ecological function. Environmental change in the immediate surroundings was a predictor of the ecological health of the reserve, with hunting and the exploitation of other forest products also predicting declining reserve condition (Laurance, Useche et al. 2012). Additionally, the reserves in which socioeconomic benefits were reported as being derived from the protected area were also more likely to produce positive outcomes for conservation. These benefits occur jointly when reserves are managed to support the sustainable use of natural resources rather than strict protection (Oldekop, Holmes et al. 2016). Protected areas, rather than excluding and alienating communities, must involve the people that form part of that system and address their welfare needs (Western and Wright 1994, Sunderland, Ehringhaus et al. 2007).

Ongoing research tries to identify characteristics that make conservation and development projects successful, examining aspects such as: the role of institutions (Barrett, Brandon et al. 2001, Vatn
2010); the importance of a complex and multilevel perspective (Berkes 2007); and the need for consideration of power and inequality (Van Hecken, Bastiaensen et al. 2015). Environmental conservation approaches that focus on simple solutions, to the neglect of local context, including history and culture, often fail to achieve the conservation of natural systems (Ostrom, Janssen et al. 2007, Ostrom and Cox 2010). Some argue that practitioners and policy-makers must use a transdisciplinary approach, embracing fields such as traditional ecological knowledge, commons research, political ecology and environmental ethics (Berkes 2004, Berkes 2007, Ostrom, Janssen et al. 2007, Ostrom and Cox 2010). Evidence suggests that protected areas can be successful in achieving integrated outcomes under certain conditions, such as consideration of the socio-economic and political context. Outcomes are improved when co-management arrangements exist that maintain the cultural and livelihood benefits that local people receive from protected areas (Persha, Agrawal et al. 2011, Oldekop, Holmes et al. 2016). Neglecting to consider the social dimension of a socio-ecological system in the implementation and management of protected areas can create environmental conflict and disadvantageous social and environmental outcomes (Oldekop, Holmes et al. 2016). Concurrently, exclusionary approaches have been shown to cause exceptionally high costs for local populations, without necessarily achieving the expected conservation outcomes (Schroeder 1999, Brown 2002, Cernea and Schmidt-Soltau 2006).

2.2.2. Protected areas in Brazil
In Brazil, protected areas fit within two broader categories; reserves under strict protection and those that allow sustainable use. Strict protection classifications generally do not permit private areas within them and public visitation is either prohibited or subject to conditions. Sustainable use classifications generally allow human occupation and some use of natural resources, in accordance with a management plan. Protected areas can be legislated by any sphere of government; local, state or federal. They are classified according to their management objectives and largely correspond with the categories established by the International Union for Conservation of Nature (IUCN) (Appendix 1). Management objectives and the corresponding restrictions for access and land use must be determined and enforced by the sphere of government that created the reserve, according a management plan elaborated specifically for the protected area. For
ecosystems with particularly high value, protected areas can be legislated by different spheres of government and can overlap, leading to challenges for the coordination of management activities.

2.2.3. The costs and benefits of protected areas

Maintaining healthy and resilient natural systems generates many benefits, but also entails economic and social costs. Where a protected area is implemented, costs concentrate at the local level, while the benefits, such as dispersed environmental services like climate regulation and carbon sequestration, as well as option, existence and bequest values, are enjoyed largely by the global community (Balmford and Whitten 2003). This unequal distribution of the costs and benefits of conservation is of particular concern in creating socially equitable conservation, as the distribution at global and local scales of these costs and benefits can reinforce existing inequalities between and within countries (Adams and Hutton 2007, Holmes 2007, Oldekop, Holmes et al. 2016). Land use restrictions associated with protected areas place limitations on access to natural resources that support economic, cultural and spiritual practises. Economic opportunities can be reduced and cultural continuity degraded as traditional practises are criminalised and people become displaced (Balmford and Whitten 2003, West, Igoe et al. 2006, Adams and Hutton 2007, Agrawal and Redford 2009, Beazley 2009, Oldekop, Holmes et al. 2016).

Local governments will also inevitably bear the costs of hosting protected areas within their jurisdiction. Local authorities rarely have the opportunity to influence decisions about the imposition of protected areas, and are mostly uncompensated for the associated costs (Ring 2008). Aside from specific areas with high levels of nature-based tourism or another economic interest specific to the natural environment, it is economically rational for local governments to be disinterested in, or even opposed to, the designation of protected areas in their territory (Ring 2008). Protected areas can limit the development of infrastructure and services necessary to support the population, thereby reducing options for economic productivity (Droste, Lima et al. 2015). The high cost of conservation for local authorities may also create a misalignment of conservation interests across spatial and political scales (Balmford and Whitten 2003). In a sense, local actors become forced providers of ecosystem services, suffering the associated costs and
reduced options for income generation. This situation is neither effective or efficient for conservation or human well-being (Ring 2008).

2.2.4. Protected areas and the role of compensation

It has been asserted that the long-term maintenance of a protected area depends on the consent, support and participation of the local population (Kremen, Merenlender et al. 1994, Adams, Aveling et al. 2004). Conservation that is considered illegitimate or inequitable by local populations will be resisted both overtly and covertly, and positive outcomes may be jeopardised (Ostrom and Cox 2010, Cavanagh and Benjaminsen 2015). Concurrently, the perception of legitimacy and equity in conservation programmes is an integral factor of their long-term success (Ostrom and Cox 2010). Others argue that to affirm that community support is necessary for the viability of protected areas is to perpetuate the myth that local forces can overcome a powerful alliance for conservation that often includes government agencies and international conservation organisations (Brockington 2004). Whilst local forces will rarely prevail in influencing conservation decisions taken at higher levels, the way communities interact with protected areas after their establishment may be influential on the quality of conservation achieved and the well-being of the people involved (Rochadelli, dos Santos et al. 2015). Acknowledging the local costs of conservation and providing compensation accordingly is considered important to the success of conservation endeavours (Rosa, Kandel et al. 2004).

Environmental payments are considered a promising opportunity in a policy-mix for conservation (Barrett, Bulte et al. 2013). Payments may have the potential to address the costs of conservation borne by those who have direct influence on the management (or mismanagement) of the ecosystems that provide environmental services (Ring 2008). Payments can reduce the social costs implied by protected area regulation (Ring, Drechsler et al. 2010). Compensation for land use restriction may change a mindset that perceives protected areas as an obstacle to well-being (Droste, Lima et al. 2015), thereby aligning local economic interests with regional and global conservation objectives. When given monetary value, protected areas may be seen as an asset rather than a burden, thus giving communities an incentive for maintenance and management (Ring 2008). Environmental payments can stimulate a local agenda for sustainable development,
potentially reducing poverty, improving perceptions of protected areas, and easing conflict between communities and conservation (Ring 2008, Milder, Scherr et al. 2010, Borie, Mathevet et al. 2014). One environmental payment mechanism that may address these issues is ecological fiscal transfers.

### 2.2.5. Ecological fiscal transfers

Ecological fiscal transfers (EFTs) refer to the distribution of tax revenue from central to local government based on ecological criteria. Many economic instruments available for conservation target private landowners; however, EFTs are always performed between levels of government, which may contribute to the transferability of the instrument from place to place (Santos, May et al. 2014). An EFT from Brazil, known as the Ecological ICMS, provides the longest running example of this type of mechanism, whereby tax revenue from the circulation of goods and services is redistributed to benefit municipalities that harbour protected natural systems.

### 2.3. The ecological ICMS

Brazil is a megadiverse country, hosting a considerable proportion of the world’s biodiversity, and over a quarter of its territory is designated as a protected area of one form or another (Veríssimo, Rolla et al. 2011). Whilst protected areas are crucial to Brazil’s efforts to protect its natural heritage, their implementation can imply high local costs and has long been a source of conflict (Diegues 1995, Hochstetler and Keck 2007). In recognition of the costs associated with the presence of protected areas in municipal territory, many Brazilian states have legislated an ecological fiscal transfer known as the Ecological ICMS (ICMS-E). It is the oldest example of an EFT globally and was the first economic instrument to pay for forest ecosystem services in Brazil (May, Veiga et al. 2002).

The ICMS (known domestically as imposto sobre circulação de mercadorias e serviços) is an essential source of tax revenue for state and municipal governments (Soares, Gomes et al. 2011). It refers to tax levied on sales and services marketed beyond municipal boundaries and applies to transportation, communication services and general supply of goods, similar to value added tax in other countries. The governments of each state levy the ICMS, and, as defined by the constitution,
25 per cent of this revenue is returned to the municipalities within that state (Figure 2). Three quarters of this total is returned to municipalities based on their economic output, hence municipalities with more economic activity receive a greater share of ICMS revenue. The remaining quarter (i.e. 6.25 per cent of the total ICMS) is distributed based on criteria defined by each state government, for example population, area or agricultural production. State governments determine these criteria in order to address distributional equity or to incentivise particular activities.

Figure 2. Distribution of ICMS between state and municipalities

Seventeen Brazilian state governments have included environmental distributive criteria and this has become known as the ICMS-E. The environmental criteria which constitute the ICMS-E differ from state to state and cover diverse themes from soil conservation and fire prevention to solid waste management and the organisation of municipal structures for environmental management (Hempel 2006). In some cases, innovations have occurred such as the use of socio-environmental criteria (Schneider 2013) and the fostering of public-private partnerships for conservation (May, Veiga et al. 2002). The percentage allocated to ecological criteria varies from 0.5 per cent to 13 per cent of the portion available for flexible distribution. There is no uniform ICMS-E; the
mechanism is legislated independently by each state, each version with different formulations, mechanisms and objectives.

The ICMS-E is considered to be important in Brazil because it represents a movement away from polluter-pays policies, instead promoting the rationale of protector-receiver (Hempel 2006). Others consider the ICMS-E interesting as it partly decentralises nature protection, potentially benefitting from local knowledge and accounting for local preference in environmental decision making (Droste, Lima et al. 2015). By introducing ecological criteria into an existing fiscal transfer mechanism, the ICMS-E builds on existing institutions and administrative procedures, resulting in low transaction costs (Ring 2008, Droste, Lima et al. 2015). Positive impacts from the ICMS-E are thought to include; increases in coverage and quality of protected areas, reduced rates of biodiversity loss, strengthening of state and municipal environmental institutions, increases to the municipal public budget, introduction of environmental agendas in small towns, improved support for protected areas from communities, positive impacts on lives of traditional peoples, increased public-private partnerships for conservation and furthering the attainment of broader targets such as the Sustainable Development Goals (Denardin, Loureiro et al. 2009, Nascimento, Van Bellen et al. 2010, Schneider 2013, Santos, May et al. 2014, The Nature Conservancy 2014, Young and Castro 2017).

2.3.1. Compensation or incentive?

Whilst funding from EFT can be considered as compensation for the costs of conservation borne by local actors, in some Brazilian states the ICMS-E has been developed to include incentives for environmental conservation and sustainable development at the local level (Droste, Lima et al. 2015). By linking the amount of the ICMS-E received to local environmental performance, local authorities with better environmental outcomes receive a greater proportion of the ICMS-E. Environmental performance may be based on the creation of new conservation areas, the maintenance or improvement of existing reserves or the development of local environmental policy, with the specifics varying from state to state (Schneider 2013, Conti, de Azevedo Irving et al. 2015). This incentive effect draws attention to the ICMS-E as it can stimulate and fund local
environmental action. Some consider the ICMS-E the most important incentive for environmental preservation that exists in Brazil (Nascimento, Nascimento et al. 2013).

The incentive that the ICMS-E offers for the creation of municipal protected areas will vary greatly, even within the same region, due to the variability in the potential of creating ICMS tax revenue from land use practises (Grieg-Gran 2000). Simulations have shown that for some municipal governments, protected area creation would generate far higher returns from the ICMS-E than alternative land uses such as farming or ranching. Other municipalities would experience a huge reduction of ICMS revenue if land were converted to protected areas, meaning the effect of incentives will not be uniform across space (Grieg-Gran 2000).

The incentive effect can also be limited by its own success. The ICMS-E available for distribution in any one year is proportional to the state revenue collected through the ICMS tax. Additional creation of protected areas or other municipal conservation activity may lead to a dilution of payments, forcing municipal governments to compete to provide more ecosystem services for lower returns (Ring 2008, May, Gebara et al. 2012).

2.3.2. Administration
The administration of the ICMS-E varies from state to state. In some states, local authorities are not required to take any action to receive the revenue, with the ecological portion of the ICMS transferred automatically to municipal accounts. In other states, municipalities must meet certain conditions to receive the funding, for example having a functioning environmental council and environmental fund (Loureiro 2002). Generally state agencies are responsible for determining which municipalities are eligible to receive the ICMS-E. The ICMS-E enters municipal accounts on a weekly basis. Depending on the system of that particular state the ecological portion can be delivered in a lump sum with the rest of the ICMS that is passed from the state government to the municipal government (known as a pass-through), or be separated. In the former case, local authorities may not know the value of the ICMS-E received by their municipality, unless it is proactively calculated.
2.3.3. Earmarking and reporting
The ICMS-E is not ring-fenced or earmarked, so municipal governments may spend it as they see fit, with constitutional barriers preventing state government dictating how ICMS funding is used locally. The constitution requires that municipal governments invest at least 15 per cent of their total annual budget in health services and not less than 25 per cent in public education. There are no requirements to specifically report on how the ICMS-E is spent. Municipalities are legally obliged to report all expenditures, however there is a lack of enforcement and follow up leading to little transparency in the application of municipal budgets (May, Gebara et al. 2012). This lack of transparency means there is little knowledge of how ICMS-E revenue is being spent or the existence of any elite capture of benefits.

2.4. Outcomes of the ICMS-E
2.4.1. Protected area increase
Whilst an increase in protected area coverage is stated as a major potential outcome of the ICMS-E (Tabarelli, Pinto et al. 2005, Júnior, Salm et al. 2007, Ring, Drechsler et al. 2010), little research exists on whether the implementation of the ICMS-E actually results in any significant change in protected area coverage. Large increases in protected area extent are present in some cases. For example, the protected area coverage in Mato Grosso state increased by 276 per cent in the first 11 years after the ICMS-E was implemented (Schneider 2013) and in Minas Gerais state by 400 per cent in nine years (Fernandes, Coelho et al. 2011). However, these are not notably greater than those recorded elsewhere in Brazil at this time. A comparison of the increase of protected area implementation in states both with and without the ICMS-E showed no significant relative increase in protected area implementation after the enactment of the ICMS-E (May, Gebara et al. 2012). The presence of the ICMS-E mechanism does correspond with higher total protected area coverage per state, however this may be because the ICMS-E was introduced in states where compensation is most needed for the many municipalities hosting protected area (Droste, Lima et al. 2015).

The incentive effect of the ICMS-E does appear to have stimulated the creation of municipal protected areas, implemented and managed by local governments (May, Gebara et al. 2012, Droste, Lima et al. 2015). In Minas Gerais state the number of protected areas legislated by local
government increased from six to 155 in the first nine years after the ICMS-E was implemented (Fernandes, Coelho et al. 2011). However, because of the generally small extent of municipally managed reserves they do not represent a significant part of a state’s overall coverage (May, Gebara et al. 2012). The municipal response may also be short-lived, occurring for just a few years after the implementation of the ICMS-E (May, Gebara et al. 2012). This may be due to the limited availability of municipal area which has appropriate characteristics for conservation, a reduction in interest in the mechanism after the end of early awareness campaigns during implementation or changes in state and federal politics (May, Gebara et al. 2012). It must therefore be concluded that there is no definitive evidence of significant expansion of protected area due to the presence of the ICMS-E.

2.4.2. Strengthening of municipal environmental agenda

The way that the ICMS-E is legislated can influence the environmental agenda of a local government. In Tocantins state in central Brazil, the ICMS-E was legislated specifically to support municipalities that engage in the application of Agenda 21. Funding is linked not just to protected area but also to municipal environmental policy, soil and water conservation, slash and burn control, solid waste disposal and sanitation systems. Municipal investment in environmental programmes increased by 500 per cent in some cases, which in turn led to larger returns from the ICMS-E establishing a virtuous cycle (Schneider 2013). In Rio de Janeiro state local governments that create protected areas are able to access a higher percentage of the ICMS-E pass-through than those who host federally managed or state managed protected areas. Local governments in Rio de Janeiro also must possess a municipal environmental system comprising of an environmental council, fund, and administrative organ to execute environmental policy and employ a municipal environmental guard (Conti, de Azevedo Irving et al. 2015). Depending on the legislative framework and local capacity, the ICMS-E can strengthen the environmental agenda of local government.

2.4.3. Municipal budget

There are numerous cases where the small percentage of the ICMS allocated to environmental criteria represents 60-70 per cent of the total ICMS returned to municipalities (Schneider 2013).
In some cases, the ICMS-E represents over 80 per cent of a municipality’s total budget (Campos 2000). However, a study of the ICMS-E in Minas Gerais state showed that the implementation of the ecological criterion only positively affected 60 per cent of municipalities with protected areas. For the other 40 per cent the reduction of weights given to other criteria outweighed the benefits received from the ICMS-E (Grieg-Gran 2000). In Minas Gerais however, municipalities that have invested in environmental conservation have seen increases of 200 per cent in returns from the ICMS-E (Júnior, Salm et al. 2007). If municipalities are able to capitalise on the incentives offered by the ICMS-E they may be able to improve overall municipal revenue.

2.4.4. Distributional equity effects

Poverty is not necessarily related to the presence of protected areas and many poor municipalities may have no conservation areas and no areas with conservation potential. The use of ecological criteria that are based on the presence of protected areas excludes these localities from accessing a parcel of the ICMS and reduces other weightings, potentially decreasing their overall ICMS revenue. This was seen in Rondônia state, where some of the poorest municipalities had their revenue reduced when the ecological criteria were implemented (Grieg-Gran 2000). However, in Minas Gerais, whilst the implementation of the ICMS-E implied losses for 90 per cent of municipalities, it slightly increased the share of the ICMS distributed to the poorest municipalities (Grieg-Gran 2000). It has been suggested that the regressive effects of the mechanism can be minimised if implemented as a package with criteria jointly responding to social and environmental objectives jointly (Grieg-Gran 2000). In some states this has already been included in the legislation; for example, Pernambuco, where the legislation is known as the socio-environmental ICMS (Sobral and Silva Junior 2014).

2.4.5. Impacts on traditional populations

It has been suggested that the ICMS-E may improve the quality of life of traditional populations (Loureiro 2002, TNC n.d.). However, studies that examine the impact of the ICMS-E on traditional populations are limited. A noteworthy study from Mato Grosso state details a payment made by the local government to an Indigenous community to assist in costs associated with the maintenance of their reserve, including patrols to prevent poaching and illegal extraction (May,
Gebara et al. 2013). The Faxinal communities in central Paraná state are recognised by the state government as having a way of life that supports the conservation of the area they inhabit (Lemes 2015). Several municipalities transfer the percentage of ICMS-E that corresponds to the territory of the Faxinais to a community association; however, there is little information available on the significance and outcomes of this transfer (Lemes 2015). Traditional populations in Brazil encompass a great diversity of groups and further research is required to understand how and if the ICMS-E influences the ability of traditional communities to sustain their culture and livelihoods.

2.5. Current research gaps

EFTs are considered to have potential for achieving joint outcomes for conservation and development and there is interest in identifying how the Brazilian example can be emulated or adapted elsewhere (Droste, Ring et al. 2018) Claims are made about the potential of the ICMS-E to achieve a broad range of positive outcomes, including the promotion of local agendas of sustainable development (Hempel 2006), improving local institutional capacity by providing budget and structure (Loureiro 2002), and improving the situation of traditional populations (TNC n.d.). Whilst the environmental outcomes of the ICMS-E have not been clearly established, even less is known about the social outcomes of this policy. Knowledge is lacking about whether payments contribute to improving the social equity of protected areas, or if benefits are subject to elite capture. It is not well understood how the ICMS-E can be applied to sustain local culture and livelihoods, including supporting traditional and Indigenous populations that harbour local ecological knowledge and preservationist cultures. Environmental payments can change local perceptions of conservation, potentially reducing conflict (Ferraro and Kiss 2002, Souto, Deichmann et al. 2014), yet there is no evidence of these processes with consideration of the ICMS-E. It is unknown if the ICMS-E functions in the way it was intended by legislators, or if it interacts with local socio-political and institutional contexts to produce unintended outcomes. Little is known about how to institutionalise options for the use of EFTs to support conservation and sustainable development (Santos, May et al. 2014), and very little research exists which examines how local power dynamics impact on the distribution of the costs and benefits of the policy.
The way that environmental payments are appropriated locally is fundamental to the outcomes achieved for conservation and well-being. Local appropriation also has implications for equity and social justice, the recognition of traditional peoples and the maintenance and improvement of the conservation of biodiversity and other natural values. To the author’s knowledge there is no published research which examines social, institutional, political, economic and environmental interactions to observe aspects of the local context that influence the outcomes of the ICMS-E. May et al. (2013) made an important contribution to knowledge about the ICMS-E by examining its outcomes in two municipalities in the state of Mato Grosso. They questioned the cost-effectiveness of the ICMS-E for conservation, how to promote fairness in its allocation and what institutional and legal arrangements could promote equity and effectiveness at the local level (May, Gebara et al. 2013). This thesis extends this knowledge base with case studies from São Paulo and Paraná states, and incorporates findings on factors such as the how the distribution of power determines outcomes of the ICMS-E payments and elite capture of benefits. This research adds to knowledge on how environmental payments can contribute to establishing socially equitable conservation that attends to the development and well-being needs of local populations.

2.6. **Research approach**

Researchers examining how environmental payments may reconcile the requirements of human society and natural systems have been criticised as taking an ‘armchair’ approach (Van Hecken, Kolinjivadi et al. 2018). Theoretical interpretations of payment schemes, made without input from people experiencing the schemes first hand, has led to recognition of the importance of a situated approach. A situated approach may allow a sufficient level of nuance in the interpretation of human-nature relations under different conditions to illustrate the potentials and barriers of different payment programmes (Van Hecken, Kolinjivadi et al. 2018). There have been calls for the research agenda on environmental payments to take an actor-oriented approach, to consider culture, power, knowledge, and inequality, and the historical processes that have created these contexts (Muradian, Corbera et al. 2010, Van Hecken and Bastiaensen 2010, Van Hecken, Bastiaensen et al. 2015, Kolinjivadi, Van Hecken et al. 2017).
Environmental payment interventions must be examined at the level at which they effect change, where the local context adapts and interprets policy to produce results (Van Hecken, Kolinjivadi et al. 2018). The meaning and implementation of policies are negotiated and transformed from their central design to their application at the level of resource use (Clement 2010). The gap that exists between rhetoric on the potential of payments for conservation and their actual outcomes should consider the institutional and social setting, with greater attention placed on the socio-ecological contexts in which payments occur (Van Hecken, Kolinjivadi et al. 2018). When focus is placed on the science of ecosystem services, the social and political roots of environmental conflicts can be ignored. Ecosystem services interventions should not be treated separately from the social and political contexts in which they interact (Kolinjivadi, Van Hecken et al. 2017).

Consequently, this research has taken a qualitative, multiple case study approach, where the ICMS-E is examined both at its conception and formulation at the state level, and in its interpretation and application at the municipal level, with input from a wide variety of stakeholders. This approach allowed a nuanced understanding of the local context within which the ICMS-E functions.

### 2.6.1. **Why take a case-based and qualitative approach?**

Qualitative research aims to understand some aspect of social life, and is characterised by its methods, which generally generate words, rather than numbers, as data for analysis (Patton 2002). Qualitative research enables the in-depth study of a broad array of topics. Because of its relevance to a diversity of disciplines it is difficult to arrive at a single definition of qualitative research; rather, this approach has specific characteristics (Yin 2011). Qualitative research studies the meaning of people’s lives under real-world conditions, allowing for insights into the views and perspectives of participants and the contextual situation, including the social, institutional, and environmental conditions within which people’s lives take place. These factors may strongly influence human events and are difficult to explain using other methods. Qualitative research provides insights into concepts that may help to explain social behaviours and utilise multiple sources of evidence (Yin 2011).
Case studies are a useful study design when the contextual conditions are relevant to the phenomenon under study (Yin 2009). Case studies, employing qualitative methods, enable in-depth exploration of the complexity and experience of programmes and policies, and interpretation of findings with consideration of precise socio-political and historical contexts in which they are enacted (Simons 2009). Case studies can record multiple, conflicting and convergent perspectives and demonstrate the influence of key actors and interactions to explore policy in action. Additionally, case studies are responsive to unanticipated consequences of programmes in practice (Simons 2009).

A multiple case study approach enables the exploration of differences between cases, analysing aspects within and between the settings. Cases must be chosen carefully to either predict similar results or contrasting results, based on existing theory (Yin 2009). The two case studies chosen for this research had similar socio-economic and environmental contexts, yet experience different versions of the policy examined and thus contrasting results were expected. The use of a multiple case study approach facilitated a nuanced understanding of the local context within which two versions of the ICMS-E played out. Payments for conservation do not exist within a vacuum and may overlap and interact with pre-existing policies, and involve the interests of multiple tiers of organisation (Polski and Ostrom 1999).

Case study research relies upon the use of multiple sources of data, a strategy which increases the credibility of the research (Patton 2002). Data from multiple sources, including but not limited to documentation, interviews, direct observation or archival material, are converged in the analysis process. Each piece contributes to a fuller understanding of the phenomenon in question so that predictions about the similarity or contrast of results from each case study can be predicted by theory (Yin 2009). The use of a qualitative case study approach in this research allowed a more in-depth consideration of the diverse requirements for policy analysis identified in academic scholarship, such as: the multiple levels at which the ICMS-E interacts, the pre-existent policy scenario into which it has been implemented, the importance of the perspectives of local resource users, and the historical roots of environmental conflict which often influence the outcomes of

The inferences that can be drawn from case studies are not stated as generalisations or formal propositions, rather they stem from a qualitative database and appeal to a tacit approach and situated understanding for their link to other settings (Simons 2009). The usefulness of findings for informing policy depends upon acceptance of the different ways in which validity is established and findings communicated. However, the aim of case studies is usually not to make policy generalisations. Instead, case study research intends to present a rich portrayal of a setting to inform practice and add to knowledge on a specific topic (Simons 2009). The credibility and validity of case study research can be improved by the explicit consideration of these aspects throughout the design, enactment, analysis and reporting processes.

2.6.2. Validity
All research, whether qualitative or quantitative, must have quality control to ensure robust, credible and valid findings (Tong, Sainsbury et al. 2007). A valid study is one where data have been properly collected and interpreted so that conclusions accurately reflect and represent the real-world context from which the data were gathered (Yin 2011). This research addressed validity through a variety of strategies. Data gathered through interviews was triangulated against other sources of data such as document analysis to examine consistency. The triangulation of researcher-generated data against existing information is useful in verifying the robustness of findings, rather than assuming accuracy in research participants statements (Yin 2009). A reflexive journal enabled ongoing comments to be made on methods and sampling decisions and to reflect on how my presence may have been influencing the responses given. Rival explanations were also sought so that the research design and findings were not shaped by biases and preconceived notions (Patton 2002). Alternative explanations can exist at all stages of the research process, and examining them ensures that misleading information has the opportunity to be given a counterpoint (Yin 2011). Rivals explanations were sought inductively, by looking for different ways of organizing the data that might lead to different findings, and logically, where alternative logical possibilities were examined to see if they could be supported by the data (Patton 2002).
2.6.3. Positionality

Qualitative research contributes to understanding the suite of interactions and influences relevant to a particular phenomenon. Findings will be subject to the possible biases and subjectivities of the researcher (Tong, Sainsbury et al. 2007). A researcher’s beliefs and value systems are inseparable from the research process and informed by their education, ethnicity, life experiences, education and many other factors. The position of the researcher should be acknowledged, particularly with reference to how it may influence the conduct and conclusions of a study (Tong, Sainsbury et al. 2007). Where interviews are conducted the information provided is always a function of the interviewer and interview situation (Briggs 1986). Whilst undesirable consequences can be prevented through careful and robust research design, (for example by avoiding asking leading questions), it is impossible to remove the effect that the researcher has. What is important is to understand the how the interviewer may be influencing the responses given and consider this throughout a reflexive process (Yin 2009).

Additionally, as a ‘foreign’ researcher, that is, my cultural identity, language and history were different from the subjects of my study, it was extremely important to promote a ‘culturally responsive’ approach in all aspects of my research (Chouinard 2014). This implies the recognition that context and culture are not just related to demographics but to the diversity of values present in the study site and less articulated issues of power, racism and economic, class and gender issues. The relationship between the researcher and the participants is of high importance, with the challenge of understanding how this shapes interactions and whether my role could sufficiently capture the situational and cultural complexity of the object of study in its context (Chouinard 2014). Consideration of ethical implications has been an ongoing, reflexive process throughout the development of this thesis, further elaborated below.

Whilst I have always attempted to approach this research without preconception or bias, my presence and interpretation have inevitably influenced my results at every stage. I lived in Brazil for four years prior to conducting this research; much of this time was spent in São Paulo city. The experience of living in Brazil and developing significant personal relationships in the country were
important elements in the decision to undertake research on a Brazilian policy instrument, despite being a PhD candidate at an Australian institution, and Australian myself. During the time living in São Paulo I developed good Portuguese language skills, allowing me an ability for interaction not necessarily afforded to other foreign researchers. I was also exposed to Brazil’s exuberant and wonderful nature, its diverse, but without exception, warm culture, and also to its high levels of social, economic and political inequality and environmental struggles.

The case study approach may have certain shortcomings, including the difficulty in processing large quantities of data, the subjectivity of the researcher, the way in which inferences are drawn from a single case, and the usefulness of findings to inform policy (Simons 2009). Helen Simons (2009) addresses these concerns at length, concluding that they need not be limitations, but rather a question of perception and interpretation. For example, the subjectivity of the researcher need not be a problem. Appropriately monitored, reported and disciplined it may be an essential element of understanding and interpreting the case (Simons 2009). A reflexive approach, where there is constant scrutiny of the relationship between the researched and the researcher, enables self-awareness. Within this process the position of the researcher does not need correcting, rather, the influence that the researcher’s perspective has on their choices may be beneficial in allowing them to use their unique skills and expertise (Blair 2015).

