

Assessing the impact of institutional conditions upon REDD+

Timothy Laing

London School of Economics and Political
Science

A thesis submitted to the Department of Geography and
Environment of the London School of Economics for the
Degree of Doctor of Philosophy in Environmental Economics,
London, April 2014

Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

The copyright of this thesis rests with the author. Quotation from it is permitted, provided that full acknowledgement is made. This thesis may not be reproduced without my prior written consent.

I warrant that this authorisation does not, to the best of my belief, infringe the rights of any third party.

I declare that my thesis consists of 97,927 words.

Statement of conjoint work

I confirm that Chapter 4 was jointly co-authored with Dr Charles Palmer and I contributed 75% of this work.

Statement of use of third party for editorial help (if applicable)

I can confirm that my thesis was copy edited for conventions of language, spelling and grammar by Simone Cooper and Stuart Laing.

Acknowledgements

Firstly I would like to thank my supervisor Charles Palmer who has been an inspiration from before the start of my PhD right through to submission. He has helped to shape the ideas that underlie this thesis, has guided my thoughts and ramblings through countless meetings, lunches and coffees. Without his proddings, suggestions and many, many comments this thesis would never have come together.

I gratefully thank the Economic and Social Research Council for providing me with the funding to both sustain me through the first three years of my PhD but also for providing the finance for me to spend nine months of fieldwork in Guyana collecting the primary data, and the overall viewpoints and experience on the ground that are so integral to this work.

I would also like to thank the Department of Geography and Environment of the London School of Economics for the additional funds required to see me through to the final stages of submission.

The comments, suggestions and questions of numerous colleagues in both the Department and also the Grantham Research Institute through all the presentations and seminars conducted throughout my PhD have proved invaluable. Their patience through my varied presentations is much appreciated, as are their experience that have helped this thesis reach this stage.

The overall support of the Grantham Research Institute is especially appreciated. They have provided me with a home for the last 3 ½ years, hidden away from the rest of the LSE on the top of the towers. My colleagues there, past and present, have provided endless advice and inspiration on this journey. A special mention is deserving for Murray Collins who has been a constant source of wisdom on all things forest – and has helped fill many gaps in my knowledge.

The support, encouragement, advice, lunches, drinks and general chats with all the staff of Conservation International – Guyana has proved crucial to my entire PhD experience. They kindly hosted me for 9 months of fieldwork between 2011 and 2012 and have provided hospitality, friendship and a desk on my subsequent visits. I would like to especially thank Preeya Rampersaud for facilitating the connection and all the consequent words of advice, guidance and views. This work would not have been possible without the kindness, friendship and guidance of Dr David Singh who found me a home at CI and has helped me understand Guyana and Guyanese society like never before. I hope the experience of hosting me as a PhD student will lead to many future endeavours in this area. I would also like to thank Rene Edwards for his many useful ideas, discussions and especially driving me up and down from the Rupununi and giving me a forum with The Consultancy Group IDEAS sessions to present my ideas and thoughts on all things Guyana.

I would like to thank a number of individuals across a variety of departments of the Government of Guyana. The work was conducted under an Environmental Research Permit from the Environmental Protection Agency and I would like to thank the Agency for their assistance.

The staff of the Guyana Geology and Mines Commission Library have proved especially helpful and patient with me as I searched through their archives for various documents, and proved gracious hosts as I spent many hours ploughing through Gazettes extracting data.

I would like to thank all the interviewees across a huge range of agencies and bodies in Guyana. The views of every single one has helped to shape the overall findings, conclusions and thinking behind the study, above and beyond any specific quotations used. I am grateful for the time that they put aside to assist me in my project.

I would also like to thank the staff of the University of Guyana, especially the Institute of Development Studies, Professor Clive Thomas and Dr Thomas Singh who also hosted me during my fieldwork. They provided me with an office of solace away from the craziness of CI. They also assisted hugely with giving me many forums to present early findings and research, helping to craft my thinking. I hope again this is a platform for future collaboration.

The assistance of two reviewers of various elements of my thesis is also much appreciated. Professor Gavin Hilson provided many words of wisdom from his extensive knowledge of small-scale mining to the work on mining in Guyana. Simone Cooper provided help in both copy-editing various chapters, and providing a lay-persons ear for various REDD+ discussions.

I would like to apologise to all my friends for my ever-increasing absence over the last couple of years as this thesis has picked away at any remaining free time. Their continued support through the journey has been crucial in me keeping some aspects of my sanity!

Without the support of my family in more ways than I can count this thesis would never have seen the light of day. They have remained constant sources of inspiration and support. A special mention is for my father who provided not only advice, guidance, but also crucial copy-editing support to various chapters.

Finally this thesis would not have been at all possible without the support of my loving wife. She has remained patient and kind throughout my constant disappearances on evenings and weekends to complete an ever increasing list of small tasks to complete the thesis. Her support through all my fieldwork in Guyana, and the welcoming arms of her family have made a huge impact on this thesis and my life in general. Without her love and support this thesis would remain unfinished on a shelf.

Abstract

This thesis investigates the role that institutional conditions have on policy for Reducing Emissions from Deforestation and Forest Degradation (REDD+) by applying a New Institutional Economics perspective and a multimethodological approach. It focuses on three specific institutional conditions: property rights, governance and politics, and applies theoretical and empirical techniques. A single case study of Guyana's innovative REDD+ programme is used for empirical analysis.

The thesis provides contributions to normative and evaluative REDD+ literature, especially with regard to early assessments of the design, impacts and effectiveness of national-level REDD+. It makes subsidiary contributions in the areas of small-scale mining, policy design under political influence and environmental governance.

Through analytical modelling the thesis finds that design of REDD+ is significantly altered when placed in a general equilibrium setting, along with when political influence is included. Econometric analysis of a unique data-set from Guyana shows effects from electoral cycles on the holding of property rights relating to the main driver of deforestation, mining, along with the introduction of REDD+. Qualitative analysis of interviews and media sources highlight that governance of REDD+ in Guyana has remained predominantly state-centric, with only some evidence that multi-actor, multi-level governance has emerged. Issues such as capacity, political will, electioneering, the retained control of finance by donors and the introduction of complicated systems of safeguards have all affected the emergence of 'pure' REDD+ in Guyana.

The thesis provides key conclusions on the importance of a cognisance of the institutional landscape on which REDD+ is to be implemented. Including such an institutional perspective raises questions over the perceived cheapness of REDD+ as a mitigation option. It offers guidance for the design and implementation of national level REDD+ policy and highlights the need for a differentiated approach to REDD+, factoring in the relevant institutional conditions prevalent in each jurisdiction.

Contents

Chapter 1: Introduction	14
1.1 Introduction	15
1.2 Motivations	15
1.3 Research Questions	22
1.4 Methodology	24
1.5 Structure of thesis	29
Chapter 2: Reducing Emissions from Deforestation and Forest Degradation –Overview of Issues.....	32
2.1 Introduction	33
2.2 Brief History of Deforestation and Forest Policy	35
2.2.1 Drivers of deforestation	35
2.2.2 Forest Policies	39
2.3 Emergence of REDD+	44
2.4 Key issues for REDD+.....	47
2.4.1 Evaluating Success – Additionality and the three E’s	47
2.4.2 Policy Choices for REDD+ and institutional conditions	49
2.4.3 The Scale of REDD+: Opportunity Costs, Partial and General Equilibrium thinking	52
2.4.4 The Governance of REDD+	54
2.5 Conclusions	57
Chapter 3: Guyana Context.....	59
3.1 Introduction	60
3.2 Background	60
3.2.1 History	60
3.2.2 Geography	62
3.2.3 Economy	64
3.2.4 Political structure	67
3.2.5 Governance	71
3.2.6 Governance in the Natural Resource Sectors	72
3.2.7 Indigenous population	73
3.3 Guyana’s Forests	75
3.3.1 Background	75
3.3.2 Deforestation	76
3.3.3 Land Tenure	79
3.4 Guyana and REDD+	82

3.4.1 The Memorandum of Understanding with Norway	82
3.4.2 Low Carbon Development Strategy	86
3.5 Mining in Guyana	94
3.5.1 Background	94
3.5.2 Regulatory structure in Guyana	97
3.6 Discussion.....	101
Chapter 4: Economy-wide effects of REDD+ when there is political influence	104
4.1 Introduction	105
4.2 The basic model	108
4.2.1 Production.....	108
4.2.2 Consumption.....	111
4.2.3 Income	112
4.3 Introducing REDD+	112
4.3.1 Payment Scheme	113
4.3.2 Taxes	116
4.4 Interest Group Influence.....	118
4.4.1 Mining sector influence	120
4.4.2 SFM sector influence.....	122
4.4.3 Input and Output taxes	123
4.5 Labour market constraints.....	124
4.6 Discussion and Conclusions	124
Chapter 5: Rights to the forest, REDD+ and Elections: Mining in Guyana.....	128
5.1 Introduction	129
5.2 Property Rights, the Forest, Expropriation and Mining	131
5.3 Mining model	134
5.3.1 Expected prices	138
5.3.2 Expected production rate	139
5.3.3 Expected costs.....	139
5.3.4 Expected Regulatory Risk.....	140
5.4 Data	141
5.5 Methodology.....	144
5.6 Results	150
5.6.1 Diagnostic tests	150
5.6.2 Number of claims taken out	152

5.6.3 Number of claims given up	156
5.7 Discussion.....	160
Chapter 6: Multi-level governance of REDD+ in Guyana	165
6.1 Introduction	166
6.2 Governance and Multi-level Governance	167
6.3 Research objectives	171
6.4 Methodology.....	172
6.5 The Governance of the LCDS	177
6.5.1 Actors	177
6.5.2 Scales.....	184
6.5.3 Interests	200
6.6 Discussion/Conclusion	208
Chapter 7: REDD+ in Guyana – How well does it fit the standard model?.....	211
7.1 Introduction	212
7.2 The structure of the arrangement	214
7.2.1 The Memorandum of Understanding	214
7.2.2 The Guyana REDD+ Investment Fund	217
7.2.3 The Low Carbon Development Strategy	219
7.3 The motivations of the key participants	225
7.4 Evolution of the agreement.....	228
7.4.1 Delays.....	229
7.4.2 Conditionality and safeguards	234
7.5 Lessons and Conclusions.....	238
Chapter 8: Conclusion	242
8.1 Introduction	243
8.2 Impact of institutional conditions upon REDD+: Lessons for implementation.....	244
8.2.1 Institutions matter	245
8.2.2 Importance of scale and its related impacts.....	246
8.2.3 Security of all types of property rights.....	248
8.2.4 Politics will play a role.....	250
8.2.5 Capacity is crucial.....	252
8.2.6 Need for REDD+ specific institutions and models.....	254
8.2.7 REDD+ and extractive industries.....	255
8.2.8 REDD+ going forward?	257

8.3 Limitations.....	258
8.4 Directions for future research.....	261
8.5 Conclusions	263
Bibliography	264
Appendices.....	293
Appendix 1: Membership of the Multi-Stakeholder Steering Committee	293
Appendix 2: Derivation of results for input and output taxes	294
Appendix 3: Derivation of results under labour market constraints	298
Appendix 4: Correlation of independent variables.....	300
Appendix 5: Model specifications.....	301
Appendix 6: Model Results <i>Claims Taken Out</i>	302
Appendix 7: Model Results <i>Claims Given up</i>	309
Appendix 8: Average prices and price volatility results.....	317
Appendix 9: Consultations and Awareness Sessions	325
Appendix 10: Consent form for interviews.....	327
Appendix 11: Interview guides	328

Figures and Tables

Figure 3.1: Gross domestic product growth 1981-2012	65
Figure 3.2: GDP by sector 2006-2012	66
Figure 3.3: Exports by sector 2012	67
Figure 3.4: World Bank Governance Indicators 2007-2011.....	71
Figure 3.5: Total forest loss 1990-2010	76
Figure 3.6: Annualised Area Deforested by Driver	77
Figure 3.7: Forest Tenure and Logging concessions in Guyana	79
Figure 3.8: Potential annual payments from Norway under the MOU	85
Figure 3.9: Structure of project proposals and finance flows under the GRIF	85
Figure 3.10: Multi-level actors for REDD+ in Guyana4	92
Figure 3.11: Total declared gold production in Guyana 1979-2012	95
Figure 3.12: Gold prices and Gold revenue in Guyana 1979-2012	95
Figure 3.13: Forest clearance and a mine pit in Guyana	97
Figure 3.14: Mining Districts of Guyana.....	100
Figure 5.1: Number of claims held 1996-2012, by district.....	144
Figure 5.2: Number of claims held 1996-2012, by type.....	145
Figure 5.3: Correlations between year and <i>takenout</i> and <i>takenout</i> and lagged <i>takenout</i>	146
Figure 5.4: Correlations between year and <i>givenup</i> and <i>givenup</i> and lagged <i>givenup</i>	146
Figure 5.5: Number of legal permanent residents entering the United States from Guyana	163
Figure 6.1: Conceptualisation of multi-level governance	170
Figure 6.2: Multi-level actors participating in REDD+	171
Figure 6.3: Themes related to actors.....	178
Figure 6.4: Themes related to scales	185
Figure 6.5: Timeline of MSSC Meetings	195
Figure 6.6: Themes related to Interests.....	201
Figure 7.1: The finances of the GRIF: pledged amount, expenditure, income and cash balance	230

Table 3.1: Guyana demographics by region 2002.....	64
Table 3.2: Guyana Election Results 2011	70
Table 3.3: Investment of Funds from Climate Services 2009-2014 (US\$ millions).....	90
Table 3.4: Rental Fees for Mining claims and licences in Guyana 2013	100
Table 5.1: Mining Districts and Types	142
Table 5.2: Summary of dependent variables	142
Table 5.3: Summary of independent variables	142
Table 5.4: Breitung unit root tests of dependent variables.....	146
Table 5.5: Tests of normality of dependent variables	148
Table 5.6: Model Results.....	154
Table 5.7: Structural break tests for number of claims taken out.....	157
Table 5.8: Structural break tests for number of claims given up.....	161
Table 6.1: Occurrence of themes relating to Actors among respondents.....	179
Table 6.2: Occurrence of themes relating to the MSC among respondents	186
Table 6.3: Occurrence of themes relating to the consultative process among respondents.....	197
Table 6.4: Occurrence of themes relating to Interests.....	202
Table 7.1: Status of GRIF funded projects.....	224
Table 7.2: Indicators of Enabling Activities and examples of action for 2012/2013	237

Abbreviations

AFC – Alliance for Change
APA – Amerindian People’s Association
APNU - A Partnership of National Unity
ASM – Artisanal and small-scale mining
ATA – Applied Thematic Analysis
BAU – Business as Usual
CCBA – Climate, Community and Biodiversity Alliance
CDM – Clean Development Mechanism
CI - Conservation International
CIFOR – Centre for International Forest Research
COCA - Konashen Community-Owned Conservation Area
COP – Conference of the Parties
DfiD – Department for International Development
EITI - Extractive Industry Transparency Initiative
EKC - Environmental Kuznets Curve
EPA - Environmental Protection Agency
EVN - Economic Value to the Nation
FAO - Food and Agricultural Organization
FCPF – Forest Carbon Partnership Facility
FPA – Forest Producers Association
FPIC - Free Prior and Informed Consent
GEE – Generalised Estimating Equations
GFC - Guyana Forestry Commission
GGDMA – Guyana Gold and Diamond Miners Association
GGMC - Guyana Geology and Mines Commission
GLM – Generalised Linear Models
GLSC - Guyana Lands and Surveys Commission
GMTCS – Guyana Marine Turtle Conservation Society
GoG – Government of Guyana
GRIF - Guyana REDD+ Investment Fund
HFLD – High Forest cover, Low Deforestation Rate
IDB - Inter-American Development Bank
IIED - International Institute for Environment and Development
JCN – Joint Concept Note
KMCRG - Kanuku Mountains Community Resource Group
LCDS – Low Carbon Development Strategy
MLG – Multi-Level Governance
MNRE - Ministry of Natural Resources and the Environment
MOU - Memorandum of Understanding
MRV - Monitoring, Reporting and Verification
MSSC - Multi-Stakeholder Steering Committee
NGOs – Non-Governmental Organisations
NICFI – Norway International Climate and Forest Initiative

NICIL - National Industrial and Commercial Investment Ltd
NRDDB - North Rupununi District Development Board
NTC - National Toshias Council
OCC - Office of Climate Change
ODA – Overseas Development Assistance
OLS – Ordinary Least Squares
PAC - Protected Areas Commission
PCSE - Panel-Corrected Standard Errors
PES – Payment for Ecosystem Services
PMO - Project Management Office
PNC – People’s National Congress
PPG7 – Pilot Program to Conserve the Brazilian Rain Forest
PPP - People’s Progressive Party
PPP-C – People’s Progressive Party / Civic
REDD+ - Reducing Emissions from Deforestation and Degradation
RPP - Readiness Preparation Proposal
SCPDA - South Central People’s Development Association
SFE - State Forest Estate
SFM – Sustainable Forest Management
SFP - State Forest Permissions
SLUC - Special Land Use Committee
TAAMOG – The Amerindian Action Movement of Guyana
TFAP – Tropical Forest Action Plan
TSA - Timber Sales Agreements
TSCS – Time Series Cross-Section
UECC – Upper Essequibo Conservation Concession
UN – United Nations
UNCBD – United Nations Convention on Biological Diversity
UNDP - United Nations Development Programme
UNFCCC – United Nations Framework Convention on Climate Change
VCS – Verified Carbon Standard
WCL - Wood Cutting Leases
WWF - World Wild Fund for Nature
ZINB – Zero-inflated negative binomial

Chapter 1: Introduction

1.1 Introduction

Reducing Emissions from Deforestation and Forest Degradation (REDD+) has rapidly emerged as a crucial part of the climate change policy mix, moving in a few short years from a small number of academic papers to projects and national programmes across the developing world. As the concept has evolved, so the literature relating to REDD+ has mushroomed, however significant questions remain regarding how it should be designed and implemented and what lessons can be learnt from early REDD+ movers for its wider deployment. This thesis aims to answer questions in all of these areas, making contributions to the literature relating to REDD+ policy design and implementation and also to subsidiary literatures regarding small-scale mining, modelling of policy instruments under political influence and environmental governance.

REDD+ started as a simple idea: the opportunity costs of clearing forest compared to alternative uses have been estimated to be relatively small (Blaser & Robledo, 2007; Eliasch, 2008; Kindermann et al., 2008) therefore targeted policies, such as payments for ecosystem services (PES) could create the incentive to conserve forest rather than undertake clearance. Yet as REDD+ developed from a basic economic idea to reality on the ground it has become more complex. Rent-seeking, insecure property rights, poor governance, political lobbying, centralization and a lack of institutional capacity in both government and wider society are common in REDD+ countries, and create complications to the simple REDD+ story. Although these issues have been identified in the literature as a concern, their actual impact on how REDD+ should be, and is being, implemented has yet to be widely studied.

This thesis tackles the question of how institutional conditions, such as those highlighted above, can affect REDD+ policy, from both a theoretical perspective and through the use of empirical evidence from the world's first national-level REDD+ programme in Guyana.

This Chapter serves to introduce the thesis by describing the motivations for the research and the methodologies adopted to answer the problem, and providing an outline to the remainder of the thesis. Section 1.2 provides a summary of the motivations for the work. Section 1.3 breaks open the research objective into a series of research questions that form the structure of the remainder of the thesis. Section 1.4 discusses the overall methodologies adopted to answer these research questions and Section 1.5 provides a roadmap for the thesis.

1.2 Motivations

Climate Change has emerged as perhaps the defining global problem of our time. Its influence on environment, development and the economy has been stressed in a huge range of publications not

least the work of the Inter-governmental Panel on Climate Change (IPCC) that assesses the science and policy context to climate change (Metz, Davidson, Bosch, Dave, & Meyer, 2007; Parry, Canziani, Palutikof, van der Linden, & Hanson, 2007) and the Stern Review that provides the key economic rationale for action on climate change (N. Stern, 2006). The link between greenhouse gas emissions (GHG) and climate change has been clearly established in the scientific literature (Stocker, Dahe, & Plattner, 2013) with the majority of anthropogenic GHG emissions coming from the burning of fossil fuels for the generation of electricity, the transportation of vehicles and industrial processes such as the manufacturing of steel and cement (Metz et al., 2007). A large percentage however, between 10-20% (depending on the year and the different estimation techniques used), arise as a result of deforestation and land-use change (Harris, Brown, Hagen, Baccini, & Houghton, 2012; van der Werf et al., 2009, 2010). Carbon dioxide is released from the burning of vegetation as forests are cleared, with further releases from soil post-clearance (Houghton, 1991). These emissions are an important part of the climate change problem, however international policies to incentivise their reduction were generally excluded from the climate change policy architecture constructed in the wake of the 1992 United Nations Framework Convention on Climate Change (UNFCCC), and the related 1997 Kyoto Protocol. Under the Protocol Annex 1 countries¹ are required to account for land-use change,² but since the vast majority of emissions from deforestation occur from the clearance of tropical forest in non-Annex 1 countries³ the exclusion of avoided deforestation from the Clean Development Mechanism (CDM) (the main mechanism targeting these countries) for reasons such as the difficulties in defining a forest and methodological issues such as leakage⁴, permanence⁵ and additionality⁶ meant that tropical deforestation emissions were excluded from the framework (Trines et al., 2006).

Climate change is an example of a market failure - the costs of greenhouse gases production are not faced by the producers of the gas, due to the impacts falling on future generations and in countries other than the producer. Producers thus have an incentive to over-produce these gases – creating

¹ Annex I Parties are defined in the UNFCCC and are described on https://unfccc.int/parties_and_observers/items/2704.php as including the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

² As per Article 3 Paragraphs 3 and 4 of the Kyoto Protocol.

³ Non-Annex I countries are those parties to the UNFCCC not defined as Annex I countries and are mostly developing countries.

⁴ Leakage is defined by Atmadja & Verchot, (2011) pp. 312 as occurring 'when interventions to reduce carbon emissions in one place causes carbon emissions in another place'.

⁵ Permanence is defined by IPCC, (2000) as 'the longevity of a carbon pool and the stability of its stocks, given the management and disturbance environment in which it occurs'.

⁶ Additionality is defined by Valatin, (2011) pp. V as 'net GHG emissions savings or sequestration benefits over and above those that would have arisen anyway in the absence of a given activity or project'.

socially inefficient levels of pollution. The same is true of deforestation, both with regard to the carbon emissions that it produces and also other co-benefits that forests offer such as biodiversity and watershed protection. The standard economic approach to such 'externalities' is to create a price signal for producers that includes the social costs of the pollution they create. The problem of carbon emissions from tropical deforestation has been approached in the same manner.

A mechanism entitled Reducing Emissions from Deforestation and Forest Degradation (REDD+) has been proposed in a stream of literature, and has rapidly been piloted through policy developments in a number of countries to aid the inclusion of tropical deforestation into the climate change framework and to create a price signal to internalise the externality. REDD+ has been hypothesised as a cheap abatement option, predicated on a simple economic model (Heal & Conrad, 2006; Moutinho, Santilli, Schwartzman, & Rodrigues, 2005; Schlamadinger et al., 2005). The relatively low opportunity cost that has been estimated for conserving forest rather than undertaking deforesting activities such as clearing land for agriculture could be overcome through small payments to the key actors, whether governments or landowners, through policy tools such as PES, creating a price signal for the actors behind deforestation. This basic economic model is at the heart of REDD+ policy development but as REDD+ has moved from an idea on paper to a reality on the ground a realisation has started to emerge it may not be as simple as first conceived. Issues such as leakage and permanence along with the need for deforestation to be addressed through policy reforms have meant that the design for a REDD+ framework, that had previously developed from an original national level idea to a basic project-level system, similar to the CDM, has moved back towards a national or jurisdictional level system, with national deforestation baselines below which payment will be made and payments themselves and responsibility for interventions in the hands of national or regional governments. This move brings REDD+ more firmly into the hands of politicians raising the spectre of the programme being affected by politics (Clements, 2010; Di Gregorio, Brockhaus, Cronin, & Muharrom, 2012). It creates a long chain of actors from initial REDD+ financiers to policy on the ground in forested countries increasing the number of institutions and actors involved, raising questions of governance and capacity. The long chain of actors also raises questions regarding property rights to the ownership and use of the forest, and also to the REDD+ finance on offer. Finally the increase in the scope, size, and perspective of REDD+ widens the room for REDD+ to have economy-wide effects, impacting sectors far beyond those directly using the forests. All of these issues imply an increased need for a focus on the institutional aspects of REDD+, and a move beyond the simplistic opportunity cost model that the mechanism was initially predicated upon. To date the REDD+ literature has been slow to adopt this institutional approach, and thus the main objective of this thesis is to extend the literature in this direction, providing a major contribution to both the

academic and policy debates surrounding REDD+. It adopts the perspective of New Institutional Economics (NIE) that has emerged recently in economic thought.

Institutions have been defined differently by a wide variety of authors, depending on their background, philosophical leanings and discipline. The economist Douglas North defined institutions as ‘rules of the game in a society or more formally the humanly devised constraints that shape human interaction’.⁷ They are the rules that humans have developed to manage their relations, shaping economies and societies. This definition, along with those from other fields,⁸ is however somewhat inadequate as it fails to answer fundamental questions such as whether institutions are just formal rules, or also include informal norms and conventions, and whether institutions are pre-defined or do they evolve with human action and design? These questions and more have been argued over by a variety of scholars from different disciplines and schools (Djelic, 2010). In an attempt to resolve some of these issues Richard Scott provided a broader definition of institutions as ‘comprised of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life’⁹, hinting that institutions contain both formal and informal elements, and are both external constraints on actors, and also evolve in response to the actions of these actors.

The importance of institutions to economic thought is not new. Work in the early 20th century by economists such as Thomas Veblen and Wesley Mitchell showed the importance of institutions to economic interactions, and the need to think of institutions as endogenous to economic models (Hodgson, 2004). The cognisance of the importance of institutions to economic thought catalysed the modern field of New Institutional Economics (NIE). The field is recognised to have begun with the publication of ‘The Nature of the Firm’ in 1937 by Ronald Coase (1998) that explicitly introduced transaction costs into economic analysis. The field has developed into a major influence on modern economics with seminal work by authors such as Coase (1992), Elinor Ostrom (2005) and Douglass North (1990) and has been fundamental to the development of environmental economics as a discipline.¹⁰ This thesis adopts the NIE framework, retaining the basis of microeconomic thought but aiming to understand the impact that a cognisance of institutions has upon the simple

⁷ North, (1990) pp. 3.

⁸ For example institutions have been defined as ‘wide cultural and symbolic patterns’ (Meyer & Rowan, 1977), ‘essentially structural frames, organisational solutions and formal rules or systems’ (Djelic, 2010) or ‘ex-ante agreements about a structure of cooperation’ (Shepsle, 1986).

⁹ Scott, (2008) pp. 48.

¹⁰ The Coase Theorem that describes the economic efficiency of the allocation of property rights in the presence of externalities is at the heart of many environmental economic tools such as tradable pollution permits (Coase, 1960).

microeconomic concept that lies at the heart of REDD+, along with the Scott definition of institutions encompassing formal and informal phenomena.

The formal and informal nature of institutions, as understood by NIE, implies that a wide variety of social constructs fall within the scope of the term. Various NIE has studied transaction costs, property rights, modes of governance, social capital, strategic behaviour, contractual situations and social norms (Menard & Shirley, 2005). All of these constructs could have an influence upon REDD+ policy design and effectiveness, however the study of all of these would be a lifetime's work. This thesis thus focuses on the effect of three specific institutional conditions upon REDD+: property rights, governance and politics.

Property Rights are a fundamental concept in economics, if often over-looked and left undefined. The term property rights is often used casually in the economic literature (Bromley, 1991) yet the concept has been shown to be crucial to incentives to invest and develop (De Soto, 1989; North, 1990), and their perfection is crucial to well-functioning markets and is an implicit assumption of neo-classical economic work. NIE has brought wider attention on the role that property rights, and importantly unclear or insecure property rights, has within economic systems. To understand this role a clear understanding of property rights is required. Bromley defines rights as *'not relationships between me and an object'*¹¹ as the term is often used, but as *'relationships between me and others with respect to that object'*¹² and therefore *'property is not an object but rather is a social relation that defines the property holder with respect to something of value'*¹³. Property rights are thus a social construct (fitting snugly into the definition of institutions) that define the rights and responsibilities between parties regarding something of value. Property rights can often be insecure and unclear – if responsibilities are undefined or not upheld, or if the rights are ill-defined or overlapping. The assumption of perfect and well-defined property rights is fundamental to much of basic microeconomic thought and, given REDD+'s conception as a basic microeconomic model, is crucial to the robustness of the basic model of REDD. REDD+'s translation into effective policy thus depends on property rights and thus they form an integral part of the set of institutions studied in this thesis.

Governance is becoming increasingly *'central to the study of political, economic, spatial and social order in general'*.¹⁴ It has been defined by Enderlein, Walti, & Zurn (2010) as *'the sum of regulations brought about by actors, processes as well as structures and justified with reference to a public*

¹¹ Bromley, (1991) pp. 15.

¹² Ibid pp. 2.

¹³ Ibid pp. 2.

¹⁴ Levi-Faur, (2012) pp. 3.

*problem*¹⁵, and is thus a broader term than that of government referring to a full range of structures, processes, mechanisms and strategies that shape the overall response to public problems. The use of the term in the academic literature was sparse prior to the 1980s but rose dramatically with the rise in interest in corporate governance sparked by the seminal paper of Williamson, (1979) (Levi-Faur, 2012). Its use in the literature has mushroomed since this time spreading to the disciplines of economics, management, political science and environmental studies. It has a broad definition and has been utilised to represent a wide number of concepts. Levi-Faur, (2012) identifies four broad areas that governance has been used to describe:

- **Structure** – signifying the architecture of formal and informal institutions
- **Process** – signifying the dynamics and steering functions of the ongoing policy-making process
- **Mechanism** – signifying the institutional procedures of decision-making
- **Strategy** – representing the efforts of actors to govern and control the design of institutions and their related mechanisms in order to shape choices and preferences.

From this wide scope it can be seen that governance is potentially a broad term applying to many different formal and informal aspects of the policy-making process. The majority of literature adopts governance as structure (Levi-Faur, 2012), and this is the definition adopted here in this thesis. Understanding governance as a system of formal and informal regulations and structures that are used to address policy problems shows the importance of governance to a concept such as REDD+ that draws in a number of different actors, both government and non-government from local, national and international spheres. The importance of ‘good’ governance for REDD+ has been stressed in a wide spread of literature (Forsyth, 2009; Karsenty & Ongolo, 2011; Thompson, Baruah, & Carr, 2011), discussed in greater depth in Chapter 2. The normative nature of this literature is perhaps inevitable given the early stages of REDD+ and a series of governance models for successful REDD+ implementation have been proposed, along with safeguards and standards required for such governance. The theory of Multi-Level Governance (MLG), designed to explain the governance structures of the EU and local government in the US (Hooghe & Marks, 2001, 2003), is one such model proposed for REDD+ as it provides a governance framework that encompasses the multilevel, multiactor nature of REDD+, including international, national and local actors, each of whom have dissimilar influence and values (Brockhaus & Angelsen, 2012; Doherty & Schroeder, 2011; Forsyth, 2009).¹⁶ What has been generally lacking in the REDD+ literature is an evaluative account of governance of REDD+ at a national level to assess the extent to which it is meeting the standards

¹⁵ Enderlein, Walthi, & Zurn, (2012) pp. 2.

¹⁶ MLG is discussed in greater depth in Chapter 6.

proposed by such governance models. Such an evaluative study would provide a valuable contribution to the understanding of the governance for REDD+, providing feedback for the further development of normative models, and would also be a valuable addition to the emerging evaluative literature on the effectiveness, efficiency and equitableness of REDD+, a set of desirable outcomes proposed by CIFOR and becoming mainstream for REDD+ (Angelsen, 2008a; Angelsen et al., 2009; Angelsen, Brockhaus, Sunderlin, & Verchot, 2012a). The evaluative work of REDD+ policy undertaken in this thesis provides just such a contribution.

An important component of governance in modern democratic systems is the political process and the role of elections. Politics is defined by Hague and Harrop (2001) as cited in Axford et al., (2002) as *'the process by which groups make collective decisions'*¹⁷. The political process is a crucial part of the governance process in all countries, and in liberal democracies in particular. Bargaining between political groups, and the use of policies by governments to gain political support, and benefit important lobby groups has been widely studied (Becker, 1983; Grossman & Helpman, 1996; Hula, 1999). Electioneering both legal and extra-legal is increasingly common in both the developed and developing world (Sussman, 2005). Election events can create uncertainty in their build-up and aftermath as investors' risk increases with potential changes in government and policy and the effect has been widely studied in relation to the returns on financial assets (Füss & Bechtel, 2007; Julio & Yook, 2012; Li & Born, 2006). The increasingly national-level of REDD+ places the policy more and more into the hands of politicians opening it up to lobby-group influence.¹⁸ There is large potential for the policy to become a tool in elections, with finance being used to benefit important electoral groups. Despite this as yet the role of politics in relation to REDD+ has been little studied. The uncertain investment environment surrounding elections is also likely to impact the economic uses of the forest that contribute to deforestation. Although there is some initial work in this area (Burgess, Hansen, Olken, Potapov, & Sieber, 2010) such studies are in their infancy. This thesis provides a contribution to the literature exploring the impact of politics and elections upon REDD+ through understanding how election cycles have impacted the use of the forest, and also on how political lobbying and elections could, and is, having effects on REDD+ policy both theoretically and empirically.

The assessment of the impact of institutions upon REDD+ could be approached from a series of different perspectives. The adaptation of existing theories relating to REDD+ to include the institutional situations prevalent in REDD+ countries is one method that is used in this thesis. In

¹⁷ Axford et al., (2002).

¹⁸ See Di Gregorio, Brockhaus, Cronin, & Muharrom, (2012) for a discussion of the different political processes and lobby groups shaping REDD+ policy.

order to provide a fuller understanding of how institutions have actually shaped REDD+ policy and implementation however evidence from existing REDD+ schemes is required. Unfortunately, due to the nascent nature of the REDD+ mechanism, few such schemes are sufficiently well-developed to provide much insight. There is one notable exception – the world-leader in national level REDD+: Guyana. This small High Forest Cover, Low Deforestation (HFLD)¹⁹ country in South America has embarked on a ground-breaking REDD+ agreement in which Norway provides up to US\$250 million of performance-related REDD+ finance over 5 years for Guyana reducing, and maintaining a low deforestation rate.²⁰ Finance is used in an innovative fashion – it is invested via the priorities identified in a Low Carbon Development Strategy (LCDS) (Office of the President, 2013). Guyana is the first country in the world to reach the payment-for-performance stage of REDD+ and thus provides an interesting case study to study early evidence for the effectiveness of REDD+ policy, and also the effect that the types of institutions identified in this thesis have had in shaping both policy design and implementation. Guyana also provides an interesting case study of a HFLD country implementing REDD+ at the very same time as its forests are coming under increasing pressure from a gold mining-led natural resource boom. Small and medium scale gold mining has rapidly become the main driver of economic growth, and represents over half of Guyana’s exports. The very same mining activity is also the major driver of deforestation in the country. Guyana faces crucial economic trade-offs between REDD+ on the one hand, and small-scale gold mining activity on the other, and understanding the interactions between the policy and the major driver of deforestation will be crucial for REDD+’s success in the country.

Studying empirical evidence from Guyana can thus make an important contribution to the REDD+ literature, providing lessons for the wider roll-out of REDD+ across the world. As yet, however, there have been no such broad evaluative academic studies of the progress of the REDD+ mechanism in Guyana. This thesis provides such an evaluation, combining both quantitative and qualitative evidence to assess the impact of institutional conditions upon REDD+ policy in Guyana.

1.3 Research Questions

The overall research objective of this thesis is to understand the impact that institutional conditions could, and are having on REDD+ policy, both in theory and from the emerging evidence in Guyana.

¹⁹ HFLD Countries have high levels of forest cover due to historically low levels of deforestation (da Fonseca et al., 2007). They are an important grouping with regard to REDD+ as although they may produce low levels of emissions now, there is potential for their deforestation rates, and therefore their emissions, to rise rapidly in the future. Understanding how HFLD countries such as Guyana, Suriname and Democratic Republic of Congo can be compensated is a crucial topic in the REDD+ literature.

²⁰ The agreement is outlined in a Memorandum of Understanding (MOU) between Guyana and Norway (The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), 2009).

This objective is wide ranging therefore in order to create a manageable research framework the objective is broken down into a series of research questions. They focus on the assessment of the three main institutional conditions identified above: property rights, governance and politics using both theoretical and empirical methodologies. Four research questions are identified:

- What are the impacts on policy choice for REDD+ of taking into account its potential economy-wide effects, and the scope for political influence upon decision-making?
- Have election cycles and the introduction of a REDD+ framework in Guyana changed the landscape of deforestation, through changing how mining property rights are held?
- How well does the governance framework for REDD+ that has evolved in Guyana fit into the multi-level governance framework that has been posited as important for REDD+?
- To what extent has the agreement between Guyana and Norway embodied REDD+ in its purest form?

These four questions allow for an understanding of how politics, governance and property rights could affect REDD+ in theory, and have affected the development of REDD+ in Guyana. The first focuses on how the national level scale for REDD+, combined with the role of politics, could affect how REDD+ is enacted on the ground. The question is answered through a theoretical lens using general equilibrium analysis. This approach provides insights and analysis of the key impacts of different institutional conditions upon REDD+ policy design. The second, third and fourth questions move to an empirical approach using a variety of data from Guyana to provide empirical evidence to support the insights from the theoretical analysis.

The second question investigates the effect that REDD+ has had on Guyana through the channel of forest-related mining property rights. It also investigates how elections have affected the forest landscape in Guyana through the same channel using a unique quantitative data set collected from Guyana to understand these effects. It follows a similar theme to the political component used in the first model in relation to REDD+ policy to instead examine the effect of politics and elections upon the deforestation landscape.

The third and fourth questions explore the development of REDD+ in Guyana, using a qualitative data set. They provide qualitative evidence to examine some of the findings of the model used to answer the first question. The third examines how the national-level governance framework has evolved, and how well it fits into theoretical governance models proposed for REDD+. The fourth examines more fundamentally Guyana's REDD+ agreement with Norway and to what extent it fits

into the basic 'pure' theoretical model of REDD+ and the role that institutional conditions have played in shaping REDD+ in Guyana.

The combination of research questions in this thesis allows the impact of institutional conditions upon REDD+ policy in theory, upon the deforestation landscape and upon the development of national and international level policy to be examined, providing a holistic analysis of the impact that institutions can have upon REDD+. This is a significant contribution to the REDD+ policy literature.

The thesis also contributes to subsidiary literature relating to mining (specifically the understanding of small-scale mining prevalent in Guyana), the modelling of complex policy instruments under conditions of political influence and the understanding of environmental governance in developing countries. In this way this thesis makes an original contribution to a range of literature and provides a set of key lessons, and future pathways for research, to both academia and policy-makers.

1.4 Methodology

In answering the overall research objective and the identified research questions this thesis utilises a series of different methodologies. Theoretical modelling, econometric analysis of quantitative data and applied thematic analysis (ATA) of qualitative data are all employed to answer the questions. The mix of methods allows for different aspects of REDD+ policy to be analysed, and the effect of different institutional conditions to be examined. Each individual methodology is addressed in their relevant chapters with the overall framework discussed here.

Multimethodology

The overall approach of the thesis is to integrate different methodologies together to answer the overall research objective. This technique has been described by Mingers, (1997) in the field of Operational Research as multimethodology defined as '*the whole area of utilizing a plurality of methodologies or techniques within the practice of taking action in problematic situations*'.²¹ The approach is similar to the mixed methods approach, first adopted in the 1950s in the field of psychology, which involves the '*combining or integration of qualitative and quantitative research and data in a research study*'²². The mixed methods approach generally involves the use of both qualitative and quantitative data to answer singular research questions. This thesis takes a slightly different approach, using quantitative and qualitative data along with theoretical modelling to answer a set of different research questions that combined together answer the overall research objective. Such an approach has its advantages in that it allows multiple dimensions of research

²¹ Mingers & Gill, (1997) pp. 2.

²² Creswell, (2014) pp. 14.

problems to be analysed using the different analysis techniques that each methodology offer. It allows different facets of the problem to be captured and is most useful when neither qualitative nor quantitative techniques are fully adequate to answer a research question (Creswell, 2014). Although quantitative data relevant to some aspects of the research objective exists, and is viable to assess the impact of institutional events on the deforestation landscape, no such data exists to understand the impact of governance on REDD+ policy, given the time horizon and the nature of the problem. The impact of governance and politics upon REDD+ policy design are inherently difficult to quantify, and qualitative techniques are more useful in this regard. The use of theoretical models can complement these techniques by allowing abstraction away from irrelevant factors that may be influencing the key decision-variables. The combination of these methodologies in this thesis allows for the capturing of a range of effects from different institutional conditions upon different components of the REDD+ policy puzzle, from the landscape on to which it is enacted, to the design of the policy itself, through to its effectiveness. In utilising these techniques this thesis provides the first such multimethodology study relating to REDD+ in Guyana and the impact of institutional conditions upon the policy.

Single case study

The empirical aspect of this thesis focuses on a case study of Guyana. Mabry, (2008) describes a case study as an *'empirical investigation of a specified or bounded phenomenon'*²³. Such an investigation allows for a deep understanding of particular instances of phenomena. It allows for a delving into the details of the context whether historic, economic, geographic, social or political. This can bring a depth of analysis that other techniques which employ broader datasets may exclude. A case study approach is suitable for this thesis as understanding how institutions have affected REDD+ policy requires a detailed understanding of the country in which the policy is implemented and an in-depth analysis of the economic and political context. The case study approach, whilst bringing depth, does bring a lack of generalizability. This is amplified by the use of a single case study. Using just one example of a phenomenon means that it is difficult to isolate the effects of the variables of interest, from other external variables from whom the effects cannot be controlled. For example in relation to this thesis it may be difficult to ascribe any one outcome of REDD+ policy to one particular institutional condition. Although the use of a single case study is not ideal sometimes circumstances require such an approach. As described above the implementation of national-level REDD+ is still in its infancy and there are very few suitable cases available which can be analysed to understand the impact that institutional conditions have had upon REDD+.

²³ Mabry, (2008) pp. 214.