2.7. Research design

2.7.1. Case studies

São Paulo and Paraná were chosen as the research sites due to the length of time since the ICMS-E was enacted in each state, the divergent paths that the ICMS-E legislation has taken despite similar origins, and their important ecological role in hosting remnant Atlantic forest. From each state a municipality was selected, Guaraqueçaba, in Paraná and Cananéia, in São Paulo. Their municipal boundaries meet at the state border, although there is not direct connection by road (Figure 3). The two municipalities exhibit similar characteristics in that both are amongst the poorest municipalities in their respective states and both are within one of the largest remnants of Atlantic forest, with the majority of their territories under environment protection (Figures 4, 5 and 6). The ICMS-E provides a significant source of revenue for each municipality, yet each
municipal government operates under a very different ICMS-E compensation scheme. These two version of the ICMS-E are described in detail in Chapter 3.
Figure 3. Location of case study municipalities. Data source: UNEP-WCMC (2018).
Figure 4. Protected areas in the Municipality of Guaraqueçaba, Paraná State. Protected area coverage compiled from SPVS (2009), ICMBio (2018) and UNEP-WCMC (2018). Road network from CIESIN and ITOS (2013). For translation and description of protected area categories see Appendix 1.
Figure 5. Protected areas in the municipality of Cananéia, São Paulo State. Data source: UNEP-WCMC (2018). For translation and description of the protected area categories see Appendix 1.
Figure 6. Remnant Atlantic forest in the study municipalities and surrounding region. Data source: SOS Mata Atlântica and INPE (2016)
2.7.2. Sampling process

This research used a multi-faceted sampling strategy, necessary due to the range of participants needed to provide credible data, and the large differences in the visibility of target groups. Samples that specifically capture heterogeneity in a population may generate conclusions that adequately represent the entire range of variation and not just a small subset of views (Yin 2011). The sampling techniques used were purposeful and snowball, using reputational and positional criteria (Tansey 2007).

Purposeful sampling is a strategy employed to select particular individuals for the important and unique information that they can provide (Patton 2002). Purposeful sampling should seek to recruit participants who might offer contrary views in order to provide opportunity to test for rival explanations (Yin 2011). Purposeful sampling can be used to illuminate the reasons for differences between settings or individuals, and is commonly used in qualitative multiple case studies, such as this one. Snowball sampling is a useful strategy when the population of interest is not fully visible, as in the politically marginalised groups relevant to this study. The participants chosen through the snowball technique were also chosen for a purposive reason, that is, for the additional information they could provide, to avoid a common problem of this technique where participants suggest others with similar characteristics to themselves (Tansey 2007).

Reputational criteria refer to the participation of individuals with particular expertise that is likely to be informative and advance the research aims (Scott 2017). This included the recruitment of actors involved in the design and legislation of the original ICMS-E and subsequent evolutions, or in the case of São Paulo where the legislation has not changed, those involved in attempts to alter the design of the mechanism. Positional criteria refer to the recruitment of individuals who are members of previously identified groups which will provide information relevant to the research (Scott 2017). In this research, the groups identified belonged to local, state and federal government agencies, civil society groups and individuals at the municipal level, reserve owners and managers, non-government organisations with local and regional interests and university academics conducting long term research in the region or on the ICMS-E in general (Table 1).
Where possible, contact was initiated with participants via email or phone to determine the level of interest in participation and guarantee recruitment before travel to Brazil was initiated. However, in many cases, initial contact could only be made in person due to the lack of internet and phone services available in the case study region. For some stakeholder groups, particularly local government, personal contact was also required to initiate the recruitment process due to limited response rates to emails and phone calls. My physical presence in the reception area of the municipal building stimulated a better response.

2.7.3. Questionnaire design

In order to accurately assess the ICMS-E within the pre-existing policy context and cultural setting, the interview instrument (Appendix 2) was designed to cover four main themes: (1) The policy context, included questions on the conservation regime in place and how other policy interventions were perceived by stakeholder groups. Questions allowed for the examination of the different perceptions of conservation that existed between stakeholder groups. (2) Design of the ICMS-E, which revealed the processes of the original policy formulation, subsequent attempts at evolution and the intentions of those involved in its conception in each state. (3) Interaction, which examined how the ICMS-E functioned at the local level, for example, knowledge of the mechanism among stakeholder groups, interactions between parties and opportunities for community participation. (4) Outcomes of the ICMS-E, covering the implementation and application of ICMS-E resources at the municipal level, its perceived and actual outcomes and general impressions of the policy. Suggestions for improvement were sought from those with expertise or experience.

The questions used were targeted at the stakeholder group to which the participant belonged; for example, questions about the design of the instrument were directed to members of the environmental agencies, not community members (Table 1). Questions that regarded specific activities, such as the functioning of a municipal environmental council, were only directed to those with appropriate knowledge and experience. The questionnaire was also slightly different between the states due to the different policy processes and evolutions of the ICMS-E mechanism in each place, with that context making some questions irrelevant and others pertinent. The language used in the survey questions was always simple and non-technical.
Table 1. Stakeholder groups and interview themes

<table>
<thead>
<tr>
<th>Stakeholder group</th>
<th>Number of participants</th>
<th>Themes included in the interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paraná</td>
<td>São Paulo</td>
</tr>
<tr>
<td>Protected area managers (federal, state and private)</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>State Government</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Municipal government</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Community members</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>NGOs</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Academics</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Plus one researcher who had general knowledge of the ICMS-E</td>
<td></td>
</tr>
</tbody>
</table>

2.7.4. Data collection and analysis

Data were collected both in the municipalities and the state capitals, and on three occasions, to capture participants in other locations around Brazil, via Skype or phone. I was based in São Paulo city and visits were made to other locations. Two visits were made to Cananéia, one to Guaraqueçaba, due to higher difficulty of access, and two to Curitiba, the capital of Paraná state between May and September 2016. The total time spent in each municipality was around three weeks.

Participants were interviewed in Portuguese, except one case where the participant was a native English speaker. Interviews were audio recorded and transcribed. They took place in cafes, offices, living rooms, on front verandas and boats and occasionally by phone or Skype. They lasted between half an hour and two hours. Interviews were semi-structured, guided by open-ended questions, which allowed interviewees to direct the flow of conversation to the themes they considered most significant (Bernard 1995).
The data collected via interviews was supplemented by primary and secondary documentation, including scientific papers, federal, state and local legislation, justifications and decrees, publications from the public prosecutor’s office, government websites, protected area management plans, reports on projects undertaken in the region by NGOs, local and regional newspaper articles, historical documents and demographic and economic census data. This information allowed for triangulation of themes that arose from data generated by interviews.

The software program Nvivo 9 was used to manage, code and qualitatively analyse the transcripts and documental material. Data analysis began with a reading of all material to achieve immersion, followed by rigorous and systematic reading that enabled the derivation of themes, or codes (Miles and Huberman 1994). The process of coding refers to carefully reading and distinguishing sections of text according to the themes it embodies. Each code represents one concept and multiple codes can be applied to one section of text (Patton 2002). In this approach information is obtained directly from participants, without the imposition of preconceived categories or theoretical perspectives (Hsieh and Shannon 2005). Passages were coded until saturation was reached, that is, no new aspects arose (Strauss and Corbin 1990). This process allowed the identification of themes important to participants, the similarities and difference across groups and interrogation of patterns and relationships (Thomas 2006). The use of software enabled the systematic recall of data that have been coded for a particular concept. To report findings exemplar quotations were chosen that represent the themes that arose. These quotes are used throughout the following chapters as evidence to support the findings (Hsieh and Shannon 2005).

2.7.5. Ethical considerations
Prior to conducting fieldwork this research project underwent full review by the University of Western Australia’s Human Research Ethics Committee (Reference: RA/4/1/7929). Additional ethical approval was sought through Brazil’s National System of Ethics in Research (Sistema Nacional de Ética em Pesquisa) and, as is required for any research undertaken in a protected area in the state of São Paulo, also by the Technical-Scientific Commission of the Forest Institute of São Paulo (Comissão Técnico-Científica Instituto Florestal-COTEC). Additional approval was not required by the Paraná state government.
During field research care was taken to obtain informed consent. All participants were presented with an Information Sheet (Appendix 3), written in plain Portuguese language, and asked to sign or write their name on a Consent Form (Appendix 4) elaborated for this purpose. Given that many interviewees belonged to either privileged or marginalised groups, particular attention was paid to power relations, with care taken to set participants at ease and treat them equally, independent of their position.

Special considerations were taken when interviewing members of rural communities. Due to low levels of formal education of some participants, the information contained in the Information Sheet was also discussed verbally to alleviate potential issues of distrust or misunderstandings. Participants were also verbally informed in simple language that there was no obligation to answer any questions and they were free to withdraw at any time without repercussions. Interestingly, once informed of the nature and purpose of the research, the participants recruited from rural communities were, without exception, eager to be interviewed. It would be natural to expect a level of distrust of ‘official-looking’ forms and the need for signatures, due to the relationship between the inhabitants of protected areas and the authorities that regulate resource use, which is discussed further at later stages of the thesis. I was told on numerous occasions that had I represented a Brazilian government or non-government organisation, many participants would not have been willing to talk with me, however as a foreigner, I was warmly received by all I approached. Despite the vulnerability of some participants belonging to marginalised rural communities, not one individual requested for their identity to be protected. Whilst identifying features have been removed from the text in most cases, explicit consent for the identification of participants was sought due to the small sample size and identification of the locality of the case studies. Although not explicitly named in the text, it is possible, for example, to discover who was a mayor or park manager in the year that interviews were conducted and thus anonymity could not be guaranteed.

This research aspires to avoid participants being exposed to any possible harm due to its publication. It also intends to give voice to all the varied stakeholder groups, including those not normally heard. Additionally, ethical dilemmas may arise around the access to the results of this
research, which may be available to English speaking parties with internet access, but certainly not to those who live in the rural setting visited for this research. In collaboration with the participants from rural communities it was established that a separate report, specific to their municipality and written in simple Portuguese, would be sent in hardcopy via post to each community. Postal addresses were collected at the time of interviews of all parties that showed an interest in learning of the results of this research.

2.8. Thesis structure

Chapter 3 introduces the first set of results which relate to the how the design and intended outcomes of the ICMS-E influence its actual outcomes when applied in a local context that confronts significant institutional and technical difficulties. Chapter 3 first develops a framework for analysis that identifies the aspects of environmental payments that may be important to outcomes, including the design of the payment, the interactions that occur among actors and structural characteristics. The framework is then applied to both case study municipalities to determine how the different versions of the ICMS-E achieve intended and unintended outcomes.

Chapter 4 examines the social perceptions of the ICMS-E by stakeholder groups in each municipality to determine if the receipt of monetary compensation alters local opinion of a conservation regime which has implied high costs for resident communities. Chapter 4 examines whether the application of the ICMS-E entails any tangible benefits that trigger improvements in the socio-economic situation of a population characterised by high levels of poverty.

Chapter 5 interrogates the dimensions of power and governance that determine how the benefits of the ICMS-E revenue are distributed locally. Many environmental payment schemes are subject to elite capture and can reproduce socio-economic inequality by reinforcing local power hierarchies. However, sometimes environmental payments create leverage for minority groups. The outcomes of the ICMS-E are examined to determine how power dynamics and governance impact on outcomes.
Chapter 6 provides a summary of all research findings, the contributions this thesis makes to theory and policy implications for environmental payments. The findings of the research are drawn on to develop some recommendations for environmental payments that occur in regions of poverty.
2.9. References


A selection of some public facilities in the case study municipalities. The health centre, top left, was built to service the Batuva community of Guaraqueçaba, however is only open and staffed once a month. School transport is provided by boats which collect children from island communities, weather and tide permitting. The state government-managed school in Cananéia has been abandoned.
CHAPTER 3: A framework for analysing the effectiveness of the ICMS-E for conservation and well-being

Prologue
The original research and discussion portion of this thesis begins with Chapter 3, a paper which examines the design of the ICMS-E and how it translates to the local context of the case study municipalities to produce outcomes for conservation and well-being. Chapter 3 develops a framework for the analysis of the ICMS-E that captures how the policy design interacts with relational and structural aspects of the municipalities. Chapter 3 identifies how the ICMS-E could be more effective if its design was responsive to local capacity and constraints. Chapter 3 has been submitted to the Journal of Latin American Studies as,

Verde Selva, G., Pauli, N, Clifton, J and Kim, M. A framework for analysing the outcomes of payments for ecosystems services: case studies from the Brazilian Atlantic forest.

Abstract
Economic instruments, such as payments for ecosystem services (PES), have been promoted as a potentially efficient way to achieve conservation and development. This research tested whether a Brazilian government-led PES scheme could achieve these outcomes through developing a framework for the analysis of payments for conservation and applying it to case studies from a region with high biodiversity values concurrent with extensive poverty. The frame of analysis included, i) design, related to the way a policy is legislated and implemented, ii) relational aspects, or the characteristics of the interactions that occur, and, iii) structural aspects, which relate to the choices and opportunities available, relative control over resources and capacities of different actors. Results suggest that, even when the design of PES seems, theoretically, to be capable of producing integrated outcomes, once the scheme is applied in a local context of poor institutional capacity and local political interests it may not produce the anticipated results. A lack of transparency, poor perception of conservation and limited participation by civil society in decision-
making processes all contributed to the poor outcomes of the payments. This highlights the need for deeper understanding of the institutional sphere at which payments are received.

3.1. Introduction

The need to find policy solutions to address socio-economic development and environmental conservation is of utmost importance in Brazil, with environmental systems of global significance and a large, often impoverished population, inhabiting those ecosystems. Questions of realism and social justice have led to the understanding that conservation programmes should address the welfare of local populations (Adams, Aveling et al. 2004, Sunderland, Ehringhaus et al. 2007). Economic instruments, such as payments for ecosystem services (PES), have been promoted as a potentially efficient way to achieve conservation and development (Grieg-Gran, Porras et al. 2005, Milder, Scherr et al. 2010, Barrett, Bulte et al. 2013). Yet PES programmes that achieve positive outcomes for conservation and human well-being are rare (Tallis, Kareiva et al. 2008, McShane, Hirsch et al. 2011, Muradian, Arsel et al. 2013). Despite many critiques, of both the concept itself and specific PES projects, (Gómez-Baggethun and Muradian 2015, Van Hecken, Bastiaensen et al. 2015, Fletcher and Büscher 2017), PES remains a popular instrument for a variety of institutions around the world (Barrett, Bulte et al. 2013).

This research contributes to the literature on the effectiveness of environmental payments in contributing to joint conservation and development outcomes by examining the longest-standing economic instrument for conservation in Brazil, known as the Ecological ICMS (ICMS-E). The ICMS-E distributes tax revenue to municipal governments based on ecological criteria, alleviating some local costs of conservation and potentially stimulating municipal conservation activity. A comparative analysis of this instrument was conducted in two, neighbouring Brazilian states, where the mechanism has different intended outcomes, formulation and implementation.

The research presented here marks the first examination of how the design of the ICMS-E, the horizontal and vertical interactions among various stakeholders and structural aspects influence the outcomes of the mechanism. This is achieved through developing a framework for analysis, described in Section 3.2. The framework is used to examine the ICMS-E in two case study
municipalities, informed by primary and secondary data sources to determine how the interplay between these factors influences outcomes for conservation and well-being. This enables key lessons to be identified which may assist in the development of environmental payments in other contexts.

3.2. Theoretical framework

3.2.1. Finding policy solutions
The complexities involved with the conservation of biodiversity in regions of poverty and natural resource dependence are well established (Barrett, Brandon et al. 2001, Adams and Hutton 2007, Rands, Adams et al. 2010). There is general consensus that conservation and development should be approached jointly (Adams, Aveling et al., 2004, Sunderland, Ehringhaus, et al. 2007), yet policies which achieve win-win outcomes are rare (McShane et al., 2011; Muradian et al., 2013). Conservation ‘panaceas’ are recognised as inadequate to manage the intricacies of socio-ecological systems, maintaining decent livelihoods within healthy ecosystems (Ostrom, Janssen, et al. 2007). Accordingly, it has been acknowledged that the outcomes of economic incentives for conservation are context specific and PES should not be used a blue-print approach (Roth and Dressler 2012, Sarkki, Rantala et al. 2015). The integration of aspects of different conservation strategies may capitalise on the strengths of each approach, and counteract their problematic features (Barrett, Brandon et al. 2001, García-Amado, Ruiz Pérez et al. 2013). Berkes (2009) alluded to this, suggesting that the future of co-management may need to include better understanding of the use of market mechanisms or other incentives for communities to engage in co-management. There is a need for a policy approach which responds to local social, political, economic and environmental circumstances, whilst creating linkages between stakeholders that engage their specific capacities (Berkes 2007, Ostrom, Janssen et al. 2007, Ostrom and Cox 2010).

A comprehensive literature on policy evaluation exists, providing methodologies and frameworks that can be utilised by researchers to gauge how well policies are functioning. Research that evaluates economic approaches to conservation tends to look at outcomes in terms of efficiency, additionality and equity, from global to local scales, providing valuable insights on the design of effective PES (Le Velly and Dutilly 2016). However, the way that environmental payments are
interpreted locally to contribute to outcomes for conservation and well-being is not entirely measured by additionality or efficiency. Exploring the relationships, interactions, perspectives and motivations of local users of natural resources, and examining conservation payments within this context may help untangle this complexity, providing direction for the when, where and how of effective conservation payments.

### 3.2.2. Economic instruments for conservation

Economic instruments for conservation can be characterised as instruments that induce environmentally responsible behaviour to generate financial benefits (Perman, Ma et al. 2003). Economic instruments can be considered as an efficient and direct way to achieve conservation and development (Frost and Bond 2008). They allow voluntary adhesion of social and/or political actors and flexibility in responses to environmental protection initiatives, in accordance with the availability of time and resources (Conti, de Azevedo Irving et al. 2015). Whilst there is no consensual definition, economic instruments for conservation are generally considered to have the following characteristics (Conti, de Azevedo Irving et al. 2015);

1. The existence of financial stimulation,
2. The possibility of voluntary action,
3. Involvement of government authorities,
4. The intention to directly or indirectly assure the maintenance or improvement of environmental quality.

Various aspects of economic instruments for conservation have been criticised. Some argue that payments for conservation may simplify the complex socio-ecological relationships present in human inhabited protected areas (Kosoy and Corbera 2010, Norgaard 2010, Van Hecken, Bastiaensen et al. 2015) and may undermine intrinsic conservation motivations (Muradian, Arsel et al. 2013, Cetas and Yasué 2017). Other authors caution of perverse distribution effects, as actors with higher organisational and financial capacity for the implementation of environmental actions will be most highly compensated, to the detriment of parties with lower capacity (Conti et al, 2015). Basic terminology around this type of conservation is inconsistent and contested, leading
to confusion (Muradian and Gómez-Baggethun 2013, Fletcher and Büscher 2017). A warning has been made, that the narrow focus on ecosystem services may exclude environments not deemed useful to humans, (Redford and Adams 2009), though the debate on the value of ecosystems is becoming more sophisticated through projects such as such as ‘The Economics of Ecosystems and Biodiversity’ (TEEB) and ‘The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services’ (IPBES). Some question the ability of market mechanisms to solve environmental problems that were caused by those very markets (Büscher, Sullivan et al. 2012, McAfee 2012, Fletcher, Dressler et al. 2016, Fletcher and Büscher 2017). However, the concept of PES has evolved considerably from its conception as a voluntary and conditional buyer-pays system (Wunder 2005). Muradian et al. (2010, p. 1205) redefined PES as, “a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources”. This definition brought the concept closer to reflecting the reality of most PES projects; PES is almost always conducted within a public policy framework and funded by the state, with no market interaction (Gómez-Baggethun and Muradian 2015).

3.2.3. Ecological fiscal transfers as conservation payments

The ICMS-E is a type of conservation payment known as an ecological fiscal transfer (EFT). EFTs distribute existing tax income based on ecological criteria (Ring 2008). EFTs may complement a traditional command and control approach to conservation, utilising the ‘protector receives’ rationale, rather than ‘polluter pays’. Due to the very limited number of this type of policy intervention around the world, there is little analysis of their outcomes.

3.2.4. Finding a framework – How to evaluate the ICMS-E?

A wide range of characteristics have been identified as relevant to the examination of conservation and development policies. Recognising that environmental problems are complex, occur over a long time-frame, and our knowledge of them may be uncertain or incomplete, Mickwitz (2003) developed a framework for the evaluation of environmental policy instruments. The framework examines the anticipated and unanticipated effects of a policy intervention, evaluating those effects based on criteria under three themes; general, economic and democracy related. Many elements of
this framework are useful for the evaluation of the ICMS-E; however, it focuses strongly on measuring effects or outcomes. Those outcomes may be influenced by the way a policy is designed, implemented and functions, the characteristics of the institutions that are involved and interactions between stakeholders across multiple levels (Berkes 2007).

Creating resilient and shared natural resource management is determined by factors at a range of levels, from constitutional and organisational to those at the user level. Therefore, it is necessary to identify how policy creates the conditions necessary to foster vertical and horizontal linkages and how knowledge is shared amongst actors (Adger, Brown et al. 2006). Linkages are interactions between stakeholders that provide information or resources related to natural resource management. Parting from the premise that institutional linkages that cross multi-level governance systems are important to managing multiple use natural resources (Berkes 2002), Adger, Brown and Tompkins, (2006) outline a political economy framework that explores how information and resources can influence stakeholder ability to access and create cross-level linkages. Horizontal linkages amongst local level actors and vertical linkages with other institutions, depend on the trust built up between parties, the presence of leadership and the translation of knowledge. The costs associated with creating linkages can act as a barrier to their formation (Adger, Brown et al. 2006).

Drawing from this literature, aspects have been identified within three themes that should be considered in order to evaluate the ICMS-E, summarised in Table 2. The first theme is design (§3.2.5), related to the way the policy is legislated and implemented. The way payments function at the local level is influenced by relational aspects (§3.2.6), or the characteristics of the interactions between different actors, and between actors and policy itself. Finally, structural aspects (§3.2.7) are considered, which relate to the recurrent arrangements that configure the choices and opportunities available, relative control over resources and capacities of different actors (Moulaert, Jessop et al. 2016). It is particularly critical to assess these aspects in the context of developing nations, where institutional capacity and availability of resources can often be precarious (Barrett, Brandon et al. 2001).
Table 2. Framework for evaluating payment for conservation policy

<table>
<thead>
<tr>
<th>Design Aspects</th>
<th>Transparency</th>
<th>Legitimacy</th>
<th>Knowledge</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Objectives</td>
<td>To what degree are the policy processes observable?</td>
<td>To what degree is the instrument accepted by stakeholders?</td>
<td>Local and scientific knowledge informs policy and is shared freely between all parties</td>
<td>Broad and equal participation by government, civil society and private enterprise, including partnerships between stakeholders and capacity building</td>
</tr>
<tr>
<td>Linkages</td>
<td>Does the policy foster vertical and horizontal linkages between actors?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>Can the instrument cope with changing conditions and be adapted to local circumstances?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


3.2.5. Design aspects

The design and implementation of a policy intervention are critical to outcomes, influencing participation rates, the creation of alliances or the exacerbation of conflicts of interest (Pascual, Muradian et al. 2010), and whether the policy is relevant to real problems and effective (Mickwitz 2003). Programmes that create horizontal linkages between the levels of government and other parties may provide opportunities to deal with multiple objectives and knowledge systems (Berkes 2007). The aspects of policy design and implementation that are particularly relevant to payments for conservation are explained below.

3.2.5.1. Explicit multiple objectives

Inherent in payments for conservation is a sustainable development approach, yet most projects emphasize either conservation or development. To manage complex systems both outcomes should be of equal importance and receive equal attention (Berkes 2007).
3.2.5.2. **Linkages amongst stakeholders**

The involvement of multiple organizations, including government, civil society and private enterprise, allows each to bring their relative strengths to support and build capacity. Horizontal and vertical interplay between actors in the form of partnerships, alliances and networks contributes to the understanding of problems and the provision of necessary resources for policy implementation (Adger, Brown et al. 2006, Berkes 2007).

3.2.5.3. **Flexibility**

Environmental policy interventions should avoid rigid adherence to a preconceived strategy, instead allowing significant flexibility (Mickwitz 2003). This allows for the development of relationships which benefit local circumstances and adaptation to changing conditions (Mickwitz 2003). It has been suggested that payments for conservation should be highly flexible, allowing institutions to adapt payments to local contexts (Frost and Bond 2008).

3.2.6. **Relational aspects**

Effective conservation cannot be solely conceived and implemented at one sphere (local, regional, national or global) but often requires management at multiple levels, with horizontal and vertical interplay between actors (Berkes 2007). It is also assumed that non-state actors will participate in decision making processes at various levels (Newig and Fritsch 2009). A multi-level approach to environmental management may capture the comparative advantages provided by both local resource users and higher institutional spheres (Berkes 2004), helping to overcome institutional deficiencies sometimes present in developing countries, where biodiversity conservation is critical (Barrett, Brandon et al. 2001). Interplay between actors can contribute to better understanding of problems and provision of resources for policy implementation (Newig and Fritsch 2009). Vertical interplay is particularly important in building the capacity of less powerful stakeholder groups, through refining skills and sharing information (Adger, Brown et al. 2006). Many aspects of the relationships between stakeholders are interlinked and interdependent. The relational aspects to be considered in this research are discussed below.
3.2.6.1. Transparency

Transparency refers to the degree to which the processes of policy formulation and implementation are observable. The level of transparency of a policy intervention will influence how it is perceived by stakeholders, affecting its legitimacy (Adger, Brown et al. 2006).

3.2.6.2. Legitimacy

Environmental problems are often characterised by the conflicting goals and divergent belief systems of different stakeholder groups (Mickwitz 2003). The way a governance arrangement fits the local context and whether it is considered legitimate and equitable are integral to its success (Ostrom and Cox 2010). The legitimacy of an intervention may be influenced by how environmental problems are understood by stakeholders with different perspectives or worldviews. Where responsibility for policy is held jointly by multiple levels of government, each level must be accountable (Bardhan and Mookherjee 2006, Savoia, Easaw et al. 2010).

3.2.6.3. Knowledge

Knowledge is important, both to the policy process and to questions of equity. Translating and incorporating local and scientific knowledge into policy responses through deliberation can create shared understanding and increase the range of information available to create better informed policy responses (Berkes 2007). The democratization of access to knowledge can improve the legitimacy and equity of interventions (Adger, Brown et al. 2006).

3.2.6.4. Participation

Participation, where it is conceived solely as co-option or coercion, contributes to the failure of conservation and development interventions. Instead communities should be partners, involved in capacity building and working relationships (Berkes 2007). Participation during policy formulation can align community needs with the intended policy outcomes, informing decisions to provide increased benefits and efficiency. Broad participation in the application of conservation payments can direct the use of the funds towards activities that benefit the community as a whole, reducing the potential capture of those benefits by the local elite (Pascual, Muradian et al. 2010).
3.2.7. Structural aspects

Structural aspects, such as stakeholders’ access to resources and capacity, are important considerations for conservation policies that share responsibility between multiple jurisdictional levels.

3.2.7.1. Resources

An appropriate governance structure for natural resource management should include the sharing of responsibilities, rights and resources (Adger, Brown et al. 2006). However, the devolution of responsibility may not always be accompanied by the devolution of sufficient rights and resources (Brown 2003). Since the end of the military dictatorship and the People’s Constitution of 1988, Brazil’s political system has undergone a process of decentralisation, with local government increasingly responsible for service provision (Limana 1999). Whilst the sharing of responsibility in public policy is thought to have many benefits, it has not been accompanied by adequate transfer of resources, often rendering municipal governments with limited capacity to perform their responsibilities (Brown 2003, Baiocchi 2006).

3.2.7.2. Capacity

Where payments have positive outcomes for livelihoods, it is because governance structures have ensured this outcome (Swiderska, Roe et al. 2008), highlighting the role of institutions in achieving positive results from economic instruments for conservation. Institutional capacity depends not only on people’s capabilities but also on the overall size of the task, the resources required to perform the task and the framework within which capacities are used (Franks 1999). The involvement of multiple organisations, including government, civil society and private enterprise, allows each entity to bring their relative strengths to support and build capacity. The capacity of institutions is critical to dealing with conflict, cooperation and change in a policy setting (Vatn 2010).

3.2.8. The ecological ICMS

Brazilian state governments have been operating payment for conservation schemes that provide longstanding examples for analysis. The ICMS-E is the redistribution of revenue raised by an
existing tax according to environmental criteria. The ICMS (*imposto sobre circulação de mercadorias e serviços*) is a levy on the circulation of goods and services and an essential source of tax revenue for state and municipal governments (Soares, Gomes et al. 2011). The ICMS accrues to the state government and one quarter is returned to the municipalities within that state (Figure 7). The majority (75 per cent) of ICMS that is transferred to local government is based on the performance of the municipality’s economy, whilst the remaining quarter is distributed according to state legislation. Further details of the processes by which these proportions are allocated are provided by De Mello (2008). Local governments may develop public policies which stimulate economic activity and thus guarantee an increased participation in the ICMS distribution. However, many municipalities that experience land use restrictions, such as those associated with the presence of protected areas, are less able to stimulate economic activity and are therefore at a competitive disadvantage with regards to accessing the 75 per cent proportion of the ICMS distributed according to economic criteria. In response, numerous states have included ecological criteria to determine the distribution of the ‘flexible’ quarter of the ICMS, which has become known as the ICMS-E. In some states incentives for conservation activities are also provided to stimulate and reward municipal management of natural resources.

Figure 7. Distribution of ICMS between state and municipalities
The ICMS-E is part of a fiscal system where the redistribution of tax revenue across levels of government helps to ensure sufficient financial capacity to fulfil public functions at all levels. Whilst the ICMS-E is intended to compensate and sometimes also stimulate local environmental activity, the management of this revenue is determined by municipal government and is not conditional on any pre-defined conservation activity. Even so, the ICMS-E is considered to have a broad range of potential positive impacts including; reduced rates of biodiversity loss, strengthening of state and municipal environmental institutions, increases to the municipal public budget, introduction of environmental agendas in small towns, improved support for protected areas from communities, and furthering the attainment of broader targets such as the Sustainable Development Goals (Denardin, Loureiro et al. 2009, Nascimento, Van Bellen et al. 2010, Schneider 2013, Santos, May et al. 2014, The Nature Conservancy 2014, Young and Castro 2017). However, there is very little published research which evaluates whether the ICMS-E is achieving any of these outcomes. The ability of the mechanism to achieve one or all of the potential outcomes for biodiversity and human well-being depends on how it is legislated and implemented on a state-by-state basis, and how it functions at the municipal level. This research uses case studies from Paraná, where the mechanism originated in 1991, and neighbouring São Paulo, the second state to implement the ICMS-E in 1993. The legislation of each state, whilst initially similar, has followed different trajectories in the subsequent decades.

### 3.2.9. Case study states

Paraná and São Paulo are neighbouring states in Brazil’s south and south-east regions. They are part of the economic powerhouse of the country, having the fourth and first highest gross domestic products (GDP) of the 27 states, accounting jointly for 40 per cent of the nation’s GDP (São Paulo alone is responsible for around 30 per cent). Both states are situated within the Atlantic forest biome, one of the most threatened in the world with only seven to twelve per cent of its original area remaining as intact forest (Tabarelli, Pinto et al. 2005). The Atlantic forest supports exceptional levels of endemism (Ribeiro, Metzger et al. 2009), is home to over 60 per cent of Brazil’s threatened mammal species (Tabarelli, Pinto et al. 2005), and has plant species diversity per unit area higher than the Amazon (Joly, Metzger et al. 2014). The conservation of the remaining forest is of critical importance.
The municipalities of Guaraqueçaba (Paraná) and Cananéia (São Paulo) are neighbours, their territories meeting at the Paraná-São Paulo state border. Both lie within the largest intact remnant of Atlantic forest. The large majority of their territory is under environmental protection by a mosaic of protected areas under federal, state and private control, making the ICMS-E a significant revenue source (Table 3). Both municipalities exhibit high incidences of poverty and are ranked towards the bottom of their state for human development (Table 3).

Table 3. Characteristics of ICMS-E in each state and case study municipalities

<table>
<thead>
<tr>
<th></th>
<th>Paraná</th>
<th>São Paulo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total value of ICMS-E pass-through</td>
<td>49,854,188</td>
<td>38,209,335</td>
</tr>
<tr>
<td>in 2016 (USD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipalities benefitting from the</td>
<td>203 of 399</td>
<td>186 of 645</td>
</tr>
<tr>
<td>ICMS-E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State HDI</td>
<td>0.749</td>
<td>0.783</td>
</tr>
<tr>
<td>Incidence of poverty in state</td>
<td>39%</td>
<td>26.6%</td>
</tr>
<tr>
<td>Illiterate over 15yrs of age</td>
<td>6.28%</td>
<td>4.33%</td>
</tr>
<tr>
<td>Case study municipality</td>
<td>Guaraqueçaba</td>
<td>Cananéia</td>
</tr>
<tr>
<td>Municipal territory designated as</td>
<td>~98%</td>
<td>~74%</td>
</tr>
<tr>
<td>protected area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICMS-E received 2016 (USD)</td>
<td>1,592,236</td>
<td>1,289,784</td>
</tr>
<tr>
<td>Municipal HDI and state ranking</td>
<td>0.587 Lowest 1%</td>
<td>0.72 Lowest 25%</td>
</tr>
<tr>
<td>Incidence of poverty in municipality</td>
<td>48.8%</td>
<td>38.7%</td>
</tr>
<tr>
<td>Illiterate over 15yrs of age</td>
<td>14.71%</td>
<td>7.61%</td>
</tr>
</tbody>
</table>


3.3. Methodological framework

3.3.1. Data acquisition
Fieldwork for this research was undertaken in 2016 in the states of Paraná and São Paulo. It involved conducting semi-structured interviews with participants selected through reputational and positional sampling (Scott 2017). Participants were recruited from each state and included

1 Currency conversions are based on conversion rates from December 2016 (http://www.xe.com)
participants active in the state and/or federal sphere \((n=11)\) such as environmental agency representatives, protected area managers and politicians involved in the development and implementation of the ICMS-E. Participants from the local sphere \((n=31)\) included municipal government representatives, private protected areas owners, community leaders and local businesses. Some participants, for example non-government organisations (NGOs) and researchers, were active across jurisdictional levels, with interactions at municipal and state spheres, and interests (in the case of NGOs) reaching the national level \((n=9)\). Participants were interviewed using a semi-structured approach, guided by open-ended questions that allowed them to direct the flow of conversation (Bernard 1995). This allowed interviews to reflect the themes considered most significant by those with intimate knowledge of the ICMS-E. The interview questions did not explicitly refer to all the criteria listed in Table 2 to allow for a more natural evaluation based on the participant’s interpretation of the important aspects of the policy. Interviews were conducted in Portuguese by the author (except in the case where the participant was a native English speaker), lasted from half an hour to two hours in length and were recorded and transcribed verbatim, using the software program Nvivo 9 to manage, code and analyse the data. Quotes have been translated by the author. The research is also informed by the examination of documents including local and state legislation, projects of law, decrees and justifications, management plans, technical reports and grey literature.

3.4. State case studies – The ICMS-E in Paraná and São Paulo

3.4.1. The design of the ICMS-E
This section examines the design of the ICMS-E in each state according to the aspects identified in Table 2.

3.4.1.1. Paraná
The ICMS-E legislation in Paraná originated as a compensatory mechanism with environmental questions of secondary importance. However, the legislation evolved to include incentives, intending to become a stimulus for conservation activity by local governments seeking a larger parcel of ICMS-E revenue (Loureiro 2002). A timeline of the evolution of the ICMS-E legislation
is presented in Table 4. The legislation allocates 2.5 per cent of the 25 per cent decided by state government (see Figure 7) to be distributed between eligible municipalities, based on the proportion, category and quality index of each protected area. The quality index is comprised of around 67 variables and is determined annually for each municipality by the state environmental agency, hereafter referred to as IAP (Instituto Ambiental do Paraná). These variables include biological quality and representativeness of the protected area, development of management plans, access control, and municipal action regarding urban planning, agriculture and sanitation. The quality index enables governments to benefit financially from local conservation activities as a higher score is related to a higher monetary return for ecological criteria the following year. The ecological portion of the ICMS is transferred separately from the rest of the ICMS, so local government can easily recognise the ‘ecological’ value and identify increases or eventual decreases. However, the incentive effect may be inhibited by the policy’s success. If many municipalities improve their quality index the economic return becomes diluted, potentially leading to a reduction in the monetary incentive if economic growth does not maintain pace.

Table 4. Evolution of ICMS-E legislation in Paraná

<table>
<thead>
<tr>
<th>Year</th>
<th>Legislation passed</th>
<th>Intended outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>Original mechanism allocates 2.5% to municipalities hosting protected area.</td>
<td>To provide monetary compensation for opportunity costs arising from protected area.</td>
</tr>
<tr>
<td>1996</td>
<td>Introduction of qualitative measures affecting value of pass-through and introduction of Terms of Engagement.</td>
<td>To improve biodiversity conservation outcomes through incentivising and formalising local environmental action.</td>
</tr>
<tr>
<td>1997</td>
<td>Framework established for monetary transfers from municipal government to traditional communities known as Faxinais.</td>
<td>To maintain the cultural heritage of the Faxinais and associated sustainable land use practices.</td>
</tr>
<tr>
<td>2005, updated in 2007</td>
<td>Framework established to provide incentives for the creation of private protected area.</td>
<td>To improve biodiversity conservation outcomes through increasing protected area coverage on private property.</td>
</tr>
</tbody>
</table>

Source: Adapted from Loureiro, Pinto et al. (2008).

3.4.1.2. São Paulo

In São Paulo, ecological criteria determine the distribution of 0.5 per cent of the flexible portion of the ICMS. The ICMS-E calculation is based on the proportion of the municipal territory
designated as protected area multiplied by the category of the protected area, with more strictly protected areas (equivalent to IUCN category I or II) receiving higher weighting due to the more stringent land use restrictions. The legislation only recognises state managed protected areas, not federal, municipal or private, with seven protected area categories included, and weightings ranging from 0.1 to 1.0. It does not include a quality index and does not reward municipal environmental action. The ecological portion of the ICMS arrives in the municipal account jointly with the rest of the ICMS, meaning that local authorities do not necessarily know its value. Despite numerous attempts the legislation in this state has not been amended since its inception.

3.4.2. Multiple objectives

The ICMS-E in both states originated with one objective: to compensate municipal governments for the inability to utilise their territory for economic production due to the presence of protected areas. In São Paulo, this has not changed and the mechanism remains a simple compensation for the opportunity costs of protected areas. The amount allocated to the ecological criteria was a political decision, not based on the potential foregone tax revenue of alternative land uses. This is reflected in the official justification for the law which states that its objective is to, “promote balance in the distribution of the ICMS between municipalities.” (Justification 117/1993).

In Paraná, successive years of policy evolution have led to the mechanism being referred to as ‘the ICMS-E for Biodiversity’ with the following objectives (translated from state documents (IAP 2016)),

1. The designation and regulation of protected areas, including their planning, creation, management and sustainability.

2. Construction of ecological corridors.

3. Integrating society into protected area management, including the free flow of information and environmental education, ecotourism and regulation of land use.
4. Institutional enhancement through legislation, capacity-building, decentralisation and structuring of long-term public policy.

5. Promoting the ‘protector-receiver’ rationale to achieve funding for the conservation of biodiversity.

The ICMS-E for Biodiversity of Paraná contains multiple and diverse objectives covering social, institutional and biological themes.

3.4.3. Linkages
The ICMS-E in Paraná formally establishes the responsibility of local government for the environment through the creation of Terms of Engagement (Termos de Compromisso). The document is developed by the state environment agency in consultation with the municipal government as part of the annual evaluation of the municipality’s quality index. The Terms of Engagement formalise the participation of the municipality, either directly in the management of the protected area, or indirectly through aligning local expenditures, for example on sanitation, agriculture or urban development, with the improvement of local environmental quality. Non-compliance will result in the,

“Cancelling of the record of the protected area in the state register (that determines the ICMS-E calculation), implying automatically the loss of monetary resources that originate from that area to be passed to the municipality the following year.”

(Loureiro 2002, p. 83)

Despite being a resource constitutionally prohibited from being earmarked, state environmental authorities have found a way to direct the ICMS-E revenue to environmental outcomes. According to a technical officer involved in annual evaluations the approach taken focuses strongly on the improvement of biodiversity conservation rather than the institutional and social objectives.
A legal platform also exists for creating public-private partnerships for biodiversity conservation. Much of the remaining Atlantic forest exists on private land and Paraná’s state government have focused on incentivising the creation of private reserves. Parting from the premise that local government benefit from the creation of protected areas due to the generation of the ICMS-E, a legal framework exists for local government to support owners of private reserves with maintenance costs (Decree No 1529 - 02/10/2007). Agreements are made between reserve owners and local government and may pertain to 100 per cent of the ICMS-E received for the presence of the private reserve or a part thereof. Investments in the quality of the reserve by the municipality, in theory, may generate further revenue for the local government, creating a virtuous cycle.

In São Paulo, the ICMS-E is a simple transfer of revenue. It does not create any linkages between stakeholders nor demand any local engagement with environmental management.

### 3.4.4. Flexibility

According to an individual involved in the formulation and evolution of the ICMS-E in Paraná, it is intended,

“As a platform, that makes possible an endless set of arrangements.”

The ICMS-E is managed by IAP who conduct annual evaluations of every municipality in the state. This captures variation in the presence and quality of protected areas, allowing payments to reflect changing conditions. By containing broad criteria that can influence the score of a municipality, it allows local government to capitalise on the incentive effect in a variety of ways, depending on their comparative advantage. For example, a municipality with a large territory and low population may choose to set aside some land for a municipal reserve, whilst it may be more efficient for another municipality to improve local sanitation. Both will increase their score and the associated return from the ICMS-E. However, municipal activity must be passed into local law in order to contribute towards improving the ICMS-E score.
In São Paulo, the ICMS-E has low flexibility, as the only way to alter the value of the ICMS-E received by a municipality is for state legislators to create (or remove) a protected area or reclassify its level of protection. The legislation specifies the categories and weightings of protected area included for the pass-through and there is no room for regulation of the mechanism by the state environmental agency. This was considered problematic by the environmental agency representative responsible for its allocation to municipalities, who stated that,

“We can’t make any alteration, like the inclusion of a category or change in the weights. That can only be done by changing the whole ICMS law. This is a problem because we can’t use the ICMS-E to stimulate or reward any action.”

Whilst in Paraná the ICMS-E has explicit multiple objectives, creates institutional linkages and is highly flexible, in Sao Paulo the ICMS-E has one objective, creates no linkages and is inflexible (Table 5). Based on theory alone it could be hypothesised that the design of the version of the ICMS-E from Paraná would be more effective in creating positive outcomes for conservation and development. The following section will examine how these two versions of payments for conservation function at the local level and the outcomes that are achieved.

Table 5. Design of the ICMS-E legislative framework in Paraná and São Paulo states.

<table>
<thead>
<tr>
<th>Design Aspect</th>
<th>Paraná</th>
<th>São Paulo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion of multiple objectives</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Promotes linkages amongst stakeholders</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Flexible</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

3.5. Municipal case studies - The ICMS-E on the ground

This section will firstly examine the way that the revenue from the ICMS-E is applied in each case study municipality to identify any positive outcomes for conservation and/or development from the perspective of local stakeholders. The influence of the relational aspects of the policy in its implementation at the municipal level is examined. Finally, the impact of structural aspects on the outcomes of the ICMS-E are explored.
3.5.1. Paraná – The ICMS-E in Guaraqueçaba

Guaraqueçaba is amongst the poorest municipalities in Paraná with lower than average rankings for a wide variety of indicators (Table 3). With around 98 per cent of its territory under some form of environmental protection the ICMS-E is a critical source of income for local government, accounting for 20-30 per cent of total annual revenue and almost 75 per cent of ICMS revenue.

In Guaraqueçaba the ICMS-E revenue was mostly used for the salaries of municipal employees. A portion was also used to fund community beach clean-up activities, with the intention of improving social welfare and environmental conditions. The Starfish Programme (*Programa Estrela do Mar*) was implemented in 2015 and rewarded women from island communities with basic food and hygiene products every month, in return for twice weekly collection and sorting of rubbish from the beach. This was the first initiative undertaken by the administration of Guaraqueçaba to invest part of the ICMS-E revenue into a project with social and environmental outcomes, previously utilised in its entirety for the payroll of municipal employees. Members of the local administration had reasonable knowledge of the mechanism and interest in the potential to profit from conservation action, with the mayor stating in interview that,

“I sought to learn more about the ICMS-E, to try to understand how I could work with it.”

However, the Starfish Programme, with positive outcomes for environmental education and the maintenance of the shoreline of protected areas, was not used to contribute to an increase in the ICMS-E. The mayor identified that she,

“…did not have the time. I didn’t participate in any meeting to discuss how to go about this process.”

Despite the ICMS-E framework establishing a clear linkage between local environmental legislation and monetary reward, the complicated nature of the legislation has hindered uptake in Guaraqueçaba. The full ICMS-E legislation is a 108-page document supported by online
information portals on the IAP website, yet there is no tool which demonstrates how local activities will affect the value of the ICMS-E. To navigate, interpret and infer how to benefit from the incentives offered requires time and capacity and a more simplified approach may be needed, as summarised by the mayor,

“We need to know how much ICMS-E will be generated by our activities, then we could perform better in relation to environmental preservation.”

Despite a lack of nuanced understanding of how to utilise the incentive effect, government respondents identified activities which would provide mutual benefits in increasing ICMS-E revenue and improving local conditions, including the creation of a municipal environmental council. The hypothetical council would manage a fund, resourced by the ICMS-E, for hiring professionals such as environmental engineers to support and implement socio-environmental projects. It is interesting to note that the focus of this theoretical investment was on increasing local technical capacity, the lack of which arose in many interviews and is further discussed below. Improving partnerships with landowners to incentivise the creation and maintenance of private reserves was also emphasised, with the mayor asserting,

“It is my understanding that a percentage of the money that enters the city coffers from the presence of the private reserve should be passed to the owner, to help them manage their land. This would stimulate more people to establish reserves on their properties, which isn’t an easy service to provide.”

The environmental secretary asserted that this would benefit the municipality through an increase in ICMS-E revenue due to better managed private reserves, which, belonging to a stringent protected area category, attract a high return from the ICMS-E,

“We did the calculations. Private reserves return more [ICMS-E revenue] than the Area of Environmental Protection [of Guaraqueçaba, a less restrictive category of
protected area. *We researched the [ICMS-E] law and we know it’s possible. Next year we want to include this in our system.*”

It was also suggested that this would stimulate local jobs as reserve owners could hire park guards and maintenance workers. Government interviewees showed a good knowledge of the opportunities for innovation afforded by the design of the ICMS-E. However, there could be significant barriers to realising these opportunities. According to a representative of an NGO that owns a private reserve in Guaraqueçaba, they had made repeated attempts to establish a partnership with the local administration,

“We started this process in 2009. We went to speak with the mayor, we consulted the state accounting office, we hired a lawyer and made a work plan. At first the mayor was interested in working together. We had done the calculation, of how much return they would get from an investment in the reserve, and it was very advantageous. But, when it came time to approve the law, there was always a problem and they ended up not passing it. We have made various attempts, with various administrations. I really don’t know what impedes them, if they are justified in their resistance to pass these laws. The money from the ICMS-E is very precious because it’s not earmarked, they can use it as they need.”

Almost all revenue received by municipal governments is destined by state or federal law to a specific application. ICMS revenue is an exception, with states constitutionally prohibited from earmarking its use locally. The scarcity of ‘free’ resources available to the local government means that careful consideration when legislating even a small percentage to a particular project was certainly a concern for the mayor,

“When I assumed this role, I assumed responsibility for 430 employees. I have a payroll of over a million reais per month. If I give up on part of this [ICMS-E] resource and pass it on to someone, I would have to reduce my payroll. And how do I do that? By firing someone. So, I would resolve one problem, by stimulating private reserves, but I would create a social problem.”
The flexible design of the ICMS-E in Paraná, with the opportunity for local government to innovate using the framework provided, has led to some interaction with the policy by local government. However, this has generated few significant outcomes due to local constraints. The barriers appear to be related to structural aspects of capacity and resources, further discussed below.

3.5.2. São Paulo – The ICMS-E in Cananéia

Cananéia is amongst the poorest municipalities of São Paulo, with below average education and health and a high incidence of poverty when compared to the rest of the state (Table 3). Around three-quarters of its municipal territory is covered by protected areas and the 0.5 per cent of the ICMS distributed according to ecological criteria produces 60 per cent of the municipality’s total ICMS revenue. Due to different perspectives and knowledges exhibited in interviews, the local government representatives in this analysis are divided into two groups: those who worked for the environmental secretariat, and those who did not.

Non-environment local government representatives had no knowledge of the value provided by the ecological criteria of the ICMS. All participants underestimated the significance of the ICMS-E for the local budget, with one high ranking official estimating it at 10 per cent of the actual amount (400 000 versus 4 million reais annually). No participant from this group could explain how the revenue was spent. Knowledge of the mechanism was extremely poor, with confusion about all aspects of the ICMS-E. One representative believed the entire amount of the ICMS-E was earmarked for environmental activities. Despite not knowing the value, this group showed dissatisfaction with the amount distributed according to ecological criteria, with the mayor stating,

“I believe that much more money should come.”

The restrictions implied by conservation were perceived as a direct impediment to the economic well-being of the community, requiring greater compensation, the mayor opining,
“There are many things we can’t do here because of the environment. We can’t deforest and bring industry. The municipality would have to receive a lot more to compensate for this loss.”

The imposition of protected areas by state government was perceived as a barrier to local development and the compensation from the ICMS-E was insufficient to counteract this view, possibly aggravated by the lack of knowledge of the true monetary values involved.

Local government participants from within the environmental secretariat had a contrasting perspective. They exhibited good knowledge of the ICMS-E and its value, although, apart from the 10 per cent used to fund their department, they did not know how the ICMS-E revenue was used, assuming that it went to health, education and payroll. Local outcomes of the conservation payments are not identifiable.

These participants were also able to identify aspects of the mechanism they considered substandard compared to other states. The compensatory nature of the ICMS-E was the main concern as the mechanism does not stimulate local engagement with environmental problems,

“We have an absence of public management. The environment is abandoned by the local authorities. The ICMS-E in São Paulo has to change, because there is no incentive for a mayor to pay attention to the subject. It’s a passive thing, it’s enough to have so many hectares of protected area. The local government doesn’t need to do anything.”

Related to this was the lack of recognition of municipal and private reserves in the ICMS-E legislation, with another respondent complaining that,

“The municipality doesn’t receive ICMS-E for the presence of a private reserve, neither if they implement one themselves. We have written a plan for the creation of a
reserve, but it hasn’t been legislated. Investing in conservation doesn’t entail any benefit for the municipality. Maybe if there was an incentive they would be interested.”

Nevertheless, organised civil society had some success in allocating part of the revenue for environmental activities. The municipal environmental council consisted of representatives from local government, civil society groups and state government agencies. In 2011 the council lobbied to pass legislation to allocate some of the ICMS-E to an environmental fund for activities determined by the council. The coordinator of the council explained the reasoning behind the law as follows,

“The ICMS-E law in São Paulo doesn’t change, so independent of that we wanted to apply some of this resource to the environment. We studied the accounts and talked to the finance department and arrived at the conclusion that two per cent of the ICMS-E would be sufficient to operationalise some projects without compromising public accounts.”

By creating a municipal law the environmental council believed they would be able to function independently of the interests of changing administrations, stating that,

“We wanted a legal instrument that tied the ICMS-E to the environmental fund, regardless of the government. Otherwise you are at the mercy of the will of one mayor or another.”

The law was passed and the fund became operational, receiving a number of payments which were utilized in the development of a recycling programme. However, following a change of government in the next election the payments stopped. The new administration claimed the transfer to be unconstitutional, even though similar laws had been successfully enacted in other municipalities. The coordinator of the council explained her understanding of the motivations for this as follows,
“The municipal administrations are always short on money. Any money that is redirected can be prejudicial. Local public authorities still see the environment as a bad thing, something that interferes with development. They don’t see any benefit in spending municipal money on environmental matters.”

The same respondent felt that the absence of a direct monetary incentive for conservation action within the ICMS-E mechanism reduced the leverage that the council had in advocating for the application of the resource to the environment,

“Perhaps, if we could show the return that an investment in the environment would give, we would be successful in re-instating the payments.”

The case of Cananéia demonstrates that organised civil society, and the leadership that exists within it, may be important for the local management of natural resources. However, direct monetary incentives may provide the leverage necessary to mobilise politicians. The environmental council coordinator had previously worked for the state government performing the calculation of the ICMS-E and had conducted her own research on the instrument. Her knowledge and experience of the mechanism, and her tireless efforts, were critical to the success of the council in originally passing the law. However, the political interests of those in charge and negative perceptions of conservation may be key indicators of the success of any local initiative that aligns the ICMS-E with environmental outcomes.

3.5.3. Relational aspects
This section discusses how the implementation and functioning of the ICMS-E in the municipalities have been influenced by the relational aspects (knowledge, legitimacy, transparency, participation) identified in Table 2, with results summarised in Table 6.

In Guaraqueçaba the value of ICMS-E was transparent and well known amongst local government representatives and the application of the revenue made deliberately, whilst in Cananéia its value and application were largely unknown. The separation of the ecological portion from the rest of
the ICMS when it enters municipal accounts appears to increase the visibility of the payments. If this simple change was made in São Paulo it could enhance recognition of the economic value of protected areas and help to counteract negative perceptions of protected areas held by some local stakeholders.

Recent developments in Guaraqueçaba indicated that the mechanism had influenced local decision making. In early 2017 a new local government was elected and within one year had advanced the creation of four protected areas corresponding to IUCN categories I and II. The justification for this legislation (which at the time of writing had not yet been passed), clearly identifies the ICMS-E as a key motivation and indicates that the mechanism improves the perception of equitable distribution of the ICMS as a whole, stating that,

“Another... positive impact is the immediate increase in ICMS-E revenue, by the simple creation of the protected areas. The ICMS-E revenue may be used for all matters, not just the environment. Nothing is more just than Guaraqueçaba, almost 100 per cent covered by protected areas, receiving a significant share of this [ICMS-E] resource.”

In both São Paulo and Paraná, the ICMS-E was implemented due to the mobilisation of local governments affected by the local costs of protected areas. In Paraná, active participation in the ICMS-E by local government is prescribed in the mechanism, with the annual evaluation and determination of the Terms of Agreement in tandem with local authorities. In Guaraqueçaba this has contributed to increased interaction with the mechanism, both in its application to socio-environmental projects, and recently through the proposed creation of local protected areas to increase monetary return from the ICMS-E. The authorities in Guaraqueçaba have been unable or unwilling to promote public-private partnerships for conservation, even when economically beneficial.

In São Paulo, the legislation is entirely passive, with no requirements for participation. Yet, the existence of an environmental council with motivated and knowledgeable members in Cananéia
led to community participation in the application of ICMS-E revenue. This is entirely unanticipated in the ICMS-E legislation and has important implications. Local perception of the importance of natural resource management, and the responsibility the community feel for conservation, are fundamental to the outcomes of conservation payments. The importance of local leadership for information sharing and mobilisation is also emphasised by this finding.

In summary, the expertise, and environmental consciousness of members of the environmental council motivated legislative change in Cananéia. However, a lack of knowledge of the value of the ICMS-E meant that it was considered inadequate by local government and had created a conservation stalemate. In Guaraqueçaba, reasonable knowledge has proven insufficient when navigating an extremely complex policy, and knowledge sharing and capacitation between institutional spheres is lacking, despite this being a specific objective of the ICMS-E.

Table 6. Relational aspects of the ICMS-E legislative framework in Guaraqueçaba and Cananéia.

<table>
<thead>
<tr>
<th>Relational Aspects</th>
<th>Guaraqueçaba, Parana</th>
<th>Cananéia, São Paulo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency</td>
<td>Value observable, application known.</td>
<td>Value not observable, application unknown.</td>
</tr>
<tr>
<td>Legitimacy</td>
<td>Accepted and utilised.</td>
<td>Values considered insufficient.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Local government have good knowledge of mechanism.</td>
<td>Local government have poor knowledge of the mechanism.</td>
</tr>
<tr>
<td>Participation</td>
<td>ICMS-E influences decision making by local government. No means for participation of broader community.</td>
<td>Civil society mobilised some interaction from local government, however it was not sustained.</td>
</tr>
</tbody>
</table>

3.5.4. Structural aspects

This section discusses how the implementation and functioning of the ICMS-E in the municipalities have been influenced by the structural aspects (capacity and resources) identified in Table 2, with results summarised in Table 7.

A common theme in interviews was the lack of resources available to municipal governments to meet their responsibilities. Increasing the institutional capacity of local authorities is inherent in the objectives of the ICMS-E in Paraná. However, programmes and partnerships to address this appear to be lacking and the policy instead places onus on local authorities through the Terms of
Engagement. In Brazil, municipal government is recognised as the government entity least capable of producing meaningful results due to institutional and technical limitations (Afonso and Araujo 2000, Batista 2015). This was evident in the inability of the authorities in Guaraqueçaba to establish partnerships with private reserve owners, despite the advantages that would arise from such interaction, and the inability to integrate existing legislation into ICMS-E evaluations.

Municipalities may require further technical support and orientation from state government to capitalise on the opportunities offered by the ICMS-E. Furthermore, the ICMS-E legislation may require streamlining so it is easier for local actors to engage with. Municipalities must also be able to easily identify which environmental activities will produce the best economic return. Perhaps for these reasons, IAP is developing a new system to distribute the ICMS-E in Paraná state. The intention is to base the ecological criteria on the presence and activity of a municipal environmental council controlling an environmental fund with the budget coming directly from the ICMS-E. The higher percentage of ICMS-E funds earmarked by local law for this fund, the higher the monetary reward received.

Whilst this is certainly a simplified approach, and easier for local government to navigate, it entails potential consequences for distributional equity, remembering that the core motivation of the intergovernmental transfer of the ICMS is to provide resources so local government can perform critical public functions. Municipal governments have responsibilities in health, education, transport, sanitation, solid waste and other basic services. Constitutionally, the ICMS cannot be earmarked, so linking it so fundamentally to environmental activity may not be appropriate. Well-resourced municipalities may be able to allocate a large proportion of the ICMS-E to the environmental fund and thus be better compensated, whilst impoverished municipalities that depend on that money for payroll and basic services will be less able to do so. The creation of a functioning environmental council also demands capacity, time and resources, potentially further disadvantaging places like Guaraqueçaba where these are all in short supply.

Higher government levels generally have more consolidated administrative structures for environmental management, making them better enabled to allocate and manage protected areas
(Conti, de Azevedo Irving et al. 2015). Even so, many protected areas administered by these higher levels of government do not adhere to the basic management instruments that federal legislation obliges. For example, the federal environmental agency is still elaborating the management plan for the Superagui National Park in Guaraqueçaba some 28 years after the park was first implemented, despite federal legislation requiring a plan by 2005. This calls into question the ability of the less well-resourced municipal government of Guaraqueçaba to effectively administer the four new parks currently being legislated, especially considering the presence of communities within the designated areas and the potential conflicts that may arise. The development and implementation of a management plan requires financial investment and technical capacity. The lack of technical capacity present at the municipal level suggests that the situation of the municipal protected areas may be precarious. Poor management will lead to poor evaluation and little return from the ICMS-E. Social justice issues also arise when parks are designated in areas already inhabited by communities and local government may not be sufficiently capable of navigating and resolving these complex issues. It is unclear if the monetary return from the ICMS-E will justify the financial investment and possible social costs. It is however interesting to note that the presence of the ICMS-E incentive has made the creation of local protected areas a productive investment, as oppose to a burden, as it was viewed in Cananéia. The ICMS-E needs to be articulated with other state interventions to increase local capacity for equitable environmental management.