The basis for selecting case studies is often made on an ad-hoc basis, with selection largely dependent upon the *'researchers interest, his or her industry in identifying a case informative to be worth studying and his or her skill in negotiating access to its site'*²⁴. Authors have attempted to create a more formal tool for case study selection with Seawright & Gerring, (2008) proposing seven different procedures for choosing case studies: typical, diverse, extreme, deviant, influential, most similar and most different. They provide a methodology, and accompanying quantitative tools, for choosing multiple case studies from a wide population. These tools are not suitable for the selection of the single case study employed here, but they do provide a guide as to what features to focus on when choosing case studies. As discussed above Guyana provides the most advanced example of a national-level REDD+ programme, it may thus be thought of as one of the most influential, but also most deviant and extreme of case studies. Its geography and size is atypical of most REDD+ countries, being smaller and more forested than most.²⁵ With its main driver of deforestation being small-scale mining it is also an outlier in how forests are being used and destroyed. Its atypical nature means that not all of the lessons drawn from it can be generalised to other cases, however it does allow some insights to be drawn on where, when and under what conditions REDD+ policy may be effective. Has Guyana's atypical nature amplified, or dampened the effect of institutions of REDD+ policy? And is Guyana's atypical nature one of the reasons why it has become the global-leader in the area? The single use of Guyana does limit the findings of this thesis, however by assessing the most advanced national-level REDD+ scheme it provides early lessons for the development of other national-level REDD+ programmes around the world.

Theory and Empirics

Theory and empirics are used throughout the thesis, in a variety of different ways, to answer the different identified research questions. Theory is defined by Creswell, (2014) in relation to quantitative analysis as an; *'interrelated set of constructs (or variables) formed into propositions, or hypotheses, that specify the relationship among variables (typically in terms of magnitude or direction),'*²⁶ and also *'a broad explanation for behaviour and attitudes, and it may be complete with variables, constructs and hypotheses'*²⁷ in relation to qualitative work. These definitions are adopted to understand theory in this thesis with different theoretical concepts being used in different ways.

²⁴ Mabry, (2008) pp. 217.

²⁵ See Chapter 3, Section 3.1 for more detail on Guyana's geography and Section 3.2 for details on Guyana's forests.

²⁶ Creswell, (2014) pp. 54.

²⁷ Ibid pp. 64.

In order to answer the first research question a theoretical model is constructed that allows for both the potential economy-wide effects of REDD+ and also the effect of political lobbying to be included in understanding how decisions for REDD+ policy may be made. Models are a specific type of theory used to provide predictions as to the direction of variables or constructs in response to changes in other such variables (Ouliaris, 2011). As described by Helmer, (1966) models are abstractions from reality, deliberately omitting certain aspects that are irrelevant to the problem at hand, with the resulting simplification that results can be helpful in analysing the problem and investigating solutions. Such models have formed the basis of much of economic thought, with assumptions made regarding the behaviour of individuals and institutions. These economic models form the basis of the rationale for REDD+ policy. The majority of models in this regard have been partial equilibrium in nature, taking into account only a portion of the economy (Lubowski & Rose, 2013). These are useful in analysing small effects in markets or sectors that may not affect other markets, or the wider economy, however once effects are sufficiently large or the sectors or markets of interest dominate the economy as a whole, a different approach is required. General equilibrium analysis, building on the work of Walras, (1954), focuses on explaining the supply, demand and prices of all inputs and outputs in an economy as a whole, allowing the elicitation of economy-wide effects of external interventions, such as policies.²⁸

The use of general equilibrium models does have limitations including the need to assume all markets are in equilibrium simultaneously (seldom observed in reality) and the need to make a large number of simplifying assumptions regarding market structure and production functions in order to be solved analytically (Borges, 1986). They may however supply a suitable framework for analysing national-level REDD+ programmes that may have impacts far and beyond the forest sector providing their limitations are taken into consideration. To date their use has been limited in analysing REDD+ (notable exceptions are Bosello, Eboli, Parrado, & Rosa, 2010 and Ollivier, 2012) and the formulation of a basic analytic general equilibrium model in Chapter 4 of this thesis is a major contribution to the literature.

The second research question takes a different approach to the use of theory and empirics. A simple microeconomic model of mining property rights holder behaviour is formulated and tested using quantitative analysis.²⁹ Quantitative Analysis allows the summarisation of vast quantities of data and allows comparisons across different categories and between time periods (Kruger, 2003) helping to

²⁸ General equilibrium analysis has been described by Baldry, (1980) pp. 13 as: *'a method of analysing economic processes which has as its target the whole economy system, conceived of as a set of disaggregated interdependent sectors'*.

²⁹ Quantitative analysis is a technique with aim of *'testing objective theories by examining the relationship among variables'* Creswell, (2014) pp. 4.

analyse large amounts of numerical data, and testing the predictions of theory. Care must be taken however as quantitative analysis has a number of limitations including the difficulty in controlling for variables external to the analysis, and the requirement for large amounts of data to produce robust and valid results. The application of quantitative data to the testing of theory in the discipline of economics is called econometrics described by Samuelson, Koopmans, & Stone, (1954) as *'the quantitative analysis of actual economic phenomena based on the concurrent development of theory and observation, related by appropriate methods of inference'*.³⁰ The use of econometrics is adopted here to answer the second research question that involves the analysis of a large data set on mining property rights to test the predictions of the model created. The specifics of the econometric techniques used in this analysis, and their limitations, are discussed in Chapter 5, Section 5.5.

In answering the third and fourth research questions this thesis takes a slightly different approach regarding theory and empirics. To answer the third question an existing theory relating to the governance of REDD+ is presented and then the extent to which that theory explains the governance mode that has been implemented is analysed. A more policy-oriented approach is adopted to answer the fourth question. The extent to which Guyana's agreement with Norway embodied the basic 'pure' model of REDD+ at its outset, and through its evolution is examined and the implications for other national level REDD+ schemes are drawn-out. Both questions are answered using qualitative research to answer their relevant research questions.³¹ The technique employs data from a huge range of sources including interviews, participant observations, secondary reports and media sources, generally constructing themes from the data to make meaningful interpretations (Creswell, 2014). The nature of the technique makes it suitable for studying issues such as governance that lack numerical data, and depend on the perceptions of the actors involved. The employment of qualitative analytical techniques to analyse such data are described in more depth in Chapter 6, Section 6.4 along with their limitations. Answering the third and fourth research question requires an understanding of how actors have viewed the governance process in Guyana, how it has evolved in relation to the action of different actors and how the effectiveness of REDD+ in Guyana has been affected by this process. The techniques of qualitative data research that emphasise perceptions, assumptions, prejudgments and presuppositions (van Manen, 1977) offer a suitable framework for helping to provide such an understanding.

This thesis adopts a multimethodological approach, using a mix of theoretical, qualitative and quantitative research to analyse a single case study of Guyana with limitations to the overall

³⁰ Samuelson et al., (1954) pp. 142.

³¹ Qualitative research is described by Creswell, (2014) pp. 4 as *'exploring and understanding the meaning individuals or groups ascribe to a social or human problem'*.

approach and further limitations on each methodological component (discussed in each Chapter throughout this thesis). It does however provide a suitable framework for investigating the issue of the impact of institutional conditions upon REDD+ from a range of different perspectives, and allows the utilisation of valuable early evidence from the atypical case of REDD+ in Guyana to draw lessons for the design and implementation of REDD+ elsewhere.

1.5 Structure of thesis

This introduction has set out the motivations, the research objectives and questions and the overall methodological approach for this thesis. This section now provides a road-map to the remainder of the thesis, identifying the contents and main objectives of each Chapter.

Chapters 2 and 3 focus on the background to the problem, providing an overview of the context to REDD+, deforestation and Guyana with an objective of providing the context to the overall research objective and the related research questions. Chapter 2 outlines the key academic and policy literature, and the major conceptual developments relating to tropical deforestation, forest policy (both international and domestic), the background and history of REDD+ and the key issues facing its design and implementation today.

Chapter 3 provides a background to Guyana and its REDD+ programme. It discusses the economic, historical, geographical, political and governance context of the country – helping to shape an understanding of the institutional context in which REDD+ has been implemented. The main driver of deforestation, small-scale mining, is discussed in detail from both an operational and regulatory perspective. Guyana's REDD+ programme is outlined including the MOU with Norway and the LCDS.

The next four Chapters of the thesis answer each of the research questions in turn. Chapter 4 examines the impacts on policy choice for REDD+ of political influence, and the understanding that REDD+ may have economy-wide effects. Three sub-questions are posited:

- What might be the economy-wide, general equilibrium effects of implementing REDD+?
- How might these affect government policies for achieving REDD+?
- How do these effects change with political influence from sectors affected by REDD+?

A three-sector analytical general equilibrium model is constructed that contextualises a simple economy on to which REDD+ policy is imposed. The level of international incentives from REDD+ that reach different sectors in the form of domestic REDD+ policy is analysed. The model is extended by applying the Grossman & Helpman, (1994) approach to examining how political lobbying can affect

the level of policy variables. It provides an extension of the framework by applying it to a policy instrument that both changes relative prices and also provides unequal income transfers.³²

Chapter 5 uses a globally-unique data set of small-scale mining property rights from Guyana to answer the second of the research questions, breaking the problem down to two sub-questions:

- Have election cycles in Guyana affected how small-scale mining property rights are taken out and given up?
- Has the introduction of a REDD+ framework through the MOU with Norway and the LCDS changed how small-scale mining property rights are held?

A model of mining property right holder behaviour is constructed, building on related models in the field, and then tested using the data set utilising a range of count-data and time-series cross-sectional specific econometric techniques.

Chapter 6 examines the governance framework of REDD+ in Guyana, assessing it against the MLG framework posited for REDD+. It uses two sources of qualitative data: semi-structured elite interviews with key stakeholders in Guyana, and a database of media articles relating to REDD+ and the overall governance environment in Guyana. The data are analysed by ATA answering the following sub-questions:

- How has REDD+ policy in the guise of the LCDS in Guyana developed?
- Who has driven the policy choices for the LCDS in Guyana?
- How have the different actors driven the policy outcomes that are emerging?
- How well does the governance environment fit into the MLG framework that has been posited as important for REDD+?
- What does the experience in Guyana tell us about how effective MLG can be built for REDD+ more generally?

The questions provide a framework to evaluate the extent to which domestic governance of REDD+ in Guyana fits into the MLG framework, and the implications of this for successful REDD+ implementation.

Chapter 7 also uses the qualitative data used in Chapter 6, in combination with set of secondary reports, to discuss the extent to which REDD+ that has actually been implemented in Guyana fits into the pure REDD+ model discussed in the literature. It builds on the domestic analysis of governance in Chapter 6 by answering the following sub-questions:

³² The approach has previously been used to investigate instruments that just amend relative prices via taxation or other such instruments, returning the revenue on a per capita basis.

- What were the original aims of the agreement, and how far did the original structure of the agreement fit into the standard model of REDD+?
- How has the agreement evolved, and how does that evolution affect how well the agreement fits into the broad principles of REDD+?

Taking a policy-oriented approach the Chapter examines the institutional design of the original agreement, and how that design has changed and evolved over its life span. It discusses how well this institutional design fitted into the standard REDD+ model at its inception, the motivations of the different parties and how the agreement looks today, drawing lessons for the implementation of national-level REDD+ elsewhere.

Chapter 8 provides a conclusion for the thesis, bringing together the key findings relating to the set of institutional conditions investigated to present a set of lessons for both policy and research related to REDD+. It summarises the limitations to the thesis and presents a research agenda for the area based on the lessons and these limitations.

Chapter 2: Reducing Emissions from Deforestation and Forest Degradation – Overview of Issues

2.1 Introduction

In order to contextualise the research objective and questions identified in Chapter 1 Section 1.3 that form the basis of this thesis it is necessary to examine the background to the problem, and the existing literature in the area. This chapter provides an overview of tropical deforestation, historic forest policy interventions, the rise of Reducing Emissions from Deforestation and Forest Degradation (REDD+) policy in the international climate change negotiations and a brief review of the key issues currently facing REDD+.

Forests cover 31% of the world's land area, approximately 4 billion hectares, however around 13 million of these hectares have been lost every year during this century, a slightly lower rate than the peak of the last century in the 1990s when 16 million hectares were lost annually (FAO, 2010a). The majority of deforestation occurs in tropical regions, with two countries, Brazil and Indonesia, accounting for the largest share. As these countries have reduced their deforestation, the drivers of this deforestation have moved to other countries, with rates remaining high and even increasing in countries across Africa, Australia, South-East Asia and South America (FAO, 2010a).

Greenhouse gas (GHG) emissions from deforestation, forest degradation and land-use account for approximately 12-20% of total annual global emissions depending on the year and the measurement methodology used (van der Werf et al., 2009, 2010). Reducing these emissions and ensuring that standing forests are conserved can make a major contribution to mitigating global GHG emissions. There are also a wide range of potential co-benefits from reducing deforestation, including protection of biodiversity, local ecosystem services, and the livelihoods of the over 1 billion people who depend directly on forests (World Resources Institute, United Nations Development Programme, United Nations Environment Programme, & World Bank, 2005).

The challenge is more than simply cutting historical levels of deforestation and its associated emissions. Tropical forests across the world act as a huge store of carbon that could be emitted in the future should they be cleared. Pan et al., (2011) estimate the total carbon stock in the world's forest at approximately 3157 GtCO₂. Between 1990 and 2007 they estimate that forests operated as a net global sink of 4.03 GtCO₂ per year, although tropical forests operated as a net carbon source to the extent of 3.67 Gt CO₂ per year. To put these numbers into context global CO₂ emissions in 2012 were 35.6 GtCO₂e. These estimates indicate both the scale of the potential problem, and also the huge potential opportunities that tropical forests offer. Ignoring the scope of current emissions from forest would negate strong action in other sectors, and healthy tropical and temperate forests can absorb some of the carbon emitted to generate electricity, power industry and provide heat, light

and transportation to the world's population, increasingly important given the rapidly rising emissions from these sources.

Measuring deforestation and forest cover is difficult and country-level data are often unreliable, patchy and inaccurate.³³ This means that although the overall scale of the problem can be appreciated understanding country and regional-level issues is more difficult. Deforestation is affected by local economic, political and social factors, meaning that policy has to be locally-specific, taking into account local institutions and circumstances. Policy for Reducing Emissions from Deforestation and Degradation (REDD+) must be cognisant of these institutions while building on a history of forest policy, both national and international, littered with some successes, but mostly failures (Pfaff et al., 2010).

Tropical deforestation is representative of the market failure that embodies climate change more generally. Reducing deforestation, and conserving standing forest, provides valuable climatic services to the wider world, in addition to other benefits including biodiversity. These benefits are not included in the decision-making of the actors who cause the deforestation (Bulte & Engel, 2006) leading to socially inefficient levels. Actors equate their own private benefits from deforestation (such as timber, agricultural production) with their own private costs, which include both the costs of clearance, and also local environmental services such as protecting against soil erosion. As a consequence of excluding the wider costs of deforestation the actor engages in a higher level of deforestation than that that is socially efficient, leading to an excess of tropical deforestation. In addition to these missing markets for forest services there are a number of other types of market failure that can lead to the excesses of deforestation observed across the tropics (Bulte & Engel, 2006): property rights related to forests are often improperly designed, insecure or missing altogether (discussed more in Section 2.4.2); there are market imperfections in capital and labour markets that restrict the sustainable use of forests; and private actors involved in the decision-making regarding tropical forests tend to have higher discount rates than social planners (and less than socially optimal levels), implying that the short-term benefits from deforestation are valued more highly than the longer-term costs from deforestation. These market failures combine to imply that tropical deforestation rates are higher than the socially optimal level, which is not necessarily zero, justifying a role for policy in targeting the various different drivers of deforestation by

³³ Understanding, measuring and addressing deforestation is complicated by the thorny issue of defining a forest. Definitions differ depending on their purpose. Even in the climate change discussions many options are available. The Marrakech Accords of 2001 that set out the rules of the Clean Development Mechanism (CDM) define forest as essentially a piece of land with trees on it. This potentially allows the removal of tropical forest to be replaced by mono-culture plantations such as Acacia, with implications for biodiversity, ecosystem services and livelihoods. It also fails to take into account the fact that there may be carbon losses from activities that degrade forests but fall short of full deforestation (Sasaki & Putz, 2009).

correcting these market failures and ensuring that private actors' decision-making reflects the social cost of deforestation.

Section 2.2 of this Chapter provides an outline of the drivers of deforestation and the policies that have been designed to address the range of market failures associated with the phenomenon and their successes and failures. Section 2.3 focuses on the emergence of REDD+. Section 2.4 provides an overview of some of the key issues identified in the literature relating to the wide implementation of REDD+ and Section 2.5 concludes.

2.2 Brief History of Deforestation and Forest Policy

Deforestation is not a new phenomenon, occurring throughout human history (Williams, 2001) but the issue came to global prominence with rapid rises in deforestation in the Amazon during the 1970s and 1980s, caused in part by the opening of the Trans-Amaçonia Highway in 1970, and Brazilian government policy aimed at securing and developing the Amazon region (Fearnside, 2005; Mahar, 1989). Deforestation played an important role in the discussions leading up to the Rio Conventions in 1992 and was included in the resulting Agenda 21 programme after the conference (United Nations Sustainable Development, 1993). These movements in international negotiations mirrored policy movements on the ground with a number of major programmes and policies launched in the 1980s and 1990s such as the Tropical Forest Action Plan (TFAP) and the Pilot Program to Conserve the Brazilian Rain Forest (PP-G7). However these have *'failed to substantially slow the loss of the world's forests'*³⁴ creating the need for new policy instruments such as REDD+. It is important to learn from the successes and failures of previous policies, and to understand the context in which REDD+ will be employed, before starting any discussions regarding design of REDD+ policy.

2.2.1 Drivers of deforestation

The key rationale behind the wide variety of private actors undertaking deforestation is it brings private economic benefits over and above any costs that those actors face. These economic benefits stem from a range of different activities, and their growth (and decline) is affected by a range of economic and political factors. These factors may increase (or indeed reduce) the gap between the private and social costs and benefits of deforestation – thereby increasing or reducing the gap between current deforestation rates from its socially optimal levels.

The main global driver of deforestation is agricultural expansion, (Barbier, 2004a, 2004b; DeFries, Rudel, Uriarte, & Hansen, 2010), however within countries and regions drivers differ significantly,

³⁴ Pfaff et al., (2010) pp 10.

from clear felling of forest for lumber (Geist & Lambin, 2001), as clearance for oil-palm or soy plantations in Indonesia (Gaveau et al., 2009), for beef pasture and soy plantations in Brazil (Fearnside, 2005; Laurance et al., 2002), or to clear areas to mine for minerals (Geist & Lambin, 2001). There is also strong empirical evidence of the effect of institutional conditions such as tenure (Angelsen, 1999; Araujo, Bonjean, Combes, Combes Motel, & Reis, 2009), democracy (Didia, 1997), governance (Bhattarai & Hammig, 2001) and electoral cycles (Burgess et al., 2010) upon deforestation both in individual countries and across countries. These factors work to either raise or reduce the private economic costs and benefits of deforestation. In addition there is evidence that these institutional conditions work together to affect the efficacy of policy designed to reduce deforestation (Culas, 2007). Understanding that such institutional issues will both affect the deforestation landscape, and also the impact and design of policy is crucial for the success of REDD+ and, as highlighted in Chapter 1, forms the main motivation for the research questions answered in this thesis.

With the main drivers of deforestation being agricultural expansion economic factors that affect the returns to agriculture such as international commodity prices and wages have found to be important determinants of rises and falls in deforestation rates (Barbier & Burgess, 1996; Fitzherbert et al., 2008; Koh & Wilcove, 2008; Shively, 2001). Beyond these economic factors, however, a range of infrastructural and institutional factors have also been found to be important. The role of roads in explaining deforestation patterns is well understood in the literature and is common across the world (Chomitz & Gray, 1996; Chomitz & Thomas, 2003; Cropper, Puri, & Griffiths, 2001; Mena, Bilsborrow, & McClain, 2006; Nepstad et al., 2001; Weinhold & Reis, 2008), while political factors have also been shown to have an impact on deforestation patterns. Ehrhardt-Martinez et al. (2002), using a cross-country dataset, found that ‘muscle democracies’ with strong state scope and high political democracy have reduced deforestation rates, while weak democracies are associated with higher deforestation rates. Didia (1997) found similar results when investigating tropical deforestation in democratic and non-democratic countries, finding that deforestation fell with increases in an index of democracy. The majority of the literature that has examined the relationship between political factors and deforestation has adopted a cross-country approach, predominantly due to the lack of suitable country-level data. This approach however ignores the many country-level complexities, and the unique domestic political environments that shape deforestation rates and policy responses. It also relies on cross-country level deforestation data that suffers from serious questions regarding its veracity (Pallante & Zoppoli, 2013).

An interesting addition to the literature is a country-level paper by Burgess et al. (2010) that investigates the linkages between political issues, deforestation and forest use in Indonesia, finding evidence for 'political logging cycles' with increases in illegal logging activity observed in the build-up to district elections – either due to the permitting or facilitation of logging by district officials in return for campaign financing, or a reduced enforcement of illegal logging in order to win votes. For REDD+ to make a meaningful contribution to climate change it must affect deforestation over decades rather than years, therefore understanding how deforestation drivers respond to political events is crucial in designing long-term REDD+ policy. Chapter 5 of this thesis builds on the country-level work of Burgess and the cross-country studies by conducting an analysis of the impact of election cycles on mining activity in Guyana.

Land tenure has also been shown to be a significant determinant of deforestation patterns. Where property rights are insecure, holders of those rights face the risk of expropriation and/or eviction and may choose activities that offer the more immediate returns from clearing forest rather than the longer term returns from sustainable forest management or conservation (Mendelsohn, 1994), further exacerbating the gap between private and social costs and benefits of deforestation and the overall market failure. The lack of security for investment in capital on the land, whether natural or manufactured, can lead to less capital-intensive activities, implying moves toward agriculture rather than forest management, and also to low value, low yield agriculture (Deacon, 1999). This is predicated on the assumption that forest extraction has a lower capital intensity than forest conservation. Where this is not the case (such as in large mining activities, and oil extraction) forest conservation may actually result from property rights insecurity (Bohn & Deacon, 2000). Bulte & Engel, (2006) highlight an important interlinkage between land tenure and timber prices in affecting deforestation, with high prices and tenure security associated with sustainable forest management, but high prices and a lack of tenure security associated with deforestation, as owners look to maximise short-term returns.

Angelsen, (1999) provides an alternative perspective on the situation, highlighting that where clearance itself can establish property rights, increases in tenure security (i.e. the reduced probability of losing the land), will increase deforestation. In Brazil the Constitution allowed for invasion and settlement of both public and private lands that are not being used productively (Alston, Libecap, & Mueller, 1999). As much of the Brazilian Amazon is under public domain, and there is no clear definition of what productive use entails, the forested Amazonian lands are highly vulnerable to land grabbing (Araujo et al., 2009). In this context the clearing of forested land can be seen as a rational strategy to deter squatters and signal to the relevant authorities that land is being

used productively. Araujo, Bonjean, Combes, Combes Motel, & Reis (2009) provide empirical evidence for these linkages with a study of deforestation data in the nine states of the Brazilian Legal Amazon showing a link between property rights insecurity and deforestation. The literature relating to the impact of insecure property rights upon deforestation has focused on agricultural land, due to the fact that it is the main global driver of deforestation. Other drivers, however, can be crucial in other contexts, and there is currently a gap in the literature in understanding how insecure property rights in other industries affect deforestation.

An alternative stream of literature also identifies the importance of institutional factors on deforestation patterns. It has grown out of two-related areas of work: the application of the Environmental Kuznets Curve (EKC)³⁵ to deforestation and the Forest Transition Curve.³⁶ A body of empirical work has emerged that tests the impact of institutional conditions on the predictions of the EKC and the Forest Transition Curve with some evidence for the existence of an EKC for deforestation, and also an impact from institutional quality upon deforestation (Bhattarai & Hammig, 2001; Culas, 2007). However there is a further body of literature that fails to find evidence for the EKC (Scricciu, 2007; D. I. Stern, 2004), while some papers have failed to find evidence for the curve but have found an impact of institutions upon deforestation patterns (Nguyen Van & Azomahou, 2007).

The main driver of deforestation globally is agricultural expansion, but many other drivers play important roles in many parts of the world. Further a number of proximate influences including infrastructural and institutional factors have also been shown to affect deforestation patterns, exacerbating the overall market failure. For REDD+ to be successful policy-makers must first understand and then factor in these influences and policy should be designed to best solve the overall market failure. Chapter 5 provides a valuable contribution in this area by analysing how electoral patterns have affected the incentive to hold the property rights relating to the main driver of deforestation in Guyana, small-scale mining.

³⁵ The EKC mirrors the original Kuznets curve that postulates that inequality first rises as a country's income grows before declining as income grows further (Kuznets, 1955). The EKC literature proposes the same effect for environmental degradation and pollution, and has been applied to a variety of environmental media, including deforestation, with mixed success (Dinda, 2004; Lopez, 1994; Mills & Waite, 2009; D. I. Stern, 1998, 2004).

³⁶ The Forest Transition Curve Hypothesis first proposed by Mather (1992) postulates that forested areas move through a transition of first low, then high deforestation rates, before embarking on regrowth. It was initially an empirical observation based on the experience of, predominantly, developed countries, but theoretical underpinnings have subsequently been proposed (Barbier, Burgess, & Grainger, 2010; Grainger, 1995; Mather & Needle, 1998).

2.2.2 Forest Policies

As tropical deforestation increased through the 1980s and 1990s so did a raft of international and domestic policy interventions designed to protect and conserve tropical forests. These have served as the precursors to REDD+ and learning the lessons from their (general) failure is crucial for understanding the context in which REDD+ operates and answering the research questions of this thesis identified in Chapter 1, Section 1.3. Policies have been implemented at both the international and domestic level and have attempted to solve the overall market failures that lie behind the various drivers of deforestation through different channels.

International forest policy

Traditionally international attempts to address the market failures that have led to tropical deforestation and its related carbon emissions have focused on command and control regulations that dictate specific land-uses, or remedial measures to replant and improve deforested areas and degraded forests; the latter however has proved to be expensive and ineffectual, while the lack of an international enforcement mechanism limits the use of the former (Bulte & Engel, 2006).

In their stead a range of number of different policy measures have been employed to address the various market failures that can serve as a learning experience for REDD+ policy. This is crucial as the efficacy of these various policies has been limited, with little slowing of deforestation directly attributable to the policies (Pfaff et al., 2010). Many of the institutional issues faced by these previous programmes will be faced by REDD+, and avoiding the mistakes made by previous programmes in addressing these issues will be crucial for REDD+ to become an effective, efficient and equitable mechanism. Pfaff et al., (2010) breaks down international forest policy measures into four broad categories loan conditionality, donor coordination, debt relief and demand management, of which the first two are most relevant to REDD+:

1. *Loan Conditionality*

As focus intensified on the efficacy of development aid in the 1980s and 1990s conditionality was introduced to loans and grants given by developed countries and through the multi-lateral financial institutions (Stokke, 2013). This pattern was echoed in the forest sector with conditionality introduced to encourage sustainable forestry practices and good governance in many countries including Cambodia, Philippines and Indonesia (Keohane & Levy, 1996). Generally these initiatives failed to introduce the widespread policy reforms that are required to address the deforestation challenge, failing to overcome domestic political interests (Pfaff et al., 2010), they may have lacked the appropriate price signal to solve the underlying market failure. These programmes generated

greatest levels of success where the domestic reform agenda was already strong (Mayer & Mourmouras, 2005) with perhaps the market failure being weakest in these cases and the external pressure of loan conditionality strengthening the domestic policy agenda (Ross, 1996; Seymour & Dubash, 2000). The experience of loan conditionality in the forest sector highlights the importance of the local political economy situation in the effectiveness of international forest policy.

2. *Donor coordination*

Also adopted from the general development policy agenda and mainstreamed into the forest sector has been donor coordination. Coordination of donor funded programmes is designed to reduce duplication, inefficiencies and the administrative burden on recipient governments, promoting the effectiveness and efficiency of loans and grants (Lawson, 2013). Within the forest sector there are two key examples of this type of policy: TFAP and Brazil's PP-G7. TFAP is perhaps the closest predecessor to REDD+ in terms of its scope and scale (Pfaff et al., 2010). It was a programme led by the World Bank, the UN and the World Resources Institute beginning in 1985 with an objective of conserving and developing tropical forest resources, along with an associated objective to encourage rural sustainable development (FAO, 1989). Although TFAP succeeded in boosting forestry aid levels to US\$1.3 billion per year in 1990, it was widely perceived to have failed in its objectives as tropical deforestation surged in the late 1980s and early 1990s (FAO, 1991). TFAP's failures have been attributed to *inter alia* a narrow focus on the industrial forest sector, a failure to recognise issues such as land tenure and a failure to coalesce international and national policy goals (Pfaff et al., 2010), mirroring the types of concerns that dogged loan conditionality. The PP-G7, launched in 1990 by the G7 countries, had the aim to maximise the environmental benefits of Brazil's rain forests consistent with Brazil's development goals (Indufor Oy & STCP Engenharia de Projectos Ltda, 2000). The programme established extractive reserves, demarcated indigenous lands and built capacity within Brazil to engage in environmental issues. Whether these had a significant effect on deforestation levels has proved difficult to assess, however the greater local stakeholder involvement in the programme than in TFAP does seem to have yielded some evidence of better forest outcomes (Adeney, Christensen, & Pimm, 2009; D. Nepstad et al., 2006).

REDD+ shares many of the characteristics of previous international forest policy interventions. The experience of TFAP and PPG-7 and the loan conditionality imposed in several forested countries show the importance of viewing deforestation as not just a problem in the forest sector, but across the economy as a whole, and highlights the need for both the involvement, and the agreement of local stakeholders in creating effective policy to combat deforestation. These two themes are picked up in Chapters 4 and 6 in the construction of an economy-wide model for REDD+ and the

investigation into stakeholder involvement in REDD+ in Guyana. The experience highlights the importance of creating sufficient incentives to domestic governments to engage in the type of wide-ranging reform and programmes and policies to increase the private costs of deforestation and help to correct the market failure. The history of international forest policy is generally these incentives have failed to be created – hence the motivations behind offering a clear price signal through mechanisms such as REDD+.

Domestic forest policy

Complementing international forest policy has been the development of domestic forest policy. Providing imperatives (through protected areas), incentives (through payments for ecosystem services), and capacities (through decentralisation) to forest actors domestic policy has targeted the underlying market failure in a wide variety of forms, its efficacy in addressing the global deforestation problem varying widely.³⁷

Protected Areas

The most common domestic policy aimed at forest conservation is the establishment of protected areas. Their use has boomed, post the introduction of clear country-level targets via the United Nations Convention on Biological Diversity (UNCBD) (Biodiversity Indicators Partnership, 2010). They provide clear mechanisms for ensuring forest conservation through restricting or outlawing completely deforestation. In this way they serve to increase the private costs of deforestation to either an infinite amount if deforestation becomes impossible, or at least to a very high amount if penalties such as fines are given to those conducting illegal activity. By increasing these private costs protected areas correct, to some degree, the underlying market failure, assuming of course that they are effective deterrent to activity that would have occurred in their absence. To understand whether this is the case it must be understood whether deforestation was actually avoided due to their creation.³⁸ A large body of research has been devoted to assessing their impact and has generally concluded that protected areas have avoided some deforestation but not as much as was originally envisaged (Andam, Ferraro, Pfaff, Sanchez-Azofeifa, & Robalino, 2008; Arturo Sanchez-Azofeifa, Daily, Pfaff, & Busch, 2003; Hayes, 2006; L. N. Joppa & Pfaff, 2011; Linkie et al., 2008). The effectiveness of protected areas depends crucially on the level of political support they receive, and the resources that flow from that support (Bruner, Gullison, Rice, & da Fonseca, 2001). Many protected areas are

³⁷ The policy mix of imperatives, incentives and capacities mirrors that proposed for climate policy more generally by Gouldson, (2008).

³⁸ The land they cover tends not to be representative of countries as a whole, situated further away from roads and urban centres, and on more marginal agricultural land (L. Joppa & Pfaff, 2010).

mere 'paper parks' that exist only on maps and do not reflect reality on the ground (Bonham, Sacayon, & Tzi, 2008). Like international forest policy local political support and stakeholder involvement has proved crucial to the success of Protected Areas. Thus where support is strongest and stakeholder involvement is greatest they have proved more effective in correcting market failures and reducing excess deforestation.

Payments for Ecosystem Services

Payments for ecosystem services (PES) schemes have emerged as a popular policy tool across a wide range of environmental media, both in literature and practice. Their rationale is simple; by providing payments for provision of ecosystem services they reward landowners and users for limiting destructive use of their land, helping to conserve forests, water and other environmental media. They provide payments conditional on environmental performance – in effect offering a price signal to landowners – thus bridging the gap between private and social costs of deforestation. In doing so they help to solve the major market failures associated with forests. This feature has led to them being proposed as a suitable domestic policy to be utilised to achieve REDD+.

A wide literature has emerged that has assessed the effectiveness, efficiency and equity of PES schemes across the world (Gauvin, Uchida, Rozelle, Xu, & Zhan, 2010; B. Groom, Grosjean, Kontoleon, Swanson, & Zhang, 2009; Mayrand & Paquin, 2004; Sierra & Russman, 2006; Wunder & Alban, 2008). This has complemented an existing literature that has attempted to answer the various design questions that these schemes raise (Engel, Pagiola, & Wunder, 2008; Wunder, 2007, 2008). The lessons from existing PES schemes will be vital for their use in effective REDD+ policy. Clearly defining property rights, addressing leakage and permanence, removing perverse incentives and clearly defining programme goals and objectives will all be vital for the translation of the concept of small-scale PES schemes to a national and international level REDD+ mechanism (OECD, 2010). Authors have highlighted that PES schemes are likely to be most effective when tenure rights are secure, and when schemes focus on not just conservation but also promote other environmentally friendly activities such as agroforestry or eco-tourism (Rosa et al 2003).

Key questions arise with the design of PES schemes such as who gets paid, whether national governments or local communities, and how finance and incentives can trickle down. Issues relating to moral hazard problems that require costly monitoring and rent-seeking also need to be resolved to ensure effective and efficient PES policy (Bulte & Engel, 2006)

Where the literature is currently sparse is to how lessons from small-scale PES schemes translate to large-scale REDD+, when factors such as the potential economy-wide nature of REDD+, and the

incentives of political actors implementing REDD+ are included. This thesis works to fill some of these gaps, complementing the existing PES and REDD+ literature, predominantly in the analysis presented in Chapter 4.

Decentralisation and Devolution of Land Tenure

As discussed above property rights insecurity can lead to deforestation through a number of channels. Securing land tenure whether through devolution of property rights or through other processes has emerged as a key policy lever for addressing, not only deforestation, but also rural development.

Historically the world's forests were common property (Ciriacy-Wantrup & Bishop, 1975). In tropical countries this common property were seized by colonial and national governments, removing *de jure* property rights from forest users who often retained *de facto* rights. State owned forests are often zoned for timber or agricultural concessions or converted into protected areas, creating a disconnect between local users and legal owners with consequences including illegal logging, clearing and incursions into national parks (Curran et al., 2004; Jenkins, 2008). These issues have led to a wave of decentralisation across state forests and in some cases devolution of land tenure. The policy grew out of academic literature regarding the potential for community managed resources to be efficient, effective and equitable (Ostrom, 1991; Schlager & Ostrom, 1992) in contrast to earlier work which regarded communal land as suffering from a 'Tragedy of the Commons' (G. Hardin, 1968).³⁹ An evaluative literature has subsequently emerged assessing the success or otherwise of this devolution process finding that it can bring proposed benefits, but only when institutional conditions such as enforcement and collective action are in place (Chhatre & Agrawal, 2008; Larson & Ribot, 2009; Larson & Soto, 2008; Petkova, Larson, & Pacheco, 2010).

Agricultural policies

As discussed above agriculture is the world's main driver of deforestation. Policies affecting agricultural prices, technology and infrastructure have the potential therefore to both retard, and also stimulate deforestation patterns. As highlighted in Section 2.1, there is evidence that deforestation has tracked the evolution of commodity prices therefore policies that depress output prices either explicitly through taxation or implicitly through demand management or overvaluation of currencies have the potential for stemming deforestation. The key inputs for the majority of agriculture resulting in deforestation are land and labour (Pfaff et al., 2010). Lower labour costs can

³⁹ Tragedy of the Commons refers to the situation where a shared resource is depleted through the rational self-interest of each party.

encourage clearing by increasing the profitability of agriculture (Shively, 2001), although labour intensive technological change can reduce the pressure to clear the forest (Kaimowitz & Angelsen, 2001). Policies that affect relative labour costs, or encourage labour intensive technical change, can therefore affect deforestation patterns by changing the private costs and benefits of different economic activities, and incentivising actors to move toward economic activities with a smaller deforestation footprint.

Summary

Domestic forest policies have been implemented in one form or another across tropical forests yet evidence for their effectiveness – or indeed their performance against other potentially relevant criteria – such as equity or efficiency is limited. The evidence that does exist suggests that overall policy performance to address deforestation has been inadequate at best. The need for better evaluation of conservation investments is highlighted in Ferraro & Pattanayak (2006). These domestic policies have played on either imperatives, incentives or capacities to correct the overall underlying market failure.

The empirical literature also has little to say on the choice between domestic forest policies. This question has mainly been analysed in the theoretical realm by authors such as Ferraro & Simpson (2002), Groom & Palmer (2008), Muller & Albers (2004) and Deacon (1995). This literature predominantly predates the debate on REDD+ and currently there is little theoretical work analysing domestic policy choices for REDD+ policy.

The experience gleaned from the various different domestic forest policy measures that have been employed across tropical forested countries is vital in designing future forest interventions, including REDD+. The importance of local stakeholder involvement, domestic political will and dealing with institutional challenges including property rights is highlighted across policies and understanding the impact of these factors on policy, and how effective policies can be at addressing the underlying market failure, will be crucial for creating an effective REDD+ mechanism. This provides the key motivation for the research objective of this thesis.

2.3 Emergence of REDD+

Due to a number of technical and political challenges emission savings relating to avoided deforestation in developing countries were excluded from the mechanisms that evolved from the Kyoto Protocol such as the Clean Development Mechanism (CDM) (Fearnside, 2001; Trines et al.,

2006; Tropical Forest Group, 2007).⁴⁰ The issue of avoided deforestation came to prominence in 2005 with a body of literature that advocated a system of incentives for developing countries to reduce their deforestation rates (Heal & Conrad, 2006; Moutinho et al., 2005; Santilli et al., 2005; Schlamadinger et al., 2005; Silva-Chavez & Petsonik, 2005). This system focused on addressing the market failures associated with the carbon emissions that arise from deforestation that lead to excess deforestation occurring. The initial system focused on a 'pure' model of incentives – with payments given for environmental performance, i.e. reducing emissions from deforestation and ownership of finance transferring to recipient countries akin to other models of carbon trading. The original model had a strong national focus, based on perceptions of effectiveness (Angelsen & McNeil, 2012). The proposal led to an agenda item called '*Reducing emissions from deforestation in developing countries and approaches to stimulate action*' appearing on the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) in Montreal in December 2005, following requests from the governments of Papua New Guinea and Costa Rica (Laurance, 2008).

REDD+ evolved rapidly from a mechanism labelled 'Reducing Emissions from Deforestation' (RED), through the inclusion of degradation (REDD) through lobbying from the Coalition of Rainforest Nations in 2006 and the presentations by India and China for the mechanism to compensate conservation and afforestation leading to the inclusion of the + in the 2009 negotiation text (Pistorius, 2012). It has become an important element in international climate change negotiations.⁴¹ An agreement was reached at COP16 in Cancun in 2010 to include REDD+ in the international architecture of the UNFCCC, covering reducing emissions from deforestation and forest degradation, conservation and enhancement of carbon stocks and sustainable management of forest (Conference of the Parties, 2011). The commitment of the parties to further the REDD+ process can be seen in the decision of the COP adopted at Cancun in 2010:

'Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities, as deemed appropriate by each Party and in accordance with their respective capabilities and national circumstances:

- (a) Reducing emissions from deforestation;*
- (b) Reducing emissions from forest degradation;*
- (c) Conservation of forest carbon stocks;*
- (d) Sustainable management of forests;*

⁴⁰ Projects relating to afforestation and reforestation are allowed, though few of these have emerged.

⁴¹ For a detailed history of the emergence of REDD+ in the international negotiations see Holloway & Giandomenico, (2009).

(e) Enhancement of forest carbon stocks⁴²

The decision highlights that REDD+ as envisaged by the UNFCCC is a mechanism for addressing both deforestation occurring today, and also ensuring the protection of the substantial carbon stocks in standing forests. Also arising out of Cancun was a decision that requests developing countries to develop national strategies, reference levels and monitoring systems – indicating a strong move towards basing REDD+ at a national level.⁴³

Alongside the developments at the international negotiations regarding REDD+, a range of pilot projects have been initiated across the world, and a number of countries including Brazil, Indonesia and Guyana have entered into bilateral REDD+ agreements with Norway.⁴⁴ In addition both the World Bank and the UN have established programmes to move countries toward REDD+ ‘readiness’⁴⁵ in the form of the Forest Carbon Partnership Facility (FCPF)⁴⁶ and UN-REDD.⁴⁷

REDD+ has developed rapidly from a series of brief proposals in the mid-2000s to a burgeoning programme in a number of countries, and a source of millions pounds of finance to both national governments and project developers. As the mechanism has emerged, the issues related to it have evolved, and the literature has developed. There are three main generations of literature that can be identified (Angelsen et al., 2012a):

1st. Designing REDD+ and learning from related experiences in the past

The first generation focuses on how REDD+ should be formed. It examines broad questions relating to design of REDD+ policy such as leakage, permanence and additionality. Its main aims are to examine the key design questions for REDD+ at different scales, focusing on how REDD+ should look.

⁴² Conference of the Parties (2011) s70 pp. 12.

⁴³ Ibid s71 .

⁴⁴ Information on these partnerships is available at : Brazil

<http://www.regjeringen.no/nb/dep/md/kampanjer/regjeringens-klima--og-skogprosjekt/hvem-er-vare-samarbeidspartnere/brasil1.html?id=734166>, Indonesia

<http://www.regjeringen.no/nb/dep/md/kampanjer/regjeringens-klima--og-skogprosjekt/hvem-er-vare-samarbeidspartnere/indonesia.html?id=734165>, Guyana

<http://www.regjeringen.no/nb/dep/md/kampanjer/regjeringens-klima--og-skogprosjekt/hvem-er-vare-samarbeidspartnere/guyana.html?id=734164>.

⁴⁵ REDD+ readiness is a process that a number of countries are undertaking to enable participation in REDD+; appraising policy options; establishing strategy and consensus; and establish and maintain the ability to successfully implement and monitor REDD+ activities (Streck & Parker, 2012).

⁴⁶ The FCPF is a global partnership of governments, businesses, civil society and indigenous people focused on REDD+ led by the World Bank.