In São Paulo the ICMS-E, despite being criticised for its lack of incentive, does not demand any attention from local government and so does not divert critical capacity away from the local authorities providing core services. The activity of the environmental council indicates that the community considers conservation important and demands action in this area. Knowledge sharing and increasing participation of local civil society in decision making processes may be more important to conservation outcomes than legislation that places onus and responsibility on the local sphere.

In São Paulo, where the ICMS is purely compensatory, state government have introduced a complementary programme to stimulate local natural resource management. The Programa Município VerdeAzul (GreenBlue Municipality Programme), implemented in 2007, is voluntary,
and all 645 municipalities have enrolled. The programme invites representatives of all municipalities to participate in workshops and seminars which build technical capacity and share knowledge. Annual evaluations are conducted to measure municipal environmental performance including air quality, water management, urban greening, biodiversity management, environmental education and the action of the environmental council. These criteria allow participation of all municipalities, not just those that host protected areas. A score is given out of 100 and those municipalities receiving more than 80 points receive preferential treatment when making applications to the state fund for pollution control and prevention (FECOP), in 2017 worth R$15 million (USD 4 608 000). Agreements are made between local and state governments for the use of the fund to, for example, pay for solid waste and recycling infrastructure or systems to capture and reuse water.

Initiatives that include the capacitation and participation of all municipalities, may be more adequate for stimulating local natural resources management and improving environmental consciousness of local governments than simply offering a monetary incentive. The money received from FECOP by successful municipalities is additional, not withdrawn from the pool required to cover basic public functions as is the case of the ICMS-E. The participation of municipal staff in the VerdeAzul programme helps to address the critical problem of low capacity within local governments. Whilst in Paraná there is little publically available data of the ICMS-E outcomes, aside from an initial increase in municipal protected areas, the Programa Município VerdeAzul has clearly demonstrated environmental outcomes, with all funds applied to additional environmental management (for more information see Município VerdeAzul 2018).

Table 7. Structural aspects of the ICMS-E legislative framework in Guaraqueçaba and Cananéia.

<table>
<thead>
<tr>
<th>Structural Aspects</th>
<th>Guaraqueçaba, Parana</th>
<th>Cananéia, São Paulo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Access to resources insufficient, ICMS-E critical source of income.</td>
<td>Access to resources insufficient generally, ICMS-E important source of income.</td>
</tr>
<tr>
<td>Capacity</td>
<td>High capacity required to capitalise on incentives from the ICMS-E.</td>
<td>ICMS-E does not draw any capacity from local governance.</td>
</tr>
</tbody>
</table>
3.5.5. Framing the payments narrative

The discussion of how to determine the value of payments for conservation often centres around the opportunity costs of activities prohibited under the conservation scheme (Ma, Bauchet et al. 2017). In 2016, in São Paulo, the ICMS-E transferred more than USD 38 million (120 million Brazilian reais) to 186 municipalities, as compensation for hosting protected areas. The amount allocated to the ecological criteria of the ICMS was a political decision, based not on the potential tax revenue of alternative land uses nor what may be considered as ‘fair reward for acting responsibly’ (Vatn 2010, p.1250). It has been suggested that compensation (as oppose to incentives or payments for conservation) may evoke the sense that one is being rewarded for a ‘good’ act and foster intrinsic motivations for conservation, following a rationale of reciprocity (Vatn 2010). However, in a region characterised by high poverty and limited access to opportunity and resources, appealing to ‘green altruism’ from local authorities may not overcome the understandable imperative for local economic development. The framing of payments as compensation is therefore problematic. A federal park manager commented as follows,

“The notion that you’re poor because of the environment is totally misleading, both scientifically and historically. But the ICMS-E was a political-economic response to this premise. You’re going to get some money so you stop saying you’re poor because of the environment.”

Characterising the ICMS-E as compensation legitimises the perception that conservation is detrimental to local communities and impedes development. Whilst the local costs of conservation are significant, and should not be treated lightly, economic instruments should endeavour to reverse these negative perceptions by focusing on the multiple values of conservation, rather than reinforce them.

3.6. Conclusion

This research has examined two versions of an ecological fiscal transfer known as the ICMS-E in Brazil. In the state of Paraná, despite the policy being flexible and fostering multi-level linkages, it does not adequately account for the local context in which it functions. The complexity of the
policy may overwhelm the incentives offered for additional natural resource management. Where the incentive can most obviously be accessed, through the creation of municipal protected areas, there are important questions of social justice and conservation quality that need to be addressed, in tandem with higher institutional spheres. Either capacity building within municipal government to enable them to capitalise on incentives offered, or a simplification of the incentive mechanism is needed. The mechanism also encounters problems with distributional justice in its current form, and in the form proposed for an overhaul in 2018, favouring municipalities that experience higher levels of institutional capacity and greater access to financial resources.

In São Paulo, the ICMS-E is inflexible and undemanding of local governments. It acts as simple compensation for the costs of conservation, without stimulating local natural resource management. The negative perception of the protected areas by local municipal authorities had a detrimental impact on local engagement with conservation activity, despite civil society leadership in this area. Funding was not applied to environmental projects as this was considered a wasted investment. In this case the presence of a direct monetary incentive may produce positive results, at least as leverage for local environmental activists. Better dissemination of the mechanism is also necessary as a lack of knowledge of the values involved is a significant barrier to implementing local natural resource management.

Whilst ecological fiscal transfers, like the ICMS-E, can contribute towards economic well-being and conservation, their development should be carefully considered. Revenue from intergovernmental transfers is intended, and indeed required, for the provision of basic services at the municipal level. Linking this revenue to conservation activity has potential repercussions for local governance, particularly in this context, where municipal institutions are the least well-resourced, and the least efficient and effective in applying revenue (Batista 2015). The ICMS-E is a critical source of local funding, and distributional equity should be at the centre of decisions about its allocation, with care taken not to further disadvantage the already disadvantaged. The ICMS-E mechanism should highlight the benefits provided by protected areas. Both Cananéia and Guaraqueçaba benefit from opportunities for sustainable development available to few other places in Brazil. In this region, the natural environment provides the most important opportunity for
creating a viable economic strategy. This could occur through the realisation of the productive and employment potential afforded by the presence of abundant and intact nature, informed by diverse, and place specific cultures. Conservation payments may be a part of this scenario, however local authorities need to understand this potential and be enabled to capitalise on it in ways that are sensitive to cultural and natural heritage, particularly by working jointly with communities, protected area managers and environmental authorities. State and federal capacity building interventions will be required.

Economic instruments for conservation are being applied around the world, and payment for ecosystem services is amongst the most common interventions. The design and implementation of payments to stimulate conservation or to compensate for its local costs should be carefully considered as outcomes are highly context dependent. Whilst it is difficult to extrapolate some of the findings of this research to other places, the application of the framework here allowed several observations to be made that may be more universal in nature;

- The outcomes of conservation payments depend largely on the structural characteristics of the institutional level at which payments are received. A lack of institutional capacity, and limited resources (technical, monetary and even time) in Guaraqueçaba prevented the production of positive outcomes for conservation and development, despite the presence of a payment design that should have stimulated these outcomes. The relevance of institutions in the outcomes of natural resource management has been identified in other research (Paavola 2007), and also specifically in the context of conservation payments (Clements, John et al. 2010).

- Design of payments significantly alters how they function at the local level and incentives may be a key factor to stimulating local environmental activity, both through direct monetary reward but also by creating leverage for stakeholders with environmental interests.
• The way a protected area is perceived influences how payments for conservation are applied locally, and outcomes produced. Payments for conservation alone may not be sufficient to change the perceptions of conservation by those who experience its consequences negatively. Framing conservation payments in ways that improve the visibility of the multiple values of ecosystems may help to overcome negative perceptions.

• Knowledge of conservation payments should be universal and transparent. Knowledgeable civil society leadership is significant for local natural resource management and increased civil society participation in public processes may be more important to local natural resource management than legislation that places responsibility for conservation on local authorities.

The framework developed in this research, and then applied to the case studies has enabled a fuller understanding of how the ICMS-E functions in a local context. If analysed simply for design aspects, without consideration of the relational and structural aspects, the ICMS-E in Paraná could have been considered a leading example of a conservation payment scheme. The application of the framework has enabled the identification of significant downfalls. Applying the framework to other contexts, and other payment schemes, could reveal similarly surprising findings and inform the development of new programmes.
3.7. References


Signage around some protected areas in the case study municipalities.
CHAPTER 4: The ICMS-E and socially equitable conservation. Perceptions and outcomes of environmental compensation in the Brazilian Atlantic forest

Prologue
The previous chapter applied a framework of analysis to the ICMS-E in Paraná and São Paulo states and the corresponding case study municipalities to identify how the local context acts upon the design of the ICMS-E to produce intended and unintended outcomes. Chapter 4 examines the social perceptions of the ICMS-E to identify if monetary compensation alters stakeholder perceptions of conservation. In the region that this research took place the costs of conservation for local actors is high. The extensive nature of the protected areas in each municipality impacts on the opportunities available for the development of infrastructure and economic activity and also on the customary institutions for forest governance that have been established over generations by the local inhabitants. This chapter identifies how different stakeholder groups perceive the protected areas and determines whether the monetary compensation of the ICMS-E is sufficient to reduce the human-environmental conflicts that occur. Chapter 4 has been submitted to the journal Local Environment as,


Abstract
Economic instruments are considered a way of achieving integrated outcomes for conservation and development. The intricacies of specific socio-ecological systems may determine how conservation payments are interpreted locally to produce outcomes. This research examines the social perceptions of an ecological fiscal transfer, which intends to compensate the substantial local costs of conservation in a hotspot of biological and social diversity in the Brazilian Atlantic forest. In this context, does monetary compensation influence local perceptions of the conservation
regime and contribute towards the reconciliation of human-conservation conflicts? Does compensation entail any meaningful improvement in the socio-economic situation? Results show that environmental compensation is not widely recognised as producing any tangible benefits for the community, nor is it perceived by local authorities as sufficient to enact meaningful socio-economic development. Environmental compensation could play an important role in a policy-mix to address the local costs of conservation. Its effectiveness in achieving positive outcomes depends on the larger political, social and environmental context within which environmental compensation occurs, how it is communicated and how the funding is applied locally.

4.1. Introduction

The pursuit of an exclusionary approach to managing protected areas has been recognised as causing exceptionally high costs for local populations, without necessarily achieving the expected conservation outcomes (Brown 2002, Cernea 2006, Cavanagh and Benjaminsen 2015). The most recent paradigm presented as capable of achieving integrated outcomes for conservation and socio-economic development is economic instruments for conservation (Engel, Pagiola et al. 2008). Payments for ecosystem services (PES) can compensate communities that experience the local costs of conservation, reducing poverty and easing conflict between communities and conservation (Ring 2008, Milder, Scherr et al. 2010, Borie, Mathevet et al. 2014). The impacts of payments for conservation on communities affected by top-down conservation regimes are generally not well understood, particularly where local institutions for natural resource management have been undermined by the approach to conservation (Holmes and Cavanagh 2016). This research contributes to a significant gap in the literature by examining the social perceptions of a long-running, government-funded ecological fiscal transfer, which is intended to compensate the substantial local costs of conservation in a hotspot of biological and social diversity in the Brazilian Atlantic forest.

4.1.1. The costs of conservation and the role of environmental compensation

Regions of high biodiversity often coincide with regions of poverty and the implementation of protected areas can make the rural poor responsible for subsidizing a global biodiversity conservation agenda (Cavanagh and Benjaminsen 2015), affecting livelihoods and access to
services (Balmford and Whitten 2003). Limitations are placed on infrastructure development and options for income generation are reduced (Ring 2008). However, the costs of conservation are not just economic. The creation of conservation areas, and the level of human interaction permitted within them are often determined by ecological and economic factors, without consideration of social and political aspects (Adams and Hutton 2007). Until recently there has been a lack of published research that describes the social costs of protected area, perhaps due to the perception that attempts to assess social impacts may prove detrimental to fragile conservation efforts (Balmford and Whitten 2003, Brockington, Igoe et al. 2006, West, Igoe et al. 2006). The documented social impacts of protected area on local populations can include displacement, economic vulnerability, food insecurity, loss of rights to land and access to resources, social disarticulation and the loss of traditional, cultural and spiritual practices associated with land use practices (Cernea and Schmidt-Soltau 2006, Adams and Hutton 2007, Holmes and Brockington 2012, Hitchcock, Sapignoli et al. 2015).

Research on the way that economic approaches to conservation produce outcomes for local stakeholders is more limited (Zheng, Robinson et al. 2013, Holmes and Cavanagh 2016). Access to compensation schemes is advocated as a potential positive outcome of environmental conservation (Dudley and Stolton 2010). Research points to the effectiveness of compensation schemes in improving protected area management (Bruner, Gullison et al. 2001), and their potential for poverty alleviation (Farley, Anderson et al. 2011). Receiving payments may improve local perceptions of conservation, reducing conflicts and making biodiversity conservation a viable land use (Ferraro and Kiss 2002, Borie, Mathevet et al. 2014). Payments have also been shown to foster intrinsic motivation for conservation (Souto, Deichmann et al. 2014). However other studies demonstrate a crowding out of this motivation once payments are applied (Festre and Garrouste 2014). The way that payments are made and the local context within which they occur can influence outcomes (Cetas & Yasué, 2017). Examination of the social, cultural, political, economic and environmental contexts is therefore necessary. In cases where local institutions for natural resource management have been developed, the intricacies of that socio-ecological system may determine how conservation payments are interpreted locally to produce outcomes.
A socio-ecological system is an ecological system, linked with and affected by a social system (Anderies, Janssen et al. 2004). The breadth and diversity of human-nature interactions in socio-ecological systems is reflected by a diversity of practises for managing natural resources. Traditional ecological knowledge, accumulated through observation, internalised into culture and transmitted through generations, informs traditional management practises (Berkes, Colding et al. 2000). Traditional ecological knowledge is an attribute of societies with historical continuity in resource use, not necessarily restricted to tribal or indigenous groups (Berkes, Colding et al. 2000).

Institutions within socio-ecological systems are rules or constraints, both formal and informal, that structure human interaction (Berkes 2004). They are shared understandings among those involved about the actions that are required, permitted or prohibited and determine the contributions that ecosystems make to human well-being (Ostrom and Crawford 2005, Whitfield and Reed 2012). Access to natural resources is governed by institutions, and in the case of people living within conservation areas, institutions may be both legislative and customary. Customary institutions may be central to maintenance of environmental condition and resilience, particularly when those institutions are governed by stable communities and protected from outside forces (Gibson, McKean et al. 2000). When customary institutions are replaced by regulatory institutions through top down processes of conservation, traditional management practices, cultures and economies are eroded, often with detrimental outcomes for conservation, as well as social capital (Gibson, McKean et al. 2000).

4.1.2. **Protected areas and ecological fiscal transfers in Brazil**

Brazil is considered the most biologically diverse country on the planet (Mittermeier, Da Fonseca et al. 2005). The implementation of protected area in Brazil has expanded greatly since the mid 1970s. Between 2003 and 2008 Brazil was responsible for over 70 per cent of new land protection globally (Jenkins and Joppa 2009) and over a quarter of Brazil’s territory is designated as reserves (Verí ssimo, Rolla et al. 2011). Since the 1930s the environmental movement within Brazil has been an important influence on the formation of environmental policy (Medeiros 2006) and environmental legislation in Brazil has evolved to be some of the most advanced in the world (Marangon and Agudelo 2004, Schneider 2013).
In 2000 a national protected area system was introduced to standardise existing regulation (Medeiros 2006). Known as SNUC (Sistema Nacional de Unidades de Conservação - Law 9.985/2000) the legislation coincides with the objectives outlined by the International Union for Nature Conservation (IUCN) (Ferreira, Negrelle et al. 2011). SNUC provided a legislative platform for an approach to protected area that incorporates social, economic and environmental considerations (Appendix 1). SNUC recognises the necessity of protecting not just flora and fauna but people, by securing traditional cultural and material activities. SNUC contains strictly protected and sustainable use categories so that conservation areas can reflect the local context and respond to socio-economic realities, with management plans elaborated in tandem with civil society. However, SNUC is often not implemented, monitored or enforced effectively (Schneider 2013). Management is often dominated by economic or ecological factors, rather than social considerations and is limited by insufficient resources (Diegues 1995, Santos 2001, Dumora 2006). The reality of protected area in Brazil does not reflect the socio-environmental values of SNUC, particularly where implementation occurred prior to 2000 or where management plans have not been elaborated (Meda and de Araujo Junior 2014). Despite social and environmental movements bringing attention to these issues, the presence of protected areas in Brazil causes frequent conflict for local populations (Rochadelli, dos Santos et al. 2015).

In many Brazilian states, complementary law has been passed which recognises and compensates the costs of conservation incurred at the local level. The Ecological ICMS (ICMS-E), is the longest running example of an ecological fiscal transfer. Pre-existing tax revenue from the circulation of goods and services is redistributed from state to local government based on environmental criteria (Ring 2008, Droste, Lima et al. 2015). Although there has been no valuation by state government of the social and economic impacts of conservation on local populations, the ICMS-E endeavours to counteract these impacts, at least in part, by financially compensating local governments for the opportunity costs of hosting protected areas.
4.1.3. **Aim of the research**

This research examines the ICMS-E in the Atlantic forest region, where local actors have been alienated from government processes of biodiversity conservation (Teixeira 2004). Forest dwellers are ‘invisible’, except as the recipients of punitive measures for practising subsistence activities which have become environmental crimes (Ferreira, Negrelle et al. 2011). In this context, does monetary compensation influence local perceptions of the conservation regime and contribute towards the reconciliation of human-conservation conflicts? Does compensation entail any meaningful improvement in the socio-economic situation of local stakeholders? This paper presents results for two case studies of socially and biologically diverse municipalities, with long histories of protected area implementation and environmental conflict. The questions guiding the research are:

1. How do different stakeholder groups view the conservation regime imposed on their municipality?
2. How aware are stakeholder groups of the compensation received for the presence of protected area?
3. Are any benefits perceived from the compensation and how does this impact on stakeholder perceptions of protected area?

The research contributes to the limited available literature on the social dimensions of economic instruments for conservation and human well-being. If economic instruments are to contribute to the effective management of socio-ecological systems, it is necessary to understand their reception by local actors and the resulting outcomes. The lessons derived from this analysis may be useful for policy-makers, planners and anyone with an interest in economic instruments for socially equitable conservation.

4.2. **Methodology**

4.2.1. **Case study descriptions**

The research was conducted in 2016 in two Brazilian municipalities: Guaraqueçaba, Paraná state and Cananéia, São Paulo state. Guaraqueçaba is situated on the north coast of Paraná, at the São
Paulo border, neighbouring Cananéia (Figure 8). Despite their proximity, the journey by road takes around 8 hours, due to geographical barriers and poor road conditions. Both municipalities are amongst the most economically disadvantaged of their respective states (IBGE 2010), and are located in the largest continuous remnant of Atlantic forest. The Atlantic forest is the most threatened biome in Brazil, with only seven to twelve per cent of its original area intact (Tabarelli, Pinto et al. 2005). Its conservation is of high national and international priority (UNESCO 2011). Historical processes of economic and geographical isolation left an uninterrupted swathe of coastal Atlantic forest and it has since become protected by a mosaic of state and federal protected areas (Teixeira 2004). Around 98 per cent of Guaraqueçaba is under environmental protection, whilst in Cananéia the figure is 75 per cent.

Figure 8. Map of study area. Protected area coverage compiled from UNEP-WCMC (2018)

The region was home to indigenous people belonging to the Carijó and Tupiniquim groups prior to the arrival of Portuguese colonialists in the early 1500s (Martins 1995). From the 17th century
enslaved men and women were trafficked from Africa and forced to work in plantations (Priori, Pomari et al. 2012). The process of miscegenation over centuries has led to the development of communities with unique traditions, social organisation and livelihoods. Known as traditional communities they are culturally differentiated (Diegues, Arruda et al. 1999). Fundamental to the definition of traditional communities is the existence of a system of natural resource management marked by knowledge and respect for natural cycles, and the use of natural resources that respects reproductive capacity (Diegues, Arruda et al. 1999). Traditional societies have developed through generations of observation and experimentation an extensive and detailed knowledge of natural processes, thus their management practices are uniquely adapted to the environment they inhabit. As traditional communities generally do not have access to another source of income, the use of natural resources is of fundamental importance, not just for subsistence but for social and cultural processes; their culture and practices are inseparable from the ecosystem they inhabit (Diegues 2004).

There are two types of non-indigenous traditional communities in the study region; Caiçaras and Quilombolas. Caiçaras can be understood as communities formed with ethno-cultural contributions from indigenous tribes, Portuguese colonisers, and to a lesser degree African people. This culture developed primarily along the coast of Paraná, São Paulo and Rio de Janeiro states (Diegues, Arruda et al. 1999). Subsistence agriculture and fishing are the mainstay of livelihoods, supplemented by resource extraction from the Atlantic forest. Caiçaras have developed an itinerant agricultural system known as pousio, with collective land use which reduces soil degradation and allows forest to regenerate (Campos, Sulzbach et al. 2013). Caiçaras are recognised for the contribution they have made to the maintenance of biodiversity, through their intimate ecological knowledge and traditional natural resource management systems (Diegues, Arruda et al. 1999).

Quilombolas are of African origin, descendants of men and women enslaved by colonialists. Their ancestors, fugitives of forced labour, found refuge in remote locations of difficult access and over time communities were established (Priori, Pomari et al. 2012). Their isolation led to the development of a distinct culture and way of surviving in the forest based on resource extraction
and subsistence agriculture (Rezende da Silva 2008). Generally, *Quilombos* maintain the production patterns developed by their ancestors, based on principles of cooperativism and subsistence (Priori, Pomari et al. 2012). Residents of *Quilombos* have a constitutional right to the land settled by their ancestors, although there are many barriers to this being fulfilled.

The implementation of protected area in this region started in the late 1960s, but increased rapidly in the 1980s. Although the categorisation of the reserves varies between sustainable use and strict protection, the whole region is also under the Atlantic Forest Decree (Federal Decree Nº 6660/08), which is very restrictive, prescribing a moratorium on the use of forest products except with specific authorisation by the relevant environmental agencies. A preservationist approach to conservation treated communities as external to the natural environment, often placing them in conflict with the conservation regime, side-lining them from decision-making and criminalizing subsistence activities (Marangon and Agudelo 2004). Land use restrictions impact on all aspects of livelihoods including agriculture, extractivism, fishing and hunting, and have curtailed the *pousio* system. Communal farming practices have been lost, and with them the cultural and religious activities associated with the harvest (Marangon and Agudelo 2004, da Rocha and da Campanha 2007). Subsistence farmers must obtain specific authorisation to clear plots for planting. Restrictions are placed on the collection of food and materials from the forest including a complete ban on hunting and the collection of important resources such as palm heart, timber and vines (Rochadelli, Silva et al. 2013). There has been little investment in the social welfare of inhabitants or policies aimed at supporting the local economy, for example, through technical support to help farmers adapt agricultural systems to the restrictions of conservation (Marangon and Agudelo 2004). Despite often contradicting law, rural communities in this region remain heavily reliant on natural resources as a means of income and subsistence (Dumora 2006).

The ICMS-E began in Paraná in 1991 and in São Paulo in 1993, assigning a small percentage of the flexible ICMS tax revenue to the presence and category of protected area, with more restrictive reserves attracting higher monetary compensation. The ICMS-E is an important source of revenue for each municipality. Only a tiny proportion of ICMS revenue is distributed according to ecological criteria, with the majority allocated to reward economic production, yet the ICMS-E
accounts for over 60 per cent of the ICMS tax revenue received. In Guaraqueçaba the ICMS-E accounts for 20-30 per cent of the total annual budget, whilst in Cananéia it provides 10 per cent.

There are key differences between the ICMS-E in the two states. In Paraná, local government legislation that supports biodiversity conservation can result in a higher return from the ICMS-E, creating incentives for conservation. Revenue can also fall if protected areas are degraded or local policy negatively impacts on conservation outcomes (Lourenço 2002, May, Veiga et al. 2002). In São Paulo, the ICMS-E is unaffected by local activity. In Paraná, the ecological payment is made separately from the rest of the ICMS, making the value transparent, whilst in São Paulo the transfer is made together so the value received as environmental compensation is not obvious. ICMS-E revenue is not earmarked for environmental purposes and is available for use as required by local government.

4.2.2. Data collection
This paper presents results from semi-structured interviews with community representatives (n=16) (often in the capacity of president of the local resident’s association) and local government actors (n=10) in the two municipalities. Interviewees were selected through reputational and positional sampling (Scott 2017). The perspectives of park managers, environmental NGOs and researchers working in the region (n=16) complement the results from the two main stakeholder groups. Participants were interviewed using a semi-structured approach, guided by open-ended questions. Interviews were conducted in Portuguese by the author, lasted from half an hour to two hours in length and were recorded and transcribed verbatim. Quotes have been translated by the author. The software program Nvivo 9 was used to manage, code and analyse the transcripts to determine key themes amongst different stakeholder groups on the following topics: perception of environmental conservation in general and as implemented in the region; knowledge and opinion of the ICMS-E and the application of revenue.

4.3. Results
The results section is divided into two parts. The first addresses how stakeholders view environmental conservation, and the role of the state in administering it in their region, as opposed
to the traditional institutions which previously governed natural resource management. The second section reports on the level of knowledge around the ICMS-E and how the payment influences perceptions of the conservation regime.

### 4.3.1. The legitimacy of environmental conservation

This section highlights how members of traditional communities living rurally distinguish between conservation supported by traditional institutions, or local rules and norms, and conservation imposed since the 1980s by state and federal regulation and enforced by environmental police. Community responses from across both municipalities were aligned, however responses from local government differed. This section is divided into the themes that recurred during interviews; results are summarised in Table 6.

#### 4.3.1.1. Framing the forests

Almost all respondents acknowledged that conservation of the environment was of fundamental importance, however the stakeholder groups (community and local government) framed the forest differently. Traditional communities from both municipalities framed the forest in cultural terms, with natural resources forming the basis of livelihood activities,

> “We can’t go to the market to buy meat every day. Besides, it’s part of our culture to hunt, the farming is part of our culture too... there’s no way to escape it.”  
> (Community representative, Guaraqueçaba)

> “My parents... used nature, they lived off farming and fishing. There was no other way. But they cared for everything. We have always preserved. If I am going to cut a tree I need to know why I am cutting it. If it’s not really necessary, I don’t cut it.”  
> (Community representative, Cananéia)

In Guaraqueçaba most elected members of local government self-identified as belonging to the traditional communities of the region, however their discourse focused on the utility of the forest and its economic potential,
“I was born here, I am Caiçara. We are rich in fauna and flora, we are environmentally rich. The municipality does its part to preserve because it is for our own benefit. Our autonomy is attached to the environment; to agriculture, organic production and tourism, even academic tourism for ecological research.”

(Government representative, Guaraqueçaba)

In Cananéia, local government respondents working on environmental issues had a similar view,

“*I see this region today in a marvellous light, with extremely rich potential.*”

(Environmental secretary, Cananéia)

Politicians working outside of the environmental secretariat in Cananéia asserted that the forest was important but emphasised the difficulties and barriers imposed by conservation. A high-ranking local official stated,

“There are many things we can’t do here because of the environment.”

(Government representative, Cananéia)

4.3.1.2. Local support for the state and federal conservation regime

Despite considering forest conservation important, respondents from rural communities did not accept the role of the government in conservation, identifying themselves as responsible for the forest being intact today, and opposing the conservation regime,

“There is a person who lives here, who cares for it, who has knowledge. Before people talked about conservation, before IBAMA existed [the federal environmental agency], the traditional population already had a culture of preservation. Everything that has been deforested in our state was not done by the traditional inhabitant, he is the one who always respects nature.”

(Community representative, Cananéia)
“If you take away the salary of the government conservationist, will he stay to protect the forest? No, we are the ones that care for this place.”

(Community representative, Guaraqueçaba)

In Guaraqueçaba, local government expressed how they were sidelined in decisions about conservation,

“Public policies are made in air-conditioned offices in the capitals of the country. And we, who live in the place, suffer all the consequences. Conservation needs to be developed with social responsibility, that is missing in the projects.”

(Government representative, Guaraqueçaba)

Rural communities highlighted their mistreatment throughout the implementation of protected area, as if they had been responsible for the deterioration on the forest,

“Actually, who deteriorated nature was not us. The traditional inhabitants, by their way of living, preserve. They might take a tree to build a fence, but it’s for subsistence, no one here has an industry. We have a history, every community has its history, its way of living. All this should be respected”.

(Community representative, Guaraqueçaba)

“Some [protected] areas were instituted way up from the top. There’s a feeling that it’s not good. Every time it gets more restrictive, the law doesn’t let you do anything.”

(Community representative, Cananéia)

Agricultural incentives were responsible for the arrival of large-scale agriculture to the region in the 1970s, which led to significant deforestation and the displacement of many local communities to marginal areas (Teixeira 2004). With the implementation of protected areas, ranchers and farmers were remunerated to leave, and the remaining agricultural communities became the focus
of government agencies, collaborating with conservation NGOs, in the creation of management plans for the reserves (Diegues 1995). Policy interventions in the region focused on preventing those communities from adversely affecting the forest, rather than addressing the deep poverty, poor access to services and absence of economic opportunity (Teixeira 2004). Whilst authorities did not acknowledge the role of the communities in the condition of the preserved forest throughout this process, communities attribute traditional institutions with having guaranteed the intact state of the forest across centuries,

“They [conservationists] say, ‘You have to understand that this forest is conserved.’ But it always has been, for the 500 years since we got here. This is not a privilege of NGOs or management. Someone brought that. It was the wisdom of the indigenous people, of the Caiçara. They secured this place for you to benefit today.”

(Community representative, Guaraqueçaba)

“We created some community restrictions, so that we could have oysters until today, and we do. We have one of the spaces that has the most oysters in the municipality of Cananéia.”

(Community representative, Cananéia)

“We have been here for 500 years, caring for our forest. We know how to take care of it. We know that we have the forest and we have to preserve it, so much so that we continue preserving it today.”

(Community representative, Guaraqueçaba)

A government representative from Guaraqueçaba also described the role of local institutions in preserving the forest over time,

“Us, Guaraqueçabanos, it’s not that we don’t accept rules or accept impositions to maintain the environment. Everything you see here was maintained by our people, throughout all of this time.”
However, the erosion of customary institutions by the imposition of regulation were also described,

“We would go and cut palm heart, but we never cut the palm that had a flowering stem. We knew that it would give a lot more. But not today. Today they get that flowering palm. Why? They need to escape the surveillance. They have to be quick, so they end up cutting everything.”

(Community representative, Guaraqueçaba)

Respondents also described how food was cultivated clandestinely, with small plots hidden within the forest. This phenomenon of ‘guerrilla agriculture’ is considered a mechanism of resistance used by rural populations against the imposition of conservation (Cavanagh and Benjaminsen 2015).

4.3.1.3. Positive impacts of protected area

Protection from outsiders in the form of land grabs and poaching was one perceived benefit of protected areas, as acknowledged by a resident of the Cardoso Island state park in Cananéia,

“In our community, when it became a park, at the time it was good for us. I am saying that because it was a time of a lot of land grabbing. Some people had sold their houses to tourists and the women of the community became maids. Nobody could work for themselves anymore. Then the park came and the summer houses were demolished.”

Parks were also recognised as having some effect in protecting the region from over-exploitation. Many respondents identified ‘outsiders’ as a threat to the ecosystem, with poachers and palm heart collectors invading the area,

“We are surrounded by reserves, and that’s good because we need them, otherwise the environment here would be much worse.”
“There was a big invasion of people from the outside, mostly in the capture of crabs. They were taking tonnes of crabs from here.”

(Community representatives, Cananéia)

However other participants believed that the protected areas had deteriorated local institutions, and without an appropriate level of monitoring had worsened overexploitation by outsiders,

“The exploitation of palm heart, which was a way of life, had a kind of control. Today it is prohibited and there is no control. So, people go into the forest and steal the palm heart. We’re at the mercy of these palm heart thieves.”

(Community representative, Guaraqueçaba)

Conflict between local inhabitants and outsiders that extract palm heart for the black market has been documented in this region, with records of violent encounters between local communities and poachers (Rocha 2015).

4.3.1.4. Negative impacts of protected area
Local stakeholders described how they were sidelined by the approach to conservation. The process of demarcation and implementation was perceived to have focused on the conservation of biodiversity, in most cases without acknowledging the role of humans in conserving that system. The mayor of Guaraqueçaba asserted that,

“When they thought about the environmental protection of Guaraqueçaba they thought of everything, the water, the animals, the plants. But they forget the most precious good, which is my people. They forgot the people and invested everything in preservation. I am against that... I can’t tell a father not to cut a palm heart, when I can’t offer anything else for his son to eat. If they can’t plant, how can they survive?... they [environmental agencies] didn’t offer anything to the people.”
Criminalisation of activities associated with subsistence livelihoods strongly impacted the cultural and economic well-being of rural communities,

“Here, in this region, it is just one big restriction. Everything is prohibited since they created the park and the environmental police. The government put them onto the communities, without giving any support to the people, and so, everything was prohibited.”

(Community representative, Cananéia)

Respondents described the fines and prison time experienced by friends and family, and the sometimes-violent encounters with environmental police. The alienation experienced by local communities through the processes of state conservation has set them in opposition to state conservation,

“During the implementation, the worst mistake they made was to not have positioned us as friends, but on the side. Then you end up not having an ally, but an enemy of preservation.”

(Community representative, Guaraqueçaba)

The limitations placed on subsistence activities were described. In some categories of protected area, it is possible to request authorisation for certain land-use activities, however the process is difficult and slow,

“You can get authorisation to plant, but it’s really complicated. When you manage to get it the time to do the planting has already passed, so everything is backwards.”

(Community representative, Cananéia)

There is also a perception that the intention of environmental agencies is to inhibit the local population until they are no longer able to persist, leaving the area for its intended ‘vocation’ of biodiversity preservation,
“If you say no to everything, how will he go home and have food, medicine, access to schools? What is the counter offer for him to be able to live? I don’t understand where they want to get. Do they want all my people to leave here?”

(Government representative, Guaraqueçaba)

“Legislation is made, it’s just that there also exist inhabitants. So, what should we do? Go back to living in the caves?”

(Government representative, Cananéia)

“Living here is all very complicated. But even so, we live here, we’re living off our stubbornness. We won’t give up.”

(Community member, Guaraqueçaba)

Representatives from local government also acknowledged the difficulties in governing under the land use restrictions,

“There are a lot of things that need to be done and they don’t happen because we can’t take down trees and other things, bring industry.”

(Government representative, Cananéia)

Community members were aware of their inability to make demands or participate meaningfully in conservation and development decisions. They were also cognisant of their role in being subjugated to the conservation regime,

“We know what we must do for the state. For our people to do any kind of renovation or repair, anything, they have to ask permission. We know everything we owe to the state... but the state doesn’t provide us with any kind of support.”

(Community representative, Cananéia)
“You must understand that we are fragile inside here [the reserve]. We’ve heard a lot said, like, ‘You are in the park, you can’t do that, you are living under state control.’ Gee, we were born here, we built here, we cared for here. But we don’t have any strength, none at all.”

(Community representative, Guaraqueçaba)

Government officials also described a lack of support from the upper echelons of government as a barrier to improving the conditions of the municipality,

“What’s missing for us is investment from the state or federal government.”

“The municipality doesn’t have the conditions to stimulate our economy. So, I went to seek collaboration with the state government. I didn’t have success.”

(Government representatives, Guaraqueçaba)

“The biggest barrier is a lack of political will from the state government, from the federal too.”

(Government representative, Cananéia)

The inhabitants of the study site consider themselves responsible for the preserved state of the forest, feel alienated from state processes of conservation and suffer high negative impacts from land use restrictions. There is little difference in responses between the municipalities, particularly from rural communities, who share a similar history of exclusion, restriction and surveillance. The forests are considered integral to local culture, identity and economy, however forest preservation through state control is rejected. Imposition of protected areas without acknowledgement of the complex socio-ecological relationships that comprise the foundations of the local economy and culture has set the local population in opposition to the conservation regime.
4.3.2. Knowledge of the ICMS-E and perceptions of protected area

This section provides results on how well stakeholder groups understand the ICMS-E mechanism and if they perceive any benefits, such as improved access to services or infrastructure, or improved financial autonomy. The two case studies are presented separately, because, whilst community responses were similar, respondents from the two local governments exhibited different levels of knowledge of and interaction with the compensation provided by the ICMS-E.

4.3.2.1. Cananéia

Under ICMS-E legislation in São Paulo, local government activities do not influence the value of the ICMS-E. The ICMS-E remunerates the presence of state parks, regardless of local policy decisions. Respondents from the local government of Cananéia generally displayed very little knowledge of the ICMS-E and were unaware of its value or how it worked. One government representative phoned the treasury for more information,

“I asked them what was the percentage of revenue that came from the ecological part, but they couldn’t tell me.”

Another took a guess, estimating an amount less than 10 per cent of the actual value,

“It’s not a lot, see? I calculate that it must be 400 thousand a year, more or less. Actually, [this information] is not well disseminated. I believe that few people know about the resource.”

The ecological portion of the ICMS revenue arrives in municipal accounts together with the rest of the ICMS, which is based mostly on economic activity. In Cananéia the small percentage (0.5 per cent) of the tax revenue that is destined to compensate protected areas, accounts for 60 per cent of all revenue received from the ICMS, a fact completely unknown to all government representatives outside of the environmental secretariat. It is possible to determine this number through a simple calculation; however, the design of the mechanism does not provide any reason for public authorities to seek information about the value that protected areas are contributing to
local budgets. The ecological value is not separated and is not applied by local government for any particular purpose. How this value (10 per cent of the total annual budget) was spent was unknown, with the mayor of Cananéia responding,

“Sincerely, I do not have this knowledge.”

Another high-ranking official stated,

“I really don’t know, because it’s not divulged. There must have been some improvements in some projects from the money of the ICMS-E, but I don’t know, there’s no disclosure, no direction, you know?”

Respondents from within the environmental secretariat, in contrast, had good knowledge of the ICMS-E, could describe the values involved and recognised its economic significance. Although no-one knew how it was spent, respondents were able to make suggestions about how the revenue could or should be used,

“We have problems, because the people who live in the protected areas can’t plant or use the resources. This money could be used for projects, like organic agroforestry for example, to create a way for them to sustain themselves. It would be good actually, to be able to return this benefit to the population that are in the conservation areas.”

The ICMS-E appeared to have little or no impact on the perception of local government towards conservation. The members of the environmental secretariat did not have sufficient political sway to push an alternative agenda for the use of the money. Poor knowledge of the ICMS-E and a firm position that forest conservation was the cause of many economic difficulties meant that the compensation was seen as inadequate,

“The municipality would have to receive much more to compensate for this loss, because it’s for the municipality, right? There are so many things we can’t do.”
The presence of the environmental compensation was not divulged publically. Community members were almost entirely unable to describe anything about the ICMS-E mechanism. The only exception was a member of a highly organised community living inside a state park, who knew about the mechanism and suggested how it should be used,

“It is an indemnity that the municipality receives, of which they should pass five per cent to the communities. It’s just that most of the communities don’t have the regulation to enter into an agreement with the prefecture. We already tried to do this, but we were unsuccessful. We’re going to try again next year.”

It was recognised that better knowledge of the mechanism might improve the transparency of the use of the resource and even stimulate debate on how it was spent, described by an employee of the environmental secretariat,

“I think that if the population knew about the ICMS-E, it would have another vision. It would demand that public powers invest it, in terms of projects, or help with something in the communities.”

A lack of knowledge of the ICMS-E by both local government and community in Cananéia meant that the compensation had very little impact on the relationship between government, rural communities and conservation. With scarce knowledge of how much the revenue was received and its application, the compensation did not alter perceptions of the conservation regime, was not linked explicitly to improvements in service provision or local infrastructure and did not alleviate human-conservation tensions. This is in contrast to Guaraqueçaba, where the ICMS-E mechanism provides an extra monetary incentive for local conservation activity.

4.3.2.2. Guaraqueçaba

In Guaraqueçaba the 2.5 per cent distributed according to ecological criteria represents 75 per cent of the total ICMS revenue received. As the ecological component enters municipal accounts
separately, the economic importance of the protected areas is more visible. The local government of Guaraqueçaba displayed much greater knowledge of the ICMS-E across all departments, with the mayor particularly involved in discovering how to use the mechanism to its full potential,

“*I went to learn more about the ICMS-E to know how to work with it. It enters as a free resource, for example it can be used to pay salaries. But I understand that it should be directed to environmental questions, not used just for payroll, but to involve the population in environmental preservation.*”

The ICMS-E in Paraná includes a quality index, measured annually, which takes into account local government legislation that impacts on the quality of the protected areas and the environment generally. The mayor was knowledgeable about this incentive and had endeavoured to create public-private partnerships to enable better management of private reserves, which would result in a higher return from the ICMS-E,

“I proposed that we...pass along a percentage to the owners of private parks for them to maintain their areas and for the municipality to keep receiving the ICMS-E. Everyone agreed that this was a good way to return the money to those who preserve. But we didn’t manage to put anything into practise, so I took a part of the money to use for environmental questions.”

Limited financial resources created barriers to directing public funds to private reserve managers, so these private-public partnerships were never implemented. Instead, a social programme with environmental benefits was created that rewards women with basic food and hygiene products in return for collecting solid waste from the shoreline and sorting it for recycling. According to the mayor this was the first-time money from the ICMS-E was destined to anything other than payroll in Guaraqueçaba, although over three-quarters is still used for that purpose. The incentive effect of the ICMS-E appears to have produced a higher level of engagement in environmental issues by local politicians.
A third of Guaraqueçaba’s economy is based upon the administration and the provision of local services. Approximately 18 per cent of the population between the ages of 16 and 65 were engaged in salaried employment, with the municipal government the largest employer, responsible for two thirds of formal jobs in the municipality (IBGE 2010). However, access to the ICMS-E resource was insufficient to trigger improvements in the social and economic condition of the wider population, especially given the low capacity of local government,

“We should have big projects in the environmental area so that families could be independent of the prefecture. We lack infrastructure from the state and federal government. I have my own vision, but it’s no use for me to launch a project. The municipality doesn’t have income for that. If I don’t have the right structures, if I don’t have investment, I don’t have any way to sustain a project. The ICMS-E isn’t sufficient to enable this in any way.”

(Mayor, Guaraqueçaba)

Despite a reasonable level of interaction with the ICMS-E at the local government level, very little information had trickled down to the community. Some community respondents had heard the ICMS-E mentioned but could not describe what it was, its value or how it worked,

“The ICMS-E? I heard something about it at the meetings of the park council, but no, I don’t know.”

One individual from Guaraqueçaba who works as an environmental journalist around the country had good knowledge of the ICMS-E, but explained that the rest of the community,

“…doesn’t know. Sometimes they know because I tell them. I’ll chat with a friend at the bar and then they know. But generally, no one knows.”

Whilst rural communities don’t commonly understand how the ICMS-E works, they do understand that the conservation of the forest generates benefits that spill over municipal boundaries,
“I can’t do anything, so I know it’s preserved. But somebody is benefiting from this forest staying standing. The state is winning, somebody is winning. We can’t do anything and someone else gains.”

There was confusion about payments for the forest in some communities in Guaraqueçaba, due to NGO activity. Starting in 1999 an NGO based in the state capital, in coordination with The Nature Conservancy and funded by American automotive and energy companies to the value of US$18.4 million, purchased land in the region for the establishment of three private reserves for a carbon credit programme (Kill 2014). Rural communities were aware of this agreement and the large sums of money involved, creating a sense of resentment that ‘someone’ was benefiting financially from the forest. The scheme was considered unjust, as it excluded local inhabitants whilst not providing any perceived benefits,

“*The money goes to them [the NGO], it doesn’t benefit us. They get it, and beyond getting all the money and not returning any resources to the community, they want to restrict what we can do even more.”*

According to the NGO around 10 per cent of the total budget was spent promoting sustainable development activities around the reserves, including beekeeping and certified organic banana projects, as well as capacity building and training of employees and local people (TNC 2010). The reserve situated in Guaraqueçaba also generates 10 per cent of the ICMS-E received annually. Nearby communities were unaware of these outcomes and unsure of the relationships between the stakeholders, however they suspected that the government had benefited from the arrangement,

“*We know that the prefecture collected a lot from this reserve, but until today, there wasn’t even a cent passed through to the communities.”*

“*The money enters for the state or municipality; the communities are left to perish.”*
The resentment created by the establishment of the private reserves and the carbon credit programme meant that community perceptions of conservation were further eroded. There was a lack of knowledge of the ICMS-E generated and no perception of any local improvements for rural communities arising from the revenue it produced. Misconceptions about the activity of the conservation NGO also led to overestimations of the presence and activity of environmental organisations in the municipality,

“Lots of people say there are around 80 environmental organisations active in Guaraqueçaba, that receive resources and are getting rich. The NGOs are really rich.”

Community members were extremely sceptical of their activities and livelihood projects were rejected,

“The Guaraqueçabano doesn’t believe any more in environmental projects. We don’t accept the NGOs because their discourse isn’t that of the Caiçara, it’s different.”

“They [the NGO] came here with an example of how to grow bananas. They wanted to change how we do it, how we’ve always done it. They wanted to close part of our land to make a demonstration for people to see and they put in a big sign of their organisation. Actually, I think what they wanted was to take all our land, to turn it into a private reserve.”

The implementation of private reserves and the transactions that had occurred between environmental NGOs and corporate interests had a lasting impact on community sentiment towards conservation,

“I saw the paper, a contract for 10 million dollars between an American company and the NGO. Then they closed off the area and treated it as if it was their stronghold. The native loses. Then he gets angry, goes in there and cuts the trees. The NGO employees,
each one well dressed, with a new laptop computer, walk there in front of the natives, who have never had anything, and complain because he cuts palm hearts. That’s aggressive. The social cost is very high and it generates anti-preservation.”

In summary, better visibility of the value of the compensation provided by the ICMS-E and the presence of monetary incentives has led to engagement with the ICMS-E by local government and its partial application to at least one project with an environmental theme. However, funding is insufficient to contribute towards an agenda of sustainable development. Furthermore, rural communities do not perceive any benefits stemming from the compensation, and so the ICMS-E has no positive impacts on the relationship between forest inhabitants and protected area. Concurrently, a carbon credit programme and the implementation of private reserves created confusion and resentment about the distribution of economic benefits being created by the intact forest. All key findings are summarised in Table 8.
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4.4. Discussion

This research has shown that, in the case study areas, environmental compensation through intergovernmental transfers was ineffective in altering the perceptions of rural communities towards the conservation regime. The ICMS-E can be considered as a positive intervention in the sense that it acknowledges and reflects local sentiment about the inequitable distribution of the costs of conservation, and provides an opportunity for unconditional financial restitution for the costs of conservation imposed from above. However, as a stand-alone response to the processes of economic and cultural degradation caused by top-down implementation or protected areas, the monetary compensation offered by the ICMS-E has little impact as it is insufficient to trigger change that would enable the municipality to benefit from their natural capital.

This analysis of the ICMS-E provides lessons which can inform the development of compensation schemes that are more socially equitable, benefit and support local institutions for resource management, and reduce conflict. First, environmental compensation should be seen as a tool in a multidisciplinary approach to socially equitable conservation, not as a means to resolve existing conflicts. Second, monetary compensation alone may not be sufficient to overcome the barriers faced by local actors. Collaboration should occur horizontally and vertically to improve capacity of local stakeholders and support the development of livelihoods that support cultural and environmental values. Third, incentives should be linked to human well-being, not just conservation outcomes. Finally, the application of compensation should be transparent and explicitly linked to benefits which are tangible to the communities most affected by the costs of conservation. These four points are discussed in turn.

4.4.1. Compensation is just one tool in a multidisciplinary conservation toolbox

The findings presented here support previous research on the importance of local institutions for sustainable natural resource management, providing that they are governed by stable communities and buffered from outside forces (Dietz, Ostrom et al. 2003). However, customary local institutions that governed resource use for 500 years were interrupted and replaced through the implementation of protected areas, setting traditional custodians in opposition to conservation.
Monetary compensation may have a role in alleviating conflict, but only as part of a multidisciplinary approach that embraces the complexity of socio-ecological systems and their institutions.

Whilst not all customary institutions are aligned with the conservation of biodiversity, there are numerous examples from within Brazil and around the world of indigenous and traditional natural resource management practices and knowledges being integrated into effective conservation systems (Posey 1985, Berkes, Folke et al. 2000, Bhagwat and Rutte 2006, Schröter, Sessin-Dilascio et al. 2014). Conservation that is governed by rules that contradict daily patterns of resource use will be ignored (Gibson, McKean et al. 2000), as exemplified in this research by the practice of ‘guerrilla’ agriculture by rural communities that considered the institutions governing land use excessively restrictive and inconsistent with their knowledge and practice. Where people are respected as a part of the natural system and conservation is considered legitimate, compensation may be invested to adapt traditional subsistence activities to the restrictions of conservation.

4.4.2. Addressing poverty through multilevel collaboration

In the case studies described here, environmental conservation has been the main focus of policy interventions for over 30 years, over and above economic and social well-being. Although conservation is not to blame for poverty in the region, which relates to historical processes of geographical, political and economic isolation, the restrictions on agricultural and extractivist activities imposed by protected area legislation exacerbate the precarious situation of rural communities. Whilst payments for conservation may contribute to alleviating poverty, money alone will not be sufficient. Collaboration and capacity building initiatives from state and federal authorities must occur so that funding from environmental compensation can be applied effectively.

The development of viable livelihoods should be done under the guidance of communities. Many livelihood projects have been implemented by well-meaning organisations, but in the absence of community collaboration, these have not endured. The livelihoods of rural communities are deeply
linked with culture and identity and the imposition of a particular livelihood option by outsiders will not necessarily gain support. However, there are examples of multilevel institutional collaboration with proven positive outcomes for economic well-being and autonomy, including that of the harvest of *cataia* (Myrtaceae: *Pimenta pseudocaryophyllus*) leaves by women in Barra do Ararapira. This isolated community in Guaraqueçaba is located on the island of Superagui, a strictly protected national park. There are strict limitations on livelihood activities and extremely poor infrastructure development and access to services. Through collaboration with members of the federal environment agency stationed on the island to manage the park, the women’s association gained permission to extract a natural resource from within the park. *Cataia* leaves are known to have specific culinary and medicinal properties. Environmental technicians determined a sustainable harvest of *cataia*, and women collect and dry the leaves to sell to other communities and tourists. The leadership of individuals from within the community and the federal environmental agency was critical to this initiative, demonstrating how social capital and collaboration can overcome barriers. In Cananéia, a community-based project for tourism by the Marujá community on the Cardoso Island State Park (Schröter, Sessin-Dilascio et al. 2014) and an oyster cooperative developed by the Mandira Quilombo have also produced positive documented outcomes (Garcia 2005).

Whilst there may be scope for similar initiatives co-developed by communities and other institutions and funded by environmental compensation payments, in the case of the ICMS-E, where payments are made to the local government, there are significant barriers. Municipal government is the least well resourced, most inefficient and least technically skilled of the three spheres of government (Afonso and Araujo 2000, Batista 2015). Local government may be unwilling, or unable to commit scarce resources to projects that benefit specific communities, rather than the broader public. Rural communities may be limited if they seek support just at the local level; therefore, linkages should occur vertically as well as horizontally.

Vertical and horizontal collaboration to support traditional culture has been seen in an initiative of the Federal University of Paraná, where extension activities for students involve collaboration with diverse traditional communities from the coastal region (de Oliveira et al., 2017). The university
programme provides transport and food so community members can attend the meetings. This provide numerous benefits for community members, including sharing knowledge, ideas and problems, and learning about what is happening in other places (including other traditional communities). Despite facing similar challenges, traditional communities have little contact with one another due to their isolation and limited access to phone, internet and public transport services. The university project improves articulation amongst them and increases their visibility and agency.

4.4.3. Incentives and framing of conservation payments

This research supports previous findings that the way payments are made can impact their outcomes at the local level (García-Amado, Ruiz Pérez et al. 2013, Ma, Bauchet et al. 2017). Having compensation transferred separately from other revenue, so that the value is transparent to local administrations, can improve knowledge of the mechanism and increase the visibility of the value of protected area. The incentives offered in Paraná also appear to have positive impacts on local environmental engagement, as seen with Guaraqueçaba’s recycling programme and attempts to develop public-private conservation partnerships. Although framed in Paraná as a mechanism to improve the quality of biodiversity conservation, the ICMS-E could perhaps be more effective if linked to local sustainable development. It could include explicit incentives for the implementation of socio-economic projects that support local productive activities that enhance or maintain conservation. This could overcome the barriers that municipal governments face in investing in local livelihood programmes as it would produce twin benefits through improving livelihoods and increasing the ICMS-E revenue. A framework should be utilised which directs the ICMS-E towards local development that benefits the communities which face the highest costs of conservation. The focus should be on the development of livelihood strategies that enable locals an autonomous and dignified economic future, aligned with their traditional culture of preservation and thus adequate to both their cultural needs and the conservation demands imposed on them. This was summed up by a community member from Guaraqueçaba,

“We don’t want money, we want a means to create an income. We don’t want help, we want support. We want to live in our own corner, by our own sweat.”
4.4.4. Linking revenue to tangible outcomes - Transparency, knowledge sharing and community engagement

Communities have poor knowledge of the ICMS-E and their lived history of land use restriction and conflict with environmental police leads them to perceive protected area as negative and illegitimate. Communities do not identify any positive benefits for their communities from ICMS-E revenue. A lack of transparency and knowledge of the ICMS-E and other conservation payment schemes had created resentment and mistrust in the community, particularly in Guaraqueçaba. This has exacerbated feelings of inequality, as locals know that profits are being generated by conservation, whilst they, the traditional stewards, bear the costs. The ICMS-E, instead of creating bridges between communities and conservation, contributes to creating a larger gap. This is partly derived from the mistrust that the population has of local authorities and could be improved through increased transparency in the application of resources.

Dissemination programmes that explicitly link ICMS-E revenue to local service provision, infrastructure or livelihood projects, could improve the relationship between people and parks and help reduce resentment, as summed up by a park manager,

“If a person sees a medical centre with a sign that says, ‘resourced by the ICMS-E of the National Park of Superagui’, for sure their opinion will change, because then the benefit is materialised, you closed the cycle. This is fundamental.”

Indeed, respondents responded positively to the idea of applying environmental compensation to improve access to services and public infrastructure of the affected communities,

“If the money came to the communities and improved health or education, then for us it would be wonderful.”

This suggests, that under certain conditions, direct benefits from environmental compensation could contribute to alleviating the tensions of human-conservation conflicts, however local
benefits must be unmistakably linked to ecological revenue. Composing between 20-30 per cent of the total municipal budget the ICMS-E certainly contributes, even if indirectly, to the local provision of services. This was not recognised by the broader community.

A participatory approach to the use of a percentage of the ecological compensation may improve local outcomes. An environmental council could be charged with deciding how a percentage of the ICMS-E is spent. With adequate representation from all sectors of society the council could address needs relevant to the whole population, not just those normally involved in political decision-making. In the state of Rio de Janeiro the presence of a functioning environmental council is a prerequisite to receiving the ICMS-E, however state legislators should be careful that the institutional demands of this requirement do not prevent participation of municipalities with lower capacity.

The suggestion by a community member, to transfer a part of the ICMS-E directly to communities for their own use, has precedent in the state of Paraná, where some municipal governments have such agreements with *Faxinais* traditional communities. The *Faxinais* have been recognised by the state environmental agency as having livelihood practices that enhance and preserve the threatened Brazilian pine forest (*Aracuaria angustifolia*). Some municipalities have agreements with community associations to transfer the value of the ICMS-E relevant to the land the community is responsible for. The community uses the funding for the maintenance of their livelihood practices, which in turn provides environmental benefits.

A Federal legislative framework exists that recognises the need of traditional communities to utilise forest resources for economic and cultural production (National Policy of Sustainable Development of Traditional Peoples and Communities Decree 6.040-2007). Given the diversity of traditional communities that exist within Brazil, practising different systems of organisation and resources use, a large technical and institutional investment would be required by state and federal agencies to recognise and regulate the use of forest products in ways that are adequate to each local context. However, the investment may not be so large when the potential benefits of maintaining
social and environment capital are considered; where local users are given monitoring and use rights, better forest condition is induced (Ostrom and Cox 2010).

4.5. **Conclusion**

This research has explored how environmental compensation impacts on the relationship between people who live in and around reserves and the conservation regime under which they exist. Rural communities considered themselves as stewards of their environment, however are subjected to strict environmental regulation with high social, cultural and economic impacts. The environmental compensation received by the municipality is not recognised as producing any tangible benefits for the community, nor is it perceived by local authorities as sufficient to compensate for the local costs of conservation or enact meaningful socio-economic or environmental projects. Environmental compensation could play an important role in a policy-mix to address the local costs of conservation. However, its effectiveness in achieving positive outcomes depends on the larger political, social and environmental context within which it occurs, how it is communicated and how the funding is applied locally. Through the comparison of two versions of the ICMS-E it has been possible to identify ways in which compensation payments can fit into a policy-mix to address the inequitable distribution of the costs of conservation, contributing towards conservation that legitimises the presence and activities of traditional forest stewards whilst providing opportunities for socio-economic development and well-being.
4.6. References


Some types of housing seen in the case study municipalities.
CHAPTER 5: Opportunity for change or reinforcing inequality? 
Power, governance and equity implications of the ICMS-E 

Prologue 
The previous chapter discussed the implications of monetary compensation via the ICMS-E on the perceptions of protected area of local stakeholders that experience the associated costs. Chapter 5 maintains its focus on social aspects of the ICMS-E, identifying how local power dynamics and governance structures impact on the application of the funding to either promote social equality or reinforce unequal power relations. This chapter conducts a fine-grain analysis of one case study, focusing on Guaraqueçaba in Paraná. The ICMS-E from Paraná was described by Droste and colleagues as the “most mature EFT... including continous improvement over time”, something that could not be asserted for São Paulo (Droste, Ring et al. 2018 p.377). They suggest the ICMS-E from Paraná as a model for adaptation elsewhere and thus make its examination important to avoid replicating potential negative aspects of the mechanism. Additionally, with the inclusion of incentives, the ICMS-E in Paraná has greater potential to stimulate local conservation activity which may imply further costs and benefits for resident communities. 

Chapter 5 has been submitted to the journal Geoforum as; 

Verde Selva, G., Pauli, N, Clifton, J and Kim, M. Opportunity for change or reinforcing inequality? Power, governance and equity implications of government payments for ecological services in Brazil [May 2018].

Abstract 
Payments for ecosystem services (PES) are often invoked as a strategy to achieve the dual goals of maintaining healthy ecosystems and improving human well-being. The social outcomes of PES schemes are highly variable and have received little analysis. PES initiatives can create opportunity and political leverage for minority groups or reinforce pre-existing power relationships and reproduce socio-economic inequalities. This research focuses on the equity implications of a
government PES scheme from Brazil, examining how institutional arrangements and local power dynamics influence the application of revenue to achieve social outcomes. This research uses a case study from the Atlantic forest to determine whether the application of revenue reflects the interests of a broader community base and avoids elite capture, or if decision-making processes are engineered by local power actors to further specific interests. Results demonstrate how poor local institutional capacity limits the effective governance of the revenue leading to limited positive social outcomes. Furthermore, incentives offered by the PES mechanism stimulate conservation activity which implies high costs for the rural poor. The application of a framework of governance guides the development of recommendations for improving the social equity of government PES schemes in regions of poverty.