⁴⁷ UN REDD is the UN’s collaborative initiative on REDD+ supporting national REDD+ readiness efforts launched in 2008. It supports 48 partner countries.

2nd. Political economy and implementation of REDD+

The second generation of REDD+ research concentrates on the questions of how REDD+ is being decided and implemented and why. It analyses the early stages of policy formation for REDD+ and the design decisions taken for national and sub-national projects.

3rd. Assessing the impact of REDD+

The third generation of research asks the key questions of does REDD+ work, and how can it work better? Given the early stages of implementation the third generation of REDD+ work is the most immature.

There are still gaps within all three generations of REDD+ research and key questions to be answered. The majority of literature has understandably focused on first generation questions (Angelsen, 2008a; Angelsen et al., 2009; Palmer & Engel, 2009) while second generation work is just starting to emerge in greater depth (Angelsen et al., 2012a; Robinson, Albers, Meshack, & Lokina, 2013; Wertz-Kanounnikoff & Kongphan-apirak, 2010). Third generation work is in its infancy but as REDD+ projects and programmes reach the 3-5 year mark this literature may mushroom. This thesis contributes to all three generations of research. Chapter 4 provides a model that can help inform the design process of both national level REDD+ programmes and the international incentives that drive their development. Chapters 6 and 7 provide an account of the governance of the REDD+ framework in Guyana, helping to understand why the programme has evolved along the lines that it has. Chapter 5 provides some initial evidence of the effectiveness of the REDD+ framework in Guyana contributing to the third generation of research.

2.4 Key issues for REDD+

REDD+ is still in its infancy and many key issues are still open for discussion. This section discusses four of these myriad of issues that lie behind the research questions identified in Chapter 1.

2.4.1 Evaluating Success – Additionality and the three E's

REDD+ began as a simple mechanism with a singular goal of reducing carbon emissions. Its success therefore should be judged on to what extent it reduces deforestation, and its related GHG emissions. The difficulty however is determining the baseline of deforestation and emissions in the absence of REDD+. This mirrors the problems relating to additionality in the wider carbon offset market, especially regarding CDM projects (Grubb, Laing, Counsell, & Willan, 2010; Schneider, 2009; Wara & Victor, 2008). International negotiations have also raised the issue of safeguards to limit the negative social and environmental effects of REDD+ and the promotion of co-benefits such as

biodiversity and rural development which has widened the potential scope of REDD+. These complications have led to the adoption of a range of formal and informal tools designed to assess the performance and success of REDD+ programmes and projects.⁴⁸

Three main baseline approaches have been proposed and used in emerging programmes to determine the emissions-reduction performance of REDD+ programmes:

- Historical baselines of deforestation offer clarity and additionality of emissions reductions, yet would effectively omit Highly Forested, Low Deforestation rate countries (HFLD), such as Guyana. Establishing a clear historical baseline is also difficult in many countries due to capacity and data constraints.
- A reference baseline attempts to establish a business-as-usual (BAU) level of deforestation against which reductions could be counted. Such a baseline would allow the participation of a wider group of countries, and could help to create incentives to cut deforestation before it occurs, however risks the creation of tropical 'hot air' where countries are rewarded without making actual efforts to reduce deforestation rates.
- A third approach is to create a crediting baseline, not necessarily either the historic nor the BAU scenario, against which deforestation cuts and emissions reductions can be credited and financed. Such a baseline may allow greater inclusion than a strictly historical level, and may help reduce some of the fears of tropical 'hot air'. One such example of a crediting baseline is the combined incentives approach where an average of national and international deforestation is used to provide incentives to countries with low historical rates to reduce emissions, whilst maintaining global additionality (Strassburg, Turner, Fisher, Schaeffer, & Lovett, 2009).⁴⁹

Amongst the discussion regarding different baselines to judge the success of REDD+ there are some dissenting voices suggesting completely different alternatives including the stock-flow approach that explicitly takes into account existing forest stocks (Cattaneo, 2010), and approaches that focus more on efforts to reduce deforestation rather than results (Combes Motel, Pirard, & Combes, 2009). Given REDD+'s focus on avoided deforestation emissions however and the continuing efforts to integrate it into potential carbon markets most existing REDD+ programmes are based on some determination of a deforestation baseline, against which performance is judged against on an annual basis.

⁴⁸ For a detailed discussion of the complicated nature of baselines for REDD+ see Angelsen, (2008b).

⁴⁹ This is the approach adopted in Guyana, discussed in more depth in Chapter 3.

In parallel with the development of different formal criteria for assessing REDD+ performance is a literature that develops criteria for informally assessing the wider success of REDD+ programmes and projects. The criteria that has achieved the most resonance is the '3E' criteria first proposed by Stern, (2008) and promoted through a set of Centre for International Forestry Research (CIFOR) publications (Angelsen, 2008a; Angelsen et al., 2009, 2012a). The 3Es are:

- **Effectiveness** – can the mechanism bring significant emission reductions?
- **Efficiency** – are these reductions achieved at the minimum cost?
- **Equity** – are benefits and costs distributed fairly among and within countries?

These criteria have been adopted widely in the literature as the key determinants for assessing REDD+ programmes in design and those being implemented. They provide the key gauges for authors to develop recommendations for how REDD+ should be designed. They provide a framework for assessment of REDD+ policy and will be used throughout the thesis as the main criteria for assessing REDD+ policy. Early assessments of REDD+ policy using criteria such as these are vital as the full emission impacts of REDD+ policy may not be known for years after initial policy interventions due to lags in data availability, and slow changes in behaviour patterns. Providing initial assessments of the impact of REDD+ policy on proxies for deforestation can help to provide early lessons for the wider implementation of REDD+. Chapter 5 provides such an initial study, providing an assessment of how the implementation of a REDD+ framework in Guyana has impacted on the holding of property rights to the forest.

2.4.2 Policy Choices for REDD+ and institutional conditions

The suite of policies available for REDD+ mirrors that of forest conservation more generally - Angelsen has authored a number of publications outlining the different potential policy options (Angelsen 2008, Angelsen et al. 2009, Angelsen 2010), while Daviet (2009) outlines the potential for policies such as fire protection, the reduction of illegal logging and forest restoration. Angelsen et al. (2009) offers a categorisation for these policies, grouping options into four different types: policies to depress agricultural rent; policies to increase and capture forest rent; policies that directly regulate land use; and cross-sector policies that underpin the first three. These policies all work to address the underlying market failure relating to deforestation through one channel or another.

The nature of REDD+, however, may mean that some institutional conditions are more relevant to policy choice for REDD+ than for forest conservation in general and these have generally been overlooked in the literature. Insecure property rights regimes, and rent-seeking behaviour by actors have both been identified as being potential drivers of deforestation, but their mere presence may also affect both the socially optimal policy mix and also the mix that arises out of government

decision-making processes. These issues form the basis of the research questions identified in Chapter 1 that this thesis will address.

Property Rights

The majority of tropical forests lay in the hand of governments (71%) (White & Martin, 2002), with only small amounts owned by communities (22%) or private operators (7%). These percentages represent, however, *de jure* ownership (i.e. that concerning law). In practice in REDD+ countries however these *de jure* rights are often unclear and *de facto* ownership (i.e. that concerning fact) is often held by different operators or indeed absent altogether as state owned forests revert to management by local communities, or to open-access resources (Sunderlin et al. 2009).

Although a large body of literature has emerged discussing insecure property rights and deforestation, how such issues affect the choice of policy for REDD+ has been little studied, and yet the establishment of clear property rights has been identified as vital to any market-based approach for greenhouse gases (Allan & Baylis, 2006). Specific to REDD+ Cotula & Mayers (2009) outline the importance of establishing tenure as a precursor to REDD+ policy while Palmer (2010) discusses the implications of different policies for property rights, and the implications of both upon issues relating to permanence.

In addition to the issue of forest tenure is the issue of rights to carbon and the finance that could result from their sale. Much of the discussion around REDD+ is based upon inclusion of REDD+ projects in future carbon markets. Such developments require the creation of fungible credits which in turn requires legal recognition of who may have the right to the carbon embodied in trees and thus who can sell the right not to release it into the atmosphere. Such a legal framework needs to be established on top of the current forest rights regimes that are in place. There are limited moves to establish such 'carbon rights' in legislation – led chiefly by Western Australia (Eckert & McKellar 2008, Government of Western Australia 2005). In the context of countries relevant for REDD+, there have been limited moves to establish ownership of carbon. A notable exception is in Brazil in 2009 where expert legal opinion determined that indigenous communities had legal title to the carbon in the area they govern (Chagas, 2010). The imposition of carbon rights to an already complicated scenario of tenure and usage rights further complicates the situation.

Different property rights regimes may favour one forest policy over another, while the absence of formal rights regimes may limit out the use of some policies such as PES schemes that may be ineffectual without strong tenure rights as forests may be degraded by parties other than payment-contracting actors (Bulte & Engel, 2006). How these property rights regimes affect policy choices is

an important policy and academic question, as the lack of secure rights features heavily in a number of environmental problems that both national and international governments are trying to address. However causality in this problem is not just one way, REDD+ policy is likely to affect how property rights are held to the forest and forest-related resources. How policy affects these rights will be a crucial test of the efficacy of REDD+ policy. Chapter 5 of this thesis provides the first such study, examining the impact of Guyana's emerging REDD+ programme upon mining rights in the Guyanese forest.

Political Economy factors and Rent Seeking

Many potential REDD+ countries suffer from weak governance environments, experiencing high levels of corrupt activity, often more acute in forest-using sectors, and capturing of the policy agenda by vested interests (Amacher, 2006; Koyuncu & Yilmaz, 2008; Palmer, 2005). REDD+ creates a set of potential rents for capture. How these rents are distributed and to what extent they detract from efficient, effective and equitable activity will help to define the overall success of any REDD+ endeavour.

REDD+ policies, by restricting existing activities, or by imposing costs on current operators are likely to result in shifts in income or wealth with different policies creating different sets of winners and losers. In addition to pure efficiency concerns, equity issues are also vital to the realm of REDD+ policy choice: what becomes important in the context of policy choice is not just how the winners and losers balance out, but what sort of political power and access potential winners and losers have to the policy process. When governments are assumed to have different preferences than overall social welfare and where political contributions are possible policy choices are often different than that chosen under a pure social planner. This assumption forms the basis for the model constructed in Chapter 4.

The impact of political influence on policy choices has been formally modelled using common-agency models in the realm of trade policy by the seminal work of Helpman & Grossman (1994); in the area of environmental protection by Schleich (1997); and in the realm of forest conservation by Eerola (2004) all through the formation of common-agency models. Work by Jussila (2003) extends the framework to a logging industry in which there is insecure property rights and externalities from standing forests. Similar work in the area has focused on environmental policy design choices in the presence of corrupt bureaucrats (Damania, 2002). Chapter 4 extends this area of literature into the realm of REDD+ policy.

To date there has been little work relating specifically to the policy choices under a REDD+ mechanism, incorporating the difficult political and governance environments that many of the countries involved face, in either a formal or case-study setting. Silva (2004) has analysed the influence of political economy factors on the development of forest policy in Chile and Mexico but as of yet there has been little analysis done on policies specific to REDD+. Chapter 6 provides a case study of Guyana that examines some of the impacts that political economy factors have had on policy choice for REDD+.

2.4.3 The Scale of REDD+: Opportunity Costs, Partial and General Equilibrium thinking

Scale

Sub-national approaches that determine emission reductions at local levels have been the favoured approach in the majority of pilot projects for REDD+ (Ecosystem Marketplace, 2012). Such an approach however precludes national –level policy interventions, such as the removal of subsidies that encourage the clearing of forest area and also raises the risk of ‘leakage’ where emissions are merely ‘leaked’ to an area outside the scheme as deforestation drivers relocate outside the jurisdiction of the scheme. It may however be an initial solution in countries with little capacity, and may be more attractive to companies funding REDD+ for compliance or to show corporate social responsibility. A national-level approach may be more appropriate where there is greater capacity to monitor deforestation, or where drivers need to be addressed at national level. The UNFCCC debate has moved toward establishing baselines and crediting at national level,⁵⁰ and national schemes are now being established in countries such as Guyana. A third intermediate, nested approach has been proposed that would allow initial sub-national endeavours to be scaled up to a national level approach once capacity has been built (Angelsen, Streck, Peskett, Brown, & Luttrell, 2008).

The current policy discourse is predominantly focused on a mix of national or nested approaches. The latest initiative is the development of a methodology for so-called Jurisdictional Nested REDD+ (JNR).⁵¹ This is a framework in which emissions are monitored across a jurisdictional area and credit is received not just for project-level interventions, but also for any policies or programmes that reduce deforestation. The approach minimises the threat of leakage and also allows for a holistic approach to be taken to reduce deforestation. As REDD+ is still an emerging mechanism the final scale of any such scheme is still to be determined, however this thesis makes the assumption that REDD+ will follow a JNR approach with emissions and policies being produced by national or regional

⁵⁰ Conference of the Parties, (2011) s71.

⁵¹ An accounting framework for JNR is being piloted by the Verified Carbon Standards organisation. More information is available at <http://www.v-c-s.org/JNRI>.

governments who then play a crucial role in determining policies and projects and distributing finance.

Abatement Costs

Much of the early literature on REDD+ has focused on its potential as a low-cost abatement option, highlighting its low level of marginal abatement costs compared to many of the options available in energy and transport (Blaser & Robledo, 2007; Eliasch, 2008; Kindermann et al., 2008; Obersteiner, Kindermann, Rametsteiner, & Sohngen, 2006). These studies focus on the opportunity cost methodology, where costs of REDD+ are equivalent to the forgone revenue from the best alternative land-use (Streck & Parker, 2012). The suppositions that REDD+ offered a cheap abatement option led to the key findings of the Stern Review (N. Stern, 2006) that a:

'substantial body of evidence suggests that action to prevent further deforestation would be relatively cheap compared with other types of mitigation, if the right policies and institutional structures are put in place'⁵² and

'Research carried out for this report indicates that the opportunity cost of forest protection in 8 countries responsible for 70 per cent of emissions from land use could be around \$5 billion per annum initially, although over time marginal costs would rise'⁵³

Stern's work reinforced the rise of REDD+ into the climate change mainstream policy agenda. There is however a number of institutional issues that need to be overcome that may add significant transaction costs to the costs of REDD+. As highlighted by Streck & Parker, (2012) opportunity cost measurements fail to take into account the incentive required for governments to commit to meeting a particular target (IWG-IFR, 2009) or the political factors that are required to be overcome to make the key decisions necessary for REDD+ (Streck & Parker, 2012). Understanding how these factors could impact on the costs of REDD+ is vital for understanding the scale of finance required. A movement towards this understanding is one of the key aims of Chapter 4 of this thesis.

Even though the economic scale of REDD+ today is relatively limited, it may be significant in small economies such as Cambodia and Guyana who are at the forefront of REDD+, with large effects on both government budgets and the wider economy. This implies a movement away from the partial equilibrium approach adopted in early work relating to REDD+ towards an approach that takes an economy-wide perspective. Work is starting to develop that examines the potential economy-wide effects of REDD+ (Lubowski & Rose, 2013) and there is an emerging use of computable general

⁵² N. Stern, (2006) pp. xiii.

⁵³ Ibid pp. xvi.

equilibrium models to examine the distributional effects of REDD+ policies (Ibarraran & Boyd, 2010), and analytical general equilibrium models to assess the long-term impacts of REDD+ transfers (Ollivier, 2012). This thesis extends the general equilibrium literature that examines REDD+ in Chapter 4.

2.4.4 The Governance of REDD+

The basic framework for REDD+ is based on the hypothesis that if countries (or operators) receive a rent equal to the opportunity cost of conserving a forest they will change their behaviour and forgo clearing the forest – this will in practice raise the private cost of deforestation towards the overall social cost. In this framework it is assumed that the government is a rational agent, and is capable of taking action to implement and enforce policies that can reduce deforestation. However as REDD+ has developed these assumptions have been questioned (Karsenty & Ongolo, 2011), and a literature has emerged regarding how REDD+ can be implemented to best support governments to make rational choices, and have the capability to implement and enforce policies. The movement away from REDD+ as a simple economic policy to a wider set of reforms, and changes in governance patterns is succinctly described by Thompson, Baruah, & Carr, (2011). They describe REDD+ as *'more than an impartial container for the various tools and actors concerned with addressing deforestation'*⁵⁴. Instead they identify REDD+ as a form of governance: *'a means of aligning a diverse set of stakeholders around agreed-upon objects to be governed, tools of governance, and forms of environmental, economic and social knowledge'*.⁵⁵ This broad perception of REDD+ matches that discussed in 2.4.3, with REDD+ moving beyond a CDM-style project-based approach to a national level package of projects and policies. The view of REDD+ as a package of interventions and policies across the economy raises questions as to how such a basket of policies should be governed.⁵⁶ These questions have led to two main streams of literature: the first provides normative discussions on how best to structure governance of REDD+ in order to achieve 'successful' REDD+ as measured by such criteria as the 3Es; the second, more nascent stream, works to evaluate the governance of emerging REDD+ programmes.

Normative literature

The normative literature on REDD+ governance has focused on prescribing criteria that the governance of REDD+ should meet in order to be effective, efficient and equitable. Focus has generally been on the use of safeguards by either the donor to a REDD+ programme or the certifying

⁵⁴ Thompson, Baruah, & Carr (2011) pp. 100.

⁵⁵ *ibid* pp. 102.

⁵⁶ Although governance questions arise no matter the scale of REDD+ these questions are greatest when national-level broad REDD+ interventions are discussed.

agency of small-scale REDD+ projects, and the use of Free, Prior and Informed Consent (FPIC) to protect the rights of indigenous, and other forest-dependent communities. The debates about the content and imposition of safeguards and the use of FPIC have mostly taken place in the policy and grey literature (Anderson, 2011; Greenpeace, 2011b; Murphy, 2011). In addition an academic literature has emerged proposing governance frameworks, such as multi-level governance (MLG), for the successful implementation of REDD+. Understanding these discussions is a crucial first step to conducting the type of evaluative study of governance that will be conducted in Chapters 6 and 7.

Safeguards have been described as norms or institutions (Jagger et al., 2012 who follows the definition of institutions given by North, 1990), that focus on achieving minimum social and environmental standards. They are non-binding guiding principles, that are theoretically voluntary, at least at the UNFCCC level (Hite, 2010), although they are increasingly becoming mainstreamed into national-level frameworks and policies, and are becoming essential for sub-national REDD+ projects targeting the voluntary market.⁵⁷ The specificities of safeguards differ from country-to-country and project-to-project but the Cancun Agreement at COP16 of the UNFCCC provides a framework for the types of areas that safeguards should address, and therefore provides a framework for the governance of REDD+ (Conference of the Parties, 2011). The Agreement calls on parties to support, implement and report on seven social and environmental safeguards for REDD+:

1. *Actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements*
2. *Transparent and effective national governance structures, taking into account national legislation and sovereignty*
3. *Respect for knowledge and rights of indigenous people and local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the UN Declaration on the Rights of Indigenous Peoples (UNDRIP)*
4. *Full and effective participation of relevant stakeholders, in particular indigenous people and local communities, in the actions referred to in Article 70 and 72 of this decision*
5. *Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivise the protection and conservation of natural forests and their ecosystem services, and to enhance other societal benefits*
6. *Actions to address the risk of reversals*

⁵⁷ Standards such as the Verified Carbon Standard (VCS) and the standards put forward by the Climate, Community and Biodiversity Alliance (CCBA) have ensured that these safeguards have become mainstream.

7. *Actions to reduce the displacement of emissions*

The fourth of these safeguards is intrinsically linked to the principle of FPIC. This principle is already embodied in a number of UN conventions and declarations including the UNCBD and the UNDRIP (UN-REDD, 2013), although the extent that it has been fully implemented is questionable (Carino, 2005; Mcgee, 2009). UN-REDD define FPIC as '*potentially impacted peoples have the right to participate in and consent to or withhold consent from a proposed action*'⁵⁸. Despite this statement the focus on FPIC has been on indigenous people, with a large body of grey literature focusing on the implementation of the concept for indigenous communities, with other local communities included as almost an afterthought (Anderson, 2011). The focus of the literature on FPIC with regard to indigenous communities leaves a gap in evaluating this aspect of REDD+ governance with regard to the whole population. The work in Chapter 6 of this thesis provides a first step to providing such analysis.

Authors have extended the normative literature for elements of REDD+ governance to provide normative judgments on the entire governance environment for REDD+. Combining the messages regarding safeguards, FPIC and the inherent nature of REDD+ that requires the involvement of international, national and local actors, authors have proposed that REDD+ could accelerate the trend of forest decentralisation that has been seen in tropical forests around the world in recent years (Larson & Ribot, 2009). Other authors have gone further along the same lines and proposed whole frameworks for the governance of REDD+. A key model proposed is that of Multi-Level Governance (MLG), a governance model first put forward to explain the governance of the European Union (Hooghe & Marks, 2001). The governance mode has been proposed as being suitable for REDD+ to be efficient, equitable and effective by authors such as Forsyth, (2009), Skutsch & Van Laake, (2009) and Doherty & Schroeder, (2011). This literature has focused on making normative statements about how MLG could be a suitable governance mode for REDD+ - a gap exists in assessing whether any national-level framework around the world is embodying this type of governance. Chapter 6 fills that gap by providing an assessment of to what extent the REDD+ framework that has evolved in Guyana fits into the MLG model.

Evaluative literature

Evaluative work relating to REDD+ governance is evolving rapidly as REDD+ programmes have developed. The first major works in the area focused on evaluating governance at the international

⁵⁸ UN-REDD, (2013) pp.18.

level: Cadman & Maraseni (2011) evaluate the governance quality of the emerging international REDD+ mechanisms of UN-REDD+, the FCPF and the UNFCCC REDD+ negotiations.

Subsequently as country-level programmes have matured the literature has moved to evaluate the emerging governance environments for REDD+ at a country level. CIFOR have conducted the greatest range of work examining the emergence governance of REDD+ through their Global Comparative Study on REDD+. The project *'analyses how national processes that formulate and implement REDD+ policies are accounting for diverse interests at all levels'*.⁵⁹ The project covers Bolivia, Brazil, Cameroon, Democratic Republic of Congo, Indonesia, Nepal, Peru, Tanzania, Vietnam and Papua New Guinea, but not Guyana. The project has focused on two types of country-level studies. The first focuses on drivers, actors and institutions, providing background and initial analysis into the development of national level REDD+ strategies and assessing the strategies against the 3E's criteria and includes May, Millikan, & Gebara, (2011) in Brazil and Almeida, Salomao, & Wertzkanounnikoff, (2012) in Mozambique. The second investigates how REDD+ processes and policies are portrayed in the media and how these public debates have shaped REDD+ policy in the project study countries such as Brazil (P. H. May, Calixto, & Gebara, 2011) and Indonesia (Cronin & Santoso, 2010). The project has also created spin-off academic literature such as Luttrell, Resosudarmo, Muharrom, Brockhaus, & Seymour (2012) examining the political context of REDD+ in Indonesia.

Beyond the CIFOR project Purnomo, Suyamto, Abdullah, & Irawati, (2012) conduct a stakeholder analysis and a political mapping of the actors involved in REDD+ in Jambi, Indonesia; Toni, (2011) examines the relationship between subnational governments and REDD+ in Brazil, finding that REDD+ is unlikely to curb the decentralisation trend that has emerged in Brazilian forest policy; and Peskett et al., (2011) examine the actors, rules and links to external institutions involved in forest carbon projects in Uganda. What is missing from the evaluative literature of forest governance is an evaluation of a national-level framework that is actually at the performance-payments stage of REDD+ - Chapter 6 provides the first such study.

2.5 Conclusions

REDD+ is an emerging mechanism that aims to succeed where previous international and domestic policy interventions in the forest sector have failed. It aims to internalise the externality associated with deforestation, correcting a market failure that previous policy interventions have been unable to correct. Many open questions remain as to how best to design and implement REDD+ to make it efficient, effective and equitable. In order to answer these questions lessons can be drawn from a literature that evaluates previous forest policy interventions, both international such as TFAP and

⁵⁹ Extract from <http://www.cifor.org/gcs/about-gcs/national-redd-processes-and-policies.html>.

PPPG-7, and domestic such as protected areas and PES schemes, and also a literature investigating the causes and drivers of deforestation.

As REDD+ has developed into a key issue in the UNFCCC negotiations, from a series of small pilot projects into a number of national level bilateral arrangements, a REDD+ specific literature has emerged discussing key design issues, tools to evaluate success and initial assessments of progress. This literature has recently moved into its third generation, although key gaps remain in both the first and second generations.

This chapter briefly reviews the literature relating to historical forest policy, the drivers of deforestation and key design issues for REDD+. It identifies a number of key gaps in the theoretical and evaluative literature that this thesis aims to fill. Chapter 4 extends the literature relating to policy choice for REDD+ by introducing both general equilibrium and political economy effects. Chapter 5 extends the literature that models the drivers of deforestation, and assesses the impact of REDD+ policy, by providing an econometric study of the holding of mining property rights in Guyana in relation to electoral cycles and the introduction of REDD+ policy. Chapter 6 extends the literature relating to the governance of REDD+ by providing an assessment of the national dimensions of the governance of Guyana's nascent REDD+ programme. Chapter 7 provides an assessment of the very nature of the REDD+ framework that has emerged in Guyana. They provide a contribution to both the evaluative and normative governance literature in providing early evidence from the ground of Guyana's progress, and an assessment of the suitability of MLG as a proposed mode of governance for REDD+. In its totality the thesis adds to a number of streams of literature, from that understanding the drivers of deforestation, to the governance of REDD+, the design of national-level REDD+ policy and the assessment of the efficacy of emerging REDD+ programmes.

Chapter 3: Guyana Context

3.1 Introduction

Chapter 2 has shown that the envisaged global mechanism for Reducing Emissions from Deforestation and Forest Degradation (REDD+) is still at a nascent stage with many open questions regarding its final structure. This gives large scope for learning-by-doing from the pilot endeavours being undertaken around the globe. As highlighted in Chapter 1 the small South-American country of Guyana is leading the world in establishing a national-level REDD+ mechanism and offers a suitable case-study to examine the impact that various institutional conditions have had upon the evolution of REDD+ policy. In order to answer these questions it is first necessary to understand the economic, social, political and geographic background to REDD+ in Guyana. This chapter provides such a background, reviewing the history, economy, politics and geography of Guyana before outlining the REDD+ programme, and the major threat to the forest today: mining.

Guyana twins a high level of forest cover with a small rate of deforestation (small-scale mining accounts for almost all of this low level of forest clearance). The country as a whole and the natural resource management sector in particular, has encountered issues regarding governance, corruption, and insecure property rights. It faces increasing threats from immigration from Brazil, and increased access to forested areas, and the minerals that lie beneath. Norway is providing up to US\$250 million over five years of performance-related finance to help Guyana move to a low-carbon development pathway, using a national-level REDD+ scheme to lead the endeavour. Section 3.2 of this chapter helps outline the historical, geographical, economic and political context in which this REDD+ mechanism is being developed. The nature of the forest sector, and the users, owners and related property rights is discussed in more depth in Section 3.3. The REDD+ mechanism in Guyana and the Low-Carbon Development Strategy (LCDS) are outlined in Section 3.4. The mining sector and regulatory framework is discussed in Section 3.5. Section 3.6 provides discussion and conclusions from the Guyanese context.

3.2 Background

3.2.1 History

The history of Guyana provides the background to its forest use and its current economic and political situation that led to the formation of its REDD+ programme. This section provides a brief background to the historical context in which REDD+ has been formed in Guyana.⁶⁰

⁶⁰ This section is based on Senauth, (2009).

Guyana is a former British colony, first settled by the Dutch who established the first European settlement in 1616. It changed hands between Britain, France and the Netherlands a number of times before Britain brought the colonies of Berbice, Demerara and Essequibo together to form British Guiana in 1831. The colony was primarily used to produce sugar using rich fertile soils along the coastal plain, a result of alluvial deposition from the Amazon and the Orinoco rivers and a system of dykes and polders constructed by the Dutch. In order to work the sugar estates the British brought in slaves from West Africa which, along with conflict and disease, displaced the majority of the early native populations of Carib, Makushi and Arawak. With the cessation of the slave trade across the British Empire in 1807, the abolition of slavery in the colony in 1838, and the resistance of former slaves to continue work on the sugar plantations, the British colonial government turned to indentured labourers from the Indian sub-continent, with the first boat-load arriving on May 5, 1838. Along with Portuguese and Chinese immigrants the descendants of these workers make up the diverse ethnic mix seen in the small population today.

Guyana was granted independence from Britain on 29th May 1966 after a short but tumultuous period of pre-independence government that saw the emergence of the current political make-up of the country, with one party, the People's National Congress (PNC), representing the majority of Afro-Guyanese, and another, the People's Progressive Party (PPP), representing the majority of Indo-Guyanese (The Council of Freely Elected Heads of Government, 1993).

In the 1950s both parties followed socialist beliefs but the PNC won the right to be the first independent government of Guyana, following labour unrest and claims of intervention by both British and American governments (Lowe, 2013). The first Prime Minister, Forbes Burnham, ruled the country until his death in August 1985 through a period of heavily contested elections, all of which declared the PNC victorious (The Council of Freely Elected Heads of Government, 1993). Burnham led Guyana toward socialism leading to a period of economic stagnation and repression. Upon Burnham's death in 1985 the vice-president Desmond Hoyte became the new president and undertook economic reform, embrace of the private sector and, through the interventions of Jimmy Carter, led the country toward democracy (The Council of Freely Elected Heads of Government, 1993).

In 1992, following the first elections since 1964 to be internationally recognised as free and fair, the opposition PPP were elected in partnership with the Civic Party to form the PPP-C coalition, with their leader Cheddi Jagan sworn in as President. Although the elections were internationally recognised there was substantial inter-ethnic violence (The Council of Freely Elected Heads of Government, 1993). President Jagan followed Desmond Hoyte's economic restructuring, and

adopted an International Monetary Fund (IMF) structural adjustment programme, that led to growth in Gross Domestic Product (GDP) but erosion of real incomes. Cheddi Jagan died in 1997 while in office, and after a brief period of rule by his American-born wife Janet, Finance Minister Bharrat Jagdeo took on the Presidency. Elections were held in 2001, with the PPP-C again winning, although violence was rife especially in the capital Georgetown (Lowe, 2013). President Jagdeo continued the move toward economic liberalism, but dependence on the key economic sectors of sugar, rice and mining continued. Further elections occurred in 2006, this time with notably less violence. Economic growth strengthened with economic reforms, and booms in commodity prices, although allegations of government corruption, growth in the trans-shipment of cocaine, and large out-migration of Guyana's young and educated hindered progress (Baker, 1997).

The 2011 elections (discussed in greater depth in Section 3.2.4) brought about a new era in Guyana's history with the combined opposition A Partnership of National Unity (APNU)⁶¹ and the Alliance For Change (AFC) winning a parliamentary majority for the first time, with PPP-C retaining the presidency in the guise of President Donald Ramotar, former President Bharrat Jagdeo having reached the end of his self-imposed two-term limit.

It is in this historical context that Bharrat Jagdeo announced the formation of a Low Carbon Development Strategy (LCDS) in 2009 and signed a historic Memorandum of Understanding (MOU) with Norway for the formation of a national-level REDD+ programme, with payments of up to US\$250 million on a payments-by-results basis (the agreement and strategy is outlined in Section 3.4).

3.2.2 Geography

Along with historical factors REDD+ in Guyana has been shaped by the geography of the country, both physical and human. The unique geography of the country can help explain both why REDD+ developed and how it has been implemented.

Guyana is one of the smallest countries in South America with a land area just 3% of that of Brazil, and 75% of Ecuador. It is dominated by the forest that makes up over 75% of its land area (Guyana Forestry Commission & Indufor, 2012). The remainder of the country is made up of two small areas of savannahs (one in the south of the country near the border with Brazil, and the other in the north-east near the border with Suriname) and the agricultural areas of the coastal plain where the vast majority of the population of around 750,000 reside. The capital, Georgetown, located on the

⁶¹ APNU is a coalition between the PNC and a number of smaller parties.

Demerara River, accounts for almost a third of the total population and is the economic and political hub of the country. Guyana is split into 10 administrative regions (Table 3.1).

The Guyanese population is made up of a mix of different ethnic groups, with those of Indian descent forming the largest community, followed by those of African descent (Guyana Bureau of Statistics, 2002) . Amerindian communities comprised 9.1% of the population at the date of the last census (Guyana Bureau of Statistics, 2002), and live almost exclusively in the interior of the country, predominantly in Regions 1, 7, 8 and 9 (Table 3.1).⁶² They provide the most important stakeholder group in forested areas, and much of the REDD+ policy that has been designed has been focused on engagement with those communities. In recent years Brazilian migration has grown strongly, both in remote mining areas, and also in the capital Georgetown though data on the extent of the trend is sparse.⁶³ Mining communities, including Brazilians, have generally not been included in the REDD+ debate in Guyana. However as their economic power has grown (see Section 3.2.3 below), they have become important stakeholders and the important role they have played in shaping policy is discussed in more depth in Chapter 6.

⁶² Amerindians are the indigenous population of Guyana, comprising a number of different tribes.

⁶³ Only one major study has been conducted on the phenomenon, a Master's thesis from the University of Para (Pahoona Corbin, 2007).

Table 3.1: Guyana demographics by region 2002

Source: Guyana Bureau of Statistics (2002)

Region	Population	Amerindian population total	Amerindian population as %	Area (km ²)
1. Barima-Waini	24,275	15109	62.24	20,339
2. Pomeroon-Supenaam	49,254	8014	16.27	6,195
3. Essequibo Islands- West Demerara	103,061	2072	2.01	2,232
4. Demerara- Mahaica	310,320	5244	1.69	1,843
5. Mahaica-Berbice	52,428	1022	1.95	3,755
6. East Berbice-Correntyne	123,694	2016	1.63	36,234
7. Cuyuni-Mazaruni	17,597	7336	41.69	47,213
8. Potaro-Siparuni	10,094	7662	75.91	20,051
9. Upper Takutu- Upper Essequibo	19,388	17294	89.2	57,750
10. Upper Demerara – Berbice	41,114	2919	7.1	19,387
Total	751,223	68689	9.14	214,999

Guyana has one of the least developed road networks of any country in South America. Only 7.5% of the road network has been paved and the main thoroughfare to Brazil, via the towns of Linden and Lethem, is paved for less than half of its total distance (Mott MacDonald 2008). In the forest interior there are a small number of unpaved roads and logging trails that provide access to remote communities, logging concessions and mining areas. The lack of a developed road network within the forest is one important factor for the current intact nature of Guyana's forests. The growth of activities that could increase road building, such as increased mining activity, brings a new level of threats to the forest. The few scenarios that analyse future deforestation patterns in Guyana focus on the importance of roads bringing new threats to the forest (discussed in more depth in Section 3.3.2 below).

3.2.3 Economy

At its heart REDD+ is an economic instrument providing incentives to governments, operators and individuals to change their behaviour regarding forested areas. It is thus important to understand the economic context in which Guyana's REDD+ programme has emerged. Guyana partners its high level of intact forest with low levels of income and development. GDP per capita in 2012 was

US\$3596 (International Monetary Fund, 2013), and the UN ranked the country 118th in the Human Development Index, lowest in South America, below Bolivia and neighbouring Suriname (UNDP, 2013). Economic growth has been slow but steady, averaging 2.45% annually between 2000 and 2012, but rising recently to around 4.4% between 2006 and 2012 (Figure 3.1) (International Monetary Fund, 2013).

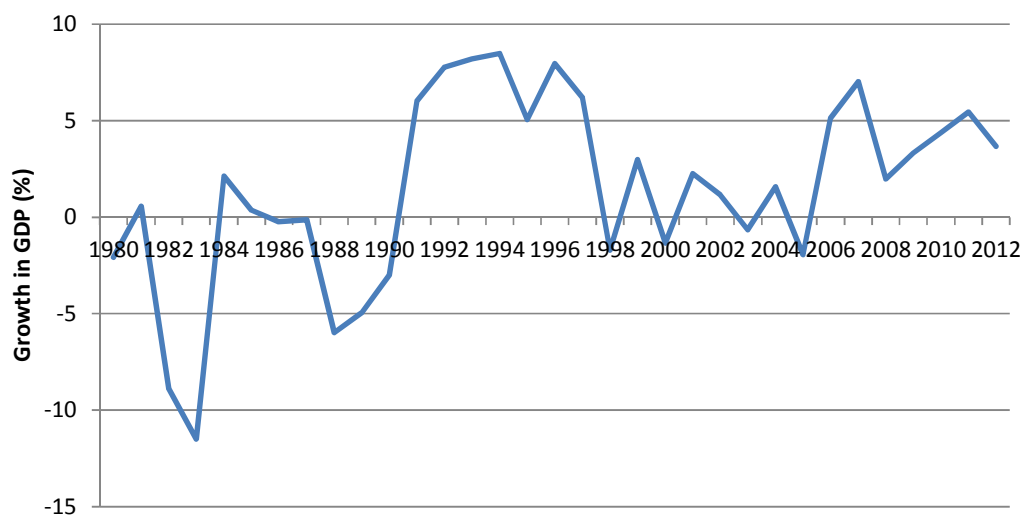


Figure 3.1 Gross domestic product growth 1981-2012

Source: International Monetary Fund, (2013)

The economy is heavily dependent on agricultural commodities and extractive industries (Figure 3.2). In 2012 mining accounted for 21% of GDP, up from 11% in 2006, reflecting recent increases in both mining activity and commodity prices (Guyana Bureau of Statistics, 2013). Agriculture's share declined from 24% in 2006 to 19% in 2012.

For foreign exchange Guyana relies heavily on a small number of commodities with gold, predominantly from small-scale operations, and bauxite contributing over 60% of all exports by value in 2012, with rice and sugar accounting for another 25% (Figure 3.3) (Guyana Bureau of Statistics, 2012). The dependence on mined products, especially gold, has grown in recent years, despite the closure of the only large scale gold mining operation in 2006.⁶⁴ This growth in gold exports has resulted from both increased gold prices, and also increased activity. In fact the economies dependence on gold is likely to be under-estimated, as legally all gold must be sold to Guyana's Gold Board,⁶⁵ but sales through other channels is common, perhaps accounting for a third of all gold mined (International Human Rights Clinic, 2007).

⁶⁴ The part-Canadian owned Omai gold mine shut in 2005 after twelve years of operation.

⁶⁵ As per the provisions of the Guyana Gold Board Act.

Timber’s contribution to the economy is relatively small, contributing only 3% of exports, while imports are dominated by fuel and lubricants, making up 31% of all imported value (Guyana Bureau of Statistics, 2012). This fuel is not just for Guyana’s growing transportation sector, but also for the diesel generation that dominates Guyana’s electricity generation capacity.

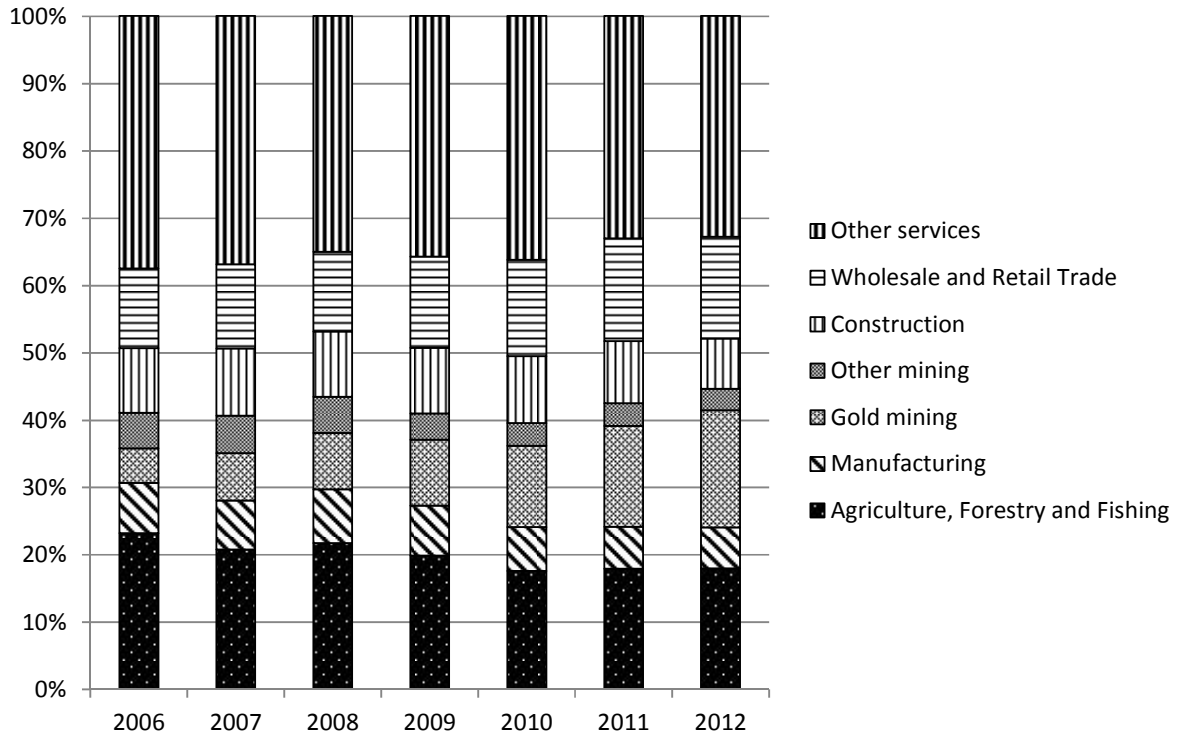


Figure 3.2: GDP by sector 2006-2012

Source: Guyana Bureau of Statistics, (2013)

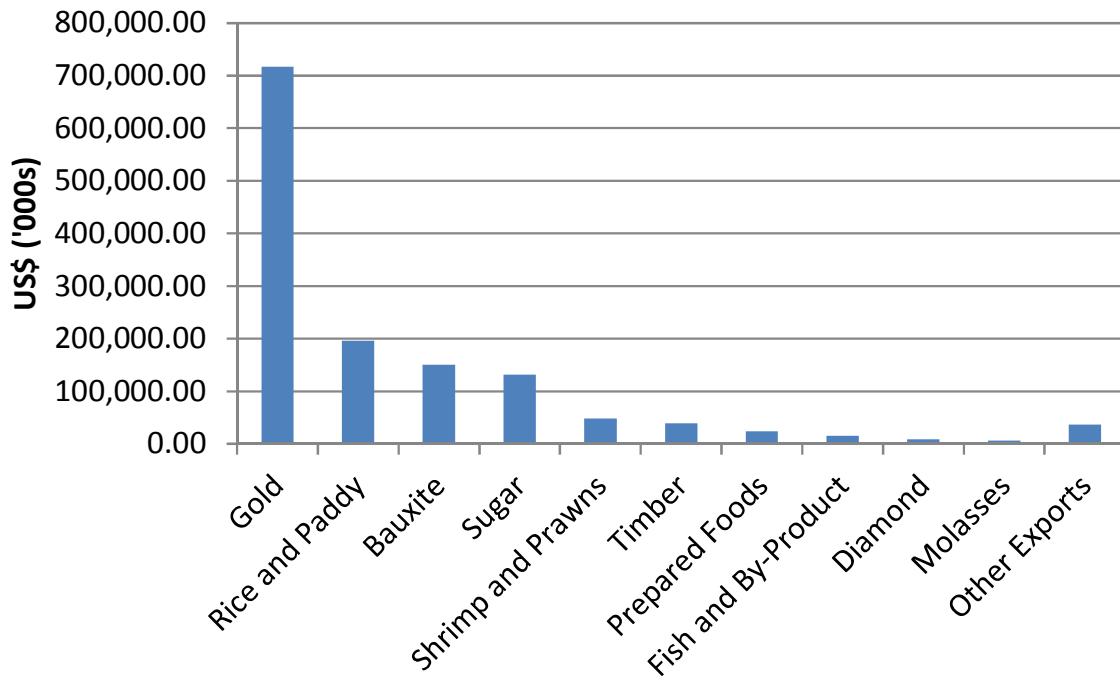


Figure 3.3: Exports by sector 2012

Source: Guyana Bureau of Statistics, (2012)

3.2.4 Political structure

As was highlighted in Chapter 2 REDD+ is not just an economic instrument, but also a mode of governance, and thus has a deeply political nature. It is therefore instructive to examine the political and governance environment in which REDD+ was developed in Guyana. This section examines the current political structure in Guyana, while the following two sections highlight the governance of the country as a whole, and the natural resources sector in particular.