5.1. Introduction

Payments for ecosystem services (PES) are often invoked as a strategy to achieve the dual goals of maintaining healthy ecosystems and improving human well-being, known as integrated outcomes. However, the outcomes of PES schemes are highly variable and may depend largely on the specific context within which they are applied. There has been limited analysis of the determinants of social outcomes of PES (Börner, Baylis et al. 2017). PES initiatives can create opportunities and political leverage for minority groups, countering traditional power hierarchies (Birner and Wittmer 2003, Van Hecken, Bastiaensen et al. 2015). Conversely, access to the benefits of PES can be highly asymmetrical and subject to elite capture, reinforcing pre-existing power relationships and reproducing socio-economic inequalities (Adams and Hutton 2007, Dressler, To et al. 2013, Cavanagh and Benjaminsen 2015, Ma, Bauchet et al. 2017). Scholars have called for greater attention on how local governance structures and power dynamics influence the outcomes of PES for conservation and human well-being (Van Hecken, Bastiaensen et al. 2015, Holmes and Cavanagh 2016). Justice and social equity outcomes are increasingly recognised as crucial to the effectiveness of PES initiatives (Martin, Gross-Camp et al. 2014, Pascual, Phelps et al. 2014, Lehmann, Martin et al. 2018).

The research presented here examines governance and power structures associated with a type of PES known as an ecological fiscal transfer (EFT). EFTs are a government-led PES mechanism to
compensate the provision of ecological goods and services where benefits cross local boundaries (Ring 2008). EFTs target public authorities through the redistribution of public revenue from central to local government levels. They address large scale equity problems associated with the costs of conservation that accumulate at the local level and may support the public function of nature conservation (Balmford and Whitten 2003, Droste, Ring et al. 2018). As part of a policy-mix targeting conservation, EFTs may have advantages over other types of PES. PES often involve high transaction costs (Vatn 2010). EFTs introduce ecological criteria into a fiscal transfer system, building on existing institutions and administrative procedures which results in very low transactions costs (Ring 2008, Droste, Lima et al. 2015). Securing funding for PES schemes over the long-term can be prohibitively difficult (Pagiola, Ramírez et al. 2007, Engel 2016). EFT funding is stable and permanent, with the additional benefit of eliminating the problem of finding new sources of funding for conservation as payments are drawn from existing tax revenue (Droste, Ring et al. 2018). EFTs target local public institutions, hence emphasizing social preference over individual preference; conversely, PES often focus on private land owners (Vatn 2010). By targeting payments to local government, expenditure can be applied to further the social interests of the community according to local preference, avoiding issues such as the need to target specific ES providers, payment differentiation and the need for land users to have secure tenure (Börner, Baylis et al. 2017).

The first EFT was developed in Brazil in 1991 (Ring 2008), followed by Portugal in 2007 (Santos, Ring et al. 2012) and then India (Busch and Mukherjee 2017). There is interest and some pilot projects regarding their application in France (Borie, Mathevet et al. 2014), Germany (Schröter-Schlaack, Ring et al. 2014), Indonesia (Mumbunan 2011) and other places. Research also points to their potential use Europe-wide (Droste, Ring et al. 2018) and in a global arrangement (Farley and Costanza 2010). Despite the general interest in this type of policy mechanism, there is insufficient evidence on the local application of EFTs to understand whether they can lead to beneficial or adverse social outcomes. EFTs partly decentralise responsibility for natural resources management by providing monetary incentives for municipal government to implement local protected area or undertake other conservation measures, with these decisions theoretically determined according to the preferences of the local population. It has been argued that this may
contribute to the incorporation of local knowledge and viewpoints into conservation (Sauquet, Marchand et al. 2014). However, this perspective may not entirely account for the power dynamics that shape decision making at the local level, particularly in poor regions of the developing world where the distribution of power among local actors may be highly unequal, and clientelism prevalent (Azeredo and Lobo 2005). Local government institutions determine for what means EFT revenue is applied, and therefore to whom the benefits will accrue. From this perspective, it is clear that governance, the way by which structures and processes share power within society, and existing power dynamics, such as concentration and inequality, are intertwined and should be examined together.

The EFT examined here is the Ecological ICMS (ICMS-E) from Brazil, which has been in operation for almost three decades. It has been described as the “most mature EFT mechanism to date, including continuous improvement... over time”, and is seen as basis for adaptation to other parts of the world (Droste, Ring et al. 2018 p.377). There are significant knowledge gaps in relation to the application of the Brazilian ICMS-E, including whether the application of ICMS-E revenue reflects the interests of a broader community base and avoids elite capture, or if decision-making processes are engineered by local power actors to further specific interests. This research questions whether the ICMS-E, as a government-led PES initiative, can incorporate positive aspects of good governance to promote power distribution among stakeholder groups and create outcomes that are aligned with social preference.

The objectives of this research are to: (1) Examine the social outcomes of ICMS-E revenue application and determine how this is influenced by governance and institutional arrangements, (2) Examine how local power dynamics impact on the application of the revenue from the ICMS-E, and (3) Determine how consideration of these elements can improve the design and evolution of EFTs in other contexts.
5.2. Conceptual background

5.2.1. The role of institutional capacity in EFTs

EFTs are administered and operated by government actors, so the institutional setting and structures under which they operate are critical to outcomes. Capacity is an important aspect for consideration (Vatn 2010). The institutional capacity of the public sector plays an important role in the application of policies to achieve integrated outcomes (European Commission 2005). Institutional capacity is the result of the complex interplay between competence, resources and structures, including: the human resources available; level of expertise and availability of training and technical assistance; the types of responsibilities and availability of inter- and intra-institutional cooperation and coordination to facilitate these processes; and the style of governance in terms of transparency, efficiency and accountability (Bhagavan and Virgin 2004). Institutional capacity depends not only on the capabilities of people but also on the overall size of the task, the resources which are needed to perform the task and the framework within which capacities are used (Franks 1999). Institutional capacity is affected by the level of decentralisation present in a system of governance (Baiocchi 2006). Consideration of decentralisation is also relevant to the way power is distributed locally, an important factor in shaping the social outcomes of PES.

5.2.2. EFTs and trends of decentralisation

EFTs are considered part of the movement towards decentralisation that is occurring in many countries. Decentralisation in governance refers to the dispersal of authority and responsibility away from central government. Decentralisation allows for local preference and knowledge to be incorporated into decision making processes, theoretically creating more effective and efficient policy (Clement 2010). However, if decentralisation is not accompanied by sufficient resources and capacity building it can lead to high inefficiency and low effectiveness in achieving the local policy mandate (Bardhan and Mookherjee 2006).

In recognition of the need to promote conservation at all governance levels, EFTs are framed as an instrument with potential to incentivise and provide funding for municipal conservation activity (Borie, Mathevet et al. 2014, Schröter-Schlaack, Ring et al. 2014), with projects reflecting local preference (Sauquet, Marchand et al. 2014). However local preference may not reflect the
municipal population as a whole. The process of decentralisation can lead to the capture of
democratic processes by local elites (Bardhan and Mookherjee 2006). This effect can be directly
related to the level of inequality present locally; high inequality increases the chances of benefit
capture of policies by powerful local actors (Bardhan and Mookherjee 2002).

5.2.3. The importance of acknowledging power in EFTs
Power relations are considered central to how PES function (Van Hecken, Kolinjivadi et al. 2018),
however there is limited research on how power dimensions shape PES in practise (Kolinjivadi,
Van Hecken et al. 2017), with nothing published specifically for EFTs, to the author’s knowledge.
Local dimensions of power are the result of historical structures, practices and legacies
(Kolinjivadi, Van Hecken et al. 2017) and the resulting social-political-institutional contexts in
which PES occur are largely responsible for their outcomes (Van Hecken, Kolinjivadi et al. 2018).
Examining PES with a focus on power dynamics can contribute to understanding how policy
interventions are adapted locally to produce outcomes.

Although a contested topic, power can be understood as the application of action and knowledge
through social interaction and distribution of resources and influence, to resolve problems and
further interests (Few 2002). Power imbalances between actors affect how decisions are negotiated
and trade-offs established, with unequal distribution of power usually meaning that existing power
relationships are reinforced (Adger, Brown et al. 2006, Dressler, To et al. 2013).

Power structures impact the outcomes of conservation payments in the way they are received and
applied locally (Cetas and Yasué 2017). PES schemes can open up opportunities for participation
and negotiation over rights (McAfee and Shapiro 2010, Shapiro-Garza 2013). Social interactions
in natural resource management can provide a platform for participation and increase the
politicization of communities, countering traditional power hierarchies (Birner and Wittmer 2003).
However, PES schemes can also reinforce existing social differences among local actors (Pagiola,
Arcenas et al. 2005, Corbera, Brown et al. 2007, Hendrickson and Corbera 2015, Holmes and
Cavanagh 2016).
Individuals or collective actors can only practise power within the structural limits that enable or constrain them (Hayward and Lukes 2008). The agency (i.e., the capacity for action), of diverse actors influences the formation and outcomes of PES (Van Hecken, Kolinjivadi et al. 2018). In the context of EFTs, the agency that local government has in executing social or environmental strategies in accordance with social preference is limited or enhanced by existing structural aspects, such as technical capacity and access to resources. Powerful non-government actors, individuals and organisations may not experience the same structural limitations to agency, and have access to resources and knowledge that are not widely shared, enabling them to exert influence on public decision-making processes (Pettit 2013).

5.2.4. Governance in EFTs

EFTs produce outcomes under the governance of public institutions at the local level. In theory, this may contribute to more socially just outcomes than PES that target private entities, as local government should act in alignment with social preference. Governance is related to the processes and institutions that determine how power is shared. ‘Good’ governance is considered to have attributes including transparency, accountability and processes of participation and deliberation (Lebel, Anderies et al. 2006), which can be incorporated into EFT design (Table 9). Governance is not just practised by government, but may also emerge through the interactions of other actors, being either formally institutionalised, or expressed indirectly by influencing agendas, decision making and resource access (Lebel, Anderies et al. 2006). If the design of EFTs incorporates aspects of good governance it is possible that unequal power dynamics may be diluted, influencing how the initiative will be appropriated to produce socially just outcomes (Figure 9).
Table 9. The promotion of elements of good governance through EFT design

<table>
<thead>
<tr>
<th>Attributes of ‘good’ governance</th>
<th>Relevance for EFT design</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participatory</strong></td>
<td>Inclusive stakeholder participation that broadens range of issues and interests considered</td>
</tr>
<tr>
<td><strong>Deliberative</strong></td>
<td>Open communication with debate and negotiation</td>
</tr>
<tr>
<td><strong>Accountable</strong></td>
<td>Vertical and horizontal - authorities are obliged to explain decisions, with possible consequences</td>
</tr>
<tr>
<td><strong>Transparent</strong></td>
<td>Processes and interactions are easily observable</td>
</tr>
<tr>
<td><strong>Socially just</strong></td>
<td>Fair distribution of costs and benefits</td>
</tr>
</tbody>
</table>

Source: Author’s elaboration based on Lebel et al.’s (2006) attributes of governance.

Figure 9. Conceptual diagram outlining how the concentration of power can be filtered through the attributes of good governance to promote socially just outcomes from EFTs. The blue triangle represents the number of people who benefit from outcomes as power is filtered.
5.3. Research approach

The Brazilian EFT is associated with the ICMS (imposto sobre circulação de mercadorias e serviços), a levy on the circulation of goods and services which is an essential source of tax revenue for state and municipal governments (Soares, Gomes et al. 2011). State governments devolve a quarter of the ICMS to municipal governments, distributed mostly according to the economic productivity of the municipality. State legislation determines the criteria on which a part of the ICMS is devolved and seventeen state governments have included ecological distributive criteria. The ICMS-E is available for ‘free’ expenditure; it does not have to be used towards conservation, or any other specific activity. Local governments can increase their share of ICMS-E revenue by assigning funding to enacted legislation that improves environmental quality or by implementing new areas of conservation.

This research will explore the application of the ICMS-E in the coastal region of Paraná state in southern Brazil. The Paraná version of the ICMS-E distributes a percentage of the revenue to the proportion of municipal territory designated to conservation (IAP, 2016). The legislation has evolved from simple compensation towards providing an economic incentive for local conservation action (Loureiro, Pinto et al. 2008). Since 1996 the ICMS-E in Paraná state has been determined by calculating the proportion of each municipality’s territory under environmental protection, weighted by the category of protection and a quality factor, which measures the effectiveness of the protected area in maintaining biodiversity (Loureiro 2002, IAP 2016). The ICMS-E arrives in municipal accounts weekly and is separated from the rest of the ICMS, allowing local administrations to easily recognise the value generated by the presence of protected areas.

For the Brazilian ICSM-E it is not known whether the application of ICMS-E revenue reflects the interests of a broader community base and avoids elite capture, or if decision-making processes are engineered by local power actors to further specific interests. This research questions whether the ICMS-E, as a government-led PES initiative, can incorporate positive aspects of good governance to promote power distribution between stakeholder groups and create outcomes that are aligned with social preference. Lessons may inform the design of EFTs for their role in a
policy-mix for socially-equitable conservation. Conceptions of justice and social equity in ecosystem services governance lack clarity, however are frequently associated with the idea that everybody has the right to a decent livelihood. This does not depend just on material sufficiency, but also on opportunity to make and follow a life plan. Stakeholder participation is also highlighted as a key aspect of justice in governance (Lehmann, Martin et al. 2018).

5.3.1. Study area

Fieldwork was undertaken in late 2016 in the case study municipality, Guaraqueçaba, located in the north-east of the state of Paraná, the first state to implement the ICMS-E in 1991 (Figure 10). Guaraqueçaba, situated entirely within the largest remaining tract of Atlantic forest, is among the poorest municipalities in Paraná, with almost half of the population categorised as living in poverty and illiteracy rates at double the state average (IBGE 2010). With approximately 98 per cent of its territory covered by state and federal protected areas (Figure 11), the ICMS-E accounts for almost a third of the total municipal budget annually. The population is under 8000, of which 70 per cent live rurally in numerous small communities located throughout the mainland forest and on estuary islands (IBGE 2010). These geographical conditions mean that providing basic services such as health, education and waste management is logistically and financially challenging for local government. The municipality is also isolated; the 80 km road that connects the town centre to the nearest highway remains unpaved, in very poor condition and subject to flooding (Campos, Sulzbach et al. 2013). The 160 km journey from Guaraqueçaba to the state capital, Curitiba, takes six to eight hours.
Figure 10. Location map of Guaraqueçaba

Figure 11. Map of protected areas in Guaraqueçaba. Protected area coverage compiled from (SPVS 2009, ICMBio 2018, UNEP-WCMC 2018). Road network from CIESIN and ITOS (2013).
5.3.2. Data collection
Participants from Guaraqueçaba were recruited using reputational and positional sampling (Scott 2017). They were selected to represent stakeholder groups that are interested in or affected by the ICMS-E. Semi-structured interviews were conducted with key informants including members of local government, community leaders, business owners, eco-tourism operators, scholars and conservation NGOs active in the region \( n=24 \). Participants were asked questions on themes such as knowledge of the ICMS-E, participation in local political processes and decision-making, participation in the application of ICMS-E revenue, access to services and access to governance structures. Interviews were audio-recorded and transcribed verbatim. The software program Nvivo 9 was used to manage, code and qualitatively analyse the transcripts. The research was also informed by the examination of documents including local and state legislation, decrees and justifications, technical reports, grey literature and academic literature.

5.4. Results and Discussion
5.4.1. Local governance in the application of revenue in Guaraqueçaba
The factors which most affected the governance of the application of ICMS-E revenue were the lack of institutional capacity, leading to inefficiency, and issues associated with the broader political system, which does not demand adequate accountability and transparency.

Local government may use ICMS-E revenue in any way that supports their political agenda, theoretically acting in accordance with the social preference of the constituency they represent (Vatn 2010). Those actions may, however, be subject to constraints, such as a lack of institutional capacity (Hayward and Lukes 2008). In some cases, the structural limitations imposed on Brazilian municipal governments have been exacerbated by the national process of decentralisation.

The Brazilian constitution of 1988 started a process of decentralisation of public power and resources, not just to consolidate the democratic process after 20 years of military dictatorship, but with a vision of improving the efficiency and effectiveness of public policy implementation (Limana, 1999). Local governments became increasingly responsible for the provision of basic services and tributary reform provided means by which local governments could generate their
own revenue. However, this was insufficient to guarantee financial autonomy that matched the acquired political autonomy. Brazil’s tributary system is considered the most complex in the world and the sources of revenue generation made available to municipal government present a large degree of difficulty in administering and exploiting to their full potential (Afonso and Araujo 2000, Baiocchi 2006, Gramkow 2015). Municipalities often do not have access to sufficient resources, or precise and current information about how to increase revenue (Souza, 2001). The local sphere of government is almost totally dependent on intergovernmental transfers from the states and union; 70 per cent of municipal governments rely on intergovernmental transfers for 80 per cent of their budgets (Batista 2015, Folha de Sao Paulo 2016).

Decentralisation requires complex institutional and political engineering, however, some assert that in Brazil the process occurred without sufficient consideration of the financial and administrative capacity of municipal governments (Souza, 2001). Municipal governments in some parts of Brazil do not have capacity to expand the resources they can access, neither resources available to invest in infrastructure, services or the local economy. In some cases, the municipal budget is sufficient only for the payroll of public servants. These municipalities lack economic activity and are limited also by the poverty of their population (Souza, 2001).

In Guaraqueçaba there is evidence that structural limitations and a lack of institutional capacity constrain the actions of local actors. Whilst the ICMS-E represents a considerable proportion of the municipal budget, the overall financial resources available to municipal government are extremely low. With a high incidence of poverty and limited economic activity, Guaraqueçaba’s municipal government is almost completely unable to generate its own revenue; intergovernmental transfers from state and federal spheres account for over 90 per cent of its annual budget (IBGE 2010).

The mayor confirmed the difficulties associated with almost all municipal income being hypothecated for specific services, and identified the ICMS-E as an important resource,
“Almost all the money we receive is assigned to a particular service, like health. I can’t use it for anything else. We can’t advance other policies, like income generation. The ICMS-E is one of the only sources of free revenue for the municipality.”

Representatives of local government demonstrated good knowledge of the ICMS-E and had clear intentions for its application.

“I understand that the ICMS-E should be used to involve the population in environmental preservation.”

In Guaraqueçaba the large majority of the ICMS-E resource was used to pay the salaries of municipal employees. The local administration was the largest employer in Guaraqueçaba, responsible for two thirds of formal employment, so this application supports an important public function (IBGE 2010).

A proportion of the ICMS-E was used to implement a programme with environmental and social outcomes known as Programa Estrela do Mar, the Starfish Programme. Three hundred women from island communities were rewarded monthly with a cesta básica, a basket of basic food items defined by federal law and intended to feed a family for a month. In return, the women spent three mornings a week patrolling beaches to collect and sort rubbish for recycling or landfill. The programme aimed to provide an alternative source of basic alimentation to poor women and their families, whilst improving environmental education and reducing pollution in areas of touristic value. The mayor, the main author of the project, described her intentions,

“There is a problem to be solved, which is the question of income generation, principally for the women. The men are born fishermen, and the family rely on that for subsistence, but the woman is idle. When the fishing is favourable there is an income for the family, but when he doesn’t bring lunch, the family needs to buy other food.”
The payment of participants was made with goods, rather than direct monetary compensation. Maintaining and fostering autonomy and self-determination are important to the outcomes of economic instruments for conservation, helping to avoid eroding intrinsic motivations for conservation and improve social capital (Cetas and Yasué 2017). The social capacity, or collective agency of a group within the community, is a form of democratising power that operates within and upon structural constraints (Hayward and Lukes 2008). The project, by paying in goods, does not necessarily contribute to the financial autonomy or collective agency of the women. Evidence from other Brazilian social policies demonstrates that a small increase in revenue available to women can lead to transformative change (Rego and Pinzani 2013).

Just six months after the programme was implemented the public prosecutor recommended that Guaraqueçaba cancel its tender for the purchase of the cesta básica, due to irregularities in the purchase of over R$1 million (USD 307 thousand\(^2\)). Additionally, the total number of cesta basica to be purchased was very high, larger than the population of Guaraqueçaba (MPPR 2016). The programme was suspended by the subsequent administration in 2017.

The effective application of limited resources appeared to be hindered by inefficiency and a lack of institutional capacity, as described by members of local government,

“*We experience a lot of operational difficulty. I think our management problem is very great, even more so today that our institutions are like this. We are very poorly informed; our background is very bad.*”

“We have difficulty in organising ourselves, so the fault is partly ours.”

The Municipal Efficiency Ranking is a tool developed to inform the public about how well municipal money is being used by to provide public services. Based on indicators of health, education and sanitation and the ability of municipalities to generate revenue, the ranking shows

\(^2\) all currency conversions are based on conversion rates from December 2016 (www.xe.com)
that only 24 per cent of municipal governments achieve 50 per cent or higher spending efficiency. The national Municipal Efficiency Ranking places Guaraqueçaba in the lowest category, ‘inefficient’, and in the bottom 20 per cent of the country, despite being situated in one of the wealthiest regions of Brazil. The Municipal Performance Index, measured by the Paraná state government and based on indicators of providing health, education and jobs, ranks Guaraqueçaba in the bottom 18 of the 399 municipalities of Paraná (IPARDES 2013). Political and economic isolation have led to stagnation in Guaraqueçaba, and administrative processes are defined by inefficiency and a lack of technical capacity. This is supported by research which suggests that smaller municipalities, in terms of population size, are the least efficient in the application of resources and the least capable of generating their own income (Azeredo and Lobo 2005, Bouerí, Rocha et al. 2015).

Community members were critical of the ability of the local authorities to effectively administer ICMS-E resources to adequately support communities. Better application was considered as having potential to reduce their need to utilize the natural resources from protected areas, an environmental crime punishable by fines and prison. This was described by a member of an island community,

“The money comes from the reserves. But the government needs to know how to administer it. Not just for education or health but in other areas that need it, like the environment. They need to understand the side of the fisherman too. He doesn’t have any resources, so he will want to invade an area that has them, even if it is protected.”

Community members criticised local government for their management generally,

“The little money they have, they don’t use in the correct manner, so everything gets more complicated.”
Despite federal legislation that demands transparency in municipal spending there is very little information on how governments of any level allocate their resources (Lopes 2007). This reflects a larger problem in the Brazilian political system, as explained by a community representative,

“Here in Brazil, this is what happens. The problem isn’t how the money from the ICMS-E is spent, but how all public money is spent. It is spent very badly.”

Guaraqueçaba exemplifies the untenable situation of some Brazilian municipalities; it is a small municipality dependent largely on intergovernmental transfers and unable to generate revenue locally from a population experiencing high levels of poverty. Guaraqueçaba’s municipal budget is insufficient to develop infrastructure, livelihood programmes or improve services, especially considering the sparse distribution of the population across forested, mountainous terrain and estuary islands. Technical and administrative capacity and spending efficiency are poor, exacerbating the limited access to financial resources. It has been asserted that public servants may capitalise on operational difficulties and a lack of capacity to facilitate illicit transactions (Azevedo Sodré and Colaço Alves, 2010). In this sense, and without the ability to determine the intentions of a public actor, it may be difficult to distinguish between occasions of intentional corruption and poor management. The ability to monitor the activities of local public servants is related to the wealth of the population, with deviations of public funds being limited in municipalities with wealthier, and better educated populations (Albuquerque and Ramos, 2006).

5.4.2. Power dynamics - Reinforcing the status quo or creating opportunity?

The main aspect of local power dynamics that influenced the social outcomes of the ICMS-E was the concentration of power to an elite section of local society, and the invisibility of the rural majority. In Guaraqueçaba, the low population means that the diversity of communities (over 50 throughout mainland forests and estuary islands) is represented by just nine local councillors. In eight out of the last nine elections (since 1989), the person elected to the position of either mayor or vice-mayor belonged to one of two local families. The concentration of power in Guaraqueçaba was described by a community member, who explained the role of a single individual in local business and politics,
“He is a business man. He owns the only petrol station and the supermarket. He transformed the public square into his personal storehouse for construction material, it’s full of his bricks. He finances all the political campaigns and then cashes in afterwards. Nobody can touch him. He is a bad guy.”

Evidence from Brazil suggests that the local elite exert a large influence on municipal governance, directing activities towards their interests (Rezende 1997). Mechanisms to increase political participation of minority groups do not exist with the ICMS-E framework. According to the mayor, there was not, and has never been, community involvement in the application of ICMS-E revenue, however there were instruments to encourage participation in the management of the protected areas. The ICMS-E was originally legislated as a response to the inability of local government to generate economic activity on land under environmental protection and interacts strongly with conservation legislation. Participatory mechanisms in the form of park councils were established by state and federal environment agencies to promote co-management of the protected areas, however they confronted barriers in effectively incorporating community views. A researcher, involved in meetings between park managers and local government, where community interests should also have been represented, explained the difficulty in accessing these participatory processes,

“The invitations were sent by email. And if the people don’t have electricity? Much less they are going to have internet, right? How can you invite a community representative to participate by internet? You have to provide mechanisms for participation that guarantee that they will be there.”

Local decision-making processes, including the use of ICMS-E revenue, did not include, even rhetorically, the possibility for participation by community members. In general, a sense of mistrust pervaded the perception that communities had of local politicians, and Brazilian politics more generally. The public faced challenges when trying to create dialogue with the local authorities, as described by the president of a community association,
“When you look for the mayor they tell you she’s not there. You can go back twice or three times, but they tire you out, always saying to try again tomorrow. It’s always been like that, it doesn’t matter who the mayor is.”

A representative from another community asserted that the ICMS-E had actually made access to official information more difficult,

“You search for information in the [legislative] chamber and they don’t give it. They don’t release the accounts or any information about the ICMS-E. The local government don’t want the communities involved because we make work for them, make their lives more difficult. For them it’s easier if we’re quiet or disappear altogether.”

The invisibility of the rural population of this region in local policy, their lack of political voice and inability to demand the services and support they require has been documented (Teixeira and Limont 2007, Ferreira, Negrelle et al. 2011, Rochadelli, dos Santos et al. 2015). A researcher who had worked with communities in this region for almost 30 years explained,

“The communities are invisible, isolated. A community in an extractivist context... is represented as a negative presence, an annoyance.”

She further asserted that the application of ICMS-E funding reinforces existing power imbalances. With little political will to include the rural majority in decision-making processes and bureaucratic obstacles,

“...communities are at the margins, they don’t have political expression or access. So, who wins? The mayor, with the people who have power and influence. Not the community, the one who could most use the ICMS-E. In the end, it is they who receive the greatest impact of conservation. And those people are abandoned to their luck.”
The ICMS-E recently stimulated local policy that may further disadvantage some marginalised communities. In 2017 the incentive effect of the ICMS-E prompted local government to begin the process of legislating new protected areas. According to the proposed legislation the sustainable use reserve that currently covers almost the entire municipal territory would be superimposed with four strictly protected municipal reserves (Appendix 1), which imply more stringent land use restrictions for inhabitants, if not their displacement. At the time of writing these laws had not been passed, however this process raises questions of equity. The municipal government stand to benefit considerably from a higher return of ICMS-E based on the creation of strictly protected conservation areas. However, the costs may fall entirely to the communities living in or nearby them, in terms of limitations on livelihood activities and access to natural resources. The ICMS-E legislation does not require that any benefits be transferred to affected communities through services or infrastructure.

The incidence of poverty in Guaraqueçaba, defined as living on less than half of the minimum wage per month, is 48 per cent (IBGE 2010). Economic opportunity is also lacking, with rural communities highly dependent on natural resource extraction and subsistence agriculture for survival. Only around 18 per cent of the population between the ages of 16 and 65 were engaged in salaried employment (IBGE 2010). Services and infrastructure available to the rural population were precarious and investment in communities was perceived to be limited to election years. One participant claimed that R$55 000 (USD 16 000) was spent in her community in the lead up to the municipal election of 2016. Communities received a visiting doctor as little as once a month and many schools had the capacity to teach children only up to the age of nine. Transport and communication services were limited and the most isolated communities did not have guaranteed access to electricity. One community representative described the situation,

“It’s all abandoned, everybody suffers a lot. We are lacking a lot of things, a doctor, health, school is missing, a lot is missing. We are still fighting, but we are forgotten.”
A federal park manager, working closely with a community situated at a park boundary, recognised shortcomings in the use of ICMS-E revenue,

“It could be better, principally the question of the application of the resource. In practice, there’s no return, neither for environmental questions, nor social ones. For those who really need to benefit, those close to the reserves, there isn’t any return.”

He had campaigned local government to link the ICMS-E revenue derived from the Superagui National Park to the well-being of the communities that were affected by its land use restrictions,

“The idea was to create a municipal law which would oblige the prefecture to allocate 30 per cent of what was received for the National Park to health and education in the communities in and around the park.”

However, it was found that there was little political will in allocating the ICMS-E resource directly to the communities most affected by conservation. Despite these difficulties, the park manager still believed that the ICMS-E opened an opportunity for “invisible” communities to gain leverage in their interactions with local government,

“Whenver they are going to demand some municipal health or education policy we remind them that there is this resource generated by the park. They are empowered by this and can cash in.”

The ICMS-E is generated from the presence of forests for which the rural communities are traditional custodians (Diegues 2004). Representing up to a third of the total annual budget in Guaraqueçaba, the ICMS-E could be the economic lobby of powerless rural communities, potentially opening up access to local governance structures not currently afforded. However, organisational capacity required for this may be lacking and community knowledge of the ICMS-E is limited. Knowledge is a resource in the exercise of power; acquiring it can be costly and time-consuming, favouring more powerful actors (Adger, Brown et al. 2006).
5.4.3. The potential of EFTs to stimulate socially equitable conservation

Whilst the ICMS-E is considered a mechanism that may improve local natural resource management by providing additional funds to stimulate and reward conservation activity, when applied to the reality of local governance this may be impracticable. This research has identified severe structural and political limitations that hinder the ability of local government to enact effective policy, utilize scarce funding efficiently and incorporate community interests into decision-making processes.

In Paraná, the transfer is known as the ICMS-E for Biodiversity, demonstrating the intentions of the authors of the legislation in promoting the conservation of biodiversity through partial decentralization of natural resource management. However, it places responsibility for environmental outcomes on the sphere of governance least capable of producing results. As this case study highlights, institutional dynamics limit the capacity of local government to provide the most basic conditions for dignified human existence. To create, legislate, implement, monitor and manage new areas of conservation in a socially equitable way or initiate other types of conservation activity is a challenge that the revenue of the ICMS-E alone does not facilitate.

Additionally, the transaction costs associated with utilizing the incentive effect of the ICMS-E are high at the local level. Conservation measures must be legislated to contribute towards a higher subsequent return from the ICMS-E, requiring some level of consensus across the political spectrum. Local powerful actors may influence decision-making processes and represent singular interests, creating difficulties in reaching consensus in activities to promote conservation or policy measures that would benefit the wider community. Further, as there is no mechanism to demonstrate how well any particular activity will be recompensed by the ICMS-E, there is no guarantee that investments in conservation will be efficient and/or effective, particularly in the context of poor spending efficiency generally. With access to scarce resources, the designation of any sum to an activity with an unspecified economic return may not be viable.
5.4.4. Implications for the design of EFTs

In a context of high political and social inequality and concentration of power, the design of the ICMS-E becomes highly relevant in providing a framework that encourages good local governance. The ICMS-E, and EFTs in general, have the potential to distribute decision-making power on environmental conservation or social projects to communities not normally involved, and capitalise on their local knowledge and preference. The ICMS-E legislation does not perform this function. It does not require the participation of community stakeholders in decision-making through deliberative mechanisms. Nor does it guarantee that the costs and benefits of the conservation activity it stimulates will be fairly distributed, the foundation of good governance (Lebel, Anderies et al. 2006). Rather, the ICMS-E has incentivised the implementation of conservation areas by local government without public consultation, and may further exacerbate the difficulties experienced by communities inhabiting those areas. Whilst local spending is not transparent nor accountable, this is a broader problem and not relevant just to the ICMS-E. Despite Federal law guaranteeing transparency in spending at all levels of government, there is a deficiency of accountability of municipal government, both by means of reciprocal control between government levels, and related to citizen control, determined by factors such as level of education, political participation, information sharing and monitoring by media (Bardhan and Mookherjee 2006, Savoia, Easaw et al. 2010).

Drawing from the attributes considered necessary for good governance, it is possible to identify how they could be incorporated into the design of EFTs to avoid some of the negative social implications highlighted by this research (Table 10). Participation in the allocation of a part of the ICMS-E revenue could be done in accordance with the decision of a deliberative environmental council, representative of diverse community interests. Alternatively, funding could be specifically allocated for social programmes to support the communities most affected by land use restrictions associated with living in or nearby protected areas. Social programmes to improve education, welfare and provide economic opportunities and political participation for marginalised communities will have effects for transparency and accountability (Bardhan and Mookherjee 2006). Crucially, this will depend upon institutional cooperation and coordination to improve the capacity of local government.
5.4.5. The relevance and use of EFTs for conservation

Whilst PES programmes are designed with the clear objective of achieving additional benefits for conservation, EFTs are not necessarily well placed to return conservation benefits in the context of a developing country. Intergovernmental transfers enable the execution of public function at all spheres of government and linking EFT revenue to conservation activity may detract from this essential function, with social implications. The ICMS-E is provided to cover a revenue gap, caused by the inability of local governments to utilize land for economic production due to the protection of important ecosystems. Whilst EFTs could theoretically improve the budgetary capacity of local government, such that local expenditure on conservation increases, EFTs should not be relied upon to achieve conservation, particularly when social indicators are poor and may be more useful if explicitly applied to social programmes that support a trajectory of sustainable development.
Table 10. The presence and absence of the attributes of good governance in the ICMS-E (Paraná state), and implications for the development of other EFTs.

<table>
<thead>
<tr>
<th>Attributes of good governance</th>
<th>ICMS-E</th>
<th>Policy implication</th>
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<tbody>
<tr>
<td><strong>Participatory</strong></td>
<td>Inclusive stakeholder participation that broadens range of issues and interests considered.</td>
<td>No mechanisms for stakeholder participation or deliberation.</td>
</tr>
<tr>
<td><strong>Deliberative</strong></td>
<td>Open communication with debate and negotiation.</td>
<td></td>
</tr>
<tr>
<td><strong>Accountable</strong></td>
<td>Vertical and horizontal, authorities are obliged to explain decisions, with possible consequences.</td>
<td>Low levels of accountability for local decision making, insufficient interest by upper government spheres and power imbalances horizontally.</td>
</tr>
<tr>
<td><strong>Transparent</strong></td>
<td>Processes and interactions are easily observable.</td>
<td>Values are transparent; however application of funds is not clear to general public.</td>
</tr>
<tr>
<td><strong>Socially just</strong></td>
<td>Fair distribution of costs and benefits.</td>
<td>Application of funds must address interests broad population base, or target most socially disadvantaged.</td>
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</table>

5.5. **Conclusion**

This analysis of the most mature example of an EFT worldwide has enabled an understanding of the important role of power dynamics and local governance in the way that EFT revenue is applied locally. However, importantly it has highlighted how entrenched poverty, a lack of financial autonomy and poor institutional capacity on the part of the local administration prevents progress from being made. The case study demonstrates that, as with other types of PES, EFTs also confront
problems of unequal distributions of costs and benefits. The design of the ICMS-E does not provide sufficient opportunity to improve political representation of marginalized groups. When EFTs provide incentives for conservation, care should be taken that this does not exacerbate social inequality, stimulating activities which imply high costs for the rural poor. The monetary benefits received by local government could be partially applied to counteract the negative impacts of their own conservation actions. The transparency of the application of funds from EFTs is critical to minimize the concentration of benefits. Whilst EFTs may be considered a useful instrument for addressing the unequal distribution of the costs of conservation between levels of government, it is only with careful design and thorough understanding of the local context in which they will be applied, that the mechanism may be able to produce positive social, and perhaps also environmental, outcomes, once the basic needs of local communities are met.
5.6. References


Some features of the communities. An oyster collecting boat and community building, both abandoned. Signage on a house asking visitors not to pollute the environment, an island community and some scenes from the town centre of Guaraqueçaba.
CHAPTER 6: General Discussion

6.1. Summary of research findings

Environmental payments interact with existing socio-ecological systems, institutional arrangements and policy frameworks and consequently their design must consider all these factors. Yet these interactions, and the way they influence aspects of design to produce desired outcomes, are seldom understood (Börner, Baylis et al. 2017). This research contributes to knowledge on these interactions for two versions of an environmental payment occurring in a context of high poverty and low government capacity. Whilst the ICMS-E from Paraná is considered the most evolved EFT mechanism with the greatest potential to produce conservation outcomes (Droste, Ring et al. 2018), when examined in the local context of Guaraqueçaba the mechanism appears over-complicated and poorly designed to produce its intended outcomes for conservation. In Paraná, the ICMS-E has incentivised conservation, through the implementation of exclusionary protected areas, which may imply negative impacts for the most disadvantaged section of the population. The ICMS-E in São Paulo is a very simple mechanism that performs just one function; providing revenue for basic services. This is the intended role of intergovernmental transfers and the ICMS-E in São Paulo does not stray from this purpose. Despite this, the ICMS-E has promoted the local environmental agenda in Cananéia. Representing a significant portion of the annual budget and generated by the presence of conserved forests, the ICMS-E provided political leverage for parties with environmental interests. In this sense, the ICMS-E in São Paulo can produce unintended conservation outcomes; however, they are dependent on sufficient local capacity and civil society engagement with environmental issues.

This chapter provides a summary of the research findings of the three previous chapters, as well as the contributions that these findings make to theory and policy implications (Table 11). Based on these findings, specific recommendations for environmental payments in regions of poverty are made. The chapter then draws on all the findings of the research to explore how mechanisms such as the ICMS-E can be reimagined as instruments for improving human and environmental well-being. Ongoing research gaps are identified and suggestions given for future research.
Chapter 3 developed an analytical framework, drawing on literature about policy for conservation and development, to identify the characteristics of the ICMS-E that may be important to outcomes. Theory suggested that whilst the benefits of ecosystems cross political boundaries, so the social systems involved in conservation are also multilevel, with institutions at various levels of organisation, from local to international. Perspectives from each level are likely to be different and there are also likely to be diverse knowledge systems that inform the beliefs and interactions of actors from different levels. The interactions that occur between these levels of governance will influence the outcomes of a policy. The framework was designed to examine these interactions, as well as structural aspects that can influence outcomes.

The framework was then applied to the municipal case studies to examine the design of the ICMS-E by legislators, implementation by state authorities and reception by the municipal government and explore how these aspects interacted with aspects of the local context to produce outcomes. The results indicated that the structural characteristics (i.e. available resources and capacity) of the institutional sphere that receives environmental payments are an important determinant of the outcomes achieved with the revenue. Improving transparency and knowledge of the ICMS-E at the local level is critical. A simple, but apparently effective measure for improving knowledge of and engagement with the mechanism is separating the ‘ecological’ payment from the rest of the ICMS to increase visibility of its value. The narrative that accompanies an environmental payment initiative should be carefully considered. Rather than compensating for loss, which reinforces negative perceptions of protected areas, payment schemes should highlight the multiple values and potentials of protected areas, particularly those classified for sustainable use. The offer of incentives within the ICMS-E was sufficient to stimulate local government conservation action, but even without incentives revenue may be important as political leverage for stakeholders promoting a conservation agenda.

Chapter 4 examined social perceptions to enquire whether monetary compensation can reconcile human-conservation conflict by contributing to improved socio-economic conditions. In the context of these case studies, where traditional institutions for sustainable land management had been eroded by the implementation of conservation regulations by central agencies, monetary
compensation was insufficient to promote a change in perception. Some local government representatives viewed protected areas as a barrier to development and economic well-being, with the ICMS-E deemed insufficient compensation for the perceived losses implied by conservation. The majority of respondents were resistant, and even opposed to, the protected areas on the grounds that it was traditional practices and ways of being that had maintained the forests for centuries. Land use restrictions associated with conservation threatened those traditional modes of life. Knowledge of the ICMS-E was poor and it was not recognised as benefiting the community, exacerbated by confusion over a carbon credit programme that was seen to generate economic benefits for outsiders.

Chapter 4 pointed to the importance of the policy-mix within which environmental payments function and the necessity of regulating resource use so that natural resource dependent communities can continue to practice livelihood activities. Environmental compensation will have limited positive conservation outcomes as long as local users are positioned as opponents to the conservation regime. Livelihood activities should be supported through a collaborative network that provides appropriate institutional and technical support, guided by the community. Increasing the visibility of the outcomes of environmental payments may also be an important factor. Services provided with revenue from environmental compensation should be linked explicitly to the payment, demonstrating tangible outcomes for the community.

Chapter 5 explored whether EFTs perpetuate the negative social outcomes frequently associated with other types of PES, such as elite capture and concentration of benefits. It examined how governance arrangements and institutions at the municipal level work to distribute the benefits of the ICMS-E payments and how this is influenced by local power dynamics. The ICMS-E was analysed for its ability to promote good governance through the inclusion of mechanisms for participation, or being transparent and accountable. The ICMS-E functions in a context of poor institutional capacity and extremely limited access to technical, human and financial resources. Results show that this local institutional setting is influential on outcomes. Spending inefficiency is high and there are low levels of transparency and accountability for the application of revenue generally. Furthermore, the monetary incentive offered by the ICMS-E stimulated local
conservation policy that implies further costs for the rural poor. These findings reinforce the importance of the design of EFTs in regions of poverty if they are to promote socially equitable conservation.

Table 11. Summary of findings, contribution to theory and policy implications

<table>
<thead>
<tr>
<th>Main findings</th>
<th>Contribution to theory</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local government perceptions of protected areas influence revenue application.</td>
<td>Design of a framework for evaluating payments for conservation.</td>
<td>Incentives may have two functions; 1) direct monetary reward to stimulate conservation, 2) creating leverage for stakeholders with environmental interests. The latter depends on high transparency and wide dissemination.</td>
</tr>
<tr>
<td>Payments were insufficiently transparent, yet significant for municipal budgets.</td>
<td>Application of framework to identify how design of environmental payments influences outcomes.</td>
<td>Narratives accompanying conservation payments should focus on multiple values of ecosystems and their potentialities to help overcome negative perceptions of conservation.</td>
</tr>
<tr>
<td>Outcomes of conservation payments depend on the structural characteristics of the institutional level at which payments are received.</td>
<td></td>
<td>Separating ‘ecological’ payments from other sources of revenue is effective in improving the visibility of the value of protected areas.</td>
</tr>
<tr>
<td>Outcomes also depend how payments are communicated and how funding is applied locally.</td>
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## Chapter 4
**Does monetary compensation influence local perceptions of exclusionary conservation and contribute towards the reconciliation of human-conservation conflicts?**

<table>
<thead>
<tr>
<th>Main findings</th>
<th>Contribution to theory</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protected areas were viewed both as an impediment to well-being and unique opportunity for sustainable development. Aligning views within communities may be important to the production of socio-economic outcomes from environmental payments.</td>
<td>The social dimensions of economic instruments for conservation and human well-being.</td>
<td>Compensation must exist within a policy-mix that supports local involvement in forest governance, allowing for local livelihoods through regulated natural resource use.</td>
</tr>
<tr>
<td>Exclusionary approaches to conservation have created local opponents to conservation, despite traditional preservationist culture.</td>
<td>Environmental compensation can be an important aspect of a policy-mix to address the local costs of conservation if applied transparently in ways that are perceived by the community.</td>
<td>Where barriers to development include entrenched poverty and limited capacity, collaboration must occur both horizontally and vertically to create livelihood outcomes. Environmental payments that are highly transparent and include social as well as environmental incentives may support the implementation of local sustainable development agendas.</td>
</tr>
<tr>
<td>Payments alone are insufficient to change the perceptions of conservation by those who experience its negative consequences. They do not alleviate environmental conflict.</td>
<td></td>
<td>Transparency should include linking environmental payments directly with tangible outcomes for the community.</td>
</tr>
<tr>
<td>Resentment exists due to perception that outsiders receive conservation benefits whilst locals feel costs.</td>
<td></td>
<td></td>
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<tr>
<td>This is exacerbated by lack of knowledge of payments and no perception of benefits in their application.</td>
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Chapter 5
How do local governance structures and power dynamics impact on the distribution of the costs and benefits of the ICMS-E payments?

<table>
<thead>
<tr>
<th>Main findings</th>
<th>Contribution to theory</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ICMS-E perpetuates the social problems frequently associated with other types of PES and can reinforce existing inequalities among sectors of the community.</td>
<td>Contributes to limited understanding of the social outcomes of EFTs.</td>
<td>Revenue from EFTs may cover an important revenue gap and should not be conditional to local conservation activity.</td>
</tr>
<tr>
<td>Incentives for conservation activity may induce conservation activity with high costs for rural poor.</td>
<td>Contributes to knowledge on the role of institutions and power dynamics in the local distribution of the benefits of environmental payments.</td>
<td>The transaction costs of EFTs that fall to local government must be considered in their design and incentives must not require high levels of capacity to operate.</td>
</tr>
<tr>
<td>Additional conservation benefits are contingent on institutional capacity and innovation of municipal governments and must also align with the interests of local power actors. The transparency of the application of funds from EFTs is critical to minimize the concentration of benefits.</td>
<td>Contributes to literature on how power dimensions shape PES in practise.</td>
<td>Incentives must avoid stimulating activity that can imply high social costs for marginalised sections of the community.</td>
</tr>
<tr>
<td>Governance structures and capacity determine local ability to produce integrated outcomes with environmental payments.</td>
<td></td>
<td>Designing EFTs to foster political participation of diverse interests may improve the fairness and effectiveness of fund allocation by increasing transparency and accountability.</td>
</tr>
<tr>
<td>EFTs should not be relied upon to produce conservation in regions of poverty.</td>
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6.2. Recommendations for environmental payment schemes
Drawing from the findings of this research it is possible to identify specific aspects of the design of EFTs that may contribute to producing the desired outcomes in regions of poverty. Some
recommendations provide broader lessons and may be informative for other types of environmental payment programmes, both government and non-government.

6.2.1. Incentives
The inclusion of extra incentives is an important aspect of EFTs if additional conservation is the primary objective, and can serve two purposes. First, incentives can stimulate local conservation activity by offering financial reward. Incentives must be designed to avoid promoting local activity that increases inequality by implying costs for rural poor, such as implementation of exclusionary protected areas by municipal government with limited capacity, without adequate consideration of the social implications. Incentives may also be useful if an EFT intends to improve social outcomes. Incentives can be used to reward the allocation of funding to benefit those most affected by the limitations of protected area. This can occur directly, through the kinds of agreements seen with certain Faxinal communities in central Paraná, discussed in Chapter 4, or indirectly through provision of services and infrastructure in accordance with local preference.

The second function of extra incentives is in providing political leverage for stakeholders with environmental interests. Where municipal budgets are boosted by the presence of environmental conservation this may provide grounds for the demands of local actors who recognise the need to enact a local conservation agenda. For this to occur, payments must be transparent and well disseminated, and civil society must have sufficient capacity to act. This scenario is of interest in respect to the traditional communities, who, with adequate knowledge of the ICMS-E, may demand that a portion benefits them directly, due to their role as traditional custodians of the forest.

6.2.2. Transaction costs
EFTs have the significant advantage of implying low transaction costs at the level of allocation by state government. However, they can involve high costs for local government trying to capitalise on incentives, if the mechanism is complicated, as discussed in Chapter 3. The incentive mechanism must be simple and streamlined and allow for easy understanding of potential returns to encourage informed investments in conservation. Local transaction costs can be lowered by
providing a simulation tool, so local governments can identify their comparative advantage for conservation and implement policy with an advantageous cost-benefit ratio.

6.2.3. Narratives

Framing environmental payments as compensation implies that they are a function of a loss of well-being or ability. Narratives surrounding environmental payments should maintain focus on the benefits and potentialities produced by intact ecosystems. The benefits produced by well-managed protected areas are starting to be understood, and their multiple values appreciated (TEEB 2009, Dudley 2016). Discussions on placing a value on nature are often controversial, which can be seen in the discussion around payments for ecosystem services referenced in Chapters 1 and 2. However, initiatives such as The Economics of Ecosystems and Biodiversity (TEEB) demonstrate that sophisticated and nuanced valuation can provide useful information to decision-makers (TEEB 2010). The recognition of the value of environmental production and its use to inform policy and decision-making can be a useful communication tool to promote conservation (Costanza, de Groot et al. 2014).

Just as the majority share of the ICMS rewards economic production, the ICMS-E could reward the production of ecosystem services in a more informed and transparent way. The distribution of the ICMS-E to explicitly recompense conservation rewards the municipal production of positive environmental externalities; however, the economic value of those services is unknown. Knowledge of the multiple values provided by ecosystems should be mainstreamed and openly inform all arenas of decision-making. Searches of literature in English and Portuguese show there is a little quality information available about the economic values produced by Brazilian environments. Economic valuation, even when measuring just a small proportion of the total values supplied by ecosystems, may demonstrate that the benefits produced far outweigh the payments currently received by local governments through the ICMS-E. Payments may, of course, never match these potentially extremely high values. However, knowledge of those values may draw attention to the important role of protected areas.
By explicitly recognising, in public policy, the value that ecosystems provide, their visibility can be improved, their worth publicised and, potentially, perceptions of these areas may reflect their status as extremely valuable assets, with that worth increasing as intact ecosystems dwindle worldwide. Characterising the ICMS-E as compensation does not encourage this perspective. Narratives that accompany environmental payments should highlight the potential and opportunity provided by the environment, rather than the opportunity costs of conservation. This is particularly relevant when management categories of protected areas include sustainable use reserves, such as in the Brazilian system, outlined in Appendix 1. This is further discussed in Section 6.3.

6.2.4. Reconfiguring the ICMS for additional conservation

In the case studies examined in this thesis, the ICMS-E revenue necessarily served a social function, contributing to the provision of basic services. If there is a committed intention to produce environmental outcomes a reconfiguring of the mechanism may help. Currently ICMS-E revenue is withdrawn from the 6.25 per cent of total ICMS revenue available for distribution based on state government criteria. This funding is vital for the delivery of local government services, and may not be available for environmental activity. If the intention of the mechanism is to incentivise conservation by local government, additional funding could be withdrawn from the 75 per cent share of the ICMS that remains with the state (Figure 12). In this way, rather than drawing from a common pool of resources required for basic functions, the ICMS-E would work purely as an incentive to municipal conservation. This would complement, not replace, the existing version of the ICMS-E to avoid distributional justice issues. The revenue could be operated from a fund, perhaps following the example of the VerdeAzul Municipalities programme, described in Chapter 3, or distributed according to criteria deemed adequate by relevant stakeholders. It would require accompanying capacity building programmes for municipal governments, and the participation of relevant stakeholders to guide the management of the funding. This would promote access to the resource by all municipalities, inclusive of those with low capacity. This scenario would require social mobilisation to generate sufficient political will and signify commitment by the state to environmental protection.
6.2.5. Participation

Monetary payments are insufficient to compensate a legacy of alienation and cultural erosion of traditional forest custodians, especially considering that benefits may accrue to serve the interests of the local elite. However, with appropriate application, revenue can provide necessary services to support communities’ ongoing existence in their places, further discussed in Section 6.3. Participation in the application of a part of the funding from the ICMS-E may lead to fairer and more effective outcomes, by incorporating the needs and knowledge of the parts of society normally absent from decision-making processes. This may be beneficial for reducing the concentration of benefits derived from the ICMS-E revenue.

6.2.6. Supporting local governments

Payments that intend to produce outcomes within the context of poor institutions should include capacity building and technical support from central to local governments to improve efficient and effective application of funds. Collaboration and support across the levels of governance will be a key aspect of enabling local government to derive the greatest benefits out of limited resources.
6.2.7. Transparency and knowledge sharing

Environmental payments should be transparent at every stage. The value that enters local accounts based on ecological criteria should be separate from other transfers, to allow easy identification of the revenue attributed to nature. Information about environmental payments should be widely disseminated to local government and the broader public. This should occur beyond the roll-out phase of a programme, to accompany changing administrations. Information on payments should be easily accessible, both in terminology and in the platform used for communication. Information delivery must be done with consideration that significant parts of the community do not have access to the internet.

The application of funds should also be highly transparent and explicitly linked to tangible outcomes for communities. This may reduce the conflict that exists between communities and reserves as positive returns are perceptible to those living under land use restrictions, as discussed in Chapter 4. It would also give communities knowledge of the existence of funding derived from forests, an important aspect in creating political leverage for parts of society normally not considered in political processes (Adger, Brown et al. 2006). Explicitly linking the application of revenue to social projects beneficial for communities living in and around reserves is also important in acknowledging the role of the community in forest governance, a feature of environmental payment schemes that produces positive outcomes over the long term (Oldekop, Holmes et al. 2016).

6.3. Local outcomes of EFTs for conservation and well-being

Economic instruments for conservation have potential in addressing poverty and social well-being whilst improving conservation outcomes, and much recent scholarship on PES is focused on this topic (Lehmann, Martin et al. 2018). The following section describes how government environmental payments in regions of poverty can be reimagined to produce integrated outcomes for impoverished resident populations and the ecosystems they inhabit. The geography of the region examined in this research, coupled with inadequate infrastructure and deficient investment by state and federal government, creates many difficulties for local governance. Service provision
to rural and island communities depends on favourable natural conditions and is costly to supply, even in fair weather. In this context, the intention to derive conservation benefits from the application of tax revenue intended to enable the provision of essential human services may be misguided.

To produce conservation outcomes the ICMS-E relies on engagement and innovation by local institutions (May, Gebara et al. 2013), yet capacity at the local sphere to implement a socially equitable approach to conservation may be deficient. Conservation initiatives undertaken by local government face structural barriers such as limited resources, may be inefficient, and can imply high costs for poor rural communities as discussed in Chapter 5. This is a significant shortcoming of the mechanism; however, with a different approach can be overcome. If additional conservation benefits are to be derived from the mechanism as it exists currently, they could be a consequence of directly addressing the economic and political situation of traditional communities with cultures of preservation, currently alienated from the conservation agenda. Promoting regulated livelihood activities and other sustainable development initiatives such as cultural enterprise, may reduce pressure on protected areas exerted by inhabitants forced to practise clandestine extractive activities, improving the quality of conservation.

Observations made in the field indicated that a lack of options and the need for survival were forcing people to practice unsustainable resource extraction. Furthermore, there was a tolerance of the illegal harvest of forest resources beyond levels of recuperative capacity, when conducted by locals. This tolerance was observed in comments made both by local authorities and community members. This is a complex situation, deserving of a much more nuanced discussion, beyond the scope of this thesis. However, it is fair to say that this situation is related largely to subsistence; people must eat and their means of producing food has been limited by protected area regulation, without offer of any alternative opportunities. People require access to dignified livelihoods. As long as communities exist in poverty they will do what is necessary to provide for their families. Addressing the well-being of the people who form part of the protected ecosystem is not just the right thing to do in terms of social justice and recognition of rights, but is critical to the ongoing maintenance of reserves. Intact forests are highly threatened and better ways must be developed to
manage protected areas to promote ecosystem resilience and maintain ecosystem function (Watson, Evans et al. 2018). Whilst some argue that this requires the removal of all human interaction, recent evidence suggests that better outcomes arise from promoting the economic, social and cultural well-being of those in and around protected areas (Oldekop, Holmes et al. 2016). The findings of this research suggest that EFTs can have a role in this scenario; they can be applied to support community livelihoods, where other conservation policy has restricted them.

The application of revenue from the incentive package offered by EFTs could be targeted to promote livelihood activities that are aligned with local cultures of preservation and adapted to the conservation regime. Rather than being excluded from the use of forest resources, traditional communities should have legitimacy in utilising and defending resources according to customary institutions and with government recognition and support. Instead of furtive sales of illegally harvested products, forest resources could instead aggregate value and generate wider employment. This will require investment by central authorities to recognise and regulate livelihoods in differing ecological and social contexts, as done with the Faxinal communities, discussed in Chapter 4. However, the outcome of this scenario may be the creation of synergies between effective conservation and human well-being, and the preservation of important cultural values and knowledges. This approach may also produce advantageous economic outcomes for municipal government. The municipalities examined here have little or no comparative advantage for stimulating many conventional economic activities such as large-scale agriculture and industry. Local authorities collect little tax revenue from their impoverished populations, as discussed in Chapter 5, and stimulating the local economy will be beneficial to all actors. Opportunity lies in embracing and utilising the unparalleled access to exuberant and intact nature and forest resources in ways that are directed by the knowledge and worldview of traditional peoples of the region.

Neither Cananéia nor Guaraqueçaba are able to fully utilise the opportunities provided to them by their privileged position within the largest remaining tracts of the Atlantic forest, although each municipality has exemplars of cultural enterprise. In Cananéia this refers to the successful implementation of community based-tourism on Cardoso Island (Schröter, Sessin-Dilascio et al. 2014). In Guaraqueçaba, it is the ecotourism business of the local owner of Sebui private reserve
who conducts guided walks for scientists, tourists and school-groups. Either municipality could be a hub for Atlantic forest research, a world-renowned spot for wildlife photography, or develop the regulated extraction of non-timber forest products (NTFPs) to be promoted in a differentiated way, following the example of the women’s association of Ararapira on Superagui island in Guaraqueçaba (D’Angelis 2015). Little is known about the potential NTFPs such as bromelias, plant oils, nuts and aromatic leaves, although their marketing would tend to benefit small producers, such as those found in Guaraqueçaba, Cananéia and many other municipalities experiencing similar challenges (Balzon, da Silva et al. 2004, Turini and de Macêdo 2013). The establishment of local NTFP industries is promoted as a principal opportunity to align the socio-economic well-being of impoverished rural families with the conservation of various Brazilian biomes (Balzon, da Silva et al. 2004, Turini and de Macêdo 2013).

Embracing alternative forms of economic development, that are based in traditional knowledge and technique and do not rely on destructive practices, is the most promising opportunity available to many regions which host high biodiversity. This approach may also be a key element in societies’ evolution towards sustainability (Leff 2017). Cultural enterprise initiatives, guided by local needs and supported through collaboration with other institutions, may enable regions such as the one examined in this research to achieve social and environmental well-being. Research from Australia has elucidated how environmental payments can be framed around Indigenous rights to and relationships with traditional land (Robinson, James et al. 2016). Therefore, EFTs may have an important role as a mechanism to provide livelihood opportunities and support traditional populations in their places, maintaining social and biological diversity. Research on social policy that targets the poorest section of Brazil’s population has shown that just a small amount of extra finance can have a transformative effect on the economic conditions of impoverished families, allowing the creation of economic activities not feasible without a small injection of funds (Rego and Pinzani 2013).

Stimulating the local economy will be crucial to protecting the local population of this region. Guaraqueçaba has limited local production of goods and the price of commodities that arrive is high due to the isolation and difficult access. Current political and economic instability in Brazil
has caused the price of fuel to rise significantly. Electricity for remote communities often relies on
generators and access to communities by boat or poorly maintained road, implies high fuel costs.
For the half of the population of Guaraqueçaba who earn less than half of the minimum wage, this
can have a large impact on local purchasing power. The monthly minimum wage for 2018 is valued
at R$954 (US$261).

Such a scenario depends entirely on the policy framework that governs conservation, the political
will of those in power and multi-level collaboration between institutions. However, Brazil’s
national system of protected areas (SNUC) provides a framework under which this scenario can
function. SNUC includes sustainable use categories that are specifically designated to support
traditional communities. Extractive Reserves recognise that extraction activities are culturally and
economically vital to traditional lifestyles. Sustainable Development Reserves are explicitly
intended to enhance knowledge of sustainable productive practices of traditional peoples, where
those systems play a role in maintaining biodiversity and protecting ecosystems. With proper
implementation and management these reserves can provide a haven for traditional populations
and the ICMS-E that is derived from the reserves could be utilised to support activities within
them.