Guyana's political structure evolved from the legacy of British rule and post-independence moves towards a republic. The President of Guyana is both Head of State and the exerciser of executive power. Legislative power is vested in both the government and a National Assembly. Currently this Assembly has 65 members 25 of whom are elected via proportional representation from the 10 administrative regions while the remainder are chosen from national party lists. The President is chosen on the basis of the results of the parliamentary elections on a five-year term. President Jagdeo introduced a two-term limit in 2000.⁶⁶

As highlighted above, elections since 1992 have generally been accompanied by spates of post-electoral violence, most notably in 1992, 1997 and 2001 (Lowe, 2013). Guyana has only transitioned power between parties on two occasions in its independent, and pre-independence history – the

⁶⁶ The term-limits were introduced via the Constitution Amendment Act of 2000.

pre-independence 1964 elections where the PPP lost power to the PNC under the heavy influence of American and British interests (The Council of Freely Elected Heads of Government, 1993), and the 1992 election which led to the PPP-C's return to power through elections supervised by Jimmy Carter (Hinds, 2005). In both elections there was a period of both economic and social uncertainty following the changes. Between 1992 and 1997 the PNC accused the PPP of marginalising African Guyanese by engaging in ethnic witch-hunting in the public sector and discrimination in land distribution (Hinds, 2010). Indo-Guyanese were specifically targeted in the violence that ensued after the 1997 and 2001 elections (Trotz, 2004). This ethnic division, and the uncertainty that follows the elections and the inter-racial violence is highlighted in this story from CNN in 2001:

'This year, the uncertainty is most prevalent among Guyana's black voters, many of whom say they are suspicious of vote-rigging attempts by the governing party. "If it doesn't go fairly, people do crazy things," said Renson Patterson, who is black and works at a hair salon in Georgetown, the capital. "If it doesn't go well, you'll find the blacks against the Indians.' (CNN, 2001)

The economic and political impact of the violence and uncertainty that has characterised Guyana's post-election environment is highlighted by Gafar, (2003):

*'The street violence [of 1997] resulted in loss production and exports, reduced capital inflows, depreciation in the local currency and a rupture in investors' confidence in the political stability of Guyana.'*⁶⁷

The violence was not limited to 1997, In 2001 the PNC went to courts to try and block the swearing in of the president and PNC talk show hosts and members called for 'raging fire' and urged supporters to 'go out and burn' and 'light up Georgetown' (Gafar, 2003).

Violence and uncertainty appear to be common features of post-election periods in Guyana. The lack of democratic transitions of power in Guyana's history has raised extra tension around closely fought elections. This was the case in the last election held in 2011 where the ruling PPP-C coalition secured 48.6% of the national vote and 19 national seats, along with 13 seats in the constituencies (

⁶⁷ Gafar, (2003) pp. 13

Table 3.2). The main opposition APNU coalition secured 40.8% of the national vote, 16 national seats and 10 constituency seats. The third largest party, the AFC, secured 10.3% of the national vote, 5 national seats and 2 constituency seats. The results of the election secured the Presidency of the PPP-C candidate Donald Ramotar, but in the National Assembly the PPP-C has a minority 32 seats with the combined opposition securing a majority 33 seats. This election heralded a new era of governance in Guyana by requiring the executive to work with the legislative branch to enact legislation. This process has not been smooth and the legislature has made significant cuts to the proposed budget in both 2012 and 2013, including the allocation to the LCDS (Guyana Chronicle, 2013; Stabroek News, 2012c). The difficulties created by this new political landscape has created significant uncertainty in both policy and investment environments (Guyana Times, 2013).

The demography of Guyana, coupled with the ethnic make-up of the parties, is such that the PPP-C has a larger natural constituency than the PNC, but not a majority. This means that the influence of other ethnic communities is particularly important. This is especially the case for Amerindian communities who provide a substantial share, and even a majority, of the population in a number of regions (Table 3.1)

The constituency MPs from these regions help to tip the balance between one party and the other. This factor makes these areas, and thus the Amerindian communities, politically important (Bulkan, 2013). The electoral success of the PPP-C between 1992 and 2011 can be attributed in part to their ability to harness the votes in these areas. Indeed in the 2006 elections the PPP-C won twice the number of seats than the PNC-R in the four regions with the greatest share of the Amerindian population (1,7,8 and 9). The change in the parliamentary situation may have been caused to some degree by changed voting patterns in these regions – in 2011 APNU and AFC together won the same amount of seats as the PPC-C in these areas, helping to swing the Parliament towards the opposition (Table 3.2)

Table 3.2: Guyana Election Results 2011

Source: Caribbean Elections and Institute for Democracy and Electoral Assistance⁶⁸

<i>Region</i>	<i>APNU</i>		<i>AFC</i>		<i>PPC-C</i>		<i>TUF</i>	
	Votes	Regional Seats	Votes	Regional Seats	Votes	Regional Seats	Votes	Regional Seats
1. Barima-Waini	887	1	787	0	3,472	1	55	0
2. Pomeroon-Supenaam	3,254	0	2,159	0	12,450	2	69	0
3. Essequibo Islands- West Demerara	14,028	1	3,343	0	33,424	2	70	0
4. Demerara-Mahaica	84,828	4	10,635	0	60,851	3	145	0
5. Mahaica-Berbice	8,906	1	3,079	0	13,558	1	29	0
6. East Berbice-Correntyne	10,798	0	11,634	1	32,360	2	83	0
7. Cuyuni-Mazaruni	2,843	1	505	0	2,376	1	84	0
8. Potaro-Siparuni	739	0	995	1	741	0	95	0
9. Upper Takutu- Upper Essequibo	2,004	0	946	0	4,135	1	183	0
10. Upper Demerara – Berbice	11,358	2	1,324	0	2,860	0	34	0
Total	139,678	10	35,333	2	166,340	13	885	0
Total as % of registered voters	29.4%		7.4%		35.0%		0.2%	
National Top-up seats	16		5		19		0	
Total seats	26		7		32		0	

⁶⁸ Information on total registered voters available from: <http://www.idea.int/vt/countryview.cfm?CountryCode=GY?>

3.2.5 Governance

Guyana's governance regime is reminiscent of many other developing countries in that it suffers from corruption, a lack of government effectiveness and capacity and rent seeking. Transparency International ranked Guyana 133rd out of 176 countries in 2012, with a score of 28 out of 100 in its 2012 Corruption Perception Index (Transparency International, 2012) a slight improvement on 2005 when it scored 2.5 out of 10 (Transparency International 2005).

In the World Bank's governance indicators Guyana has scored at low levels, especially in the areas of control of corruption, rule of law, and political stability and absence of violence (World Bank 2012). Government Effectiveness was determined to have increased from 2009 to 2011 while Voice and Accountability fell from 2007 to 2011 (Figure 3.4).

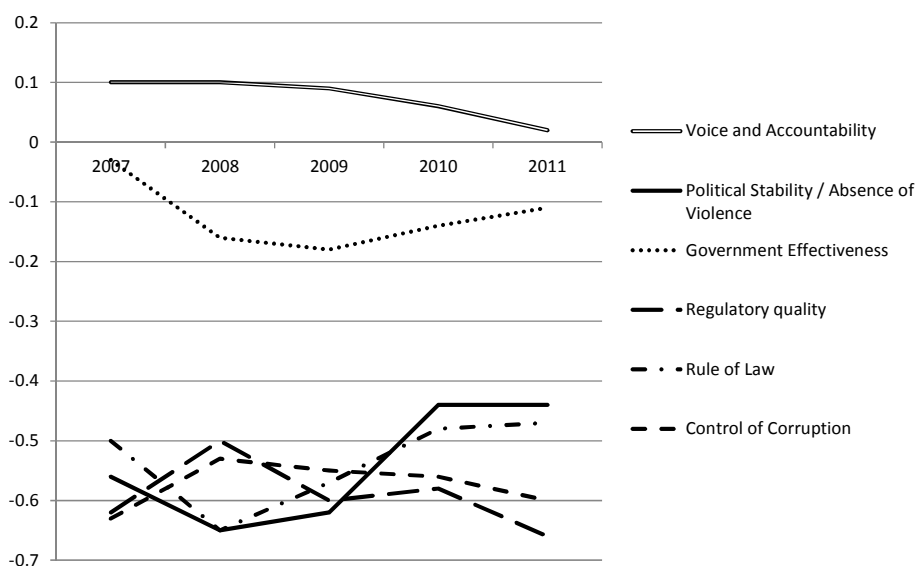


Figure 3.4: World Bank Governance Indicators 2007-2011⁶⁹

Source: World Bank (2012)

⁶⁹ Units are that of a standard normal distribution with mean zero, standard deviation of one and running from approximately -2.5 to 2.5 with higher values corresponding to better governance.

Voice and accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. **Political stability and absence of violence** measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. **Government effectiveness** captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. **Rule of law** captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. **Control of corruption** captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests (World Bank, 2012).

The historic trend of governance in Guyana has been toward centralisation of power and control. This was prevalent under British rule and the trend continued under the government of Forbes Burnham who created the position of Executive President, centralising all power in himself and a small select number of associates. The phenomenon has continued under the PPP-C rule. The process of governance has been described by some authors as ‘democratic centralism’ (Hinds, 2005; Hinova & Khemraj, 2011). This is the process where democratic institutions are respected but the nature of processes such as candidate selection and power being vested in a few key positions by the Constitution, means that in actuality a very small number of key actors are involved in decision-making. The amount of power vested in the Office of the President, including responsibility for the LCDS, and the fact that under the Jagdeo administration the President was both Minister of Forests and Minister of Forestry, along with a number of other positions, helps highlight the continuation of this historical trend. In addition to culture, centralisation of governance in Guyana may also be a result of a lack of capacity. The country’s small population, its historical brain drain to North America and the lack of a vibrant civil society (as witnessed by the small number of NGOs) all contribute to a centralisation of power in a small number of government entities and individuals.

3.2.6 Governance in the Natural Resource Sectors

The management of natural resources in Guyana lies with a newly created Ministry of Natural Resources and the Environment (MNRE). The Ministry was formed subsequent to the 2011 elections and now provides the umbrella for a series of commissions and agencies, namely:

- Guyana Forestry Commission (GFC) with responsibility for state-owned forested areas and forestry concessions within these areas.
- Guyana Geology and Mines Commission (GGMC) with responsibility for managing mineral rights and extraction in Guyana
- Guyana Lands and Surveys Commission (GLSC) with responsibility for managing state owned lands and granting agricultural concessions in these areas.
- Environmental Protection Agency (EPA) has responsibility for overall environmental management in the country
- Protected Areas Commission (PAC), formed in 2012 has responsibility for establishing and managing Protected Areas in Guyana.

The natural resource management sectors in Guyana encounter similar problems in governance as the rest of the country as a whole. In the mining sector *‘weaknesses in the political and judicial*

*systems... create major enforcement challenges and contribute to high levels of corruption*⁷⁰, while illegality is prevalent, from small breaches in regulations to operating with no lease or permission (International Human Rights Clinic, 2007). The forestry sector has also been identified as subject to rent-seeking behaviour at both political and bureaucratic levels (Chene, 2010). The scale of illegal activity is a matter of debate with some authors highlighting high levels of illegal and corrupt behaviour (Bulkan & Palmer, 2008), with others identifying only small levels of illegal activity focusing on non-compliance and illegal behaviour amongst small operators (Clarke, 2006; Trevin & Nasi, 2009).

Clear evidence of illegal activity in the forest sector can be seen in the case of Barama, a subsidiary of the Malaysian mining company Samling Global Ltd. Barama was established in 1991 and was granted a logging concession of 1.6 million hectares, the largest in Guyana. Barama has been fined on three separate occasions by the GFC for logging in neighbouring concessions, and for harvesting parts of the concession without an approved forestry plan (Council on Ethics: The Government Pension Fund Global, 2010). The last of these was part of a group of fines issued to 12 timber companies across Guyana for the same offence (Stabroek News, 2008). The performance of Barama along with subsidiaries in Malaysia has led to a recommendation to the Norwegian Ministry of Finance from its Council on Ethics to exclude Samling Global Ltd from any investments from its Government Pension Fund (Council on Ethics: The Government Pension Fund Global, 2010).

3.2.7 Indigenous population

The indigenous population of Guyana, the Amerindians, account for approximately 9.1% of the population and own approximately 14% of land, forming the majority of land not held centrally by the state (Office of the President, 2013). The Amerindian population comprises a number of different tribes including the Arawak, Carib, Wapichan, Makushi, Patamona, Akawaio and Wai-Wai (Griffiths & Anselmo, 2010). As seen in Section 3.2.2 they form large shares of the population in a number of interior regions. Communities, and the land that they own, are governed by the provisions of the 2006 Amerindian Act that outlines community management structures such as Village Councils and democratically elected Chiefs or Toshias with responsibility for managing the village's land and resources and protecting and preserving both those resources and the village's culture.⁷¹

There are currently 98 titled communities spread across all regions of Guyana with the majority in the south and west of the country (Figure 3.7) and in or around forested areas. In addition there are

⁷⁰ Chene, (2010) pp.5.

⁷¹ Amerindian Act Cap 29:01 s10, 13

12 untitled communities, some of which are embarking on titling exercises, with 19 further communities likely to become eligible for title in the future (Office of the President, 2013). A major current issue regarding Amerindian Lands is the extension of existing titled lands. Currently 33 communities have applied for extension of their lands, of which 8 have received approval (Office of the President, 2013).

Amerindian communities are generally amongst the poorest in Guyanese society with the UNDP classifying 77% of Amerindians as poor.⁷² Communities depend on both subsistence and cash-earning activities though the mix between the two depends on the type of community and region, with remoteness often being the limiting factor for the latter (Griffiths & Anselmo, 2010). Subsistence activity focuses on traditional rotational farming, complemented by hunting, fishing and gathering. Cash earning activities include full time jobs through government funding such as teaching and healthcare, sale of raw or processed food crops, livestock and fish, forestry products and crafts, occasional work as labourers, drivers, boatmen, tourist guides and NGO project workers, and mining activity either within or outside communities (Griffiths & Anselmo, 2010). As the gold mining sector has boomed in recent years there is some anecdotal evidence that Amerindians have been increasingly involved in the sector either in their own titled land, or migrating to work on mine sites across the country.

As highlighted in Section 3.2.4 the political make-up of Guyana makes the Amerindian communities potentially political king-makers. In the 1964 elections the potential power of the Amerindians was shown with The United Force (a party supported by Amerindians from the Rupununi) forming a coalition with the PNC to take control from the PPP. This led to the creation of a special Department of Amerindian Affairs and the inclusion in the independence agreement with Britain to settle Amerindian land claims (Bulkan, 2013). The lack of democratic elections under PNC rule removed this potential political power from Amerindian communities. With the revival of democratic elections in 1992 a new Amerindian party the Guyana Action Party (GAP) was formed, and enjoyed electoral success up to 2011, where upon it joined the APNU coalition. The PPP-C coalition has worked hard to garner Amerindian support since 1992, with a number of high profile Amerindian Ministers being appointed. Further there have been allegations of allocations of donor funds being determined by political support from Amerindian communities (Bulkan, 2013), and abuse of state resources in the build up to elections more generally (Electoral Assistance Bureau, 2007, 2011).

Amerindians are represented by a series of NGOs and a quasi-independent governmental body, the National Toshias Council (NTC). The most vocal, and largest of the NGOs is the Amerindian People's

⁷² http://www.undp.org.gy/web/index.php?option=com_content&view=article&id=54&Itemid=97

Association (APA) which has been criticised by the government regarding its stance on land claims and its workshops on REDD+ have been picketed by Ministers (Guyana Chronicle, 2010). Two smaller NGOs, the National Amerindian Development Foundation and The Amerindian Action Movement of Guyana have been alleged to be funded by the Office of the President (Bulkan, 2013). The NTC is a statutory body mandated by the Amerindian Act, comprising all of the elected Toshias. It meets annually with aims to promote good governance in villages and to prepare strategies and plans for reducing poverty, improving access to health and education, and the protection, conservation and sustainable management of community lands and resources.⁷³ The NTC has been alleged by some authors to be merely a 'one-way speaker for communicating government intentions downwards'.⁷⁴

3.3 Guyana's Forests

The main reason behind Guyana taking the global lead in the development of a national-level REDD+ programme, and one reason why Norway has been prepared to offer such large sums of finance, is its large swathes of intact forest, coupled with its low historic deforestation rates. This section provides a background to those forests, the causes of current deforestation, where future threats may come from and an overview of land tenure. This provides the geographical and institutional background required to understand the context in which Guyana's REDD+ programme has emerged.

3.3.1 Background

Guyana contains one of the most intact tracts of primary tropical rainforest in the world (Osborne & Kiker, 2005). Primary forest makes up almost 45% of the country's forest which covers over 75% of its land area (FAO, 2010b). There are a number of different estimates of the exact level of forest cover – mainly due to the lack of data. These range from 15.2 million ha reported by the Food and Agricultural Organization (FAO) in 2010 (FAO, 2010a) to the 18.4 million ha of forested area reported by Guyana Forestry Commission (2012a). The forest area in Guyana represents around 0.4% of global forest cover and around 2% of that in South America (FAO, 2010a).

There are few historic estimates of the carbon stock of the forest area in Guyana. The FAO (2010) assess that there is 16.29 Gt CO₂ in the living biomass in Guyana and a total of 24.11 Gt CO₂ once dead wood and litter are included. Alder & Kuijk (2009) estimate a total carbon stock of 18.4 GtCO_{2e} for the total land area as a whole. To put these numbers in perspective they are in the range of three times China's total carbon emissions in 2007, but are small in the context of total global forest carbon stocks, representing less than 1% of the global total.⁷⁵

⁷³ Amerindian Act s29:01 s38, 41

⁷⁴ Bulkan, (2013) pp. 375

⁷⁵ Based on the calculations on the global carbon content of forests in Y. Pan et al., (2011).

3.3.2 Deforestation

Guyana is a representation of a High Forest cover, Low Deforestation rate (HFLD) country. Historical estimates of forest cover and deforestation rates have suffered through lack of data but estimates of annual deforestation are extremely low, in the region of 0-0.5% (Cedergren, 2009). The FAO estimated rates of 0.1-0.3% (FAO, 2005), while Earthtrends (2003) estimate that forest area had decreased by 3% between 1990 and 2000, an annual rate of 0.3%. Alder & Kuijk (2009) estimated total deforestation and degradation between 1962 and 2001 at 24,965km², 16% of the current total forested area. They estimated an annual rate of deforestation of 0.4% since 1950 – a rate which they estimate produces 46.9MtCO₂e annually.

As part of the REDD+ agreement with Norway (discussed in detail below in Section 3.4) Guyana has embarked on establishing a Monitoring, Reporting and Verification (MRV) System for assessing its forest cover and deforestation rates. Annual reports emerging out of this system give more detailed and up-to-date deforestation data. A report in 2010 placed deforestation rates at just 0.03% per annum between 2000 and 2009 – with a rise to 0.056% in 2009-2010 (Guyana Forestry Commission & Poyry Forest Industry, 2010). The report produces the first spatially explicit estimates of deforestation. The frontiers of deforestation can be seen in Figure 3.5, with clusters located in the North-Western areas, concentrated around existing mining areas. A similar report in 2012 updated these statistics showing a slightly reduced level of annual deforestation between 2010 and 2011 of 0.054% per annum (Guyana Forestry Commission & Indufor, 2012). The updated numbers for 2012 were issued in 2013 showing deforestation rates rising to 0.08% (Guyana Forestry Commission & Indufor, 2013)

Image removed for copyright reasons

Figure 3.5: Total forest loss 1990-2010

Source: Guyana Forestry Commission & Poyry Forest Industry, (2010)

The development of the MRV system has also led to the first estimates of the scale of the different drivers of deforestation, identifying mining as the largest historical driver of deforestation (Figure 3.6). Mining is predominantly for gold and small-scale in nature (discussed in more detail in Section 3.5). The rise in deforestation rates observed between 2006-2009 and 2009-2010 was almost exclusively the result of increases in mining activity. In contrast the role of forestry in deforestation fell dramatically in this period. Potential explanations for this shifting in the balance of drivers are improvements in the management structures of logging concessions that have occurred through recent reforms in the GFC, and the recent sharp rises in the international gold price, leading to greater mining activity as the labour force switches from small-scale chainsaw harvesting to the

mining sector. A further explanation may lie in increased utilisation of mining claims in the light of potential future tighter regulations on mining activity as part of Guyana's REDD+ activities. In this way the REDD+ mechanism may be starting to create perverse incentives in Guyana.⁷⁶

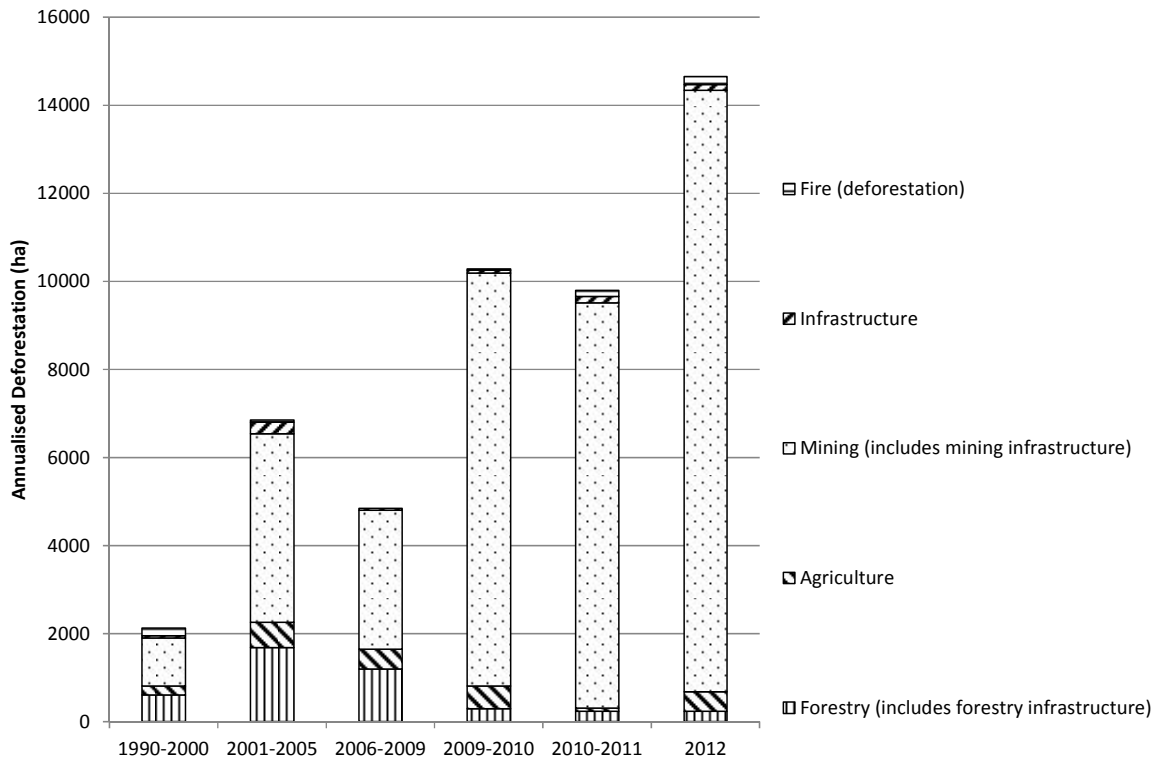


Figure 3.6: Annualised Area Deforested by Driver

Source: Guyana Forestry Commission & Indufor, (2013)

Future deforestation threats

Although Guyana has experienced relatively low levels of historic deforestation there are reasons to believe that this rate may rise under a business-as-usual (BAU) scenario. Guyana could be thought of as at the start of the forest transition as hypothesised by authors such as Mather (1992) and Grainger (1995) - implying higher future rates of deforestation as population pressures increase and access to the forest improves.

There have been two major studies that have attempted to estimate the future deforestation path of Guyana. The first of these was commissioned by the Office of the President of Guyana and produced by McKinsey & Company (Office of the President, 2008). The report set out an 'economically-rational' deforestation baseline – a rate of deforestation that it assesses would maximise the economic opportunities for the Guyana populace. In order to identify this baseline it

⁷⁶ This issue is investigated in greater depth in Chapter 5.

creates an 'Economic Value to the Nation' (EVN) of deforestation in Guyana⁷⁷ – with the value of the forest identified in four areas: standing timber value; post-harvest land-use; avoided protection costs and loss of local ecosystem services. The result of this analysis gives an 'economically rational' deforestation path that leads to forest loss of about 4.3% per annum over the course of the next 25 years, leaving just 10% of current forest area intact in the form of protected areas. A probabilistic analysis gives a range of EVN between US\$4.3 billion and US\$23.4 billion, with an 'assessed most-likely-value' of US\$5.8 billion. In addition the report identifies the 'Economic Value to the World' of the Guyanese forest area at 7 and 80 times higher than the EVN.⁷⁸

The report and its findings helped form the basis of Guyana's involvement in the REDD+ process and helps to determine the level of finance that would be required. The report has encountered criticism however regarding the extremely high rates of deforestation it predicts, and regarding some of the assumptions it makes relating to the potential for agricultural production on post-clearance forest areas (Greenpeace, 2011a).

The second report focuses on the impacts of the proposed development of a paved road between Georgetown and the town of Lethem on the Brazilian border (Alexander et al., 2009). The development of this Georgetown-Lethem transport corridor has been identified in a number of national plans as one of the highest priority projects in the country (Government of Guyana, 2000). The report aims to assess the deforestation, and the resulting emissions, that would result from the construction of the road. In order to produce these estimates the report identifies four-national level scenarios of deforestation pathways: a nostalgic past scenario where development continues along historical trends with deforestation at 0.05% per year; a BAU scenario with deforestation rising to 0.5% per year; an insufficient REDD+ scenario where Guyana initially participates in REDD+ but due to insufficient finance deforestation increases from 0.1% per year until 2015 to 0.5% afterwards; and an effective REDD+ scenario where sufficient finance keeps the deforestation rate at 0.1% per year, notably still above the historic rate of deforestation.

The two reports help highlight two key facts: first the difficulties in estimating future deforestation rates, especially when a country is expected to undertake rapid development as compared to historical trends (such as is the case with Guyana); second that Guyana is likely to experience rapid acceleration in deforestation rates and new policies and sources of finance are required to avoid this scenario.

⁷⁷ This is equivalent to the private costs of deforestation faced by the Guyanese population as a whole.

⁷⁸ The Economic Value to the World is analogous to the overall social cost of deforestation. The difference between the EVN and the Economic Value to the World represents the market failure associated with deforestation discussed in Chapter 2.

3.3.3 Land Tenure

The majority of forest area in Guyana is owned directly by the state. The State Forest Estate (SFE) and State Lands grew out of the Crown Lands of the old British colony and now account for 83% of total land area (Guyana Forestry Commission & Indufor, 2012). The SFE is managed by the GFC, with the responsibility for managing State Lands falling to the GFC, the GGMC and the GLSC, depending on whether the land-use is forestry, mining or agriculture. Over half of the SFE has been granted as logging concessions (Figure 3.7). In addition numerous mining claims are granted in the SFE, often overlapping these concessions. Privately held land is dominated by community-titled Amerindian Land, approximately 13.9% of total land area with the remainder accounted for by privately-held land along the coast used for housing and agriculture.

Forestry

There are three types of forest concessions for harvesting granted in Guyana:

- State Forest Permissions (SFP) are granted on a bi-annual basis (with possibility of renewal) for small areas of state forest less than 8,097 hectares. They are granted to small operators, communities and cooperatives operating, primarily, chainsaw logging. In 2012 there were 416 of these permits, covering 12.3% of the state forest (Guyana Forestry Commission, 2012).
- Wood Cutting Leases (WCL) are granted for between 3 and 10 years for areas between 8,097 and 24,291 hectares. There were only 2 in existence in 2012 covering just 0.2% of state forest (Guyana Forestry Commission, 2012).
- Timber Sales Agreements (TSA) are granted for between 25 and 30 years for areas greater than 24,291 hectares. These concessions are operated by large commercial interests, both Guyanese like Toolsie Persaud Inc. and foreign owned like Barama. TSAs cover the majority of the SFE granted for production, with 27 concessions covering almost a third of the total SFE area (Guyana Forestry Commission, 2012).

In addition to these harvesting permits there is the option of a State Forest Exploratory Permit (SFEP) that is valid for 3 years at the end of which the permit can be upgraded to a TSA or WCL as applicable. In 2012 there were six of these permits covering 6.9% of the state forest (Guyana Forestry Commission, 2012).

Image removed for copyright reasons

Figure 3.7: Forest Tenure and Logging concessions in Guyana

Source: Guyana Forestry Commission & Poyry Forest Industry (2010)

Mining

All sub-soil resources are the property of the state in Guyana, including those on privately-held and Amerindian-owned land.⁷⁹ Mining concessions for rights to mine on state owned land are granted by the GGMC,⁸⁰ while in order to mine on Amerindian land permission is required from two-thirds of the community,⁸¹ although for large-scale operations the government may grant approval with no local consent.⁸²

There are three types of mining claims that can be issued in Guyana:

- Small claims are issued for areas of 1,500 feet by 800 feet (approximately 27.5 acres) or up to one mile of navigable river.⁸³ Under existing regulations miners can locate the claim and then apply to the GGMC for approval after activity has begun. These are by far the most common claim in Guyana.
- Medium claims are available for areas between 150 and 1200 acres. These claims come with extra layers of regulation such as the requirement to submit an Environmental Management Plan,⁸⁴ that have proved a deterrent for their uptake, exacerbated by the fact that there is no limit to the number of small claims that any individual can hold. A number of small claims are often grouped together to effectively form a medium scale mine, but without the regulatory burden (International Human Rights Clinic, 2007).
- Large claims are for mining areas above 1200 acres and are predominantly used by multi-national mining operations. There are currently no large-scale gold mining operations, and only two bauxite operations, although a large number of gold operations are in the application, exploratory and planning phase.

Historically there has been a lack of coordination between mining and forestry claims, and the regulatory infrastructure generally places the rights of miners above other land-uses (International Human Rights Clinic, 2007). This has led to confrontation between forestry and mining interests, leading to both conflict and environmental degradation. In order to address a number of these issues a Special Land-Use committee (SLUC) was established to produce recommendations for

⁷⁹ Mining Act Cap 65:01 s6.

⁸⁰ Mining Act Cap 65:01 s7.

⁸¹ Amerindian Act Cap 29:01 s48.

⁸² Amerindian Act Cap 29:01 s50.

⁸³ Regulations under the Mining Act s12.

⁸⁴ Mining (Amendment) Regulations No 3 of 2005 s226.

improvement in the regulations, especially in the light of Guyana's new REDD+ policy (see Section 3.4).⁸⁵

Amerindian Communities

The legal basis of Amerindian land ownership and titling is the Amerindian Act of 2006 that superseded a previous act dating back pre-independence. This Act establishes clear processes for titling of communities and the rights of those titled communities. A titled Amerindian community owns the land area and also the forest resources of the land and can determine who can use those resources, with the proviso that any forest products sold outside of the community requires a permit from the GFC. With regard to mining Amerindian communities have traditional privilege to mine, along with the right to veto any small or medium scale mining activity on their land. Importantly they do not have the right to veto any large scale mining operations if the government has deemed that project in the national interest.

Protected Areas

Historically Guyana had one official protected area, the Kaieteur National Park dating back to 1929. However with the passing of the Protected Areas Act in 2011 the framework was established to move two other areas, the Kanuku Mountains, in the south-west of the country near the border with Brazil and Shell Beach in the north west of the country close to the border with Venezuela, toward Protected Areas status.

In addition to these protected areas there are three other unique forest conservation endeavours in the country. The Iwokrama International Centre for Rainforest Conservation and Development (IIC) was established in 1996 as a result of an agreement by the Government of Guyana and the Commonwealth Secretariat to: *'promote the conservation and the sustainable and equitable use of tropical rainforests in a manner that will lead to lasting ecological, economic and social benefits to the people of Guyana and to the world in general'*.⁸⁶ IIC manages 371,000 hectares of forest, situated in Region 8 through an act of parliament.⁸⁷ The area of rainforest is equally divided between a wilderness preserve and a sustainable utilization area (Watkins, 2005). In 2007 sustainable logging started, with Forest Stewardship Council certification being granted in 2008. IIC has also developed eco-tourism opportunities and other alternative livelihood activities, including butterfly farming,

⁸⁵ The SLUC is a body comprising government and non-government officials established to examine issues regarding mining, forestry and land-use. It emerged after a protest by miners regarding the LCDS (Stabroek News, 2010b).

⁸⁶ Extract from <http://www.iwokrama.org/about-us/>.

⁸⁷ The Iwokrama International Centre for Rain Forest Conversation and Development Act Cap 20:04.

with both the local Amerindian community of Fairview, located within its boundaries, and also communities outside the area through the North Rupununi District Development Board. The Iwokrama reserve has been excluded from the MOU with Norway (see Section 3.4) as it operates under a separate legal tenure than the SFE.

In July 2002 Conservation International's (CI) Guyana office and the Government of Guyana (GoG) reached an agreement to establish the Upper Essequibo Conservation Concession (UECC), an area of 200,000 acres that was protected via a mechanism where CIG obtained a 30-year logging license and pays the government fees commensurate to those that would have been paid by a logging company (Conservation International, 2008; Rice, 2002). The agreement between CI and the government came to an end in 2012 with the area reverting to the SFE.

In February 2004, GoG issued a title to more than 1 million acres of land in the Konashen Indigenous District in the far south of the country, declaring this land as the Konashen Community-Owned Conservation Area (COCA) to be managed by the Wai Wai community. This followed a request made by the Wai Wai to the government of Guyana and CIG for assistance in developing a sustainable plan for their lands. The three parties signed a Memorandum of Cooperation which outlines a plan for sustainable use of the COCA's biological resources, identifies threats to the area's biodiversity, and helps develop projects to increase awareness of the COCA as well as generating the income necessary to maintain its protected status.

3.4 Guyana and REDD+

Guyana has embarked on one of the most ambitious national REDD+ programmes in the world. The programme is built on the twin pillars of an MOU with Norway which provides financial incentives to Guyana to maintain a low deforestation level, and the LCDS which outlines a vision for the future development of the country and highlights how the revenue from the Norway agreement will be utilised. In addition Guyana is a participant in the Forest Carbon Partnership Facility (FCPF) and is developing REDD+ plans in accordance with this process. The vast majority of finance and activity relates to the MOU with Norway and the LCDS however and the remainder of this thesis will focus on these twin pillars. This section first provides an outline of the architecture of the MOU, before briefly describing the LCDS, its development through consultation and current governance mode and its implication for forest rights holders.

3.4.1 The Memorandum of Understanding with Norway

In 2006, as REDD+ discussions were emerging in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations, President Jagdeo is reported to have made a public offer to

the UK to then Prime Minister Tony Blair to *'deploy almost our entire rainforest - which is the size of England - in the long term service of the world's battle against climate change'*.⁸⁸ The UK did not take Guyana up on this offer but on the 9 November 2009 in Fairview Village, within the IIC, the Government of Guyana signed a MOU with the Government of Norway regarding *'Cooperation on Issues related to the Fight against Climate Change, the Protection of Biodiversity and the Enhancement of Sustainable Development'* (The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), 2009).

The objective of the MOU is to *'foster partnership between Guyana and Norway on issues of climate change, biodiversity and sustainable low carbon development'*, and *'the establishment of a framework for results-based Norwegian financial support to Guyana's REDD-plus efforts'*.⁸⁹

The MOU was accompanied by a Joint Concept Note (JCN) that established the framework for collaboration. The JCN was revised in 2011 and again in 2012 (Government of Guyana & Government of Norway, 2012). The key points of the framework are:

- Norway will provide Guyana with finance of up to US\$250 million over the period 2010-2015
- Finance will be channelled through a financial mechanism called the Guyana REDD+ Investment Fund (GRIF) managed by the World Bank.⁹⁰ The fund is structured to allow contributions from a number of different contributors, although at present Norway is the only contributor.
- Finance will be paid post-delivery of results measured on two sets of indicators:
 - o Indicators of Enabling Activities including the establishment of a strategic framework, a continuous multi-stakeholder consultation process, a strong governance environment and respect of the rights of indigenous peoples and other local forest communities as regards to REDD+; and,
 - o REDD+ Performance Indicators- a system of forest-based Greenhouse gas emissions related indicators, to be substituted as a system of MRV is established, the timeframe of which is set out in a MRV roadmap.
- Finance will be used to implement Guyana's LCDS and Guyana's efforts in building capacity to improve overall REDD+ efforts.
- Pending the determination of a UNFCCC reference level methodology the 'combined reference level' methodology (discussed in Chapter 2 Section 2.4.1) will be used with Guyana's reference

⁸⁸ Stabroek News, (2007).

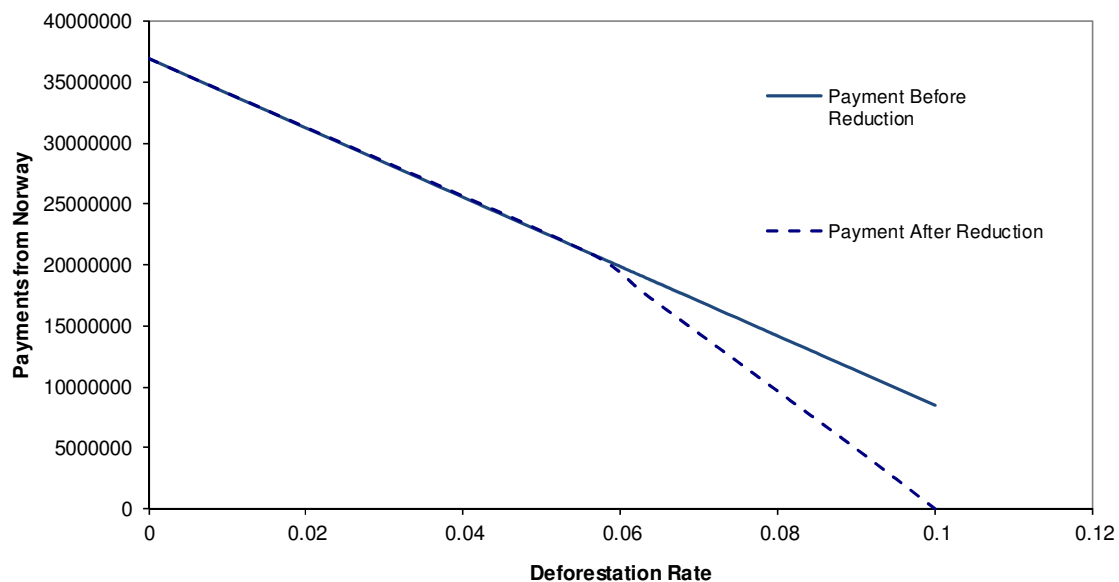
⁸⁹ The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), (2009) pp. 2.

⁹⁰ The GRIF is discussed in much greater depth in Chapter 7.

level set at an average of Guyana's mean 2000-2009 deforestation rate and the mean 2005-2009 rate in developing countries with deforestation. This methodology results in a reference level of 0.275% for Guyana.⁹¹

- Payments are calculated by subtracting Guyana's observed deforestation rate from the reference level and applying carbon-density proxies and an interim carbon price of US\$5 per tonne CO₂e.

In the June 2011 revision of the JCN a further clause was inserted which creates an 'agreed maximum level of deforestation' (Government of Guyana & Government of Norway, 2011). This is a level of deforestation, set at 0.1%, above which Guyana will receive no payments, even if deforestation is below the reference level. For deforestation rates below 0.1% payments will be calculated on the basis of the reference level described above, with the proviso that if deforestation should be below 0.1% but exceed 0.056% payments will be reduced by a sliding scale of percentages that rise as deforestation approaches 0.1%.⁹² This 'agreed maximum level of deforestation', below the reference level, is a unique concept and has not been previously discussed in the literature. The implications of agreeing such a level means that as deforestation rates rise Guyana receives less finance than it would if such a level (and the graduated reduction) were not in place (Figure 3.8).