This scenario will not be implemented by local governments alone, and requires capacity building
and technical support from central government agencies to validate traditional cultures and
activities and regulate resource use. However, the example of the Faxinais demonstrates that it is
possible. Research has shown that conservation through protected areas is most effective when
local people are explicitly integrated as stakeholders, enabling local control to maintain the socio-
economic and cultural benefits from nature that communities have always derived (Oldekop,
Holmes et al. 2016). Under the right management strategies conservation and well-being can be
highly synergistic and EFTs have the potential to play a part in building this scenario, which can
also contribute towards addressing broader challenges.
6.4. The potential of EFTs to produce broader outcomes

Instruments such as EFTs also have potential to contribute to solutions for the broader environmental and social challenges of our times. Many of the findings of this research are specific to a context of poverty, isolation and extensive protected area coverage. Managing these complexities requires a particular approach. However, achieving synergies between local development and the maintenance of resilient and functioning ecosystems in protected area will contribute towards reaching broader strategic goals. EFTs can be designed to support the achievement of national and international agendas such as the Sustainable Development Goals (SDGs) and the Aichi Targets (CBD 2010, UN 2018).

The strategy of the Aichi Targets and SDGs includes mainstreaming biodiversity across government and society. This means increasing awareness of the values of biodiversity and integrating them into development and poverty reduction strategies. EFTs are suited to this purpose as a positive incentive to the conservation and sustainable use of ecosystems. EFTs can be designed to promote broader awareness of the values produced by ecosystems, reward the production of these values and contribute to financing the development of sustainability initiatives.

Another key strategy identified by both the Aichi Targets and the SDGs is reducing ecosystem fragmentation by restoring connectivity. EFTs can be targeted to stimulate the strategic implementation of protected areas that respond to this need. Research has recently demonstrated that regenerating the Atlantic forest to improve connectivity is one of the most cost-effective methods for biodiversity conservation worldwide (Newmark, Jenkins et al. 2017).

The Aichi targets and SDGs call for effectively and equitably managed protected area systems, where ecosystems continue to contribute to livelihoods and well-being, including the needs of local communities. This research has identified that the costs of protected areas can be high for local actors, and instruments such as EFTs can contribute to compensating costs and supporting livelihood initiatives. With appropriate design and application EFTs can produce positive outcomes for the equitable conservation. The inclusion of various actors in political processes through incorporating deliberative participation mechanism is aligned with targets to reduce
inequality. The maintenance of traditional knowledge, innovation and practises is recognised as an important foundation to the management of ecosystems, with participation, knowledge sharing and capacity building key to the effective implementation of conservation policy. The Aichi Targets call for the customary use of biological resources to be integrated into national legislative processes with effective participation of actors at all levels. EFTs also contribute to the mobilisation of monetary resources for the implementation of conservation.

6.5. Further research
Considering the findings of this research on the social implications of the ICMS-E, it would be valuable to examine its outcomes in the municipalities in Paraná where revenue is partially directed to the traditional communities known as Faxinais, discussed in Chapter 4. Examination of the importance and outcomes of that funding to the well-being of the community, the processes and destination of revenue application and how benefits are distributed within the community could inform the development of similar funding scenarios with other types of communities. Additionally, an examination of the motivations of the local authorities in establishing this pass-through, which ultimately reduces the funding available for their own purposes, may provide information useful to stimulate this type of arrangement elsewhere.

The examination of the ICMS-E in other states may provide some answers about the ability of intergovernmental transfers to produce integrated outcomes. States of specific interest include Tocantins, where the ICMS-E legislation was specifically designed to incentivise the restructuring and implementation of municipal policy to support Agenda 21. Pernambuco offers a version of the ICMS-E with social and environmental outcomes explicitly incorporated into the legislation and could provide useful insights into how the mechanism can produce integrated outcomes. Further research is also necessary to understand the institutional requirements of EFTs to support the achievement of national and international targets in different contexts.

6.6. Concluding remarks
The rural communities I met, considered poor by most standards, can also be considered the wealthiest people in the world, a point made emphatically by many participants in this study. Some
communities experience high social capital, enjoy a rich culture and spirituality. People are integrated with the ecosystem and experience a profound sense of belonging. Their lives are enriched by the abundance of biodiversity of which they are a part. What they lack is equitable access to resources that would enable them autonomy and opportunity to live in a dignified way. Instead, communities are alienated and invisible in most decision-making processes. The erosion of cultural diversity globally is as alarming as the erosion of biological diversity, and maintaining traditional ways of being and worldviews is an integral part of building a broader societal response to the current destructive system under which we operate (Leff 2012).

The intact nature of many regions of Brazil is directly attributed to the presence of traditional and Indigenous populations, indicating the synergy between their cultures and conservation (Diegues, Arruda et al. 1999). It is traditional management systems that have historically safeguarded the biodiversity that we now fight to preserve using other methods (Berkes, Folke et al. 1995). Traditional peoples and their knowledges and practice in their places, are central to the conservation of biodiversity (UNEP 2003, IPBES 2018). Their attachments to their territories and imaginaries of sustainability can guide the construction of an alternative system of production (Leff 2012, Porto-Gonçalves and Leff 2015). Payment schemes can be designed to promote the recognition and support of traditional land management practices and can direct resources towards the maintenance and well-being of traditional and Indigenous societies. These societies are reservoirs of knowledge that can inform a new paradigm of sustainability, seeking production based on culture and nature as productive forces, with cultural creativity a key aspect of implementation (Leff 2017).

Alternative rationalities are being produced and the Global South is a nucleus for visionary thinkers, innovative policies and the social movements that may be the engine of change. Countries from the Global South are developing policy innovations that are at the vanguard of the local and global movement towards sustainability. China’s version of sustainable development, called eco-civilisation, forms the foundation of their national development strategy (Geall and Ely 2017). Brazil’s Extractive and Sustainable Development Reserves are an approach that supports a paradigm shift from production based on an economic rationality to an environmental rationality.
(Leff 2012). The ICMS-E is already supporting some *Faxinal* communities in their places. Structured specifically for this purpose EFTs can belong to the toolbox of policy innovations that create synergies between human well-being and environmental integrity. The Global South, with its substantial comparative advantage in natural capital, strong social movements and rich diversity of tradition and culture providing examples of alternative modes of production, is in a privileged position to lead a transition to a new paradigm.
6.7. References


Appendix 1. Protected area management categories according to Brazil’s National System of Conservation Units (Sistema Nacional de Unidades de Conservação, SNUC, Law 9.985/2000)

<table>
<thead>
<tr>
<th>Integral protection categories</th>
<th>Corresponding International Union for Conservation of Nature (IUCN) category</th>
<th>Management Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Station (Estação Ecológica)</td>
<td>Ia</td>
<td>Preserve nature and scientific research. Private areas within will be expropriated. No public visitation, except for education in accordance with management plan.</td>
</tr>
<tr>
<td>Biological Reserve (Reserva Biológica)</td>
<td>Ia</td>
<td>Preservation and recuperation of ecosystems. Private areas within will be expropriated. No public visitation, except for education in accordance with management plan.</td>
</tr>
<tr>
<td>National Park (Parque Nacional)</td>
<td>II</td>
<td>Preservation enabling research and recreation. Private areas within will be expropriated. Public visitation subject to restrictions.</td>
</tr>
<tr>
<td>Natural Monument (Monumento Natural)</td>
<td>III</td>
<td>Preserve rare, unique or extremely beautiful natural sites. Can have areas of private ownership within as long as this is compatible with the objectives. Public visitation subject to conditions in management plan.</td>
</tr>
<tr>
<td>Wildlife Refuge (Refúgio de Vida Silvestre)</td>
<td>IV</td>
<td>Protect environments which ensure the existence and reproduction of resident or migratory species. Can have areas of private ownership within as long as this is compatible with objectives. Public visitation and research subject to conditions in management plan.</td>
</tr>
<tr>
<td>Sustainable Use Categories</td>
<td>Corresponding IUCN Category</td>
<td>Definition and Objective</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Area of Environment Protection (Área de Proteção Ambiental)</td>
<td>V</td>
<td>A large area with human occupation, which contains environmental, aesthetic or cultural attributes important for society, with the objective of protecting biological diversity, regulating the occupation and ensuring sustainable use of natural resources. Made up of private and public areas. Must have council.</td>
</tr>
<tr>
<td>Area of significant ecological interest (Área de Relevante Interesse Ecológico)</td>
<td>III</td>
<td>Small area with little or no human occupation with extraordinary characteristics or rare biota. Maintains the ecosystems and regulates the allowed uses. Contains private and public land.</td>
</tr>
<tr>
<td>National Forest (Floresta Nacional)</td>
<td>VI</td>
<td>Native forested areas. Sustainable resource use and academic research permitted with an emphasis on sustainable exploitation. Private areas will be expropriated however traditional populations may remain as long as they conform to management plan. Public visitation within conditions. Must have council.</td>
</tr>
<tr>
<td>Extractive Reserve (Reserva Extrativista)</td>
<td>VI</td>
<td>Protect way of life and culture of traditional populations whose subsistence relies on extractivism and subsistence agriculture and ensure sustainable resources use. Privately owned areas will be expropriated. Public visitation and research within the conditions of the management plan. Mineral exploration, hunting and logging prohibited.</td>
</tr>
<tr>
<td>Fauna Reserve (Reserva de Fauna)</td>
<td>IV</td>
<td>An area with important animal populations for research. No private property or hunting allowed. Visitation allowed.</td>
</tr>
<tr>
<td>Sustainable Development Reserve (Reserva de desenvolvimento sustentável)</td>
<td>VI</td>
<td>Preserving nature and ensuring necessary conditions and means for reproduction and improvement of the ways and the quality of life and exploitation of natural resources of traditional populations. Value, conserve and enhance the knowledge and environmental management techniques developed by these populations Publically owned, private areas expropriated. Public visitation and scientific research are encouraged, although subject to the interests and local regulations.</td>
</tr>
<tr>
<td>Natural Heritage Private Reserve (Reserva Particular do Patrimônio Natural)</td>
<td>Non-commensurate</td>
<td>A private area, created by the owner's initiative, recorded in perpetuity, in order to conserve biological diversity. In this type of conservation unit only scientific research and visitation with tourist, recreational and educational objectives are permitted.</td>
</tr>
</tbody>
</table>
Appendix 2. Interview question guide

| Date: | Location: |

Thank you for agreeing to participate in this study. [Refer to/discuss Participant Information Form and Consent Form]

| Stakeholder Group 1: State government actors |
| Respondents: actors involved in original legislation and its evolution, members of agency that operate the policy |

Introduction

- Could you tell about your professional experience in public office and anything else you feel might be relevant?

Policy Context

- What is your opinion on the state of the environment in São Paulo/Paraná?
- Can you tell me about conservation policy in your state? What are the biggest challenges and what measures have been enacted to protect the natural environment?
- Can you tell me about the role of the environment in the state’s political agenda during the period in which the ICMS-E was legislated?
- In your opinion what were the main concerns that stimulated the introduction of the ICMS-E in your state?

Policy Design

- Can you describe the factors that informed the development of the ICMS-E legislation?
- Who were the main actors involved in legislating the ICMS-E in your state? Was there any involvement by civil society groups? (regional mayor’s associations, environmental groups)
- What was the main objective of the ICMS-E?
- Were there any other objectives? If so, were they given equal priority?
• Do any mechanisms exist to ensure that policy objectives are achieved? (monitoring, conditionality, information and support)
• The ICMS-E legislation was negotiated in the legislative chamber before it was passed. Does the mechanism reflect what was originally wanted by the its advocates?
• How has the ICMS-E evolved since it was first introduced? (PARANÁ)
• What concerns did this address? (PARANÁ)
• There have been many previous proposals to change the legislation (e.g. 2004 Jose Goldemberg proposed an increase from 0.5-1.5% and the inclusion of private reserves), however none have been successful. In your opinion what are the main barriers to legislative change? (SÃO PAULO)
• Are there any problems that are identified with the legislation in its current form?
• Are there currently any proposals to alter the ICMS-E legislation and for what purpose?

**Interactions**
• What is the process of distribution of the ICMS-E to the municipal governments?
• What interactions occur between municipal government and state agencies in the processes of distributing the ICMS-E?
• How well do you think municipalities understand the mechanism?
• Is there any official programme to inform the general public or local government about the ICMS-E?
• Do you think the ICMS-E creates an incentive for municipalities to conserve their natural resources?

**Outcomes**
• What do you think have been the main outcomes of the ICMS-E so far?
• Do you think the ICMS-E has achieved its intended outcomes?
• Have you noticed any unanticipated outcomes from the ICMS-E?
• Do you think the ICMS-E has any influence on how local government approaches environmental issues?
• How could this mechanism be improved?
• I would like to speak with other people about this subject. Could you recommend anyone?

Stakeholder Group 2: Municipal government actors

Respondents: Mayor, secretaries of relevant departments (environment, planning, tourism etc.), environmental council members.

**Introduction**

• Initially, could you tell about your professional experience in public office and anything else you feel might be relevant?

**Policy Context**

• Can you tell me about your municipality? What are the biggest challenges and opportunities here?
• What have been the main projects prioritised during your administration?
• What are the main barriers or supports to implementing the types of projects that you think are necessary for your municipality?
• What kinds of institutional and technical support does your municipality receive from state and federal institutions to enact your policy agenda?
• Do you think the environment in your municipality is well conserved?
• Do you think should be responsible for conservation? (community and local government or state or federal government or other organisations)
• What is your opinion of the protected areas in your municipality?
• Can you tell me about the participation that the local government had in the planning and implementation of the protected areas?
• In your opinion how did the broader community respond to the designation of the protected areas here?
• Have you heard of the ICMS-E? If so, can you tell me about it?

**Interactions**

• What is the process for your municipality to receive the ICMS-E?
• Is the income from the ICMS-E significant to the budget of the municipality? Do you know how much it represents in relation to the total municipal budget?
• Is this information easy or difficult to access?
• How easy or difficult is it to access information about the ICMS-E from the state government?
• Has your municipality undertaken any activity with the intention of increasing the revenue received from the ICMS-E? (PARANÁ)
• Do you have information on the costs of implementing particular social or environmental policies and how they would impact the return from the ICMS-E? (PARANÁ)
• What is the process for integrating local policy into the calculation of the ICMS-E? (PARANÁ)
• Are you aware of any state programme to inform the public or local government about the ICMS-E?
• Do you think the community know what the ICMS-E is?
• Is there any participation from civil society in the decisions over the destination of public revenue generally?
• Are communities involved in decisions about the application of ICMS-E revenue?
• Is there any formal programme to receive feedback or input from the community about policy projects and the agenda of the municipality?
• Does your municipality have any agreements in place to support private reserves through financial, service or infrastructure benefits? (PARANÁ)

Policy Outcomes

• What have been the general outcomes of the ICMS-E in your municipality?
• How is the ICMS-E revenue applied in your municipality? Is it formally committed to any specific projects?
• Is the revenue from the ICMS-E sufficient to provide funding for additional conservation activities?
• Has the revenue from the ICMS-E allowed expenditure in for projects that would otherwise not have occurred?
• Has the ICMS-E increased the visibility of environmental questions on the local political agenda?
• Do you think the local population notice any benefits from the ICMS-E?
• In your opinion has the ICMS-E had any influence on community opinion towards protected area and other conservation activities?
• Do you believe that the ICMS-E creates an incentive for municipalities to conserve their natural resources?
• What is your opinion of the ICMS-E in general? Which aspects work well and how could it be improved?
• I would like to speak with other people about this subject. Could you recommend anyone?

Additional questions for environmental council
• Can you tell me about the Environmental Council? When was it formed? How active is it?
• Which stakeholder groups are represented in the council?
• Does the council have access to any funding from the municipal government?
• Do you know if your funding is linked to the ICMS-E?
• What are the main projects that you have implemented?
• What projects would you like to enact?
• What are the main barriers and opportunities in achieving the goals of the environmental council?

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<thead>
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<th>Stakeholder Group 3: Local community actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents: rural and urban community members, local business owners</td>
</tr>
</tbody>
</table>

Introduction
• Can you tell me about yourself and your community?
• What are the biggest challenges and opportunities here?

Policy Context
• What have been the main projects implemented by this local government?
• What types of projects would you like to see in your community?
• What do you think are the barriers to implementing the types of projects that are necessary for your community?
• Do you think your municipality is well conserved environmentally?
• Who do you think should be responsible for conservation? (community and local government or state or federal government or other organisations)
• What is your opinion of the protected areas in your municipality?
• What have been the impacts of the protected areas for your community?
• Who benefits from the presence of these protected areas?
• Can you tell me about the participation that the municipality and community had in the implementation of these protected areas?
• Have you heard of the ICMS-E? If so can you tell me what you know about it?
• Are you aware of any programme to inform the public about what is the ICMS-E?

**Interactions**

• How easy or difficult is it access information about what is going on in your municipality?
• To your knowledge, how involved is the community in the decision-making processes of the local government?
• Are there any formal mechanisms for community participation in local government decision-making processes?
• Have you ever participated in local decision-making processes of the local government?

**Policy Outcomes**

• Do you have an opinion of the ICMS-E?
• Do you know how the revenue from the ICMS-E is spent?
• To your knowledge, who is involved in decisions about how the ICMS-E is spent in your municipality?
• Who do you think benefits from the revenue of the ICMS-E?
• I would like to speak with other people about this subject. Could you recommend anyone?
Stakeholder Group 4: Other stakeholders

Respondents: reserve managers, non-government organisations, researchers

Introduction

- Initially, could you tell me about your professional experience and anything else you feel might be relevant?

Policy Context

- What is your opinion about the state of environmental conservation in São Paulo/Paraná?
- Can you tell me about conservation policy in this state? What are the biggest challenges and what measures have been enacted to protect the natural environment?
- Can you tell me about the region in which you work? What are the biggest challenges and opportunities there?
- Do you think the region that you work in is well conserved?
- Do you think responsibility for conservation lies with the community and local government or should it be conducted by state or federal government or other organisations?
- What is your opinion of the protected areas in this region?
- Can you tell me about stakeholder participation in the implementation and management of the protected areas here?
- In your opinion how did the broader community respond to the designation of the protected areas?

Policy Design

- Have you heard of the ICMS-E? Can you tell me about this mechanism?
- To your knowledge, what were the concerns that stimulated the introduction of the ICMS-E?
- What do you think is the main objective of the ICMS-E?
- How do you think the ICMS-E could be improved?

Interactions
• Does the reserve you manage contribute to the ICMS-E collected by the municipal government? (reserve managers)

• Have you ever tried to access information about the ICMS-E from the state government? Was it easy or difficult?

• How well do you think municipal government understand the ICMS-E?

• How well do you think the broader community understand the ICMS-E?

• To your knowledge has this municipality undertaken any activity with the intention of improving the revenue received from the ICMS-E? (PARANÁ)

• Are you aware of any state programme to inform the public or local government about the ICMS-E?

• To your knowledge are communities involved in decisions about the application of ICMS-E revenue?

• Are you aware of participation by civil society in the decisions over the destination of municipal public revenue generally?

• Are you aware of any formal programme to receive feedback or input from the community about policy projects and the agenda of the municipality?

• Is there any formal programme for you to receive feedback or input from the community about the protected area you manage? (reserve managers)

• Do you have an agreement with the municipal government to maintain your reserve through financial, service or infrastructure support? (private reserve owners)

**Outcomes**

• Do you know how the ICMS-E revenue is applied in this municipality?

• Do you think that the ICMS-E creates an incentive for municipalities to conserve their natural resources?

• Are you aware of any conservation activity being undertaken by the municipal government?

• Do you think the ICMS-E increases the visibility of environmental questions on the local political agenda?

• What is your opinion of the ICMS-E in general? How does it work well and how could it be improved?
• Do you think the local population perceive any benefits from the protected areas?
• Do you think the local population perceive any benefits from the ICMS-E?
• In your opinion has the ICMS-E had any influence on community opinion towards protected area and other conservation activities?
• I would like to speak with other people about this subject. Could you recommend anyone?
Appendix 3. Participant information sheet

PARTICIPANT INFORMATION SHEET
RESEARCH INTO THE ECOLOGICAL ICMS

WHAT IS THE RESEARCH PROJECT?

- This research will investigate a conservation policy known as the ecological ICMS in two Brazilian states with the aim of furthering understanding of how to optimise environmental outcomes whilst considering the social and economic conditions of the municipalities involved.
- This research will happen through interviews between the researcher (Ms. Verde Selva) and participants with relevant knowledge and understanding of the ICMS-E or who inhabit the municipalities.
- As a participant, you will be asked questions about conservation and/or the ICMS-E, its operation and how it is being received by communities.

HOW WILL THE INFORMATION BE RECORDED?

- Information will be recorded by note-taking and audio-recording.
- Ms. Verde Selva will transcribe and translate the recording after the interview. The use of an audio-recording device is voluntary, but it is the best way to allow accurate and full documentation of your knowledge and perspectives. Ms. Verde Selva can provide you with a copy of your recording on CD and in a written format if requested.

HOW WILL THE INFORMATION BE USED?

- The information will be used for a PhD thesis to be submitted to the University of Western Australia. No individual participant will be identified in the thesis.
WHAT ARE THE BENEFITS?

- This research will further understanding of how to maximise the outcomes of the ICMS-E for the environment and the communities involved. This information may be useful to Brazilian policy-makers in the formulation of the ICMS-E in other states and will also contribute to wider debate in this policy area.

WHAT CAN YOU EXPECT AND ARE THERE ANY RISKS?

- The researcher, Ms. Verde Selva, will interview you. There are no anticipated risks arising from your involvement.
- As a participant, you decide what information to provide to Ms. Verde Selva, and if you find any questions difficult or inappropriate, you may decline to comment.
- Participation in this research is voluntary and you, the participant, are free to withdraw your consent at any time. You do not need to provide any reason for this. In such cases, the information you have provided will be destroyed, unless you give other instructions.

Approval to conduct this research has been provided by the University of Western Australia, and Brazil’s National System of Ethics in Research, in accordance with their ethics review and approval procedures. As a participant or potential participant, you may raise any questions or issues with the researcher at any time. In addition, if you are not satisfied with the response of the researcher, you may make a complaint by contacting the Human Research Ethics Office at the University of Western Australia on (08) 6488 3703 or by emailing to hreo-research@uwa.edu.au.

If you have any questions or concerns regarding this research, please don’t hesitate to contact the researcher, Gracie Verde Selva by e-mail at gracie.verdeselva@research.uwa.edu.au. You can also contact the research supervisor at the University of Western Australia, Dr. Julian Clifton, by e-mail at julian.clifton@uwa.edu.au.

All research participants are entitled to retain a copy of this Participant Information Form and/or Participant Consent Form relating to this project.
INFORMAÇÕES PARA O PARTICIPANTE
INVESTIGAÇÃO SOBRE O ICMS ECOLÓGICO

O QUE É O PROJETO DE PESQUISA?

• Esta pesquisa irá investigar uma política pública chamada ICMS ecológico em dois estados brasileiros com o objetivo de aprofundar a compreensão de como otimizar os resultados ambientais, enquanto considerando as condições sociais e econômicas dos municípios envolvidos.

• Esta pesquisa vai acontecer por meio de entrevistas entre o pesquisador (Ms. Verde Selva) e os participantes com conhecimentos relevantes e compreensão sobre o ICMS-E, ou os que moram nos locais relevantes a pesquisa.

• Como um participante que serão feitas perguntas sobre conservação da natureza e/ou o ICMS-E, seu funcionamento e como está sendo recebido pelas comunidades.

COMO A INFORMAÇÃO SERÁ GRAVADO?

• As informações serão registradas por anotações e áudio de gravação.

• Ms. Verde Selva vai transcrever e traduzir a gravação após a entrevista. O uso de um dispositivo de gravação de áudio é voluntário, mas é a melhor maneira de permitir que a documentação precisa e completa de seus conhecimentos e perspectivas. Ms. Verde Selva pode fornecê-lo com uma cópia de sua gravação em CD e em um formato escrito, se solicitado.

COMO A INFORMAÇÃO SERÁ USADO?
As informações serão utilizadas para uma tese de doutoramento a ser apresentada à Universidade da Austrália Ocidental. Nenhum participante será identificado na tese sem consentimento.

QUAIS SÃO OS BENEFÍCIOS?

Esta pesquisa irá aprofundar a compreensão de como maximizar os resultados do ICMS-E para o meio ambiente e as comunidades envolvidas. Esta informação pode ser útil na formulação do ICMS-E em outros estados e também irá contribuir para um debate mais amplo nesta área política.

O QUE PODE ESPERAR E HÁ ALGUM RISCO?


Como participante, você decide qual a informação a fornecer aos Ms. Verde Selva, e se você encontrar alguma dúvida difícil ou inadequada, pode recusar-se a comentar.

A participação na pesquisa é voluntária e você, o participante, são livres para retirar seu consentimento a qualquer momento. Você não precisa fornecer qualquer razão para isso. Em tais casos, as informações que você forneceu serão destruídos, a menos que você dê outras instruções.

Aprovação para a realização desta pesquisa foi fornecido pela Universidade da Austrália Ocidental, e pela Sistema Nacional de Ética em Pesquisa do Brasil de acordo com a sua revisão ética e procedimentos de aprovação. Como participante ou potencial participante, você pode levantar quaisquer dúvidas ou problemas com o pesquisador, a qualquer momento. Além disso, se você não estiver satisfeito com a resposta do pesquisador, você pode fazer uma reclamação em contato com o Escritório de Ética em Pesquisa Humana da Universidade da Austrália Ocidental em (08) 6488 3703 ou pelo e-mail para hreo-research@uwa.edu.au.

Se você tiver dúvidas ou preocupações relacionadas com esta pesquisa, por favor, não hesite em entrar em contato com o pesquisador, Gracie Verde Selva por e-mail em
gracie.verdeselva@research.uwa.edu.au. Você também pode entrar em contato com o supervisor de pesquisa da Universidade da Austrália Ocidental, Dr. Julian Clifton, por e-mail em julian.clifton@uwa.edu.au.

Todos os participantes da pesquisa têm direito a reter uma cópia deste Participante Formulário de Informação e / ou Participante Formulário de Consentimento relativas a este projeto.
PARTICIPANT CONSENT FORM

RESEARCH INTO THE ECOLOGICAL ICMS

Participant: ________________________________________________________________

Contact details (optional): ___________________________________________________

- I (the participant) understand the information provided to me about this research project and all of my questions have been answered to my satisfaction.
- I have been advised about what information is being collected, the purpose for collecting the information, and what will be done with the information upon completion of the research.
- I understand that my identity and my name is treated as strictly confidential and will not be released in any form that may identify me, unless I give permission. The only exception to this confidentiality is if documents are required by law.
- I understand that the researcher will audio-record my interview and this is entirely voluntary.
- I agree to participate in this research, understanding that I may withdraw at any time without reason and without prejudice.
- I agree that information gathered for this research may be published provided my name or other identifying information is not used, unless I have given permission to use these.

__________________________________________ __________________________
Participant signature Date
Based on the conditions above, I also agree that the researcher can:

☐ Audio-record my interview       ☐ Identify me in the thesis

Approval to conduct this research has been provided by the University of Western Australia and Brazil’s National System of Ethics in Research in accordance with their ethics review and approval procedures. Any person considering participation in this research, or agreeing to participate, may raise any questions or issues with the researchers at any time. In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Research Ethics Office at the University of Western Australia on (08) 6488 3703 or by emailing hreo-research@uwa.edu.au. All research participants are entitled to retain a copy of the Participant Information Form and/or Participant Consent Form relating to this research project. For any questions or concerns please contact the researcher, Gracie Verde Selva by e-mail gracie.verdeselva@research.uwa.edu.au, or contact the Chief Investigator (supervisor), Assistant Professor Julian Clifton, using the details provided above.

Yours sincerely

Dr Julian Clifton
FORMULÁRIO DE CONSENTIMENTO DO PARTICIPANTE
INVESTIGAÇÃO SOBRE O ICMS ECOLÓGICO

Nome do participante: ________________________________

Detalhes de contato (opcional): __________________________

- Eu (o participante) entendo as informações fornecidas a mim sobre este projeto de investigação e todas as minhas perguntas foram respondidas a minha satisfação.
- Fui informado sobre quais informações estão sendo coletadas, o objetivo de recolha de informação, e o que será feito com as informações após a conclusão da pesquisa.
- Eu entendo que minha identidade e meu nome será tratada como estritamente confidencial e não será liberado de qualquer forma que possa me identificar, a menos que eu dê permissão. A única exceção a essa confidencialidade é se os documentos são exigidos por lei.
- Eu compreendo que o investigador irá áudio-gravar minha entrevista e isso é inteiramente voluntária.
- Eu concordo em participar da pesquisa, como entendimento que eu posso me retirar a qualquer momento, sem motivo e sem preconceito.
- Concordo que as informações recolhidas por esta pesquisa podem ser publicadas desde o meu nome ou outras informações de identificação não for usado, a menos que eu tenha dado permissão para usá-los.

_________________________________          __________________
Assinatura                                                             Data

THE UNIVERSITY OF
WESTERN AUSTRALIA

S School of Earth and Environment
35 Stirling Highway
Crawley
WA 6009
Com base nas condições acima, também concordo que o pesquisador pode:

☐ Áudio-gravar minha entrevista    ☐ Me identificar na tese

Aprovação para a realização desta pesquisa foi fornecido pela Universidade da Austrália Ocidental, e pela Sistema Nacional de Ética em Pesquisa do Brasil de acordo com a sua revisão ética e procedimentos de aprovação. Qualquer pessoa considerando a participação nesta pesquisa, ou concordar em participar, pode levantar dúvidas ou problemas com os pesquisadores, a qualquer momento. Além disso, qualquer pessoa que não está satisfeito com a resposta dos pesquisadores pode levantar questões ou preocupações éticas, e poderá apresentar as queixas sobre este projeto de investigação em contato com o Escritório de Ética em Pesquisa Humana da Universidade da Austrália Ocidental em (08) 6488 3703 ou pelo e-mail hreo-research@uwa.edu.au. Todos os participantes da pesquisa têm o direito de manter uma cópia do Participante Formulário de Informação e / ou Participante Formulário de Consentimento relativa a este projeto de investigação. Para quaisquer dúvidas ou preocupações contate o pesquisador, Gracie Verde Selva por gracie.verdeselva@research.uwa.edu.au e-mail, ou contatar o investigador-chefe (orientador), Assistente Professor Julian Clifton, através dos dados fornecidos acima.

Com os melhores cumprimentos

Dr. Julian Clifton