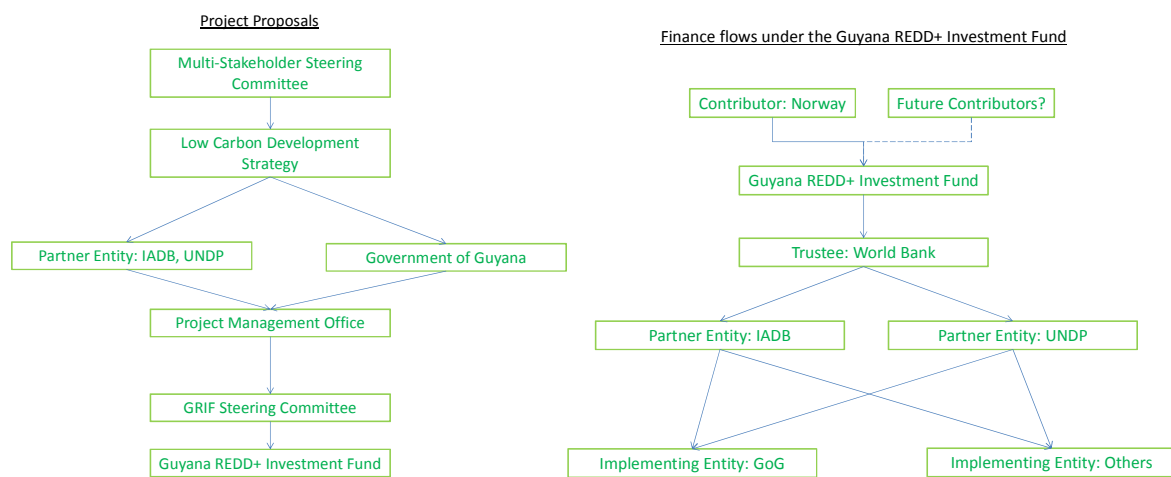
⁹¹ This is a result of the mean value for Guyana being calculated as 0.03%, and a global rate of 0.52% from FAO (2010). Prior to this data becoming available in early 2011 the level was determined as 0.45% resulting from an estimated global rate of 0.6% and a rate for Guyana at 0.3%.

⁹² Any deforestation resulting from the construction of the Amaila Falls hydroelectricity project, funded under the LCDS will not be counted towards this maximum allowable level of deforestation, but will reduce the level of payments under the standard calculation.

Figure 3.8: Potential annual payments from Norway under the MOU⁹³

Source: Author

Funds are disbursed from the GRIF for projects identified by GoG through its LCDS. Authorisation is required from a GRIF steering committee comprising members of the GoG, the Kingdom of Norway and international civil society. Funds are then disbursed through partner entities (currently the Inter-American Development Bank (IDB), the United Nations Development Programme (UNDP) and the World Bank) with projects then implemented by the relevant governmental department of the Government of Guyana. A Project Management Office (PMO) has been established within the Office of the President to oversee all projects within the LCDS. The structure of project proposals and finance flows under the GRIF is shown in Figure 3.9.

**Figure 3.9: Structure of project proposals and finance flows under the GRIF**

Source: Author

As of March 31, 2013 annual payments totalling US\$69.8 million had been received by Guyana (The World Bank Group, 2012b). Currently funding decisions have been made for two projects, Institutional Strengthening of key government institutions for US\$5.94 million and a Micro and Small Enterprise Development Fund project for US\$5 million, with project preparation fees of US\$2.5 million disbursed to five projects including an Amerindian Development Fund (The World Bank Group, 2012b). Given that the MOU is now in its fourth year the fact that such a small amount of finance has been disbursed indicates some inefficiency in the disbursement structure. These difficulties are discussed further in Chapter 7.

⁹³ Emissions from degradation are also accounted for in the MOU, but the final details of how this will occur are still being negotiated. For the calculation of this representative chart it was assumed degradation occurs at its historical rate in approximately 90,000 ha from Guyana Forestry Commission (2010), with a carbon loss of 25t/ha.

The scale of the finance Guyana is receiving from Norway is significant compared to the size of the government budget. Assuming an approximate annual payment of US\$50 million per annum this is more than 5% of the total government budget of Guyana which totalled approximately US\$880 million in 2013 (Stabroek News, 2013a).

There is no formal discussion of carbon rights in the MOU with no carbon credits, formal or otherwise being transferred between Guyana and Norway (Office of the President, 2013). The agreement is purely voluntary with Norway providing finance only in return for verified reductions in deforestation, with no tangible product in return. Thus although there is a firm agreement between Guyana and Norway regarding finance flows it is by no means a contractual situation with Norway obtaining rights to either Guyana's forests or the carbon within them. At the start of the agreement it was anticipated that by 2013 purchases of REDD+ credits from Guyana from carbon compliance markets would start to replace the transitional finance from Norway (Office of the President, 2009), however as doubts have emerged regarding such markets this expectation has reduced with such discussions removed from later documents (Office of the President, 2013). Whether the current voluntary arrangement will transition to a more formal transfer of carbon rights in exchange for finance to either public funding bodies such as Norway or to private entities remains to be seen.

3.4.2 Low Carbon Development Strategy

Guyana formally launched its LCDS on June 8, 2009, prior to the signing of the MOU with Norway. The document is built on a vision of President Bharrat Jagdeo who said:

*'we want to be a part of a global coalition that stimulates innovation and creativity to enable us to leapfrog over the high-carbon development path that today's business-as-usual trajectory suggest we must follow.'*⁹⁴

The nature of the LCDS was described succinctly by Mr Shyam Nokta Head of the Office of Climate Change (OCC):

"the LCDS tries to do two things: assist in sustainable forest management and forest conservation, that would help us and the international community address the global issue of climate change. But to deploy our forest in a manner whereby in doing this we can earn revenue that would help to move our economy along a low-carbon growth path whereby we can try to at least have more efficiency in the way we utilise our natural resources and at the same time ensure that we can safeguard and protect forest what it does is draws out some of the critical components of [the National

⁹⁴ Office of the President, (2013) pp.2.

Development Strategy and the National Competitiveness Strategy] and integrates them within the framework of REDD+.”⁹⁵

The LCDS is the firmest embodiment of REDD+ policy in Guyana. The strategy has a wider ambition than REDD+, with objectives touching all sectors of the economy, and the whole country. It represents how finance from the MOU with Norway is to be utilised in transitioning Guyana to a low-carbon pathway, including reducing emissions from deforestation.

The document provides the overall framework for the re-orientation of Guyana’s economy towards a low-carbon development pathway with REDD+ being the framework through which this re-orientation will be achieved. The LCDS was produced in parallel with the negotiations with Norway regarding the national REDD+ framework, outlined in the MOU. Following the production of the first draft in 2009 a Multi-Stakeholder Steering Committee (MSSC) was formed to guide the document and a series of national consultations was undertaken.⁹⁶

The Strategy is built on eight key strategic areas:

1. Renewable Energy – this focuses on the development of a 160MW Hydropower facility at Amaila Falls
2. Amerindian Development – this consists of hinterland renewable energy chiefly through the installation of solar panels and the development of an Amerindian Development Fund (ADF) to fund the socio-economic development of Amerindian Communities through Community Development Plans
3. Amerindian Land Titling – prioritising the titling and demarcating Amerindian communities
4. Expanding the Digital Economy and Avoiding a Digital Divide. This involves three main projects:
 - a. Development of a new fibre optic cable linking to Brazil’s telecommunications network
 - b. A One Laptop per Family Project that provides internet-ready mobile computers to families across the country
 - c. Telecommunications Liberalisation
5. Support for Medium and Small Enterprises and Vulnerable Groups – this involves the creation of a US\$10 million fund to enable low-carbon opportunities among small business and community groups
6. The establishment of a Centre for Bio-Diversity Research and Curriculum Development at the University of Guyana
7. Climate Resilience and Adaptation

⁹⁵ Nokta, S. (personal communication, December 16, 2011).

⁹⁶ The MSSC is examined in more depth in Chapter 6.

8. MRV and other LCDS Supporting Tasks

Work has been undertaken under each of these strategic areas with projects established in areas 2,4,5 and 8. Table 3.3 outlines the earned and projected payments from the MOU and how the payments are being allocated to the various key strategic areas and projects.

Table 3.3: Investment of Funds from Climate Services 2009-2014 (US\$ millions)

Source: Office of the President, (2013)

Sectors	2009-2011	2012	2013	2014
<i>Earned and Projected Payments</i>				
High End	115	45	45	45
Low End			74	74
<i>Allocation to LCDS Investments</i>				
<i>Low Carbon Economic Infrastructure</i>				
Amaila Falls	80			
Low Carbon Transportation			1	1
<i>High Potential Low Carbon Sectors</i>				
Micro and Small Enterprise	10	5	5	5
Eco-Tourism Development		2	2	2
Aquaculture		3	3	3
<i>Hinterland Development</i>				
Amerindian Development Fund	6	5	5	5
Amerindian Land Titling	7.5			
ICT Hinterland Access Programme		3	3	3
Hinterland Distance Learning through ICT		2	2	2
<i>Human Capital</i>				
Bio-Diversity Research Centre	2.5	1.5	2.5	2.5
Institutional Strengthening	6.5	7	7	7
Curriculum Development	0.5			
<i>Adaptation</i>				
Canal Rehabilitation	2			
Hinterland Adaptation Measures				10
Coastal Infrastructure		15	12-40	7-36
Comprehensive Adaptation and Climate Resilience Programme		0.5		
Strengthening of the Hydro-metrological Service Monitoring System		1		
Total	115	45	45-74	45-74

The LCDS is delineated into four phases. Phase 1 occurred in 2009 and involved launching the Strategy, undertaking national consultations and initial development of a MRV system, also encompassing the signing of the MOU with Norway. Phase 2 extends from 2010 through to 2015 and outlines Guyana's participation in the interim REDD+ arrangement, focusing on funding from the MOU with Norway, and drawing in further bilateral arrangements and fast-start funding. The aim of the phase is to undertake between five and ten priority infrastructure projects to re-orient the

economy, and to attract major international investors in at least 3 key sectors: hydropower, high-end fruit and vegetables and aquaculture. Alongside this Guyana plans to integrate forest land-use policies within the LCDS, through integrated land use planning for forestry, mining and other forest-based land uses. In the forestry sector the government aims to generate more value from the limited portion of the forest where sustainable forest harvesting will be permitted. In the mining sector the government aims to improve enforcement of existing regulations, increase coordination between forestry and mining activities and phase in the post-extraction site restoration that is already present in legislation but not in practice.

The LCDS leaves open the possibility of compensation to those whose livelihoods have been negatively affected as a consequence of REDD+ activities. A key component of Phase 2 of the LCDS is investment in communities and human capital recognising *'a balance between using forest payments to enhance the opportunities for those who live in the forest and recognising the rights of other Guyanese citizens, including the urban poor'*.⁹⁷ In order to achieve this Guyana plans to invest a significant share of any finance received from forest protection in improving job prospects, diversifying the employment base, encouraging private sector entrepreneurship and deploying micro-finance to support alternative livelihoods. In these ways REDD+ finance will be utilised to benefit communities beyond the forest, who are directly causing little or no deforestation today. These urban communities stand to benefit from the improved infrastructure and job opportunities that the LCDS can bring, without bearing the costs that those causing the deforestation will have to face.

The role for compensation for those individuals and industries causing deforestation, and therefore may be required to change behaviour or indeed to shift livelihoods away from forest extractive industries, such as mining, is not so clear. While the government has made explicit statements to the fact that large concessionaires will be allowed to continue with their operations in accordance with existing legislation, they will have no access to any REDD+ "profits" and will have no right to trade in emissions credits (Office of the President, 2010b). Statements such as this seem to place carbon rights firmly in the hand of the government. There are statements, however, that indicate that payments could be made to those whose livelihoods may be negatively affected by emissions reductions. Who these people are and how they are to be identified and compensated is unclear at this stage but could open the door to direct payments to operators such as small-scale miners in return for cessation or reduction in their activities.

⁹⁷ Office of the President, (2010) pp. 33.

The components of Phase 3 and Phase 4 of the LCDS, which span 2013 to 2020 and 2020+ respectively, are less clearly defined at this stage. In Phase 3 Guyana aims to continue investment in high priority low-carbon economic infrastructure and start to realise transformation in new targeted industrial sectors. It also aims to build further capacity to manage and invest REDD+ related funds, drive economic development projects and deploy an MRV system. Guyana also aims to agree the first set of private sector REDD+ investments, which will export forest offset credits into any Greenhouse Gas compliance trading markets that have sufficient access. How these investments will be structured is still to be determined. How such private sector investments will fit into the baseline that is being used for the agreement with Norway is also unclear. By the beginning of Phase 4 the government aims that financial flows from REDD+ markets will be at the level of EVN or above, with no need for further international fund-based payments. This statement indicates that a much higher baseline is envisaged in order to meet the level of finance required to meet the EVN. Such amplification of the baseline above the current level does raise questions of additionality.

A further option could be the scaling down of the Norwegian finance, to be replaced by private sector investment. The nature of the agreement with Norway, where payments are made on an annual basis with only deforestation avoided in that year being accounted and paid for, means that there should not be issues with double counting between such an agreement and future market-based credits. The issue of permanence, however, does need to be addressed. Reversals of deforestation avoided, beyond the lifetime of the MOU with Norway (currently 5 years), has not been addressed. Given the long-term nature of the REDD+ challenge this raises the question as to whether the structure, as currently envisaged, can provide the long-term incentives required to help Guyana move to a low-carbon development pathway.

Consultation and Governance

The launch of the LCDS in June 2009 was followed by a period of consultative activity between June and August 2009. This consisted of a set of 15 sub-national consultations at which 222 communities were represented and (including the attendees of the launch) involved 3,285 people.⁹⁸

An oversight body was established to manage the consultations and the development of the LCDS, the MSSC. The first meeting was held on June 11, 2009 and the composition of the committee has been flexible, but includes the President, Ministers, Heads of government agencies, other civil

⁹⁸ This represents almost 0.5% of the total population of Guyana. Data is compiled from www.lcds.gov.gy.

servants, local and international NGOs, civil society, industry associations, indigenous people representatives and trade unions. To date there have been 56 meetings of this committee.⁹⁹

As a result of the consultations and the evolving situation in Guyana a second draft of the LCDS was released in May 24, 2010. A third draft was released in March 2013 reflecting the progress on some of the projects and some changed priorities. The efficacy of the MSSC and the consultation process are discussed in more depth in Chapter 6.

The formation of the LCDS, and the mechanisms and institutions created to implement it represent the firmest example of REDD+ policy in Guyana. The LCDS is a document and a strategy that impacts on a wide number of sectors and the whole country and economy of Guyana. It impacts actors far and wide across Guyana. An initial analysis of secondary reports, newspaper stories, and initial interviews,¹⁰⁰ yields a general characterisation of the different actors involved in REDD+ and LCDS governance in Guyana, and the scale at which they operate. These can be seen in Figure 3.10. In addition to individual actors there are a number of institutions that serve to bring collaboration between actors at different scales, or between actors at the same scale. The two key mechanisms in this regards, are the MSSC and the GRIF Steering Committee, but in addition the NTC that brings together the Tosaos (or elected chiefs) of each Amerindian titled village together into a national-level entity is also important.

Supranational	GRIF Steering Committee	<u>Donors/Funders/ Buyers</u> UNFCCC, FCPF, World Bank, Norway, IBD, UNDP, KfW, GRIF	<u>NGOs/Policy Actors</u> CI, WWF, McKinsey, IIED, Rainforest Alliance. Global Canopy Programme
National		<u>Governmental Actors</u> PMO, OCC, GFC, GGMC, EPA, MoAA, MNRE	<u>Non-governmental actors</u> CI-Guyana, APA, TAAMOG, GGDMA, FPA, Civil Society
Sub-national	National Tosaos Council	<u>Governmental Actors</u> Tosaos, Village Councils,	<u>Non-governmental actors</u> Industry, Local political activists, Iwokrama

Multi-Stakeholder Steering Committee

Figure 3.10: Multi-level actors for REDD+ in Guyana

Source: Author

⁹⁹ Correct as of September 20, 2013. Current membership of this committee is in Appendix 1. Information from www.lcds.gov.gy.

¹⁰⁰ Details on the media articles and interviews are discussed in Chapter 6.

Forest right holders and the LCDS

The LCDS is still a relatively immature document in Guyana and has few legal institutions to support it. With regard to how the LCDS will affect the various stakeholders who have different rights to the forest area only a small amount of information can be gleaned from GoG documentation.

The clearest statements made so far are those regarding the Amerindian communities. Currently the MOU with Norway covers just the SFE, those communities who have full title to their land lie outside the agreement. Both the LCDS, and the MOU through the JCN, make explicit reference to the fact that titled Amerindian communities will be able to 'opt-in' to the REDD+ agreement, with no deadline for decision. Should they choose to participate communities will receive 'a pro-rata share of forest compensation payments' (Office of the President, 2010a), although there has been no decision so far on whether money will flow to communities directly, through a fund, or a combination of both. There has been no indication made so far of any future stipulation made on communities who choose to participate beyond having to comply with existing forest regulations and the need to determine any action they might take on the use of traditional rotational farming methods.

The main policy lever the LCDS is employing against both the forestry and mining sectors is increased enforcement of existing regulation, and perhaps new legal instruments. How effective this will be, and the political acceptability of such action, remains to be seen. The difficulties that such policy changes involve can be seen in one recent example from Guyana. As a result of land disputes between the forestry and mining sectors the government proposed to introduce a new 6-month notification period in any new small-scale mining claim. This was to allow the exploitation of any timber in that area prior to clearance by mining activity. This regulation, along with a general sense of disenfranchisement from the process of the LCDS, and the potential threats it may bring to their livelihoods, led to a large protest in the mining town of Bartica in February 2010, that shutdown the town (Stabroek News, 2010a). In response to these protests the government made a number of public statements regarding their aim to allow small-scale mining to continue, along with launching a consultative committee, the SLUC comprising both government and non-government parties to discuss the issues. How such statements couple with the wider goals of the LCDS, and the fact that the main driver of deforestation is this mining activity is unclear.

Guyana's LCDS provides an innovative form of utilising the finance earned through REDD+. It focuses on changing the trajectory of Guyana's economy on to a low-carbon path through a range of projects and policies, coupled with higher levels of enforcement in the extractive sectors. The LCDS is still at

an early stage in its implementation and firm policy is still evolving, leading to uncertainty on the future direction of regulation in industries such as forestry and mining. How this uncertainty is impacting the holding of property rights for mining is investigated in Chapter 5 of this thesis.

3.5 Mining in Guyana

3.5.1 Background

As has been highlighted in Section 3.2.3 mining is now the most important economy activity in Guyana. However as discussed in Section 3.3.2 it is also the major driver of deforestation and the main current threat to the success of Guyana's REDD+ programme. The mining industry has an important role to play in relation to REDD+ and this thesis, first providing the deforestation landscape in which REDD+ has been imposed, and secondly in helping to shape the LCDS and the REDD+ governance structure. Understanding the nature of the mining industry in Guyana is thus vital before moving on to answering the key research questions identified in Chapter 1.

Mining has been an important feature of Guyana's economy since the Emancipation of slaves in 1838 created a wave of 'pork-knockers' – small-scale miners who traversed the many rivers of the country's interior seeking gold (Dalgety, 2010). Production has focused on gold (predominantly through placer mining¹⁰¹), diamonds and bauxite, with gold and diamond production from small-scale operators (with the exception of one large gold mine at Omai which operated between 1993 and 2005), and bauxite from large.

The importance of mining in Guyana's economy has grown rapidly in recent years as the small and medium-scale gold mining industry has boomed. Production has increased dramatically and, with rising international prices, revenues have grown (Figure 3.11, Figure 3.12). Mining has become an important employment opportunity for many skilled and unskilled workers with anecdotal evidence that it is drawing in employment from other main economic activities such as sugar and forestry (Guyana Chronicle, 2012b; Kaieteur News, 2013). As the majority of mining takes place in remote, unpopulated regions, it generally relies on migrant labour, predominantly from the coast, but also from local Amerindian communities. It is thus an important provider of livelihoods to communities across Guyana, but also draws labour away from other economic activities.

¹⁰¹ Placer mining is the mining of alluvial deposits for minerals.

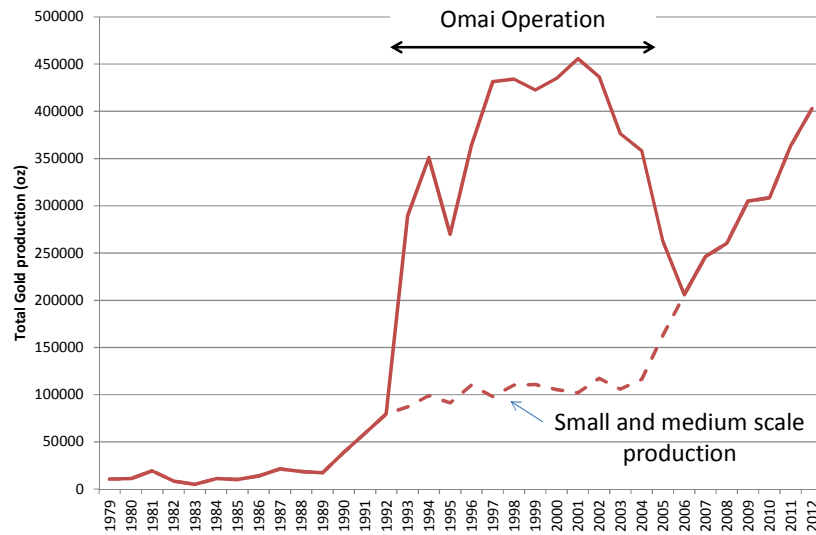


Figure 3.11: Total declared gold production in Guyana 1979-2012

Source: GGMC

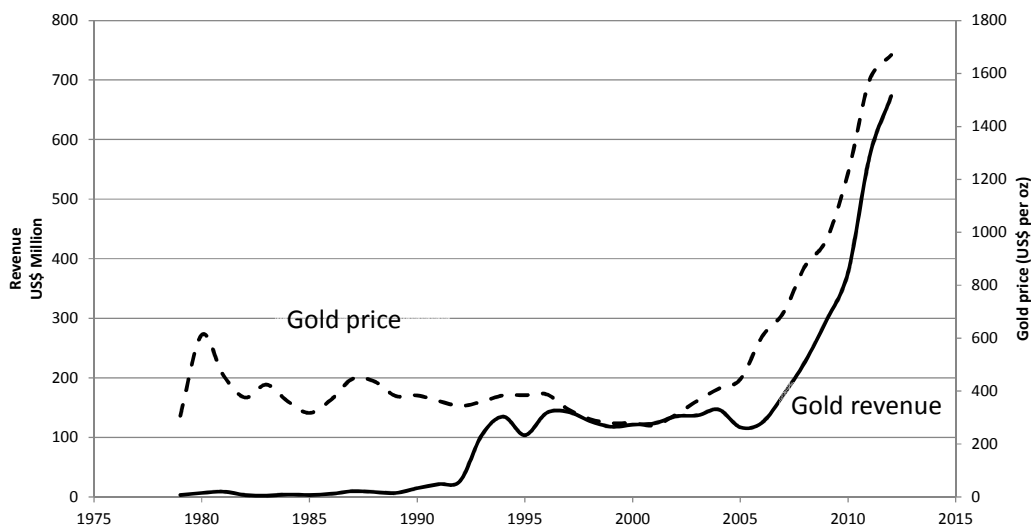


Figure 3.12: Gold prices and Gold revenue in Guyana 1979-2012¹⁰²

Source: Kitco.com and Authors own calculations based on GGMC production data

Small and medium scale gold mining is conducted through two main methods: river dredging and land dredging, with broadly similar overall concepts, though utilising different technologies, with different environmental impacts.¹⁰³

River dredging involves the use of a floating gold processing facility, often involving both machinery and accommodation space. Using either a cutterhead, a diver with a suction pump, or a 'missile' (a diver-less suction nozzle) gravel is sucked up from the river bed to the river dredge where it is

¹⁰² Revenue is calculated by multiplying annual production by the international gold price.

¹⁰³ This section is based on the description of mining techniques in Guyana in Dalgety, (2010).

passed through a sluice-box which traps the gold. The pre-concentrate obtained from the box is converted into gold through a process of panning and amalgamation whereby mercury is introduced to produce amalgamated gold, before being heated in a retort to recover the gold as a residue. River dredging, by its very nature, does not cause deforestation, although it does raise a series of other environmental concerns such as siltation of rivers as the tailings from the operation are released, and the contamination of drinking water with mercury.

Land dredging follows one of two main methods: hydraulicking or dry mining. Hydraulicking mining follows a similar process as river dredging. The first step is to clear the forest in the area for the mine pit, access roads and ancillary facilities (Figure 3.13). This step is the reason why mining has been identified as the largest driver of deforestation in Guyana, accounting for 93% of all deforestation and 83% of forest degradation in 2012 (Guyana Forestry Commission & Indufor, 2013). As well as contributing to deforestation directly for the mine pit and related roads, mining can also play a role in creating the infrastructure that other industries utilise to clear the forest for other economic activities.¹⁰⁴ Following clearance a pit is dug down to gold-bearing earth levels. Water is then pumped to the mine site where it is directed through high-pressure hoses to the gold bearing earth, creating slurry. This slurry is then pumped to the sluice box where the same process as in river dredging takes place. Dry mining is less common than hydraulicking and involves the use of excavators and bulldozers to transport and crush gold bearing earth before the material is washed through the sluice box.

The small scale mining activity common in Guyana not only causes deforestation but also hinders regrowth on deforested land. By clearing away top-soil and leaving unfilled mining pits reforestation takes longer to achieve and is sometimes impossible. If however pits are back-filled and top-soil is restored regrowth can occur relatively quickly.

¹⁰⁴ The observed correlation between roads and deforestation is discussed in Chapter 2 Section 2.2.1.



Figure 3.13: Forest clearance and a mine pit in Guyana

Source: Author

3.5.2 Regulatory structure in Guyana

Mining in Guyana is governed by the Mining Act Cap 65:01 of 1989. The Act sets out the regulatory framework for the prospecting and conveyance of minerals in Guyana. The Act outlines that all minerals in Guyana are the property of the State,¹⁰⁵ and establishes the authority of the GGMC to grant licences or permits to search, mine, take and appropriate minerals on private, governmental or State lands. The Mining Act is supplemented by two sets of Regulations, the Mining Regulations of 1973 ('Regulations') and the Mining (Amendment) Regulations No. 3 of 2005 that relate to environmental management of mining.

The Act and the two sets of Regulations discern between large, medium and small-scale mining, with different legislative provisions affecting the different scales of operation as outlined in Section 3.3.3.

Mining claims are defined by Section 2 of the Regulations as *'the area of State land in respect of which a concession is granted or a lease or license is issued, and includes any claim located whether a concession, lease or licence has been issued in respect thereof, or not, and includes the area of any land or water in respect of which a dredging concession or river location licence is granted.'*

These claims give the holder the right to *'the use and enjoyment of the surface included within the boundary lines of the claim, and to all veins, lodes, ledges and deposits below such surface and of all the metals, minerals or precious stones covered by such licence within the vertical planes in which the*

¹⁰⁵ Mining Act 65: 01 s6.

*surface boundaries lie.*¹⁰⁶ The Regulations also vest the holder of a claim with the right to use all timber growing on the claim as he may require for the proper working of such claim.¹⁰⁷ Thus the claim holder has not only the right to exploit the minerals under the surface of the claim, but also to clear any forest on the claim itself in order to so exploit.

The Act and the Regulations highlight the process of applying for a small-scale mining licence, from the initial prospecting permit through to the application for a claim licence. The process follows an initial application to the GGMC for a prospecting permit, which allows prospecting to take place, but in order to mine and subsequently sell any minerals that so result from the mining, the prospecting licence must be converted into a claim licence. The GGMC has the right via s62 (a) to refuse to grant a claim licence *'if it has reasonable grounds to believe that the applicant does not intend to carry on, in good faith, within the limits of his competence and resources, mining operations in the proposed claim'*. Thus if the Commission believes that a claim is being taken out for other purposes it can refuse to issue it. Indeed the Regulations give the right to other holders of prospecting licences to *'challenge the right of the holder of the claim to continue in occupation thereof.'*¹⁰⁸ Claims can be sold between parties in a manner stipulated by the Regulations,¹⁰⁹ however they can only be sub-let with the approval of the GGMC.¹¹⁰ Claim licences are valid from the date of issue until the 31st of December of the same year, but can be renewed annually on application to the Commission.¹¹¹ The Commission may refuse renewal if it believes that mining operations have not been carried on, or that the holder does not intend to do so. The Commission may cancel the claim licence where the holder is in default.

Current mining regulations contain a number of environmental provisions, including reclamation of mined-out land, and an environmental bond to provide finance,¹¹² yet enforcement of this, and other regulations is often lax, and there have been allegations of corruption made against the GGMC and its officers (International Human Rights Clinic, 2007).

The Act gives the right to the Minister to declare any area of Guyana a mining district. There are currently six mining districts in Guyana, along with a series of closed areas where mining cannot take

¹⁰⁶ Regulations s23.

¹⁰⁷ Regulations s68(1).

¹⁰⁸ Regulations s29.

¹⁰⁹ Regulations s50.

¹¹⁰ Regulations s143.

¹¹¹ Regulations s63 (2). Indeed as per s25 of the Regulations, 'Subject to the Act, every licence shall continue in force so long as the rent payable in respect thereof is regularly paid.'

¹¹² The bond is set at G\$25,000 for small-scale operators and G\$100,000 for medium-scale operators (International Human Rights Clinic, 2007; Stabroek News, 2013c).

place (Figure 3.14). The Mining Districts are (1) Berbice, (2) Mazaruni, (3) Potaro, (4) Cuyuni, (5) North-West, (6) Rupununi. Claims are issued in each of these districts.

Claim licences are available in one of four types: Gold, Gold and Precious Stones, Precious Stones, River. The first three relate to land claims, and the type of minerals that may be extracted and sold through those claims. The fourth relates to a claim for a stretch of river to be mined.¹¹³ The annual rental fees for these claims are shown in Table 3.4.

Table 3.4: Rental Fees for Mining claims and licences in Guyana 2013¹¹⁴

Source: Guyana Geology and Mines Commission (2012)

Mineral property / Licence Type	Annual Rental fees
Claim Licence to mine for gold and precious stones	G\$ 1,000
Claim Licence to miner for valuable minerals	G\$ 1,000
River Location Licence	G\$ 2,000

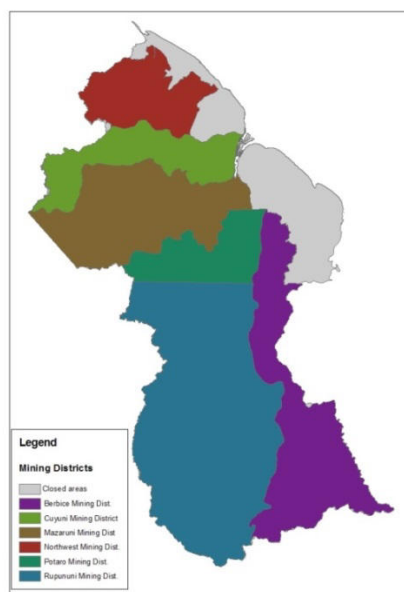


Figure 3.14: Mining Districts of Guyana

The introduction of the LCDS in 2009 did not immediately alter the regulatory framework for mining in Guyana. However due to mining's nature as the largest driver of deforestation in the country the LCDS did include explicit mention of reform for the mining industry (Office of the President, 2010b).

¹¹³ Regulations s2.

¹¹⁴ The Guyana Dollar is equivalent to approximately US\$0.05.

The JCN that outlines the conditions relating to the MOU between Guyana and Norway, and the related payments contains a number of actions that specifically target the mining sector (Government of Guyana & Government of Norway, 2012):

- Application for Extractive Industry Transparency Initiative (EITI) candidacy presented to the EITI board by May 2013 and application for EITI compliance at the last EITI board meeting in 2015;
- Continuation with the enforcement and implementation activities outlined by the SLUC.
- Management of degradation from extractive activities through capacity building and enhanced dialogue with the sectors and relevant stakeholders towards ensuring application of best practices in mining;
- Formalisation of a public access system of planning, mapping and management highlighting planned concession and reconnaissance areas for industrial agriculture, forestry and mining, titled Amerindian lands, areas under protection identified as intact forest landscapes, and priority areas for biodiversity.

In addition in 2009 the GGMC made an Order under the Mining Act that reserves specific sections of rivers in the Rupununi Mining District from prospecting and mining of minerals and metals (Guyana Geology and Mines Commission, 2009). This was followed up in 2012 by a declaration by the Minister of Natural Resources and the Environment that the processing of all river mining claims would cease, although this was later clarified and the processing of claims resumed (Guyana Times, 2012; Kaieteur News, 2012a; Stabroek News, 2012d).¹¹⁵

Thus although the LCDS may not have led directly to new or amended regulations it has introduced a changed natural resource management framework, seen notably with the introduction of the new MNRE subsequent to elections in 2011. The new emphasis was raised in an interview with the then chairman of the GGMC:

"I would say greater emphasis is being placed on the extent of deforestation and forest degradation. Also, on the safeguarding of and ensuring enforcement of regulations as these relate to, for example, conservation of species, avoided deforestation, and avoided degradation. Of course, it's inevitable that you will have some of those but try to keep it within manageable proportions, or to have some mitigation procedures or some compensatory arrangements".¹¹⁶

In Guyana the majority of the literature produced relating to the small-scale mining industry has focused on the role of mercury, the importance of reducing the use, and technological options for its

¹¹⁵ This issue is discussed in more depth in relation to multi-level governance in Chapter 6.

¹¹⁶ Singh, J. (personal communication February 3, 2012).

phasing out e.g. Hilson & Vieira, (2007). As the mining sector has grown from a livelihood activity for a small group of people to a major economic activity, and the main driver of economic growth some broad studies on the sector have emerged. Lowe (2006) provides a thorough situational analysis of the small and large scale mining sector in Guyana outlining the social, environmental and regulatory framework in Guyana. The report highlights the social importance of mining in providing livelihoods, the importance of compliance, monitoring and enforcement in improving the sector, the importance of improving recovery rates, and the scope for improving technologies, remediation and reducing mercury use. In a wide-ranging study Thomas (2009) draws on data from the GGMC and primary sources to examine the socio-economic and environmental impacts of mining in Guyana along with a discussion of the legal framework, and draws a series of recommendations for policy-makers. The study highlights both the growing importance of mining in the Guyanese economy, reflected in its title: 'Too Big to Fail' and also the need for further study and data on the industry in order to improve its performance, both economically and environmentally, and also to allow it to align with Guyana's LCDS. The potential interaction between the mining sector and the LCDS was highlighted in a 2013 study (Singh et al., 2013) by CIG, WWF Guianas and Projekt-Consult. The study outlines the recent rapid growth in the mining sector, the economic and environmental consequences, and the need for the mining sector to be integrated into the LCDS.

Mining's twin role as the major driver of deforestation and a key economic enterprise makes it crucial to Guyana's move to a low-carbon economy. Studying the interaction between the mining sector and REDD+ is thus crucial to Guyana's long-term aim of preserving forest cover while boosting incomes, however as of yet there has been little formal study of the sector. Chapter 5 of this thesis provides one of the first studies in this area.

3.6 Discussion

Guyana has embarked on one of the first national-level REDD+ schemes. It provides an interesting case-study for the implementation of REDD+ for other countries across the world and provides the key case-study for the analysis undertaken in this thesis. It will be the major subject of discussion in Chapters 5,6 and 7. This chapter has provided a background to the economic, historical, political and geographical context in Guyana, along with providing a background on the REDD+ mechanism, and the main threat to the forest: mining. This serves to provide the setting for the research questions identified in Chapter 1, which will serve as the structure for the remainder of the thesis.

Guyana has opted to use the majority of the current finance it receives from REDD+ in two main areas – strengthening of institutions and embarking on national-level infrastructural interventions. The aim of the latter projects, in relation to the drivers of deforestation, is to create alternative

options, through providing more reliable energy and telecommunications. The LCDS only targets the current drivers of deforestation directly through more stringent legislation and enforcement of existing regulations. The effectiveness of the policy choice of addressing deforestation through changing the capacity for alternative livelihood options and enforcement will help to define the effectiveness of Guyana's efforts to move to a low-carbon development pathway. It represents, perhaps, a movement away from the original pure REDD+ model proposed in the literature. The extent to which the agreement as a whole represents pure REDD+ is discussed in depth in Chapter 7.

The case study of Guyana also highlights global questions regarding REDD+, property rights and carbon rights. Although the vast majority of forested lands is owned by the state, as Bromley (1991) shows, property rights come in a number of flavours. Concessionaires have *de jure* rights in a number of areas – such as right to extract. Other users such as miners may have competing *de jure* rights along with *de facto* rights in some areas. Along with this situation Amerindian communities have *de jure* rights to some titled lands – predominantly outside the SFE– but there are many communities that have *de facto* rights over other areas and claim *de jure* rights through the titling and extension process. This complication of rights, especially between timber and mining interests, has led to both conflict and environmental damage, contributing to the creation of a SLUC to address issues. It is on this medley of insecure and unclear rights that the LCDS is imposed. As discussed in Chapter 2 the nature of property rights to the forest has a large impact on deforestation outcomes, and the effectiveness of policy to address the problem. Understanding the impact that the LCDS has, and will have on these rights to the forest will be crucial in assessing REDD+ effectiveness in Guyana. Chapter 5 provides the first econometric study of property rights in Guyana using a globally unique data-set of small-scale mining claims, investigating the impact of the LCDS, and electoral cycles on the holding of property rights.

The nature of Guyana's LCDS implies that the revenues for REDD+ will be used to benefit, directly or indirectly, a wide range of communities across Guyana – not just those who are the cause of deforestation today – or those who could be a threat in the future. How much finance is redirected to benefit communities who are not the drivers of deforestation may help define how effective REDD+ will be in Guyana. The nature of Guyanese politics and the governance system raises at least the possibility that rents may be redirected for political aims. Wider governance issues also arise regarding effectiveness, inclusivity and central government control. The political dimensions of REDD+ are touched on in the work in Chapters 4 and 6. Chapter 6 focuses on the formation of REDD+ policy in Guyana and how to what extent it reflects historical governance patterns, political machinations or moves toward new fully inclusive governance. First however Chapter 4 discusses

how, theoretically, the economy-wide nature of REDD+ in countries such as Guyana, and the political considerations that follow from this, may affect the formation of REDD+ policy.

Chapter 4: Economy-wide effects of REDD+ when there is political influence

4.1 Introduction

Chapters 2 and 3 have highlighted the emerging importance of policy for Reducing Emissions from Deforestation and Forest Degradation (REDD+) around the world. Its potential as a low-cost option has been emphasised, along with the recent trend for the policy to be based on national strategies, implying a crucial role for central governments in the REDD+ policy-making process, bringing into the equation political economy and governance factors. Policies for REDD are likely to be concentrated in forest-using sectors, yet in many tropical countries such as Guyana, as was highlighted in Chapter 3, these are often characterised by weak governance and endemic rent seeking (Amacher, 2006; Koyuncu & Yilmaz, 2008; Palmer, 2005). Introducing international finance for REDD+ could potentially redirect rent-seeking efforts towards its capture (see Myers 2007).

The thesis now moves into four chapters that answer the major research questions identified in Chapter 1. They form the main research contributions of the thesis. Chapters 5, 6 and 7 focus on REDD+ in Guyana while in this chapter, a model of a small open economy is developed in order to examine the impacts of policies implemented through a national REDD+ strategy. This serves to address the following three questions. First, what might be the economy-wide, general equilibrium effects of implementing REDD+? Second, how might these affect government policies for achieving REDD+? And third, how do these effects change with political influence from sectors affected by REDD+?

As discussed in Chapter 2 a myriad of policy options are available for REDD+, mirroring those of forest conservation more generally. Angelsen (2009) groups this plethora of policies for REDD+ into four categories: policies that increase and capture the rents from using forests sustainably; policies that reduce the rent from forest-extractive industries; policies that directly regulate land-use; and cross-sectoral policies. This chapter focuses on policies belonging to the first two categories, respectively, incentive payments (or payments of ecosystem services (PES)) along with input and output taxes. All four categories of policies and these two in particular, will have effects beyond the sector directly affected. By shifting labour, capital and other inputs between sectors – via shifts in relative prices – REDD+ policy could have broad economic impacts. For example, REDD+ may be used to encourage the growth of sectors that are less directly dependent on forest as an input to production. Input and output prices and the relative profitability of all sectors may also change. While still relatively limited, the economic scale of REDD+ is growing in many countries, with important repercussions for smaller economies such as Guyana. Chapter 3 has highlighted the scale of the existing REDD+ agreement with Norway, potentially contributing over 5% of the annual government budget on an annual basis.

Chapter 2 outlined the, mainly descriptive, literature that has begun to emerge relating to the potential economy-wide impacts of REDD+. The model presented in this chapter builds on this literature, especially work by authors such as Ollivier (2012) in that it adopts a national REDD+ strategy financed by an international transfer, however it provides an original contribution in that it examines how different policies might affect different sectors, including their use of forest.

It follows earlier work concerned with the impacts of different policies on deforestation in a general equilibrium setting; for example, Deacon (1995) examined the impact of transportation improvements, taxes and new employment opportunities on deforestation. It also extends the REDD+ general equilibrium literature in that it takes into account the potential for political influence on REDD+ policy making. Specifically, the model adopts the common-agency model of Grossman & Helpman (1994), who used it to investigate the impact of lobby group influence on trade policy. Widely applied to examine political influence in public policy-making, including environmental taxes and subsidies (Fredriksson, 1997), environmental protection (Schleich 1997, Yu 2005), and forest conservation (Eerola 2004; Jussila 2003), this chapter is the first work to apply it to international-level incentives like REDD+. The chapter also extends the framework to a different type of policy instrument. Previous work had used the model to examine instruments that amended relative price levels, such as taxes and subsidies. By applying the model to a payment scheme that involves both a change in relative prices and also unequal income transfers the chapter extends the model to a different class of policy instrument.

Section 4.2 introduces the basic model which adopts the consumer and producer formulation of Fredriksson (1997) and incorporates three sectors similar to the framework of Jussila (2003). Two sectors use forest as an input to production. In the first, 'mining', forest is substitutable with labour and use of the forest produces a carbon externality. In the second, 'sustainable forest management' (SFM), forest is used in joint production with labour, and there is no carbon externality. The distribution of forest between sectors is determined in a market setting. A third sector represents the remainder of the economy.

Inclusion of two, different forest-using sectors enables modelling of the fact that tropical forests are not always used in an extractive manner. Recent decades have witnessed growth in the non-extractive uses of forests, which potentially cause little or no deforestation. Such activities include eco-tourism, sustainable forestry and biodiversity prospecting. In countries such as Costa Rica sustainable forest activities make important contributions to the economy. Earlier work by, for example, Ferraro & Simpson (2002), Groom & Palmer (2010), and Muller & Albers (2004) modelled these activities as joint production. The model here departs from this previous work by considering

joint production in a general rather than partial equilibrium setting. REDD+ is arguably likely to be as much about shifting forest to joint production activities as it is about using incentives to set forest aside (see Angelsen 2010; Palmer 2011).

Section 4.3 introduces the REDD+ framework through which an international incentive is offered to the government of the REDD+ host country as an exogenous incentive per unit of carbon externality reduced below a BAU baseline, i.e. tied to a carbon price determined via a public funding body or a carbon market. The former could be made by a body such as the Forest Carbon Partnership Facility (FCPF) or a country seeking to finance REDD+ via bilateral arrangements in the mould of the Memorandum of Understanding (MOU) between Guyana and Norway outlined in Chapter 3, along with similar Jurisdictional and National level REDD+ (JNR) agreements between Norway and Brazil, Indonesia and Tanzania. In order to reduce emissions, the government implements a payment scheme. Payments are made to both forest-using sectors with the total sum equal to the international incentive. The government then faces a choice of the level or size of payment that it makes to either sector. As this choice determines the scale of the reduction in deforestation it also determines both the size of the total international incentive received (the 'pie') and also the distribution of this incentive between sectors (the size of the slices of this 'pie'). Increasing the payment to the mining sector strengthens the incentive to reduce forest use in that sector. This helps create a larger pie, a larger share of which is distributed to the mining sector. By contrast, reducing the payment has the opposite effect, reducing both the pie and the sector's share.

The model finds that the international incentive made to a government adopting a national REDD+ strategy may not be equivalent to the incentive transferred by that government to sectors participating in REDD+. Thus, in moving away from some of the idealised conditions for REDD+ policy implementation assumed in many economic models, REDD+ may be less cost-effective than originally envisaged at the international level. Although incentives are not offered directly to the SFM sector, the model finds that payments to the mining sector incentivise growth of the former sector through its effect on input factor markets. This illustrates the potential for positive spill-over effects from the implementation of REDD+ at the national level.

Political influence is introduced to the model by adopting the common-agency model of Grossman & Helpman (1994), in Section 4.4. In previous work by, for example Fredriksson (1997) and Jussila (2003), 'contributions' are paid to the incumbent government, which desires these to aid re-election. The contributions are essentially a valuation by the government of some element of the welfare change of one specific sector over the others in response to a change in policy. This valuation may be monetary or it may be due to preferences inherent in the government for one particular sector, for

example, due to interest group lobbying, the political make-up of the country or a perception that protection of a particular sector offers long-term benefits to the country. In the model presented here, giving contributions is conceived as having political influence, which can be offered by either forest-using sector. Only one sector is involved in lobbying activity at any time, although this can be conceptualised as one having relatively more influence compared to the other.

When the mining sector has political influence, the direction of change in incentives to either sector is indeterminate. It depends on a price effect that represents the adverse effect impact payments have on the price of forest in that sector ('forest price effect') and an income effect that tends to push up the level of payments to the mining sector as it obtains a greater share of the pie created by the incentive ('income transfer effect'). Which of these effects dominates depends on the dependence of the mining sector on the forest input, and the deforestation baseline against which the REDD+ payment is made. A similar indeterminate result is found when the SFM sector has political influence. Again, the balance between the price and the income effects determines the direction of change. This leads to the counter-intuitive result that under some conditions the SFM sector may lobby for a lower payment rate to its own sector in order to create a stronger incentive to reduce forest use in the mining sector and boost the size of the international incentive and thus the overall pie.

Also considered in Sections 4.3 and 4.4 are alternative policy instruments in the shape of input and output taxes. Taxes are shown to influence factor and output prices as well as producers and consumers. In contrast to the payment scheme, the international incentive is added to tax revenue and redistributed on a per-capita basis. This creates a separation between the size of the pie and the share. Similar effects are taken into account by the government when neither sector has political influence. When the mining sector has influence input tax rates are reduced, with tax rates rising when the SFM sector has influence. Section 4.5 discusses the effect of relaxing the assumption of perfect labour markets, concluding that the findings are robust to the changes in these assumptions. Section 4.6 discusses the results before concluding.

4.2 The basic model

4.2.1 Production

The majority of recipients of REDD+ finance can be characterised as small, open economies and this categorisation is adopted here. There are three producing sectors, two of which consist of local

monopolies that utilise a forest input, f , in production. The first of these sectors, 'mining' (β), has two inputs, f , and labour, l , substitutable using a diminishing-returns-to-scale technology.¹¹⁷

Mining is an important direct driver of deforestation in a number of areas such as Guyana (as highlighted in Section 3.3.2), across the Guiana Shield,¹¹⁸ in Madre de Dios in Peru (Gardner, 2012), and in the Congo basin (Megevand et al., 2013). The industry as a whole is one of the major private-sector land owners globally (Laing & Trines, 2011). The impact that mining activity can have on the forest can be seen in the discussion of mining in Guyana in Section 3.5. Forest is used in mining in a purely extractive manner – with forest cleared to access the minerals underneath the soil. Mining can be extensive or intensive depending on the nature and intensity of the activity, and the use of complimentary factors of production such as labour. In this model it is assumed that mining, in utilizing land under forest cover, produces a negative carbon externality from forest clearance.¹¹⁹

In the second forest-using sector (γ), SFM, forest is an input, again used in combination with labour. Following Ferraro & Simpson (2002), this sector is characterised by joint production, i.e. labour and forest are strict complements. Joint production can occur in non-extractive forest-using sectors such as ecotourism, biodiversity prospecting, and non-timber forest product extraction. Relatively undisturbed forest ecosystems are employed as inputs, which, combined with labour, produce an output, e.g. tourist excursions, chemical compounds, or fruits. Therefore, use of the forest in this sector does not produce a negative carbon externality, i.e. production occurs without forest clearance.

The third sector is termed industry (α), representing all other production in the economy and acting as a numéraire. It uses a single factor, labour, using constant returns to scale technology and has an input-output coefficient of one.

The three sectors produce goods x_α , x_β and x_γ with prices, $p_{i \in \alpha, \beta, \gamma}$ exogenously determined on the world market, with p_α normalised to one. The economy is populated by N individuals, each of whom has a single unit of labour, with N normalised to one. Individuals have a number of roles in this model. First, they can sell their labour endowment to one of the three sectors ('workers'). Second a subset of individuals owns forest, which they can lease to the local monopolies in either the mining

¹¹⁷ This follows similar assumptions made by Eerola (2004) for their forest extractive industry.

¹¹⁸ The Guiana Shield is a geological formation covering Guyana, Suriname, French Guyana, parts of northern Brazil and eastern Venezuela.

¹¹⁹ The sector thus represents a generic forest-extractive industry which varies from place to place, for example, gold mining in Guyana, soya or cattle ranching in Brazil or palm oil in Indonesia. It should be noted that these land uses may have different environmental implications, although they are analogous for the purposes of this model.

sector or the SFM sector through a concessionaire system in return for a rent.¹²⁰ Third a subset act as owners of the local monopolies in the mining and SFM sector and they receive profits from these sectors ('operators'). Fourth, individuals consume goods from all three sectors ('consumers'). Workers can sell their labour endowment to any sector. An assumed competitive labour market equilibrium implies wages are equated in all sectors at a level w .¹²¹

Similar to Ollivier (2012), it is assumed that barriers exist such that only those individuals with existing forest resources can engage in the forest market. Barriers could be, for example, economic, social, geographical or institutional. This assumption allows a focus on the effects of REDD+ in two specific ways. First, on the potential of REDD+ to incentivise forest-extractive industries to become less forest intensive and second, in providing incentives to landowners to switch between renting land to the mining and the SFM sector. It is assumed that landowners can costlessly switch from renting land from one sector to the other: the static model presented here abstracts from the dynamics of forest growth, the switch from mining to SFM is likely to require time for forest to be rehabilitated. This is an unrealistic assumption as in reality, the costs of switching from mining to SFM are likely to exceed that of switching from SFM to mining, due to the time for forest to regrow,¹²² although switching from SFM to mining will also involve costs of clearing forest.¹²³ Imposing some constraints on the ability of landowners to move from mining to SFM however does not materially alter the results; it merely reduces the level of some of the differentials thus reducing the scale of the general equilibrium effects.¹²⁴

The model follows a number of steps. There exists a restricted profit function $\pi_i(p_i, z)$ for each sector where z is the rental price of the forest input, f . Sectors derive optimal output y_i^* as the level of output that solves:

$$p_i = \frac{\partial c_i}{\partial y_i} \text{ for } i \in \beta, \gamma \quad (1)$$

¹²⁰ Such a system implies that the local monopolies have the rights to forest land they rent once they enter into a concession agreement with the land owners and thus the land owner becomes part of the sector to which they have rented the land. Although the sector is referred to as mining it could be equally relevant to other forest extractive industries operating under such a concessionaire system, such as some forms of agriculture.

¹²¹ It is assumed that there is a large enough supply of labour for x_α to be produced in all cases.

¹²² If it is even possible. Following some forms of small-scale gold mining, the removal of topsoil and contamination with chemicals means that regrowth is a slow process (Rathfon, Filmore, & Groninger, 2004).

¹²³ The framework considers a purely carbon-focused REDD+ scheme, which abstracts from the wider set of ecosystem services supplied by forests. Switching from forest to mining is likely to have implications for these, in particular those for which biodiversity may be instrumental in production.

¹²⁴ An absolute constraint would render the model void, as forest use would be fixed, with no possibility of reducing deforestation.

where $\frac{\partial c_i}{\partial y_i}$ is the partial differential of the cost function, $c_i(f_i, l_i, z, w)$. Given optimal output, the sectors then calculate their level of forest demand f_i and labour demand l_i as the solutions to:

$$\min c_i(f_i, l_i, z, w) \quad (2)$$

z is determined in a forest market and is the price that clears the market, based on the requirement that:

$$f_\beta^* + f_\gamma^* = f_t^* \quad (3)$$

where f_t^* is the total amount of forest in the economy.¹²⁵ This can be interpreted as the total, state-owned area of forest where production is legally sanctioned, i.e. excluding protected areas, and where production might be profitable.

The determination of z clears all markets and defines optimal output, y_i^* , realised forest input demands, f_i^* , labour input demands, l_i^* , and wages, w . These in turn determine profit levels in each sector.

4.2.2 Consumption

Consumers have identical preferences and consume all three goods. Their utility, U , is an additive function of consumption of the goods, $x_\alpha, x_\beta, x_\gamma$:

$$U = x_\alpha + x_\beta + x_\gamma \quad (4)$$

where x_α is consumption of the numéraire and x_β, x_γ is consumption of each production good. Consumers are subject to a budget constraint and are assumed to use all their income to purchase the three goods. Thus:

$$Y = x_\alpha + p_\beta^* \cdot x_\beta + p_\gamma^* \cdot x_\gamma \quad (5)$$

where p_β^* is the world market price for x_β and p_γ^* is the world market price for x_γ normalised by the numéraire price, and Y is the income of the population as a whole.

From equations (4) and (5) an indirect utility function, V , for the population can be derived:

$$V = Y + u(d_\beta(p_\beta^*)) - p_\beta^* d_\beta(p_\beta^*) + u(d_\gamma(p_\gamma^*)) - p_\gamma^* d_\gamma(p_\gamma^*) \quad (6)$$

¹²⁵ The simplifying assumption of perfect forest markets is justified on the basis of the focus on the general equilibrium effects of REDD+, driven by changes in relative prices. The forest market also allows for the switching of forest use between sectors. This enables the determination of the incentives to increase the use of forest in a more non-extractive rather than extractive manner.

where $d_\beta(p_\beta^*)$ and $d_\gamma(p_\gamma^*)$ are the realisations of the demand function for consumers at world market prices p_β^*, p_γ^* and $u_i(d(p_i^*))$ is the resulting utility from that demand. The last four terms on the right-hand side of (6) thus represent consumer surplus from consumption of the production goods. Given exogenously-determined prices, the values for consumer surplus are fixed and utility is a direct function of income.¹²⁶

4.2.3 Income

Income is generated from three sources, labour income, forest rents and profits. The total income of each sector is the earnings from all individuals relating to that sector, the wages of workers employed, the rents of landowners and the profits of the local monopolies:

$$Y_i = l_i w + z f_i + \pi_i \quad (7)$$

for $i \in \alpha, \beta, \gamma$, where l_i is the normalised labour demand in each sector.¹²⁷

Social welfare, W , is given by the aggregate indirect utility of the population, which follows from equations (6) and (7) as:

$$W = w + z(f_\beta^* + f_\gamma^*) + \pi_\beta + \pi_\gamma + u(d_\beta(p_\beta^*)) - p_\beta^* d_\beta(p_\beta^*) + u(d_\gamma(p_\gamma^*)) - p_\gamma^* d_\gamma(p_\gamma^*) \quad (8)$$

It is assumed that each unit of forest input used in mining, f_β , creates one unit of the carbon externality, and $F^* = f_\beta^*$ is the level of forest-based carbon externality from deforestation in the baseline scenario, i.e. before the implementation of any REDD+ policy.

4.3 Introducing REDD+

A REDD+ strategy is implemented by the government of the economy ('the government'). It is offered an international incentive at an exogenous rate, χ , per-unit of carbon for reduction in the generation of the forest-related carbon externality below the baseline level, F^* , with $\chi > 0$ and payments of zero for:

$$f_\beta^* > F^*.$$

¹²⁶ This follows similar assumptions made by Fredriksson (1997).

¹²⁷ Due to the assumption of constant-to-returns to scale technology in the industry sector π_α is zero and is therefore excluded. As the number of individuals is normalised to one and each individual has a single unit of labour, with no leisure, $l_\alpha + l_\beta + l_\gamma = 1$.

As discussed in Section 1 and Chapter 2 Section 2.4.2 the potential suite of policies available to the government to reduce deforestation, and thus reduce the level of f_{β}^* , is vast but is restricted here to: an output tax, an input tax or a direct payments scheme.

4.3.1 Payment Scheme

The payment scheme consists of a financial transfer to both the mining and SFM sectors with the total equal to the incentive received by the government. The scheme gives a payment, ρ , to each forest sector given by:

$$\rho_i = \varphi_i(F^* - f_{\beta}^*), \quad i \in \beta, \gamma \quad (9)$$

with $\chi = \sum_{i=\beta, \gamma} \varphi_i$ and $\varphi_i > 0$. Thus φ_i is the payment rate to the sectors, received by landowners who rent land to that sector.¹²⁸ The payment scheme splits the entire 'pie' from the international incentive between the two sectors, with the size of the pie dependent on deforestation in the mining sector. While the SFM sector does not engage in deforestation and emits no carbon dioxide, this sector receives payments, the size of which is dependent on the extent of deforestation in the agricultural sector. This can be interpreted as a reward for good forest stewardship and hence, plays no role in the sector's production decision. The payment scheme splits the entire 'benefit pie' from the international incentive between the two sectors. Yet, the size of this pie is also dependent on the extent of deforestation in the agricultural sector.

Conceptually, the REDD+ payment scheme is implemented as follows:

1. The exogenously-determined incentive rate per unit of carbon externality is communicated to the government.
2. The government decides the optimal rate of payment it will offer to the two forest-using sectors, and communicates this to the sectors.
3. The sectors decide upon their levels of inputs and outputs, and production of the carbon externality.
4. The international actor provides the finance based on the exogenous incentive rate and the realised level of deforestation.
5. The government passes through the payment to the sectors based on the rate communicated in step 2.

¹²⁸ It is assumed that payments accrue to landowners in the mining sector as should payments be given to consumers in β after the production decision is made there will be no effect on quantities of forest input.

In the mining sector, the payment scheme conceptually consists of two parts. First, an income transfer component equal to the payment level multiplied by baseline forest use, F^* and second, an increase in the price of utilising the forest input faced by the mining sector. In the SFM sector, the scheme equates solely to an income transfer equal to the payment to that sector multiplied by the reduction in the carbon externality. Thus, the scheme has the effect of driving a wedge in forest input prices between the two sectors gross of the payment. The payment scheme changes the relative prices of the forest input and redistributes the revenue in proportion to the change in relative prices. Through the forest market mechanism forest prices net of payment are equalised at a new equilibrium.

The introduction of the payment amends the profit function for the mining sector to:

$$\pi'_\beta = \pi_\beta [p_\beta^*, x_\beta, z + \varphi_\beta, f_\beta^*, w, l_\beta] + \varphi_\beta F^* \quad (10)$$

with the profit function for the SFM sector becoming:

$$\pi'_\gamma = \pi_\gamma [p_\gamma^*, x_\gamma, z, f_\gamma^*, w, l_\gamma] + \varphi_\gamma (F^* - f_\beta^*) \quad (11)$$

The inclusion of REDD+ payments also means that both the forest price, z , and the forest input level in mining, f_β^* , become functions of φ_β , the size of the REDD+ payment to the mining sector. Intuitively, the payment affects the returns from the use of the forest input in the mining sector, which affects the demand schedules and in turn the forest price that clears the market. By increasing the forest price to the mining sector gross of the payment it reduces the returns to that factor in that sector, leading to a lower demand for the factor, implying a lower equilibrium forest price emerging from the market. This determines the optimal allocation of forest input between sectors. Although no payment is made to the SFM sector that to the mining sector creates incentives for the former to expand: mining profits and forest prices fall, which leads to a shift in landowners renting forest to the SFM sector.

Combining (10) and (11) with (8) gives the amended social welfare function under REDD as:

$$W = w + z f_t^* + \pi'_\beta + \pi'_\gamma + u(d_\beta(p_\beta^*)) - p_\beta^* d_\beta(p_\beta^*) + u(d_\gamma(p_\gamma^*)) - p_\gamma^* d_\gamma(p_\gamma^*) \quad (12)$$

From (12) the government's maximisation problem is thus:

$$\max_{\varphi_\beta, \varphi_\gamma} W = w + z f_t^* + \pi'_\beta [p_\beta^*, w, z + \varphi_\beta, \beta, f_\beta^*, x_\beta, \varphi_\beta] + \pi'_\gamma [p_\gamma^*, x_\gamma, z, f_\gamma^*, w, \gamma, \varphi_\gamma, f_\beta^*] + CS \quad (13)$$

subject to: $\sum_{i=\beta,\gamma} \varphi_i = \chi$ where the constant level of consumer surplus relating to the two production goods is given by:¹²⁹

$$CS = u(d_\beta(p_\beta^*)) - p_\beta^* d_\beta(p_\beta^*) + u(d_\gamma(p_\gamma^*)) - p_\gamma^* d_\gamma(p_\gamma^*) \quad (14)$$

The maximisation problem is solved using the Lagrangian method with the maximisation given from (8) as:

$$W = w + z f_t^* + \pi_\beta^* [p_\beta^*, w, z + \varphi_\beta, \beta, f_\beta^*, x_\beta, \varphi_\beta] + \pi_\gamma^* [p_\gamma^*, x_\gamma, z, f_\gamma^*, w, \gamma, \varphi_\gamma, f_\beta^*] + \lambda (\varphi_\beta + \varphi_\gamma - \chi) \quad (15)$$

Differentiating (15) gives the first-order conditions of:

$$\frac{\partial W}{\partial \varphi_\beta} = \frac{\partial w}{\partial \varphi_\beta} + \frac{\partial z}{\partial \varphi_\beta} f_t^* + \frac{\partial \pi_\beta}{\partial \varphi_\beta} + F^* + \frac{\partial \pi_\gamma}{\partial \varphi_\beta} - \varphi_\gamma \frac{\partial f_\beta^*}{\partial \varphi_\beta} + \lambda \quad (16)$$

$$\frac{\partial W}{\partial \varphi_\gamma} = (F^* - f_\beta^*) + \lambda \quad (17)$$

$$\frac{\partial W}{\partial \lambda} = \varphi_\beta + \varphi_\gamma - \chi \quad (18)$$

Conditions (16), (17) and (18) are rearranged to give the following payment rates, made to each forest-using sector:

$$\varphi_\beta = \chi - \left(\frac{\partial w}{\partial f_\beta^*} + \frac{\partial z}{\partial f_\beta^*} f_t^* + \frac{\partial \pi_\beta}{\partial f_\beta^*} + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \frac{f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \right) \quad (19)$$

$$\varphi_\gamma = \frac{\partial w}{\partial f_\beta^*} + \frac{\partial z}{\partial f_\beta^*} f_t^* + \frac{\partial \pi_\beta}{\partial f_\beta^*} + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \frac{f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \quad (20)$$

with the following constraints:

$$0 < \varphi_\beta, \varphi_\gamma < \chi$$

¹²⁹ In subsequent discussions of the model CS is dropped from the welfare equation as it is a constant and hence is not affected by policy choices.

The bracketed term in equation (19) represent the general equilibrium effects of the payment scheme with the amount transferred to the mining sector equal to the international incentive minus the general equilibrium effects of implementing the scheme.

Given the composition of the payment scheme, the general equilibrium effects can be defined as follows. First, a ‘forest price effect’ can be identified as the impacts that result from the payment scheme adjusting the relative price of forest between the sectors, with impacts on wage rates, forest rental income and profit levels:

$\frac{\partial w}{\partial f_{\beta}^*} + \frac{\partial z}{\partial f_{\beta}^*} f_t^* + \frac{\partial \pi_{\beta}}{\partial f_{\beta}^*} + \frac{\partial \pi_{\gamma}}{\partial f_{\beta}^*}$. An ‘income transfer effect’ can be identified relating to the income transfer component of the scheme, and how the scale of that transfer will shift as the payment rate changes:

$\frac{f_{\beta}^*}{\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}}$.

The following assumptions are made regarding the direction of the relevant partial derivatives:

$$\frac{\partial \pi_{\beta}}{\partial f_{\beta}^*} > 0, \quad \frac{\partial \pi_{\gamma}}{\partial f_{\beta}^*} < 0, \quad \frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}} < 0, \quad \frac{\partial z}{\partial f_{\beta}^*} > 0, \quad \frac{\partial w}{\partial f_{\beta}^*} < 0 \quad ^{130}$$

Payments to the mining sector, φ_{β} , and thus incentives to reduce forest use, will be greater when: the dependence of the mining sector on forest is smaller; the responsiveness of the SFM sector to increases in forest use in mining is greater (either through restrictions on forest input to that sector, or through an increase in its price); forest use in mining is greater; and, the impact of the payment on reducing deforestation is smaller.¹³¹

4.3.2 Taxes

It is now assumed that the government implements either an input tax, r , on the forest input’s use in mining or an output tax, t , levied on mineral production. It is assumed that all revenues from these taxes are recycled to the whole population on a per-capita basis and taxes are lump sum thus:

¹³⁰ An increase in forest demand in the mining sector leads to higher demand for labour in that sector, but it also leads to a restriction of forest available for the SFM sector, leading to a constriction in demand for labour in that sector. The effect on overall wage rates will depend on the scale of these two effects. Given the assumptions made above regarding the diminishing returns to scale in the mining sector and joint production in the SFM sector the reduction in labour demand in the SFM sector is likely to exceed the increase in the mining sector implying the effect on wage demand will be negative.

¹³¹ Giving the foregoing assumptions it can be concluded that an interior solution to the model is found as long as φ_{γ} is bounded by 0 and χ . The first term of (14) is negative, the second and third are positive and the fourth and fifth are negative, which along with the assumption of a payment with a lower-bound value of zero, gives

an optimum solution if: $\left| \frac{\partial \pi_{\beta}}{\partial f_{\beta}^*} + \frac{\partial z}{\partial f_{\beta}^*} f_t^* \right| > \left| \frac{\partial \pi_{\gamma}}{\partial f_{\beta}^*} + \frac{f_{\beta}^*}{\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}} + \frac{\partial w}{\partial f_{\beta}^*} \right|$. Corner solutions exist where payments to

either the mining or SFM sector are zero, however discussion of these solutions are excluded here as although they are mathematically possible they do not provide any interest insights to REDD+ policy as the entire ‘pie’ is offered to one sector or the other.

$$z_{\beta} = z + r \quad (21)$$

$$p_{\beta} = p_{\beta}^* + t \quad (22)$$

where z_{β} is the input price faced by mining. Input taxes thus drive a relative wedge between forest input prices gross of tax, in the same manner as the direct payment scheme discussed above. The output tax changes the relative prices between the two production goods that producers face.

Amending the social welfare function (8) with (21) and (22) respectively and simplifying gives the welfare functions that the government optimises in its choice of level of each instrument:

Input tax

$$W = w + zf_t^* + \pi_{\beta} + \pi_{\gamma} + rf_{\beta}^* + \chi(F^* - f_{\beta}^*) \quad (23)$$

Output tax

$$W = w + zf_t^* + \pi_{\beta} + \pi_{\gamma} + ty_{\beta}^* + \chi(F^* - f_{\beta}^*) \quad (24)$$

(23) and (24) are maximised in the same method as used in the section above. The processes are summarised in Appendix 2.

Optimal input taxes are given by:

$$r = \chi - \left(\frac{\partial w}{\partial f_{\beta}^*} + \frac{\partial z}{\partial f_{\beta}^*} f_t^* + \frac{\partial \pi_{\beta}}{\partial f_{\beta}^*} + \frac{\partial \pi_{\gamma}}{\partial f_{\beta}^*} + \frac{f_{\beta}^*}{\frac{\partial f_{\beta}^*}{\partial r}} \right) \quad (25)$$

Optimal output taxes are:

$$t = \chi \frac{\partial f_{\beta}^*}{\partial y_{\beta}^*} - \frac{\partial w}{\partial y_{\beta}^*} - \frac{\partial z}{\partial y_{\beta}^*} f_t^* - \frac{\partial \pi_{\beta}}{\partial y_{\beta}^*} - \frac{\partial \pi_{\gamma}}{\partial y_{\beta}^*} - \frac{y_{\beta}^*}{\frac{\partial y_{\beta}^*}{\partial t}} \quad (26)$$

For the input tax the same forest price effects are taken into account as under the payment scheme when determining how much of the international incentive is passed through to producers. Similar income transfer effects are also included differing only in the inclusion of the effect of the relevant instrument on the optimal forest-use in mining $\frac{\partial f_{\beta}^*}{\partial r}$ or $\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}$. The direct payment scheme and the input tax are equivalent when there is no political influence and the effectiveness of the instruments is the

same. This is because the income transfer component of the direct payment scheme does not factor into government decision-making due to our assumptions of homogenous consumers and a government who only optimises over aggregate social welfare. Thus the unequal income transfers associated with the payment scheme has no effect on the level of the optimal instrument when there is no political influence.

The following assumptions are made regarding the direction of partial derivatives that define the output tax:

$$\frac{\partial f_{\beta}^*}{\partial y_{\beta}^*} > 0, \frac{\partial \pi_{\beta}}{\partial y_{\beta}^*} > 0, \frac{\partial \pi_{\gamma}}{\partial y_{\beta}^*} < 0, \frac{\partial z}{\partial y_{\beta}^*} > 0, \frac{\partial w}{\partial y_{\beta}^*} < 0, \frac{\partial y_{\beta}^*}{\partial t} < 0, \quad ,$$

It is assumed that an increase in optimal output in mining will result in an increase in forest input demand in that sector. It is also assumed that increases in optimal output in mining increase profits in that sector, and reduce profits in γ through driving up the forest input price, z . Further increases in the tax rate t reduce the level of optimal output y_{β}^* . The directions of change in wages and forest rents follow from these assumptions and those made in Section 4.3.1 above.

The output tax shows similar characteristics as the other two instruments in that the optimal rate includes both a forest price effect and an income transfer effect. It increases with the international payment, scaled by the impact of output upon the forest input. The impact on profits on the two sectors is taken into account – along with a final the term representing the impact on revenues from the output tax. The output tax shows a conceptual similarity to both the input tax and the direct payments scheme. How much of the international incentive reaches producers again depends on the size of general equilibrium effects.

4.4 Interest Group Influence

The situation is now examined where either of the forest-using sectors, mining or SFM, can exert some influence on government decision making above and beyond its level of overall social welfare. In investigating how this influences payment rates, the exposition of Fredriksson (1997) is followed who in turn builds on the characterisation of a menu auction problem by Bernheim & Whinston (1986) and the solution to the political equilibrium identified by Grossman & Helpman (1994).

It is first assumed that a lobby group can offer a certain amount of influence on government decision-making. What is often termed 'contributions' in the literature is characterised more generally here as 'political influence'. Influence may originate from economic power, the organisation of industry groups, or the ability to offer payments or campaign contributions directly.

The government welfare function, G , which before was merely equal to overall social welfare, W , now becomes:

$$G = W + \mu C_{i \in \beta, \gamma} \quad (27)$$

where W is overall social welfare, C_i is the level of influence offered and μ is the relative weight put on influence and overall social welfare by the government. The term μ denotes the degree of lobby group influence on government decision-making. It can represent the extent to which governments make decisions for the good of their entire population versus the extent they are made to benefit a certain subset of the population, i.e. those with political influence. If $\mu = 0$, then the model is solved in the same way as in Section 4.3. C_i is assumed to be a continuous, differentiable function on a policy vector E . This vector is populated by the range of payment rates, which could potentially be made by the government to the mining sector, φ_β .

The model takes the following steps:

- The mining or SFM sector has access to, and can influence, government decision making.
- This influence is valued by the government along with overall social welfare.
- The sector with this access offers the government a menu of levels of influence, C_i , based on each level of the policy vector E .
- The government then chooses from its menu, E , a desired realisation of the policy, given as e , and receives the identified level of influence.

Following Fredriksson (1997), $(\{C_i\}_{i \in \beta, \gamma}, [e])$ is identified as a Subgame Perfect Nash Equilibrium if and only if four conditions hold. The contributions must be feasible, i.e. non-negative and less than total income; the government sets the policy instrument at a level that maximises its own welfare, given the contributions schedule on offer; the policy instrument maximises the joint welfare of the lobby group and the government; and there exists an anchor level of contributions – that is a least favoured policy option for which contributions are zero.

The model is then solved for the case when either sector attempts to influence government policy making. Following Grossman & Helpman (1994) and Fredriksson (1997), influence is locally truthful, therefore, any change in welfare is reflected in a change in influence. The condition for the government's maximisation of its welfare function (27) is derived as:

$$\nabla W + \mu \nabla W_i = 0 \text{ for } i \in \beta, \gamma \quad (28)$$

where W_i is the welfare of the sector exerting influence on the government. Condition (28) implies that instead of the government imposing the policy instrument up to the point where the marginal benefit to society is zero it imposes the policy up to the point where a weighted sum of change in social welfare and the influential sector's change in welfare is zero.

A limitation of Grossman and Helpman's (1994) framework is that one sector must not be involved in lobbying activity at any one time. If both forest-using sectors lobby together the result is the same as if there was no lobbying activity. However, they are likely to lobby, perhaps competitively, at the same time. Yet, it can be assumed that the government only values the sector which lobbies most effectively, thus disregarding the efforts of the (relatively) less-effective sector. In the context of deforestation, forest extractive industries are likely to be the most influential lobby groups in the majority of situations. They are crucial political influences in countries like Brazil and Indonesia – witness the recent lobbying in relation to the revision of the Amazon forest code (Los Angeles Times, 2012). However, lobby groups representing environmental interests are known to have had significant influence on forest policy. For example, environmental NGOs played a significant role in driving the creation of protected areas in many countries such as Madagascar (Brockington 2008). Thus, it is important to examine situations in which not only the mining but also the SFM sector may dominate political influence in the formation of REDD+ policy.

4.4.1 Mining sector influence

When the mining sector exerts influence the government chooses a level of policy that solves:

$$\nabla W + \mu \nabla W_\beta = 0 \quad (29)$$

with the mining sector's welfare as:

$$W_\beta = w\beta + zf_\beta^* + \pi_\beta + \varphi_\beta F^* \quad (30)$$

Differentiating (24) gives:

$$\frac{\partial W_\beta}{\partial \varphi_\beta} = \frac{\partial w}{\partial \varphi_\beta} l_\beta + \frac{\partial l_\beta}{\partial \varphi_\beta} w + \frac{\partial z}{\partial \varphi_\beta} f_\beta^* + \frac{\partial f_\beta^*}{\partial \varphi_\beta} z + \frac{\partial \pi_\beta}{\partial \varphi_\beta} + F^* \quad (31)$$

Combining (31) and (29) with (16), (17) and (18) gives the following first-order conditions:

$$\begin{aligned} & \frac{\partial w}{\partial \varphi_\beta} + \frac{\partial z}{\partial \varphi_\beta} f_t^* + \frac{\partial \pi_\beta}{\partial \varphi_\beta} + F^* + \frac{\partial \pi_\gamma}{\partial \varphi_\beta} - \varphi_\gamma \frac{\partial f_\beta^*}{\partial \varphi_\beta} + \lambda \\ & + \mu \left(\frac{\partial w}{\partial \varphi_\beta} l_\beta + \frac{\partial l_\beta}{\partial \varphi_\beta} w + \frac{\partial z}{\partial \varphi_\beta} f_\beta^* + \frac{\partial f_\beta^*}{\partial \varphi_\beta} z + \frac{\partial \pi_\beta}{\partial \varphi_\beta} + F^* \right) = 0 \quad (32) \end{aligned}$$

$$F^* - f_\beta^* + \lambda = 0 \quad (33)$$

$$\varphi_\beta + \varphi_\gamma - \chi = 0 \quad (34)$$

Combining (32), (33) and (34) and rearranging yields the following:

$$\varphi_\beta = \chi - \left(\frac{\partial w}{\partial f_\beta^*} (1 + \mu l_\beta) + \frac{\partial z}{\partial f_\beta^*} (f_t^* + \mu f_\beta^*) + \frac{\partial \pi_\beta}{\partial f_\beta^*} (1 + \mu) + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \mu \left(\frac{\partial l_\beta}{\partial f_\beta^*} w + z \right) + \frac{\mu F^* + f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \right) \quad (35)$$

$$\varphi_\gamma = \frac{\partial w}{\partial f_\beta^*} (1 + \mu \beta) + \frac{\partial z}{\partial f_\beta^*} (f_t^* + \mu f_\beta^*) + \frac{\partial \pi_\beta}{\partial f_\beta^*} (1 + \mu) + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \mu \left(\frac{\partial l_\beta}{\partial f_\beta^*} w + z \right) + \frac{\mu F^* + f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \quad (36)$$

By comparing (19) to (35) and (20) to (36) it can be seen that the government factors in slightly amended indirect effects of the payment scheme when determining the payment level. The forest price and income transfer effects change in contrast to when there is no political influence. The impact on profits in mining is given greater weight (as $\mu > 0$), thus reducing the optimal payment to the mining sector, as does the amount of wages earned by labourers in the mining sector, and the forest rent received by land-owners renting to the mining sector. Meanwhile, a new term is included in the forest price effect, which relates to how labour demand in the mining sector changes in relation to an increase in forest input demand, $\frac{\partial l_\beta}{\partial f_\beta^*}$, weighted by the wage rate and the relative weight of political influence. An additional term is included in the income transfer effect, $\frac{\mu F^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}}$.

It is assumed that $\frac{\partial l_\beta}{\partial f_\beta^*}$ is positive; holding other inputs equal, an increase in forest demand will lead to an expansion in output thus increasing labour demand in the sector, although at a diminishing rate as forest demand increases. An increase in forest demand will also increase the relative price of forest vis-à-vis labour, boosting labour demand further. This in turn increases the wages in the sector, leading to a movement of labour away from the other sectors in order to equalise wages. The inclusion of this effect will increase the forest price effect thus reducing the optimal payment level to the mining sector. By contrast, the additional term in the income transfer effect will tend to increase the payment to the mining sector. This reveals a potential dilemma. On the one hand, the

mining sector prefers a smaller payment in order to reduce the rise in the price of the forest input, with its impact on both profits and the size of the sector. On the other, this sector would gain from a higher payment rate as it results in a higher income transfer. Whether the level of payment to the mining sector (and thus incentives to reduce the externality from forest use) rises or falls depends on whether or not the change to the forest price effect dominates the change in the income transfer effect.

If the impact on the forest price effect is greater, payments to mining fall, which reduces incentives to reduce forest input in that sector thus increasing f_{β}^* . This rise in f_{β}^* will in turn decrease $\frac{\partial \pi_{\beta}}{\partial f_{\beta}^*}$. These two effects will offset part of the fall in the payment made to the mining sector. But if the change to the income transfer effect dominates, payments to the mining sector rise. This increases incentives to reduce forest input, although it is partially offset by the changes to $\frac{\partial \pi_{\beta}}{\partial f_{\beta}^*}$ and f_{β}^* .

The direction of change in the level of payments to either sector – and thus the level of the international incentive passed through – depends on the balance between the change to the forest price and income transfer effects. If the former are greater, the impacts of reducing payments to mining on profit levels and sector size outweigh the reduced income transfer that this entails. If, on the other hand, the latter effect is greater than the former, payments to mining and thus incentives to reduce forest input demand will rise.

4.4.2 SFM sector influence

The same trade-off can also be seen in the case when the SFM sector has influence is examined. Following the same methodology as above, the following optimal payment rates are found:

$$\varphi_{\beta} = \chi - \left(\frac{(1 + \mu\gamma) \frac{\partial w}{\partial f_{\beta}^*} + (f_t^* + \mu f_{\gamma}^*) \frac{\partial z}{\partial f_{\beta}^*} + \frac{\partial \pi_{\beta}}{\partial f_{\beta}^*}}{(1 + \mu)} + \frac{\partial \pi_{\gamma}}{\partial f_{\beta}^*} + \frac{f_{\beta}^*}{\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}} - \frac{\mu(F^* - f_{\beta})}{\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}} \right) \quad (37)$$

$$\varphi_{\gamma} = \frac{(1 + \mu\gamma) \frac{\partial w}{\partial f_{\beta}^*} + (f_t^* + \mu f_{\gamma}^*) \frac{\partial z}{\partial f_{\beta}^*} + \frac{\partial \pi_{\beta}}{\partial f_{\beta}^*}}{(1 + \mu)} + \frac{\partial \pi_{\gamma}}{\partial f_{\beta}^*} + \frac{f_{\beta}^*}{\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}} - \frac{\mu(F^* - f_{\beta})}{\frac{\partial f_{\beta}^*}{\partial \varphi_{\beta}}} \quad (38)$$

Similar to when mining has influence, the government factors in the amended indirect effects of the payment scheme; compare (37) to (19) and (38) to (20). The government has a reduced influence from the impact of a change in mining forest input demand on mining profits. It also takes into account the impact of a change in forest input demand in the mining sector on the demand for

labour in the SFM sector. The income transfer component is modified with the government now concerned about the level of the income transfer to the SFM sector represented by $\frac{\mu(F^* - f_\beta^*)}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}}$.

The influence from the SFM sector reduces the importance of the impact of changes in forest on SFM profits. This pushes up the level of payment to mining in order to create a greater pie from the international REDD+ incentive. The inclusion of the labour demand effect works in the same direction. Yet, the extra focus on the income transfer component to the SFM sector pushes up the payment to SFM. This reduces the payment to mining and overall incentives to reduce forest input in that sector; which effect dominates determines the direction of change in the payment to either sector.

The result leads to the unexpected conclusion that, under certain conditions, the SFM sector may lobby for smaller payments to itself in order to increase the size of the overall pie even though this implies that it obtains a smaller share of that larger pie. The trade-off faced by the SFM sector is whether to use its influence to increase or reduce the size of its own payment. An increase reduces the incentive to lower the amount of forest used in mining and thus the size of the overall pie. A decrease strengthens the incentive in the mining sector to reduce forest use thus increasing the size of the overall pie. The decision is therefore whether to lobby for a greater share of a smaller pie, or a smaller share of a larger pie.

4.4.3 Input and Output taxes

The same methodology is followed to compute the levels of input and output taxes under both mining and SFM sector influence; full details are available in Appendix 2. This is done in order to compare the results under instruments that do not involve the unequal income transfer components that a direct payments scheme facilitates. As highlighted in Section 4.3.2 it is assumed that tax revenues are distributed on a per-capita basis and thus share of revenues received is separated from the incentives to reduce forest use in mining.

When the political influence on taxes is considered clear directions of change are observed, the ambiguity found with a payment scheme is absent as the income transfer effect is removed. Since taxes only work on forest prices, the inter-linked income transfer component observed when payments are made is no longer present. Mining sector influence leads to lower rates of input and output taxes, while SFM sector influence leads to higher tax rates.

The different effects of political influence upon the payment scheme and taxes highlights the key feature of the type of payment scheme examined here – the interlinkage between price and income

effects. Under taxes redistributed on a per-capita basis there is no income effect, and thus the only consideration is the effect on prices, and their knock-on effect on other economic variables. Under the payment scheme price changes and income re-distribution is interlinked meaning that the effect of both is taken into account when each sector lobbies, creating the potential for unexpected directions of lobbying. This highlights the important contribution of applying the Grossman and Helpman framework to these types of policy instruments.

4.5 Labour market constraints

The presence of perfect labour markets in the model is a strong assumption that is unlikely to hold in many of the jurisdictions in which REDD+ is, and might potentially be, implemented. When there is no political influence, relaxing this assumption has two main effects.¹³² First, if the extreme case where labour markets are perfectly rigid are examined, workers are now confined to their individual labour markets. Any changes in demand for labour are realised in terms of changes in wage rates rather than in movements of labour between sectors: wages become differentiated among sectors. The changes in wage rates in both forest-using sectors are factored in, weighted by the size of the workforce in each sector. Whether the inclusion of these wage rates increases or lowers incentive levels depends on the relative balance of the change in wage rates in the two sectors. If the wage effect is stronger in the mining sector than in the SFM sector payment rates to the mining sector will fall, and vice versa.

The second effect emanates from changes in the scale of derivatives now that the labour input to each of the sectors is fixed. Given the fixed nature of the labour supply, the change in profit levels, and forest use from a change in output levels, may change. Forest use may be more 'sticky' as landowners are unable to hire more labour to substitute for forest. In this case, all the policy instruments, taxes and payments, will tend to be set at a lower level, implying that less of the international incentive is passed on to the mining sector.

These two effects are relatively minor in the context of the model, and serve to highlight the point that whatever general equilibrium effects are relevant, given the prevailing market and production conditions, will be included by rational governments in designing REDD+ policy.

4.6 Discussion and Conclusions

In this chapter, a model has been developed that examines the general equilibrium effects of policies implemented for REDD+, and how these might change when there is political influence. Such effects help shape the distribution of the costs and benefits of REDD+ between two forest-using

¹³² Formal derivation of the results when labour market assumptions are relaxed can be found in Appendix 3.

sectors, mining and SFM, which represent an extractive and non-extractive sector, respectively. The effects are present regardless of the policy considered, i.e. either a payment or tax scheme. If they are not factored into international policy making, then the incentives to reduce extractive forest use (and the associated carbon externalities) on the ground could be different from those transferred at the international level to the government.

An efficient REDD+ policy chosen by a social welfare maximising government is one which factors in general equilibrium effects. This, the model finds, could raise the marginal cost of the policy. Hence, the full value of the international incentive may not be fully passed through to the relevant sectors if the policies chosen and implemented for REDD+ have negative economic consequences. Higher international payments would be required to meet an equivalent level of emissions reductions. Accounting for general equilibrium effects therefore implies a move away from the opportunity cost concept commonly used to understand and estimate the potential policy costs of REDD. Stern, (2006) was one of the first authors to make a case for REDD+'s cost-effectiveness based on this concept. Since then, various analyses have been published, which have come to similar conclusions (see Lubowski & Rose 2013). The model results imply that once the broader economic impacts of REDD+ are considered, the overall costs of a given REDD+ policy may rise.

Policies implemented as part of a national-level REDD+ strategy are likely to have effects beyond forest-extractive sectors. They have the potential to shift landowners between types of forest use, between sectors, and out of forest-using activities altogether. These shifts are likely to induce changes in output and input prices that may affect the wider economy and either reinforce or weaken the effectiveness of the strategy. A major concern regarding the effectiveness of REDD+ is leakage. The model includes an element of 'positive' leakage in the sense of incentivising the switch from extractive forest activities to those that utilise forest more sustainably. Indeed an important insight of the model is that even in the absence of REDD+ incentive payments to the SFM sector, this sector could still be incentivised to expand as a consequence of payments to the mining sector, i.e. via the impact of the payment on factor input prices. Forest shifting from mining into joint production results in carbon benefits, which are not directly rewarded in the framework. Incentives are only made in order to prevent a negative carbon externality. An interesting extension of the framework could also incorporate incentives for forest rehabilitation and reforestation in order to examine how their impacts compare to, and may interact with, those resulting from the general equilibrium effects.

Negative carbon leakage, on the other hand, does not occur due to the imposition of a national-level baseline in the model. Yet, it could occur, for example, if a REDD+ policy encourages production to

move to higher-carbon producing sectors or to jurisdictions and economies not participating in REDD+. The inclusion of a third forest-using sector into the model with the production of carbon below that of the mining sector but above that of the SFM sector could capture the former effect. Incentives that only target a particular forest extractive sector may encourage a shift in production to this middle sector, which potentially implies fewer carbon benefits from the REDD+ strategy. A national-level emissions baseline should, however, capture such leakage thus highlighting their importance for effective REDD+ policy.

The importance of general equilibrium effects is further illustrated when the role of political influence is examined. Application of the common-agency model to this type of policy instrument, which has the capacity to change relative prices and enact unequal income transfers, is shown to have ambiguous effects irrespective of whether the mining or SFM sector has most influence. In the former case, forest price effects, relating to increases in the cost of using forest as an input, lead to the mining sector preferring smaller payments. Income transfer effects, related to income transfers under REDD+, work in the opposite direction. The balance between the two effects will depend on the scale of the emissions baseline used for REDD+, and the relative degree to which a sector depends on forest for production. This leads to the counter-intuitive result that under certain conditions the mining sector may lobby for larger payments if the income effect dominates the price effect.

With an input or output tax, more determinate effects are found. When the mining sector has influence tax rates fall; when the SFM sector has influence they increase. This determinacy is a result of the separation between incentives and income distribution that results from the assumption of the per-capita distribution of revenue, highlighting the important distinction between taxes and payment schemes, and the contribution of this Chapter in extending the Grossman and Helpman framework to a class of instruments for which price change and income distribution is interlinked.

The model developed in this Chapter is an attempt to address some of the real-world, policy design and implementation issues that have surfaced in previous research undertaken on REDD+. It is, however, only a starting point for understanding the broader, economy-wide effects of implementing REDD+ at the national level, and how political influence might change these. The attention of the model is focused on two stylised forest-using sectors, and the impacts that REDD+ policy may have on driving inputs and production between them. The results are robust to the relaxation of perfect labour markets. But the assumption of perfect forest markets is more fundamental to the model. This assumption is unrealistic when applied to the majority of settings for REDD+. A key extension to the model would be to relax this assumption, and incorporate a more

realistic framework for allocating scarce forest resources between sectors. The way in which those resources are modelled, however, is limited by the use of a static framework. Deforestation, along with reforestation and forest rehabilitation, are inherently dynamic processes. Introducing dynamics into the framework is another promising area for further work.

The findings of this Chapter highlight the importance of both examining the wider dimensions of REDD+, seeing it as a policy that could potentially impact the wider economy of countries involved, and also the role that such a recognition could have upon how REDD+ policy is defined. The model also highlights the role that political economy factors can have upon how REDD+ policy on the ground could be formed. Ignoring these dimensions could lead to unrealistic expectations of how incentives created at the international level could translate to policy on the ground. This thesis will now move from examining these issues through a theoretical lens to examining them in a case study of REDD+ policy in Guyana. Chapter 5 examines how political cycles and the introduction of REDD+ policy has affected the holding of forest-related property rights in Guyana, while Chapter 6 examines the governance of REDD+ policy in the country and the role that politics has had upon the policy formation process.

Chapter 5: Rights to the forest, REDD+ and Elections: Mining in Guyana

5.1 Introduction

Property rights are a crucial aspect of natural resource management. They define the incentives to use, manage and preserve natural resources. Their importance in relation to both the drivers of deforestation and the implementation of policies to address the problem, including Reducing Emissions from Deforestation and Degradation (REDD+), has been discussed in Chapter 2. How property rights to the forest are taken out, held and given up will help to determine both the environment in which REDD+ policy is implemented, and how successful that policy will be, yet the literature relating to the holding of property rights relating to forest, and forest-related resources is sparse. As highlighted in Chapter 2 the literature has generally focused on agricultural property rights, and how their security or insecurity has increased deforestation rates. Other drivers of deforestation such as small-scale mining have not yet been studied in this context, indeed the study of the holding of property rights for mining generally, and small-scale mining in particular, is an under-researched area.

As discussed in Chapter 2 the introduction of REDD+ is likely to introduce further property rights to the forest, whether *de jure* or *de facto*. Understanding the conditions under-which pre-existing rights to the forest are held may be crucial to understanding how carbon rights for REDD+ may be held. REDD+ may, at the same time, create appropriate long-term incentives for forest management, and also perverse short-term incentives for deforestation. As existing forest rights become more insecure due to potential changes in regulation, incentives for short-term destruction or exploitation may increase. This effect may be accentuated if the threat of REDD+ policy creates a risk of expropriation or revocation of property rights. In unstable policy environments, property rights holders may wish to create the maximum short term value from their rights through exploitation, rather than risk holding the rights to realise longer-term potential returns.

It is not just REDD+ policy that may affect property right holders to the forest. The risk of expropriation of natural resource property rights has been a common phenomenon in a number of countries in recent decades and has sprouted a wide literature discussing both the causes and consequences (Hogan & Sturzenegger, 2010; Kobrin, 1984; Leon, 2009; J. Thomas & Worrall, 1994). Expropriation may be the consequence of long-term economic policy, or short-term events, such as elections. These events may change the pattern of behaviour of property rights holders as they create uncertainty over the potential benefit streams of rights, and indeed the validity of the rights themselves. Political events may thus change the nature of forest use, and therefore the deforestation environment that REDD+ policy is imposed upon, raising challenges for policy design.

Guyana provides an interesting case study to examine the above issues. As seen in Chapter 3 its current deforestation is dominated not by agriculture, but instead small-scale gold mining. A study of the country allows an extension of the literature regarding property rights and forest-use beyond agriculture. Through the Memorandum of Understanding (MOU) with Norway and the related Low Carbon Development Strategy (LCDS) a framework for REDD+ policy is being constructed and REDD+ related policy has been mainstream since 2009. Data is starting to emerge post REDD+ policy allowing some assessment of how policy is changing the incentives to hold property rights relating to the forest. This provides an opportunity to undertake one of the first quantitative assessments of the impact of REDD+ policy on forest use. Further as outlined in Chapter 3 Section 3.2.4 Guyana is a democratic country, but its recent elections have been fraught with controversy and violence, leading to unstable policy environments in the run-up to, and the aftermath of elections. It provides an example of a country where the risk of expropriation, and policy and investment uncertainty, has been common in its recent history, and therefore allows a study of how this risk has affected the holding of forest-related property rights.

This Chapter extends the literature relating to expropriation and property rights, the impact of REDD+ policy on property rights to the forest and the driving forces behind small-scale mining. It uses a unique data set of 17 years of mining claim data for Guyana to examine the evolution of mining property rights across the country, focusing on questions relating to how elections and the introduction of REDD+ has affected how mining claims have been taken out, held and given up. The key research questions it asks are:

- Have election cycles in Guyana affected how small-scale mining property rights are taken out and given up?
- Has the introduction of a REDD+ framework through the MOU and the LCDS changed how small-scale mining property rights are held?

An econometric model is estimated to describe the factors affecting the number of mining claims taken out or given up in each year. It focuses on how election cycles, and the implementation of the LCDS has affected incentives to hold mining property rights.

The model finds that elections seem to have a significant, and negative, effect on the number of claims being taken out in Guyana, not in the year of the elections themselves, but in subsequent years. A weaker effect is also seen on the number of claims given up, with elections increasing the number in subsequent years. This highlights the importance of political cycles upon property rights to the forest in Guyana. There is also some, albeit weaker evidence, of an effect of the introduction

of the LCDS on the holding of mining property rights, with a negative effect on the number of claims being taken out, through the gold price channel. It also seems to have had a level effect on the number of claims being given up. This provides some initial evidence of an unanticipated effect of the introduction of a REDD+ policy framework upon forest management, through the holding of mining property rights, in Guyana.

Section 5.2 provides more depth on the existing literature relating to property rights, the forest, expropriation and mining. Section 5.3 outlines a simple conceptual model for the taking out, holding and giving up of mining claims. Section 5.4 describes the data and Section 5.5 the econometric methodology. Section 5.6 provides the results of the econometric analysis and Section 5.7 concludes.

5.2 Property Rights, the Forest, Expropriation and Mining

Chapter 3 has presented the background and regulatory framework for small-scale mining in Guyana, but in order to fully understand the context to the research questions identified in Section 5.1 it is important to understand the previous literature relating to property rights, expropriation and the evolution of small-scale mining. This section identifies the key literature in these areas.

Property rights are a concept often cited but not defined. Daniel Bromley broke down their constituent elements to create a cogent definition (Bromley, 1991). He defines a right as the *'capacity to call upon the collective to stand behind one's claim to a benefit system'*.¹³³ He further states that *'rights are not relationships between me and an object, but are rather relationships between me and others with respect to that object'*.¹³⁴ Using these definitions he reaches the conclusions that:

*'Property is not an object but rather is a social relation that defines the property holder with respect to something of value (the benefit stream) against all others. Property is a triadic social relation involving benefit streams, rights holders, and duty bearers.'*¹³⁵

Using this definition of property rights it can be seen that the incentive to hold property depends on the benefit streams that the property offers, but also the likelihood that duty bearers will fulfil their duties, or if they fail whether there is a credible agency that can enforce them.

The importance of this enforcement in determining the incentive to invest in various factors of production is highlighted by North (1981). These incentives are just as crucial in developing countries

¹³³ Bromley, (1991) pp. 15.

¹³⁴ Ibid pp 15.

¹³⁵ Ibid pp 2.

as illustrated by Hernando de Soto's seminal work on the economic importance of property rights in Peru (De Soto, 1989) and Tim Besley's work in Ghana (Besley 1995).

Insecure property rights emerge from a number of different channels including overlapping rights, inadequate enforcement of duties or the risk of expropriation of some or all of the benefits conferred by the rights. All of these situations are prevalent in developing countries across the world, especially with regard to forest resources (Araujo et al., 2009; Mendelsohn, 1994; White, Martin, & Jenkins, 2002), although some such as expropriation are more common to below forest resources such as minerals than above ground resources such as timber.

With regard to expropriation the literature has generally focused on the risk faced by multi-national corporations undertaking foreign direct investment inclusive of that in natural resources. This expropriation does not necessarily involve the open removal of assets by host governments but may also involve attempts to renegotiate contracts, and change contractual conditions (Jensen, 2008). Hogan and Sturzenegger (2010) provide an elegant categorisation of these different types of expropriation. They define expropriation as either direct, such as the Bolivian takeover of Standard Oil assets in 1937 (Geiger, 1989), or indirect (or creeping), relating to governments assuming a larger share of projects, increasing royalties or tax rates, or changing environmental regulations. This second definition does not involve the seizure of physical property and allows the industry to continue operation – however it does involve changing the nature of the property rights. For example indirect expropriation, through changing the royalty structure, implies that government is claiming a greater fraction of the benefit stream from the property right. Such action may also undermine the credibility that the duties commensurate with that property right are to be respected and enforced by the same government agencies involved in changing the royalty structure. Direct expropriation was a common phenomenon in a number of countries in the 1960s and early 1970s (Kobrin, 1984), however by the mid-1970s this had generally ceased (Jensen, 2008). Indirect expropriation has continued apace however with recent examples, in the context of natural resources, from countries as diverse as Canada, Argentina, Kazakhstan, Congo and Mongolia (Hogan & Sturzenegger, 2010).

Expropriation can be motivated by a range of factors, economic, ideological or ethnic. It may occur at any time, but is often linked to periods of political instability, such as elections. This phenomenon has been seen in a number of countries, especially in Sub-Saharan Africa, where the revocation and redistribution of property rights has often been used as an electoral tool (Boone, 2009). Economic work on expropriation has generally focused on direct expropriation of multi-national assets by national governments (Jensen, 2008; Svensson, 1998) or alternatively the risk of repudiation in

international lending (Atkeson, 1991; J. Thomas & Worrall, 1994). However government expropriation can often be a purely domestic phenomenon (Chege, 2008), indeed some of the most insecure rights holders are domestic stakeholders in developing countries.

Chapter 2 has highlighted the important role of property rights in both deforestation and the design of forest policy to reduce the phenomenon, including REDD+, and the extent of the literature discussing the topic area. A large body of literature has emerged focusing on the impact of insecure land tenure upon deforestation patterns with findings that security can both decrease and increase deforestation (Angelsen, 1999; Araujo et al., 2009; Bohn & Deacon, 2000; Deacon, 1999; Mendelsohn, 1994). These studies have focused on the impact that property rights insecurity has upon agriculture. Yet agricultural property rights are by no means the only sort of right affecting the forest. Usage rights for trees are inherent in forestry concessions and the right to clear and develop forested areas are implicit in mining concessions that often dot tropical forests. These mining concessions relate to a diverse set of minerals and are held by a wide-spread of actors, from large multi-national corporations, to small-scale and artisanal operators. Many of these rights may be *de facto* rather than *de jure*. As highlighted in Chapter 4 mining is a major driver of deforestation. It also acts as a pioneer beyond the forest frontier, helping to create both infrastructure and demand for agricultural commodities, such as through the small miners called Garimpeiros operating beyond the forest frontier in Brazil (Barreto et al. 2006).

Despite its importance in this regard there has been a dearth of research relating to small-scale mining generally, and its relation to property rights and use of the forest in particular. The little modelling that exists on the decision-making processes of mining operators has focused on large-scale operators. Slade, (2001) uses a real-option model to investigate both the initial investment and operation decisions in order to assess the value of managerial flexibility for large Canadian copper mining operations, focusing on the impact of prices, costs, grades, reserves, ore extraction and metal output.

Tole & Koop, (2011) investigate the regional location decisions of major gold mining firms using political, economic, regulatory, infrastructure and investment risk variables. They find that firms are attracted to locations close to their head office, and in regions with low corruption. They find evidence of the importance of low risk, secure, transparent and stable environments in determining where firms choose to locate.

The illegal and/or semi-formal nature of small-scale mining operations in many countries has hindered research, partly due to a lack of quantitative data on the scale, scope and evolution of the

phenomenon. There is however a literature examining the drivers of small-scale mining, focusing primarily on the reasons behind its illegality. Aryee, Ntibery, & Atorkui, (2003) outline the situation surrounding small-scale mining in Ghana, highlighting the economic, technical, legal and operational factors behind its growth and its associated environmental impacts. Hilson & Potter, (2003) provide a study on why illegal artisanal and small-scale mining is so prevalent in Ghana, identifying the factors that have led to a failure to regulate and formalise the sector, focusing on property rights issues, industry support services and the skills of miners. Jønsson & Fold, (2011) provide a study on the Artisanal and small-scale mining (ASM) sector across Africa as a whole, focusing on four issues that they identify as crucial to the ASM debate: its role in livelihoods, the organisational dynamics, its conflicts with large-scale operators and the role of alternative trade regimes based on ethical standards. This literature, although identifying the key issues, rationale and factors driving the growth of ASM from a qualitative perspective, does not provide any quantitative evidence for the different role of economic, political or institutional drivers for the growth of small scale mining.

The most extensive econometric assessment of small scale mining in South America was conducted in Suriname relating to the activities of the Ndyuka people, a maroon ethnic group who live in Eastern Suriname. Heemskerk (2001) used time series analysis to look at the effect of international prices and domestic political and economic instability on gold mining activity concluding that domestic factors such as inflation and unemployment were more important in driving the Ndyuka people of Suriname into the gold mining industry than international factors. Hammond et al. (2007) conducts the only quantitative analysis of mining in Guyana in a study of the Guiana Shield as a whole. They found that global gold prices had led to production increases in large-scale mining at different scales across the Shield. They found that policy differences were a crucial determinant of the direction and rate of production changes between countries.

There is a general lack of literature with regard to risks of expropriation of property rights related to the forest. There is also a gap regarding quantitative studies relating to small-scale mining in general, and property rights in particular. This Chapter adds to both of these literature streams, as well as contributing to the early assessments of REDD+ frameworks by answering the research questions identified in Section 5.1.

5.3 Mining model

In order to understand how economic, regulatory, political and geographic factors have affected the evolution of mining activity in Guyana, a conceptual model of the behaviour of mining actors is constructed. This model builds on the literature relating to mining decision-making internationally such as Slade, (2001), the work of Heemskerk, (2001) in Suriname, and the discursive literature such

as Jønsson & Fold, (2011) that identifies the factors driving artisanal and small scale mining activity. It also draws conceptually on decision-making literature in other fields notably Harstad, (2012) who build a model to investigate the decision-making of investors into a conservation good. It is influenced by the model used by Burgess, Hansen, Olken, Potapov, & Sieber, (2010) in investigating the effect of electoral cycles on the drivers of deforestation.

The model focuses on the decisions of a rational, profit maximising miner faced with the decision to take out, hold and then give up a mining claim for an identified parcel of land.¹³⁶ The miner faces decisions in each period allowing an identification of the key variables that are anticipated to affect the probability of a claim being taken out, held or given up in any particular year.

The model starts with the initial decision faced by the actor. In Year 1 the actor faces a decision of whether or not to take out a claim for a parcel of land. In making this decision the actor weighs up the discounted future anticipated profit stream for the claim against the cost of taking out the claim. This cost is both the fee involved¹³⁷ plus the additional costs of undertaking the activities necessary to take out the claim (travel to the city to complete applications, liaising with government departments, demarcating the claim, etc.). If the discounted future anticipated profits stream is greater than the cost of taking out the claim then it is assumed that the actor takes out the claim - the probability of a claim being taken out is thus positively related to the discounted future anticipated profit stream and negatively related to the cost of taking out the claim.

Discounted future anticipated profit streams, $E\pi$, are modelled as:

$$E\pi = \int_{t=0}^T \frac{E(\pi_t)}{(1+r)^t} dt \quad (1)$$

$$E(\pi_t) = \left(E(p_t^g) \times E(prod_t) \right) - E(Operating\ cost_t) \quad (2)$$

Where:

- $E(\pi_t)$ is the expected profit at time t comprising:
 - o $E(p_t^g)$, the expected price of gold in time period t
 - o $E(prod_t)$, the expected production rate of gold in time period t

¹³⁶ It is assumed that the identified parcel of land is available for a claim to be issued, and thus the government side of the decision making process is neglected. The assumption of a rational profit-maximising actor for the miner is one that could be called into question given the importance of small-scale mining as a source of livelihoods in many situations (Bryceson & Jønsson, 2010). However in Guyana the small-scale mining sector is dominated by a number of business operators who are more likely to behave as rational profit-maximisers (C. Y. Thomas, 2009).

¹³⁷ See Section 3.4.2 for details of the fee structure in Guyana.

- $E(\text{Operating cost}_t)$, the expected cost in time period t , encompassing fuel costs, labour costs, costs of compliance, fees payable to the government, exploration costs, etc.
- t is time period
- r is the discount rate
- T is the total time that a claim is expected to be held for

The probability that a claim is taken out is positively related to expectations of future gold prices and expectations of future production at that claim, and negatively related to expectations of future costs. It is also negatively related to the discount rate. The probability also depends on the expected length of time of production at a particular claim. Although regulatory factors may play a role through a number of channels the main avenue identified by previous literature on mining (Bhappu & Guzman, 1995; Park & Matunhire, 2011) and investments generally (Clark, 1997) is the discount rate and this is the main channel through which regulatory risk is hypothesised to affect the model here. From (1) and (2) the probability that a claim is taken out is a function of a number of factors:

$$\begin{aligned} & \text{Prob}(\text{Takenout}) \\ & = f(E(p^g), E(\text{prod}), E(\text{operating costs}), E(\text{regulatory risk}), E(\text{taking out costs})) \quad (3) \\ & \quad (+) \quad (+) \quad (-) \quad (-) \quad (-) \end{aligned}$$

Where:

- $E(\text{regulatory risk})$ is the anticipated level of regulatory risk from events like elections, and the introduction of the LCDS.
- $E(\text{taking out costs})$ is the expected value of costs involved in taking out a new claim, both in terms of fees payable to the government and also opportunity costs relating to completing the regulatory process.

Once a claim has been taken out the miner faces an annual decision of whether or not to renew the claim. Nested within this decision is a series of other decisions of whether to operate the claim, i.e. start mining activity, or, if mining activity has commenced, whether to continue or cease that activity. If the activity ceases the miner faces the decision of whether to keep or rescind the claim.

The first decision the miner faces in Year 2 (the year subsequent to taking out the claim) is whether to continue to hold or to rescind the claim. It is assumed that the miner will hold the claim if, $E\pi$, is greater than the rental costs (the annual rental fee plus any associated costs). If costs are greater than the profit stream then it is assumed that the miner will give up the claim. Thus the decision to hold or give up a claim depends on the expected future profit stream.

If the miner decides to hold the claim the next decision is whether to operate the claim or not. A miner may hold a claim without operating as long as he meets the regulatory requirements.¹³⁸ He may delay operation while he undertakes exploration, clearance, or due to anticipated future rises in prices or decrease in costs. It is assumed that there exists a value from operating the claim in a given year, t:

$$\text{Operating value}_t = (E\pi | \text{prod}_t) + \pi_t \quad (4)$$

where

$$\pi_t = (\text{prod}_t \times p_t^g) - \text{operating costs}_t$$

This can be generalised to the following condition that if satisfied implies that the claim will be operated:

$$\begin{aligned} \text{Operating value}_t &= (E\pi | \text{prod}_t, \text{operating costs}_t) + \pi_t > \text{Holding value} \\ &= E\pi - \text{rental costs} \quad (5) \end{aligned}$$

Where *rental costs* is the value of the costs associated with holding the claim but not operating it, such as the rental fees payable to government highlighted in Chapter 3 Table 3.4. The claim is held, thus, if:

$$E\pi | \text{prod}_{t-1} - \text{rental costs} > 0 \quad (6)$$

This can be generalised to:

$$E\pi \left| \sum_{t=0}^n \text{prod}_{t-1} - \text{rental costs} > 0 \quad (7)$$

for subsequent time periods. From (1), (4), (5), (6) and (7) the probability of a claim being given up in any year, n, is dependent on a number of factors:

$$\begin{aligned} &\text{Prob}(\text{givenup}) \\ &= f \left(\begin{array}{cccccc} (E(p^g), E(\text{prod}), E(\text{operating costs}), E(\text{Regulatory risk})) & \left| & \sum_{t=0}^n \text{prod}_{t-1} \right. & (8) \\ (-) & (-) & (+) & (+) & (+) \end{array} \right) \end{aligned}$$

Equations (3) and (8) highlight the main determinants of the decisions to take out and give up claims. The decisions have four common elements, expected prices, expected production, expected costs

¹³⁸ These requirements are discussed in the section on Mining regulations in Section 3.5.

and expected regulatory risk. The decision to take out a claim also includes the costs involved in the process, while the decision to give up a claim includes the production history of that claim. How each of these elements could be estimated is discussed below.

5.3.1 Expected prices

The modelling of miners' gold price expectations is a complex task in itself. It may depend on a number of factors including the evolution and variation of previous prices and miners expectations and level of knowledge of future price generating trends (for gold prices expectations about the global economy is an important factor). Estimating such a complex function is beyond the scope of this Chapter - the simplest model that could be used is that expectations of future prices are based on prices today so the initial assumption is that the expectation of future prices can be modelled with the present price. The Guyana Gold Board, the main purchaser of gold in Guyana, offers the international gold price to miners.¹³⁹ Expectations of future prices are thus modelled using the inflation-adjusted international gold price.

Such a simple model however may fail to capture some of the dynamics involved in the future expectation of gold prices of miners. Therefore in order to test the robustness of the simple model two alternative specifications are tested. A three year simple moving average of gold prices is included to test the effect of the previous evolution of gold prices upon the incentives to hold and give up claims. In addition the volatility of gold prices within each individual year is computed by calculating the standard deviation of monthly gold prices. The lag of this volatility is included to test whether the volatility of gold prices plays a role in the incentives to hold mining property rights.

As discussed in Chapter 3 Section 3.5.2 mining claims in Guyana are available in each of the six mining districts and in one of four different types. Interaction variables are introduced to capture district specific and claim type specific interactions with the gold price. Given the different characteristics of districts in terms of geological conditions, prevalence of deposits and historic mining activity it may be expected that changes in the gold price may have different effects on different districts. Further given that claims can come in one of four types, Gold, Gold and Precious Stones, River and Precious Stone Only it may be hypothesised that changes in the gold price will have a greater effect on some claims (for example Gold) than on others (Precious Stones Only).

¹³⁹ The price used by the Gold Board is generally the London price (Capitol News, 2013). The actions of the Gold Board are governed by the Guyana Gold Board Act (Government of Guyana, 1994). Although there are small legal and illegal gold purchasers in remote districts there is no data as to the prices that they offer and the variation over time in their prices is likely to follow international gold price movements.

5.3.2 Expected production rate

The expected production rate from any individual claim will vary on a range of claim and owner specific variables. Beyond the inherent level of the gold reserve at the site, the location of the claim in relation to any existing operations will be important, as will the level of information that a holder has regarding the claim. Any exploration work done on the site will affect the level of expectations, either positively or negatively depending on the results. Expected future production will also vary depending on the level of previous production at the site, with the anticipation that higher previous production will be accompanied by lower future production, given a fixed level of reserve at the site of the claim. None of these variables are observable so proxies must be sought. The age of claims held in a district in any year can be obtained and this is used as a proxy for expectations of production. It is assumed that the longer claims have been in held in a particular district, the higher the expectations of production in the district as a whole, with the length of claims being held indicating good overall production. However there may be an opposing effect on the expected production of any new claims in that area. The longer the claims are held in a district, the more likely it is that the prime production land has been taken and therefore any new claims may have lower expected production. Thus it may be anticipated that age is negatively related with expected production for new claims, but positively related to expected production for existing claims.

For claims given up the model outlined above highlights the importance of the historic production of the mining claim. This cannot be observed for each claim directly, or for the district as a whole. As a proxy however, the duration that the claims given up are held for could be used, with the hypothesis that the longer claims that have been given up have been held for the greater the level of production at that claim. If claims are being given up with longer durations that may indicate it is more due to previous levels of production, rather than other factors.

5.3.3 Expected costs

The largest elements of costs to a mining operation are labour and oil (Heemskerk, 2001; Thomas, 2009). Labour is needed to operate machinery whilst diesel is required for the engine's needed to run the high pressure jets for hydraulicking or the pumps for river dredging. Diesel in Guyana is imported through two main sources Trinidad and Tobago or Venezuela.¹⁴⁰ Although preferential terms are received for diesel purchased from Venezuela the price of diesel in Guyana tends to follow world market prices.¹⁴¹ Thus to proxy domestic diesel costs global crude oil prices are used.

¹⁴⁰ Guyana imports around 50% of its domestic oil consumption via the Petro Caribe agreement with Venezuela (Jacome, 2011).

¹⁴¹ An analysis of monthly retail gasoline prices in Guyana and monthly global crude oil prices shows a correlation between the two of over 0.7 over the period 2009-2010.

There is no wage data available for Guyana for the time period required therefore as a proxy real GDP per capita is used. This variable was used by Heemskerk (2001) to proxy job opportunities outside the mining sector. It can therefore serve as a possible proxy for the opportunity cost of working within the mining sector and the level of wages demanded by workers to remain in the sector.

Rental fees in Guyana have stayed stable in recent years. This means that in fact over time these costs have fallen in real terms at the rate of inflation. Royalties have remained constant at 3% of declared production, thus these costs change in line with international gold prices. As these two elements are fixed over the time-scale of the study they are not suitable for inclusion in the model as there is no variation over the data sample, although they will undoubtedly form an element of rental and operating cost expectations.

5.3.4 Expected Regulatory Risk

There are two identified areas of regulatory risk of specific interest to this model, election events and the introduction of REDD+ policy. The hypothesis that either or both of these elements affects the incentives to take out, hold and give up mining claims in Guyana is tested here.

Elections may trigger risks relating to higher regulatory costs, affecting cost expectations; risks regarding expropriation of existing claims, and the ability to renew; expectations of higher rental fees, or even the inability for the government agencies to be able to process new claims or renew existing claims. The aftermath of elections may also see increased migratory activity as people leave the country leading to a drop-off in the demand for claims. Elections occurred in Guyana in 1997, 2002, 2006 and 2011 and the uncertainty relating to these events is discussed in Chapter 3 Section 3.2.4. To capture the potential, and differential effects that elections could have a set of dummies are constructed representing the year before, the year of, and the two years immediately subsequent to election events. They are included in different combinations to ascertain whether regulatory risk is occurring before, during or after election events. The nature of the regulatory system in Guyana where claims are only given up once annual renewal fees have not been paid implies a certain lag in the system, meaning that the evidence for claims being rescinded may only show up in years subsequent to the actual decision to rescind.

The second source of regulatory risk in Guyana is related to the introduction of the LCDS. The introduction of the strategy, accompanied by the MOU with Norway has led to uncertainty in the industry regarding the stringency of future regulations, the ability of miners to take out new claims

and the potential costs regarding operations.¹⁴² This is seen in the discussion in Section 3.5 with the introduction (and subsequent removal) of new regulations relating to mining, statements from Ministers regarding enforcement and the establishment of the Special Land-Use Committee (SLUC). Further it is hypothesised that the introduction of the LCDS has fundamentally changed miners' future expectations, implying not only level effects, but also changing the model via interaction effects with other variables such as gold prices. A variable is included to capture any change in behaviour that has occurred since the LCDS was introduced in 2009 with an interaction term included to test whether the LCDS has fundamentally changed how mining operators respond to gold prices.

The different nature of each of the four types of mining claims may mean that the regulatory risk does not have a homogenous effect. The LCDS may have affected to a greater degree those claims that use the forest (Gold, Gold and Precious Stones and Precious Stones only), while it may also be expected to affect those that use the forest more destructively (Gold and Gold and Precious Stones). To capture these effects, interaction terms are included.

5.4 Data

The source of the units of observation is the list of claim licences in existence and claims held published annually by the Guyana Geology and Mines Commission (GGMC) in the Official Gazette of Guyana¹⁴³ consisting of a list of the claims held as of December of the previous year. The Gazette includes data on the type of claim, the district in which it was held and the year that it was taken out, along with the owner and a short description of the area. Districts and Types are referred to by number as outlined in Table 5.1.¹⁴⁴ Plots of the number of claims held per district and per type are shown in Figure 5.1 and Figure 5.2.

From the data extracted from the Gazettes the number of claims taken out in each district of each type for each year (*takenout*), along with the number given up (*givenup*) can be computed. A summary of these variables is shown in Table 5.2. From the data the age of the claims held in each district of each type could also be extracted along with the duration of the claims that were given up. Data was compiled by the author from hard copies of the Gazettes held at the Library of the GGMC.

¹⁴² As communicated to the author by two members of the Guyana Gold and Diamond Miners Association (GGDMA) Shields, E. (personal communication, March 3, 2012) and Sparman, C. (personal communication June 6, 2012).

¹⁴³ List of Claim Licences in Existence and Claims held, published by the GGMC in The Official Gazette (Extraordinary) of Guyana: Published by the Authority of the Government. As legally required by the Regulations s26 (1).

¹⁴⁴ See Section 3.5.2 for more details and Figure 3.14 for a map of the mining districts.

Table 5.1: Mining Districts and Types

District Number	District Name
1	Berbice
2	Mazaruni
3	Potaro
4	Cuyuni
5	North-West
6	Rupununi

Type Number	Type Name
1	Gold
2	Gold and Precious Stones
3	Precious Stones
4	River

International gold price data is sourced from www.kitco.com and deflated using data from the IMF (International Monetary Fund, 2013). Oil price data is sourced from the BP Statistical Review 2013 (BP, 2013). Real GDP per capita data is sourced from the IMF (International Monetary Fund, 2013). A summary of the independent variables is given in Table 5.3.

The correlation of the independent variables was tested to ensure that any problems of multicollinearity are minimised. The results are shown in Appendix 4. High correlation was found in the time period between the real gold price, real oil prices and real GDP per capita. Thus the changes in the latter two variables are used in the estimation rather than the level variable. A high level of correlation between the introduction of the LCDS and real gold prices is observed due to the recent spike in gold prices. This does raise some question-marks regarding multicollinearity, however since both variables are of crucial importance to the model, and the correlation between the variables is spurious both variables are included.¹⁴⁵

Table 5.2: Summary of dependent variables

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>S.D.</i>	<i>Min</i>	<i>Max</i>	<i>Number of zeroes</i>
Taken out	408	49.32	85.03	0	561	128
Give up	384	43.35	79.13	0	648	90

Table 5.3: Summary of independent variables

<i>Variable</i>	<i>Mean</i>	<i>S.D.</i>	<i>Min</i>	<i>Max</i>
Age of claims (years)	8.93	5.42	0	22.71
Duration of claims given up (years)	5.65	6.24	0	44.2

¹⁴⁵ It should be noted that no variables were dropped from the Stata analysis for collinearity.

Real gold price (US\$)	676.86	537.78	242.27	1923.97
Change in oil price (US\$)	4.49	13.40	-38	27.28
Change in Real GDP per capita (US\$)	9422.18	9070.87	-7670.51	23131.04

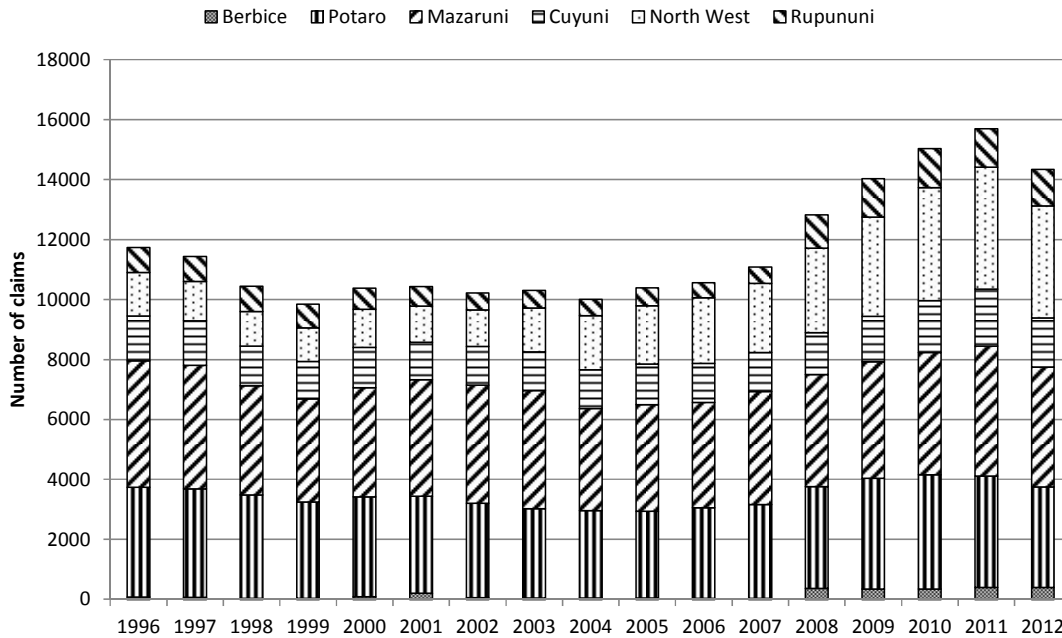


Figure 5.1: Number of claims held 1996-2012, by district

Source: The Official Gazette (Extraordinary) of Guyana

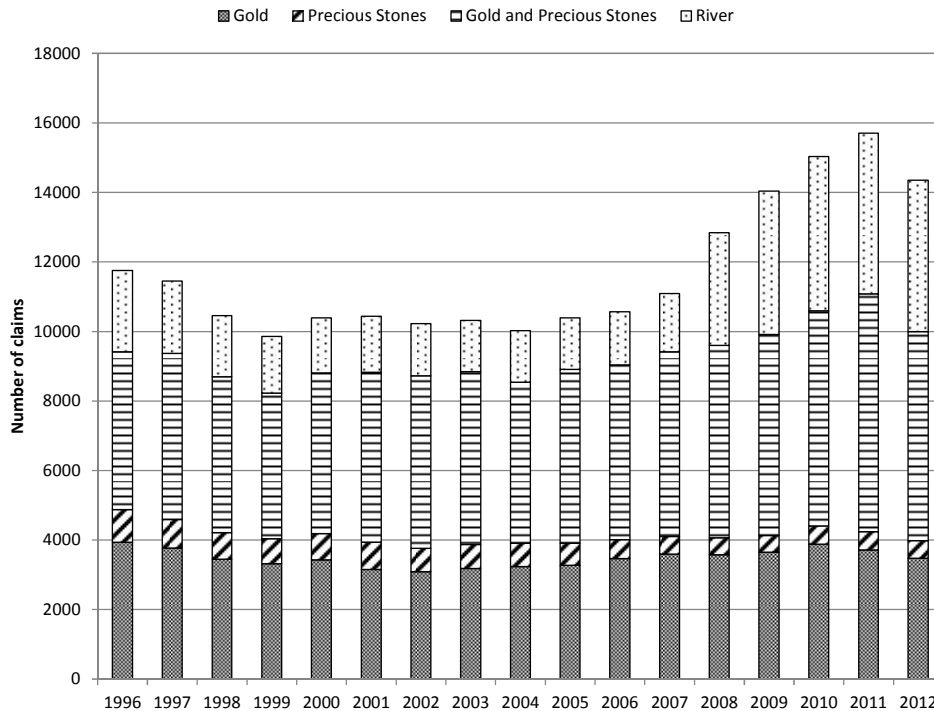


Figure 5.2 Number of claims held 1996-2012, by type

Source: The Official Gazette (Extraordinary) of Guyana

5.5 Methodology

The unit of observation is a set of time-series cross-sectional count data. Data is observed for 17 years between 1996 and 2012. In each year observations are obtained for each of the 6 mining districts of Guyana and each of the four claim types yielding a panel of 17 years by 24 district-type combinations.

A first step is to examine the behaviour of the first dependent variable, the number of claims taken out (*takenout*). Plotting the number of claims taken out against its lag shows some evidence of persistence (Figure 5.3). This may be because variables relate from year to year, expectations are formed in one year, but only result in a claim being processed in the next year, or there are ‘rushes’ or ‘shouts’ in the Guyanese parlance where gold is struck and there then follows a rush of prospectors to the area. Plotting the variable against the year there is some evidence of an upwards trend over time (Figure 5.3). This may be a result of an increase in the mining sector in Guyana generally as Brazilians have started to enter the industry due to tighter regulations in their own country. It may also be as a result of increasing prices.

Similarly the number of claims given up may show persistence with actors responding to economic shocks from previous years in forming expectations of the future. Again plotting the variable over time and against its lag shows some evidence of persistence (Figure 5.4) and a small upwards time trend.

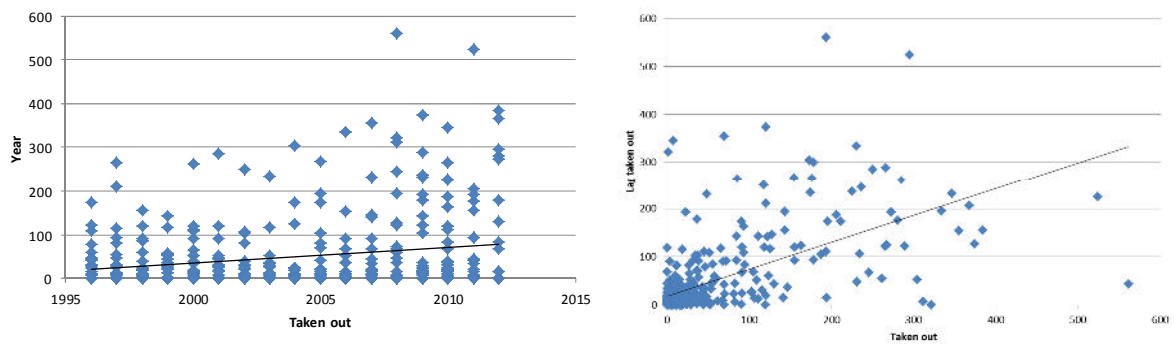


Figure 5.3: Correlations between year and *takenout* and *takenout* and lagged *takenout*¹⁴⁶

¹⁴⁶ Each point represents a district-type combination, e.g. District 1 – Gold only claims.

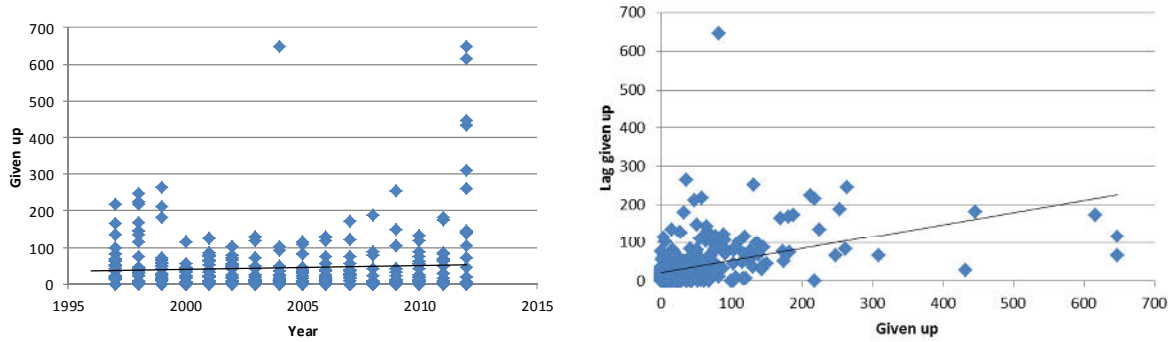


Figure 5.4: Correlations between year and *givenup* and *givenup* and lagged *givenup*

When there is evidence of persistence in the dependent variable it is important to test for the existence of a unit root. If such a unit root exists the variable could be generated by a random-walk process. Any correlation between the variable and independent variables could then be spurious, causing incorrect inference (Harvey, 1990). The Breitung panel unit root test is used as it retains good explanatory power for small datasets (Breitung, 2000). The test has a null hypothesis of the existence of a panel unit root. For both variables *takenout* and *givenup* the null hypothesis is rejected and it can be concluded the variables are stationary, i.e. there is no unit root (Table 5.4).

Table 5.4: Breitung unit root tests of dependent variables

Variable	Test statistic	p-value
<i>takenout</i>	-3.2649	0.0005
<i>Givenup</i>	-3.2192	0.0006

The observed units are fixed, there is no sampling involved, in each year data for the entire population is observed. This justifies a different approach from panel data methods that assume units are drawn from a much greater population. Conceptually the asymptotics are different – in panel data N , the number of observations increases to infinity, while for time series cross-section (TSCS) it is the number of time periods T , which increases to infinity. TSCS methods differ both theoretically and practically from panel data methods. As highlighted by Beck (2001) the issues are essentially more similar to standard time series analysis than those relating to panel data. Assuming the model is linear in nature Ordinary Least Squares (OLS) can be used to estimate the model, however it is highly likely that the Gauss-Markov assumptions regarding the structure of the errors will be violated. TSCS data often have heteroscedastic and contemporaneously correlated errors, along with serial correlation. These issues lead to OLS being inefficient, but still consistent – yielding unbiased but inefficient estimates.

Two main approaches have been proposed to deal with these issues: the first is the use of Feasible Generalised Least Squares, using the procedure known as Parks-Kmenta (Kmenta, 1986; Parks, 1967). Beck & Katz (1995) and Beck (2001) highlight however that the procedure requires estimation of an enormous number of parameters for the error co-variances and conclude that ‘the Parks-Kmenta standard errors are wrong¹⁴⁷ and ‘the Parks-Kmenta estimator simply should not be used’.¹⁴⁸ They propose an alternative methodology for solving the problems of heteroscedasticity and contemporaneous correlation called Panel-Corrected Standard Errors (PCSE). These are similar to White’s heteroscedasticity-consistent-standard errors for cross-sectional estimates, but take into account the information provided by the panel structure of the data (Beck & Katz, 1996) and are adopted here.

An issue arises however with the use of OLS estimates using PCSE’s for the data in this Chapter. The data is count data: consisting of non-negative integers, without explicit upper limits but a lower bound of zero. The use of OLS with this data can produce biased and inefficient estimates, as can the often used technique to solve some of these problems, a logged OLS model (King, 1988). OLS can be used if however the count data itself, or a suitable transformation, is normal. The Shapiro-Wilk test of normality (Shapiro & Wilk, 1965) is used to test the normality of *takenout* and *givenup*. The natural log of each of these variables is also tested, along with differences of the variables (Table 5.5). These tests indicate that none of the dependent variables of interest show normality, even if a log-transformation or differencing is applied. This means that OLS is an inappropriate technique to apply to the data. It can serve however as a useful reference point for the results from other possible models.

Table 5.5: Tests of normality of dependent variables

Variable	Z	Prob>z
Taken out	10.587	0.00000
Ln Taken out	2.787	0.00266
Given up	11.215	0.00000
Ln given up	2.758	0.00291
Differenced taken out	10.136	0.00000
Differenced givenup	10.967	0.00000

A number of models are proposed for count data that does not demonstrate normality, of which Poisson and Negative Binomial models are the most common. Poisson models are generally the workhorse of count modelling (Winkelmann, 2008), however they require a series of restrictive assumptions, not least equivalent mean and variance. This often does not hold in practice – indeed

¹⁴⁷ Beck (2001) pp. 119.

¹⁴⁸ *ibid* pp. 119.

here the dependent variables show much higher variance than means. Negative Binomial distributions have been used instead of Poisson models to deal with issues of over-dispersion, where variances are greater than means. Both models can be extended to account for data sets where there are a large number of zero observations that can cause bias to results. The extension is called zero inflation and implicitly assumes that there are two different processes at work: one being the standard count model, and one that implies that some of the zeroes have zero probability of being greater than zero. An inflationary equation is used to predict which observations fall into this second category. These models are called zero-Inflated Poissons, or zero-inflated negative binomial models (ZINB).

For time series data, however, both Poisson models and negative binomial models can be problematic as highlighted by Brandt, Williams, Fordham, & Pollins, (2000) and Brandt & Williams (2001). They show that including a lagged dependent variable, the standard approach adopted to deal with dynamic issues, is only appropriate in Poisson or Negative Binomial models for series with exponential growth rates and no dynamics. This is not the case for the data here thus merely including a lagged dependent variable into these models would be inappropriate.

An alternative approach which can incorporate both the count nature of data and dynamic elements are Generalised Estimating Equation (GEE) models.¹⁴⁹ They are a special class of Generalised Linear Models (GLM) that allow for correlation between observations, both over time and in clusters. They have been widely used in the natural sciences, especially medicine, to analyse situations where there are repeated observations on individuals over time, and are increasingly being applied in political science (Zorn, 2001). GEEs also have the advantage that they can be used with a variety of models, both linear and non-linear, allowing the use of a negative binomial distribution to take into account count data. The model was first introduced by Liang & Zeger, (1986a) and Zeger & Liang, (1986) to estimate efficient regression model parameters in the presence of correlated data and has been further advanced by Diggle, Liang, & Zeger, (1994). Failure to take into account correlation within responses can lead to incorrect inferences regarding regression parameters (Ballinger, 2004) and GEE models provide a method to correct for this issue. The technique uses quasi-likelihood estimation to estimate parameters, using an iterative quasi-scoring procedure and requires the definition of four items:

- The distribution of the dependent variable (this is defined in the model here as the negative binomial)

¹⁴⁹ For a detailed discussion of GEE models and their application see Ballinger, (2004), Hanley, Negassa, deB Edwardes, & Forrester, (2003) and Hardin & Hilbe,(2013).

- The link function – this is the link between the response variable and the linear predictor (here the default option for the negative binomial, the log function, is used)
- The independent variables
- The covariance structure of the repeated data, the working correlation matrix. There are a number of options here: independent, i.e. no correlation between observations; unstructured, there are no constraints placed on the correlations – they are driven by the data; and autoregressive where an AR (1) is assumed for the correlation between observations.¹⁵⁰

GEE models provide significant advantages, chiefly that they provide consistent estimation even with mis-specified correlation structures, however as the technique does not calculate a likelihood function it is not possible to use the methods associated with Maximum-Likelihood Estimation to test the fit of the model, or compare between models (J. Hardin & Hilbe, 2013). GEE models are most suitable for large-N samples; however their use here, although not ideal, does provide a robustness check alongside the other two modelling options. A downside of GEE models is that they merely treat the within-subject covariance structure as a nuisance - merely something to be controlled for, simply modelling the mean response (J. Hardin & Hilbe, 2013). This does not allow for elucidation of the details of the within-subject correlation, instead they provide the response of a unit change in the predictor, averaged over the entire sample.

None of the modelling options are fully suitable to capture all aspects of the data therefore three models are used to compare results and test for robustness. For the two dependent variables *takenout* and *givenup* three models are presented:

1. An OLS with PCSE and a lagged dependent variable is run to capture some of the dynamic elements and to take into account the persistence that is evident in the variable;
2. A ZINB model with robust errors is run to take into account the count data nature of the variable with an inflationary equation including the dummies for district and type, but dynamic elements are excluded;
3. A GEE model with a negative binomial distribution for the response variable is run. Using tests of Quasi-Likelihood Information Criterion,¹⁵¹ evidence of persistence in the data for both dependent variables, and theoretical considerations that there is likely to be effects

¹⁵⁰ An AR(1) process is given by: $X_t = \alpha + \beta X_{t-1} + \varepsilon_t$.

¹⁵¹ The test used is based on the extension of Akaike's Information Criterion developed by Pan, (2001) for model-selection in GEE models. It was implemented using the qic test in Stata developed by Cui, (2007).

from shocks in one time period felt in latter periods, an AR(1) correlation structure is chosen for the working covariance matrix, along with robust standard errors.¹⁵²

The OLS model adopts the following specification:

$$y_{it} = \alpha + \beta X_{it} + \delta y_{it-1} + \varepsilon_{it} \quad (9)$$

where y_{it} is the observed dependent variable with i the the district-type combination and t the time period. X_{it} is a matrix of covariates, β is a vector of estimated parameters, y_{it-1} is the lagged dependent variable, δ is an estimated parameter, ε_{it} is the error term.

The matrix of covariate variables is varied to capture the different possible options for the key determinants of the incentive to hold property rights as outlined in Section 5.3. It also includes interaction terms, and district and type specific dummies.

For the ZINB model the probability that the value of the dependent variable is observed is:

$$P(y_{it} = y) = \left(\frac{r}{r + \lambda}\right)^r \frac{\Gamma(r + y)}{\Gamma(y + 1)\Gamma(r)} \left(\frac{\lambda}{r + \lambda}\right)^y \quad (10)$$

where the dispersion parameter $r = 1/\sigma^2$ and $\lambda = \exp(\beta X_{it})$. The inflationary quation is estimated by district and type specific dummies.

For the GEE model if we let $Y_i = [y_{i1}, y_{i2}, \dots, y_{iT}]$ be a column vector of observations of dependent variable for district-type combination, i , up to time period T , X_i be a $T \times k$ matrix of covariates for observation i and $E(Y_i) = \mu_i$ then:

$$\mu_i = h(\beta X_i) \quad (11)$$

where the inverse of h is the 'link' function. The vector of estimated parameters, β , is estimated using quasi-likelihood methods as the solution to a set of k 'quasi-score' differential equations:

$$U_k(\beta) = \sum_{i=1}^N D_i' V_i^{-1} (Y_i - \mu_i) = 0 \quad (12)$$

where $D_i = \mu_i / \beta$, V_i is the variance of Y_i , given by:

¹⁵² AR(1) structures outperformed independent structures across all model specifications. Unstructured working covariance matrices did not lead to convergent models and thus could not be used.

$$V_i = \frac{(A_i)^{1/2} \mathbf{R}_i(\boldsymbol{\alpha}) (A_i)^{1/2}}{\phi} \quad (13)$$

where $\mathbf{R}_i(\boldsymbol{\alpha})$ is a $T \times T$ working correlation matrix across time, t , for a given \mathbf{Y}_i and A_i are $T \times T$ diagonal matrices with $g(\mu_{it})$ as the t th diagonal element. In the same manner for the OLS and negative binomial models the elements of \mathbf{X}_i are varied in different model specifications.

Structural breaks

As an alternative to the inclusion of dummy and price-interaction variables to capture whether the introduction of the LCDS has had an impact on the holding of mining claims tests of a structural break in the model at the introduction of the LCDS are implemented. For the OLS model a Chow test is used, while for the negative binomial and the GEE models a likelihood ratio test is used (Harvey, 1990).

5.6 Results

Ten specifications are run for both *takenout* and *givenup* under each of the three models to capture the different options for independent variables for expected prices, costs, production and regulatory risk discussed in Section 5.3 above. The details of these models are given in Appendix 5. Dummy variables are included to control for district, and claim type specific effects. Full results are given in Appendix 6 and 7.

5.6.1 Diagnostic tests

For the OLS model two diagnostic tests were implemented, a Breusch-Pagan test of heteroscedasticity (Breusch & Pagan, 1979) and a Woolridge test of autocorrelation in panel data (Woolridge, 2002). For each of the different model specifications there is significant evidence of both heteroscedasticity and autocorrelation. The first justifies the use of PCSE which helps to overcome heteroscedasticity and contemporaneous correlation. The presence of autocorrelation justifies the use of a lagged dependent variable to attempt to capture some of the dynamic aspects of the process. R^2 are calculated for each model, indicating that once a lagged dependent variable is included the models account for approximately half of the variation in the variable. Despite these problems being overcome the lack of normality of the dependent variable is an issue that cannot be surmounted, and raises doubts out of any of the results emerging out of the OLS models.

For the ZINB models two diagnostic tests were implemented. A Vuong test (Greene, 1994; Vuong, 1989) was used to compare between a ZINB and a negative-binomial, and a likelihood-ratio test used

to compare between the negative-binomial and a Poisson model.¹⁵³ Both tests indicate that for each of the specifications the suitable model is a ZINB. McFadden's Adjusted R^2 are computed (McFadden, 1974). This gives the level of improvement of the model over a basic intercept model. The adjusted version of the statistic penalises for the inclusion of too many predictors, and thus mirrors the adjusted version of the OLS R^2 . The statistics indicate that the *takenout* models outperform those for *givenup*, and there is an improvement (although slight in the latter case) from the inclusion of election events and the introduction of the LCDS over a basic expected price and production model.

For the GEE models DFBETA's were calculated to identify whether the results were being driven by a small number of key observations – an important test in GEE models (Ballinger, 2004; Diggle, Heagerty, Liang, & Zeger, 2002).¹⁵⁴ The statistics were calculated by dropping a specific district-type combination in order to test whether results were driven by any specific panel. There were no high values and thus there is no major concern that the results are being driven by any specific observations.¹⁵⁵

Marginal R^2 as proposed by Zheng, (2000) are calculated for the GEE models as per the method discussed in Hardin & Hilbe, (2013). The measure is to be interpreted as the proportion of variance in the outcome that can be explained by the model. For the *takenout* models R^2 are in the range of 0.350-0.423 indicating the approximately 40% of the variance of the number of claims taken out are explained by the model. The best performing models are those without interaction terms, but including the LCDS and election events. The *givenup* models do not perform as well with R^2 in the range of 0.09 to 0.33. This indicates that there are other factors driving the key decisions to give up claims beyond the model. The best performing are those that include district and type interaction terms, in contrast to the models for *takenout*, perhaps indicating that the decision to give up claims depends on more local and type-specific factors than the decision to take out a mining claim in the first place.

¹⁵³ The test is the ZIP test in Stata, presented in the results in Appendix 6 and 7 as the Zip test.

¹⁵⁴ The DFBETA of any particular observation is the difference between the regression coefficient for an included variable calculated for the entire data set, and the regression coefficient with the observation deleted, scaled by the standard error calculated for the data set with the observation deleted (Rethemeyer, 2007).

¹⁵⁵ For the *takenout* model there were four values on the cusp of the cut-off value ($2/\sqrt{N}$), three of which relating to Model 8 and one for Model 9. For the *givenup* model two values were on the edge of the cut-off, again one each for Model 8 and Model 9. None of these values was sufficiently high to cause major concern or to indicate that the results are being driven by a small number of observations.

5.6.2 Number of claims taken out

The empirical evidence broadly supports the model presented regarding the number of claims taken out. Full results are available in Appendix 6, whilst results from model specifications 4 and 5 (which include the LCDS and election effects) from the GEE model are presented in Table 5.6 below.

Expected prices – Real gold price

There is significant evidence of a positive effect of real gold prices on the level of claims taken out across all specifications and different models. The effect is as is predicted - a price rise, increases the incentive to take out claims, *ceteris paribus*. Calculating the incidence rate ratio (IRR) from the GEE models the scale of this effect can be seen: a US\$1 increase in the real gold price leads to approximately a 0.1% (varying between 0.08-0.019) increase in the quantity of claims being taken out, *ceteris paribus*.¹⁵⁶

With the interaction terms for the different mining districts included the strongest price effects are seen in Districts 2 and 4 (see Model 8 results in Appendix 6). These districts (Mazaruni and Potaro) are two of the three historically established mining districts, and are also the most accessible to the capital Georgetown. This may explain the higher price sensitivity of the mining operators in this area as miners in these districts can respond more easily to international price fluctuations compared to more remote operators.

¹⁵⁶ Incidence rate ratio is a ratio based on the incidence of counts. As described by Hilbe, (2008) it 'can be thought of as a ratio of ratios: i.e. the base ratio is the incidence rate of counts having some characteristic or property out of a group consisting of the population of subjects or items from which the counts are a part'.

Table 5.6: Model Results¹⁵⁷

	<i>Claims taken out</i>			<i>Claims given up</i>	
	<i>Model 4</i>	<i>Model 5</i>		<i>Model 4</i>	<i>Model 5</i>
<i>Real gold price</i>	0.00132* (-2.25)	0.00186** (2.88)		-0.000947** (-2.62)	-0.00192*** (-4.43)
<i>Age</i>	-0.257*** (-6.73)	-0.255*** (-6.91)		0.0117 (0.41)	0.0174 (0.64)
<i>Duration</i>				0.0324** (2.65)	0.0395** (3.06)
<i>Election</i>	-0.368 (-1.51)	-0.189 (-1.04)		0.733* (2.46)	0.505 (1.74)
<i>Election lag</i>	-0.178 (-1.47)	-0.0629 (-0.67)		0.323 (1.11)	0.208 (0.72)
<i>Election plus</i>	-0.536* (-2.50)	-0.355* (-2.20)		1.350*** (4.29)	1.080*** (3.54)
<i>Election plus 2</i>	-0.537*** (-3.34)	-0.459** (-2.93)		0.572* (2.06)	0.447 (1.88)
<i>LCDS</i>	-0.737 (-0.99)	0.714 (1.05)		1.388*** (3.92)	-1.050 (-1.70)
<i>LCDS * Price</i>		-0.00150* (-2.12)			0.00256*** (4.17)
<i>District 2</i>	4.110*** (-9.27)	4.106*** (9.00)		2.630*** (4.81)	2.500*** (4.70)
<i>District 3</i>	4.539*** (-8.78)	4.547*** (8.60)		2.932*** (5.41)	2.832*** (5.38)
<i>District 4</i>	3.274*** (-7.27)	3.308*** (7.13)		1.959*** (3.83)	1.824*** (3.69)
<i>District 5</i>	3.341*** (-4.53)	3.353*** (4.50)		2.372*** (3.84)	2.326*** (3.77)
<i>District 6</i>	2.825*** (-4.25)	2.837*** (4.15)		2.231*** (3.54)	2.131*** (3.46)
<i>Type 2</i>	0.683 (-1.66)	0.746 (1.80)		0.765* (2.38)	0.719* (2.18)
<i>Type 3</i>	-1.172 (-1.83)	-1.129 (-1.75)		-1.671*** (-3.58)	-1.718*** (-3.72)
<i>Type 4</i>	0.582 (-1.13)	0.558 (1.08)		-0.126 (-0.36)	-0.232 (-0.66)
<i>N</i>	405	405		382	382
<i>R²</i>	0.414	0.423		0.156	0.089

¹⁵⁷ ***0.1% significance, ** 1% significance, *5% significance

The inclusion of the type-price interaction terms shows the largest positive effects of increases in the real gold price upon the number of Gold & Precious Stone claims (Type 2) (see Model 10 results in Appendix 6). It is slightly surprising that the strongest effect of the real gold price is not upon the Gold only claims (Type 1), however the fact that the most popular claims held in Guyana are Type 2 may explain this phenomenon as they are favoured by the largest claim holders who may be more price sensitive than smaller operators.

The effect of including a three-year moving average gold price variable instead of the annual real gold price into the GEE model specifications was small. There was little change in the significance or direction of the key variables, although the absolute level of the impact of prices increased to approximately a US\$1 increase leading to a 0.2% increase in the quantity of claims being taken out, *ceteris paribus* (see Appendix 8, Table A81 for results). The annual volatility of prices variable was found to be insignificant in all cases (see Appendix 8 Table A82).

Expected Production - Age of claims

A significant negative effect of the age of claims upon the level of claims taken out is found across all model specifications (highlighted in the results from model 4 and 5 in Table 5.6). This again is in line with that predicted in the above model, where age is hypothesised as being inversely related to expected future production for new claims. A one unit increase in the age of claims (i.e. one year) reduces the quantity of claims taken out, *ceteris paribus*, by approximately 22% (with reductions ranging between 22-25% depending on the model specification).

Expected costs

The inclusion of change in real GDP per capita as a proxy for operating costs has no impact in any of the models, and change in real oil prices is only negative and significant in the OLS model (see the results of Models 6 and 7 in Appendix 6), raising question marks as to its significance. The lack of significance of the proxies for operating costs may indicate either that the proxies were not adequate measures of the bundle of costs experienced by mine operators, or that costs play little part in the decision of mining operators to take out new property rights.

Expected Regulatory Risk – Elections and the LCDS

The key variables of interest for this Chapter are the dummy variables relating to election years and the years before and after, and the dummy for years post the introduction of the LCDS. When these variables are included the results are less clear-cut than for the above independent variables.

When election years alone are introduced there is no effect on the level of claims taken out (see the results of Model 2 in Appendix 6). When the variables controlling for effects in the year prior to elections, and the years subsequent to elections are included there is a significant negative effect on the level of claims taken out the year after elections (see Model 3 in Appendix 6). Once the LCDS is introduced as well this effect is strengthened, as the dummy for the year after elections becomes significant in all three models, with also significant effects in the second year after elections. The scale of this effect can be seen by calculating the IRR. In years subsequent to elections, claims are reduced by between 28-42% depending on the model specified (see the results in Table 5.6). In the second year after elections this effect persists at approximately the same scale with claims reduced by 37-44% *ceteris paribus*.

There is little evidence of a negative level effect of the LCDS on the number of claims taken out,¹⁵⁸ however once an interaction term between the LCDS and price is introduced there is a significant, negative effect seen across all the models (see Model 5 results in Appendix 6). The scale of this effect is relatively small: in years subsequent to the LCDS a US\$1 increase in the gold price increases claims by 0.15% less than in years previous to the LCDS. This finding seems to indicate that although the LCDS may not have served to increase regulatory risk absolutely, it may have served to change the nature of the decisions that miners are making regarding prices. This may be because the LCDS has changed the time-horizon of miners, reducing the impact that future expectations of prices has upon whether to take out property rights or not. There is no evidence that the LCDS has had any differential effects on types of claim as the interaction dummies were not significant across all models.

District level effects

Across the models there is a significant difference between Districts, with each of Mining Districts 2,3,4,5 and 6 having significantly more claims taken out than the reference district, 1, Berbice. The greatest effect is in District 3, Potaro, where the IRR from the GEE models is up to 116 times that of the reference district, holding all other variables constant. The second greatest effect is District 2, Mazaruni, where the rate is up to 74 times that of the reference district. Districts 2 and 3 are the most established mining districts in Guyana with the most established mining infrastructure, in comparison District 1 has had little historic gold mining activity, and the location of possible deposits in this region are remote and generally inaccessible.

¹⁵⁸ The effect is present across OLS models, but not under the ZINB and GEE specifications.

Type effects

The difference between claim types is not as pronounced as the differences between districts. Under the GEE model there is no significant differences between the types. Under the OLS and ZINB models there is some evidence of a greater number of Type 2: Gold and Precious Stones claims being taken out, with fewer Type 3: Precious Stones claims taken out. This mirrors the overall pattern with Type 2: Gold and Precious Stones claims being the most prevalent property right type, and Type 3: Precious Stones being the least popular.

Structural break

As described in Section 5.5 tests for a structural break at the inception of the LCDS were also conducted. Model 3 was used and tests were conducted for the OLS model with PCSE and a lagged dependent variable (Chow Test), a ZINB (Likelihood ratio test) and for the GEE with an AR(1) robust error structure (Likelihood ratio test). The results of these tests are given in Table 5.7. There seems to be a structural break occurring in the model in 2009 at the inception of the LCDS, verifying the discussion above that decision-making of miners regarding the holding of property rights was changed by the introduction of REDD+ policy in Guyana.

Table 5.7: Structural break tests for number of claims taken out

Model	Test	Test statistic	Critical value	P-value
OLS with PCSE LDV	Chow Test (F)	2.759	1.672	0.000
ZINB	Likelihood Ratio Test (χ^2)	53.66	24.996	0.000
GEE AR(1) robust	Likelihood Ratio Test (χ^2)	458.22	24.996	0.000

5.6.3 Number of claims given up

The empirical evidence regarding the model for the number of claims given up does not match the predicted model as closely as that for the number of claims taken out (full results are presented in Appendix 7).

Expected Prices – Real gold prices

The estimation of the effect of real gold prices on the number of claims being given up is less clear than in the earlier case of the number being taken out. There is no clear consistent pattern across all models with the variable even positive and weakly significant in some of the model specifications under OLS and ZINB. Under the GEE model, once the LCDS is included the variable is negative and significant, as predicted by the model in Section 5.3 (see Models 4 and 5 presented in Table 5.6). This

effect is relatively small, with a reduction of 0.1-0.2% in claims given up, *ceteris paribus*, for a US\$1 increase in the real gold price. This is approximately the same scale of effect as that of real gold prices on the number of claims taken out, and shows a certain symmetry of prices being factored into the decision-making of mining operators in relation to property rights.

When district level interaction terms are included (see Model 8 in Appendix 7) the scale of the effect between districts can be seen. The greatest effect is in the less established mining districts, 1, Berbice and 6, Rupununi, with the smallest effect in the more established districts, 2, 4 and 5. This result is the opposite to that found in the *takenout* model where the most established districts were the most price sensitive. These findings seem to indicate that the decision to take out a new property right depends more on the price in established areas, where perhaps the best properties have already been taken, however operations in less established areas, where perhaps costs and production uncertainties are higher, are most sensitive to prices when deciding whether to hold the claim or not.

The inclusion of claim type interaction terms gives a surprising result (see Model 10 results in Appendix 7). The reduction in claims given up due to gold price increases is greatest for Type 3 – Precious Stones claims, with the lowest effect for Type 4 – River claims. These indicate that precious stone claim owners are more gold price sensitive than river claim owners. This does not make intuitive sense and may reflect the relative lack of data regarding precious stone claims as they are by some distance the least common type of mining claim.

The replacement of the annual gold price variable with the three-year averaged gold price variable makes little significant difference to the overall results. The same pattern was observed with prices playing a generally negative role in the number of claims being given up, but again being generally weakly significant or insignificant (Appendix 8 Table A83). The price volatility variable was also found to be insignificant in all cases (Appendix 8 Table A84).

Expected Production – Age and Duration of claims

The model in Section 5.3 predicts that the age of claims in the district of the relevant type will be negatively related to the number of claims taken out. Under OLS and ZINB this is the observed direction of the variable, being significant and negative across almost all model specifications (the exception being when type-price interaction terms are included in Model 10). However under the GEE specification the variable is not significant in the majority of runs, and when it is significant (when the type interaction terms are included) it is positive. This raises questions as to the

performance of the model for *givenup* and also the prior assumption that the age of claims is a suitable proxy for the level of anticipated production in a district.

The additional variable included to proxy for previous production of the claims given up, the duration of the claims given up, is predicted to be positively related to the number of claims given up. It is assumed that the longer claims have been held for the greater production has been in the past, so the more likely it is that the claim will be given up. Under the GEE specification this is what is observed once election effects are fully included (see Models 4 and 5 presented in Table 5.6, and the results in Appendix 7). Calculating the IRR shows the relatively small size of this effect - a one year increase in the duration of claims being given up increases the number of claims being given up by 3.3%.

Expected Costs

As in the model for the number of claims taken out neither the change in real GDP per capita, nor the change in real oil prices has any significant effect on the number of claims given up.

Expected Regulatory risk – Elections and the LCDS

The key variables of interest are those relating to the expected regulatory risk. The expectation would be that elections increase the number of claims given up, as does the introduction of the LCDS.

When the election dummy is introduced there is generally no significant effect in the OLS and ZINB models (see Model 2 results in Appendix 7), however under the GEE model there is a significant and positive effect on the number of claims given up once the LCDS is included (see Models 4 and 5 in Table 5.6). In election years the number of claims given up is approximately 109% higher on average, *ceteris paribus*. There is no significant effect in the years prior to elections; however there is much stronger evidence for a positive significant effect on the number of claims given up in the years after elections. The evidence is strong for the immediate subsequent year across all model specifications. In the GEE model the IRR varied between 174% and 308% more claims being given up than in other years. The effect in the second year after elections is weakly significant and positive in the GEE models, with between 75 and 91% more claims given up, *ceteris paribus*.

The inclusion of a dummy for the years subsequent to the LCDS is not significant in the OLS and ZINB specifications, but is positive and significant, as predicted, in the GEE models (see the results of Model 4 in Appendix 7 and Table 5.6). The effect is relatively large with the number of claims given

up in the years subsequent to the introduction of the LCDS between 300-590% higher than in years prior to the LCDS, *ceteris paribus*.

The inclusion of an interaction term between the LCDS and the real gold price complicates the picture somewhat but still indicates a positive effect from the LCDS. When this interaction term is introduced the level effect of the LCDS is negative under the OLS and ZINB models, and not significant in the GEE models (see Model 5 results in Appendix 7 and Table 5.6). However the interaction terms is positive and significant, and of the scale that implies that the overall effect of the introduction of the LCDS has been positive on the number of claims given up, with the positive effect strongest when gold prices are highest.

Interaction terms between claim type and the LCDS are introduced in Model 9. They indicate that the LCDS has had the greatest effect on the number of claims given up for Type 2: Gold and Precious Stones, and Type 4: River Claims, and the least for Type 3: Precious Stones. This may be explained by the fact that Gold and Precious Stones claims are the most popular claim type, representing 42% of all claims in 2012, and represent the main forest-using body of claims. The finding for river claims is slightly surprising as they do not use the forest directly, and thus should be affected less by the LCDS than other types of claims. However as part of the regulatory reform that has followed the introduction of the LCDS there has been moves toward tightening the regulations on river claims (Kaieteur News, 2012a; Stabroek News, 2012d) (discussed in more depth in Chapter 3) – thus the LCDS dummy may be picking up this effect rather than through the LCDS's expected impact on the use of the forest.

District level effects

In a similar fashion to the number of claims taken out each of Districts 2,3,4,5 and 6 display a higher level of the number of claims given up than in the reference District 1. The highest level of claims being given up is in District 3, with the lowest after the reference district in District 4. This, in combination with the findings relating the number of claims taken out discussed in Section 5.6.2, seems to indicate a greater churning of claims (i.e. greater amounts being taken out and given up) in District 3 than in other districts, perhaps indicating a greater level of exploratory activity, or perhaps just reflecting the greater level of overall mining activity in that District.

Type effects

Again mirroring the findings of the model for the number of claims taken out there is strong evidence that less Type 3: Precious Stones Only claims are given up than other types, all other things being equal. There is weaker, evidence of a greater number of claims being given up of Type 2: Gold

and Precious Stones than other types. These findings again reflect the greater incidence of Type 2 claims, and the lesser incidence of Type 3 claims.

Structural break

The same three structural break tests were conducted for the number of claims given up model, again for Model 3. Table 5.8 summarises the results that in the same manner as for the claims taken out model indicate the presence of a structural break in the model with the inception of the LCDS in 2009.

Table 5.8: Structural break tests for number of claims given up

Model	Test	Test statistic	Critical value	P-value
OLS with PCSE LDV	Chow Test (F)	4.282	1.654	0.000
ZINB	Likelihood Ratio Test (χ^2)	58.04	26.296	0.000
GEE AR(1) robust	Likelihood Ratio Test (χ^2)	495.18	26.296	0.000

5.7 Discussion

This chapter provides the first study into the effect of election cycles, and REDD+ policy, on forest-related property rights. It also provides one of the first studies of the effect of a national REDD+ framework on the behaviour of forest actors. The collection and use of a globally unique small-scale mining data-set provides an important addition to the discussion on the evolution of small-scale mining, which has predominantly been previously qualitative in nature. A simple cost-benefit model for mining operators was constructed to identify the key variables of interest, and their predicted directions. Political events and the REDD+ framework in the guise of the LCDS, are predicted to have negative effects on the taking out of property rights, and a positive effect on the giving up of property rights. A data-set of small scale mining claims was constructed from primary data in Guyana and used to test the model. Estimation of the model through OLS, ZINB and GEE regressions generally finds in favour of the predicted model with the model for estimating the number of claims taken out generally more robust than that for the number of claims given up.

The estimated models show that election cycles seem to play a significant role in the decision to hold mining property rights in Guyana. Controlling for other factors fewer mining claims are taken out in years subsequent to elections, and the year after that. This finding hints at the possibility that the negative effect on the holding of forest-related property rights stems more from the post-electoral uncertainty that Guyana has experienced rather than the election event itself. Elections in Guyana have tended to be held towards the end of the calendar year, thus any post-election uncertainty is more likely to arise in the subsequent year rather than the year of the election itself. The fact that the effect persists up to two years after elections, but is not observed in the year prior to the

elections indicates that the uncertainty to investors occurs more as a result of the post-election conditions rather than from an expected uncertain environment. In addition there is some weaker evidence that elections have had a positive effect on the number of mining claims rescinded. This is stronger in the year subsequent to the elections, with some effect persisting to the second year after elections. Again there is no evidence of a similar effect in the years preceding elections indicating that it is the uncertainty in the investment environment that occurs subsequent to the election rather than the election event itself that is changing the incentives to hold rights. Whether this is due to fears of expropriation, expropriation itself, a lag in the regulatory system causing election year events to appear in the data from later years, a greater willingness of the government to rescind defaulting property rights subsequent to elections rather than before, changed long-term expectations of the regulatory environment, or an increase in migration patterns reducing the demand for new claims and encouraging the rescinding of existing ones is an interesting question for future research. Evidence for the increase in migratory activity leading to a changed in incentives to hold property rights is given by anecdotal evidence communicated to the author by miners and mining families in Guyana, and also from migration data. The number of legal permanent residents entering into the United States (the main destination for Guyanese migrants) from Guyana shows two distinct spikes in and around the elections of 2001 and 2006 (Figure 5.5). More data is required to fully investigate the extent of migratory activity on the level of mining activity, and opens up interesting new avenues for future research.

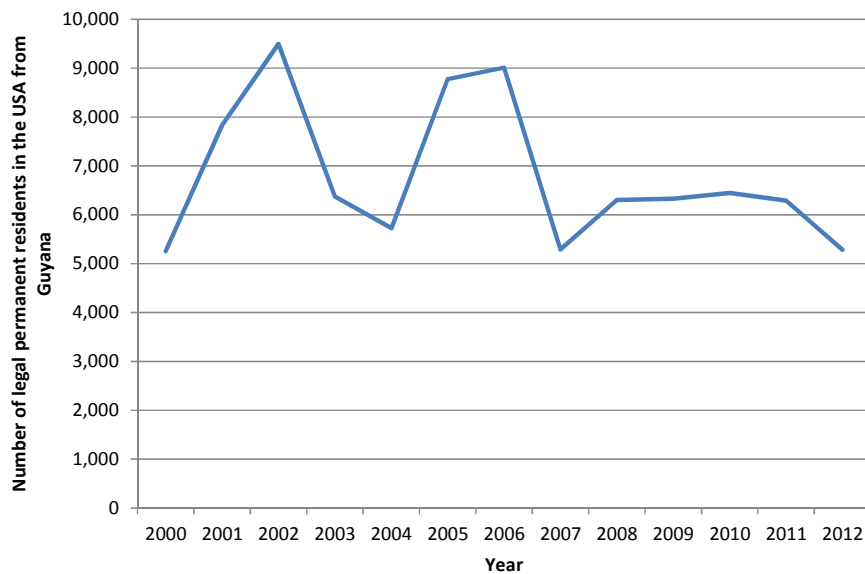


Figure 5.5: Number of legal permanent residents entering the United States from Guyana 2000-2012

Source: United States Department of Homeland Security (1999, 2009, 2012)

There is also some weak evidence that the introduction of the LCDS has reduced the incentive to hold forest-related property rights in Guyana. Controlling for other factors the start of the LCDS in 2009 seems to have negatively affected the number of mining claims being taken out, and positively affected the number of claims given up. The effect in the latter model is relatively large but weakly significant across the different model specifications. Testing for a structural break in the model at the inception of the LCDS also shows evidence that the models for how claims are taken out and given up are different before and after the LCDS. The LCDS is still in its infancy and as there are only four years of data for post-LCDS activity available the reliability of these results is questionable. As more years of data emerge the strength of findings should become stronger.

The fact that there is weak evidence of an effect of the LCDS on the holding of property rights, despite the fact that there is no specific policy within the strategy aimed at this highlights the potential of REDD+ policy to have unintended effects through other sectors of the economy by shifting expectations of property rights holders. Whether this effect persists as the LCDS develops, and policy evolves, is an important direction for future research. The implication of this finding for forest-destructive activities may differ in the short versus medium term. In the medium term the reduction in incentive to hold mining property rights may lead to the contraction of the industry potentially reducing the pressure on the forest. In the short-term however as the long-term incentives to hold these rights falls there may be bursts in destructive activity as miners choose to realise any gains that they can from pre-existing rights. Although it is impossible to verify this possibility due to the lack of data such a burst in activity has been communicated to the author by miners in Guyana that they attribute to the start of the LCDS. Whether such an effect exists is an important question for future research.

The estimation provided in this chapter is conducted with a relatively small data-set which does raise questions as to the robustness of the findings. The availability of more data in the future will allow for greater robustness in the estimation and provide greater reliability of the estimates.

The lack of adequate cost data for mining operations is also a limitation of the study. With no wage or local diesel cost data available proxies had to be used, however as both were insignificant it is difficult to judge whether the proxies were inadequate or whether costs play little role in the decision-making regarding the holding of mining property rights.

The lack of a robust econometric technique to model time-series count data that adequately incorporates fully the relevant dynamic aspects has been lamented in the literature (Brandt & Williams, 1999). GEE models capture some of these aspects to some extent but are limited in the

tests available to choose between parameterisations and specifications. OLS potentially provides unbiased but inefficient results, whilst ZINB fails to take into account the persistence of shocks affecting specific districts and types over time. Presenting these models in combination gives a sense of the degree of robustness of the results across different model types however has limitations. One option for extending the work is to transform the data into a set of duration observations, where the length that each individual claim is held for is computed. This is possible with the current data-set, though is computationally burdensome, and without more claim-specific variations in data whether further interesting results are obtainable is questionable.

The data collected is the first of its kind in its scope and depth, but an important direction for future work is to extend the data to include whether mining actually took place on each specific claim, and thus be able to identify the reasons why the claims were given up. At the moment all that is observed is the giving up, but whether that was because the area did not have gold, was unprofitable or was mined out is impossible to determine. This means that a full investigation into the behaviour of mining operators is not possible. The framework used here also excludes the role of the government in the process. It is assumed that the government is willing to issue an unlimited amount of mining claims, and will revoke properties as soon as the operator wishes not to renew them (by not paying the appropriate rental fee). In actuality the government is likely to restrict the number of properties issued and may also delay revocation due to administrative delays. Including a government actor into the model would be a worthy extension, however without observing the reasons for a claim being revoked estimating the impacts would be difficult.

The model raises some initial spatial dimension questions regarding the holding of mining property rights. It highlights differential effects of gold prices on the decisions to take out, and give up, claims in different areas, as well as different absolute district-level effects. With greater spatial information regarding the claims further questions could be asked regarding the role of transport infrastructure, geology, soil and forest types and density of human settlement on the decisions to hold property rights. All of these questions provide interesting extensions to the work.

This chapter has examined the importance of institutional conditions, in the form of political economy events such as elections and new policy frameworks, upon the forest management situation in Guyana. It focuses on the channel of how they affect another key institution: property rights to the forest, by creating uncertainty, including uncertainty over new regulatory frameworks and costs and the fear of expropriation. It highlights the importance of understanding not only the economic effects of the incentives to hold property rights to forest-related resources, but also the political economic circumstances. It raises questions for REDD+ regarding additionality. If in

uncertain election environments property rights are given up, affecting deforestation patterns should governments be rewarded or penalised if deforestation falls or rises as a result? Should such short-term deforestation patterns play a role in determining REDD+ finance?

This chapter also mirrors some of the conceptual findings of the previous chapter in terms of the importance of potential unintended consequences of REDD+ policy. Even though there is no firm policy focusing on mining under the LCDS it seems that there is some initial evidence that the LCDS has affected how mining property rights are held in Guyana. Whether the changes have led to more or less deforestation is unclear without data on why claims have been given up. It may be that claims have been given up after an intensification of production due to future regulatory uncertainty, or due to future uncertainty regarding costs. What it demonstrates however is that, as was found in Chapter 4, REDD+ may have important unintended consequences in forest-related sectors, and even across the economy as a whole. Understanding that these effects are not insignificant and could affect the efficacy of REDD+ policy is of crucial importance to policy makers.

Chapter 6: Multi-level governance of REDD+ in Guyana

6.1 Introduction

Reducing Emissions from Deforestation and Forest Degradation (REDD+) as an emerging mechanism differs significantly from previous forest interventions in a number of areas. The scale of finance is potentially orders of magnitude greater and the international focus of the mechanism implies the creation of international institutions and policy architecture to manage the arrangement. These fundamental differences imply that REDD+ is likely to be formulated in a different way from previous forest interventions. It is as likely to be the focus of the Ministry of Finance and the Ministry of Foreign Affairs as the Ministry of Environment and is likely to have impacts beyond direct forest-using industries and communities. Thus as highlighted in Chapter 2 the policy formation and governance process is likely to be different to previous forest policy, with different influences and important roles for domestic and international stakeholders.

It was shown in Chapter 2 that the majority of the early literature relating to REDD+ has been of the 'first generation' - what REDD+ should look like in order to be effective, efficient and equitable. This includes determining the possible costs and discussions of the types of policy instruments available to governments to implement changes in the forest sector. As financing for REDD+ has started to emerge and countries are engaging in strategies to implement such programmes, the focus has turned more towards the 'second generation' - how such policy is being formed, and how REDD+ is being governed in emerging programmes.

Chapter 2 has already discussed how governing REDD+ and utilising finance in an effective, efficient and equitable manner has become an important topic in the emerging REDD+ literature (Angelsen et al., 2009; Barbier & Tesfaw, 2012). Many features of an effective governance environment for REDD+ have been put proposed focusing on issues such as participation, tenure, accountability, inclusion and transparency (Barbier & Tesfaw, 2012; Kanowski, McDermott, & Cashore, 2011; Lyster, 2011). One proposed structure is that of multi-level governance (MLG), a theory that evolved to explain the governance structure of the European Union (Hooghe & Marks, 2001). The theory stresses the importance of the involvement of different actors, at different scales bringing together different interests. Whether this governance structure is suitable, practical, effective, or has emerged in nascent REDD+ programmes are important questions.

As highlighted in Chapter 3 Guyana provides an important early case study for implementation of REDD+ policy. Its innovative bilateral financing arrangement with Norway and the development of its Low Carbon Development Strategy (LCDS) to implement REDD+ and utilise revenues from the arrangement, provides a useful framework to understand the role that institutional conditions, such as governance, has played in shaping REDD+ policy.

This Chapter analyses the extent to which the emerging REDD+ programme, and the related LCDS, in Guyana has embodied the features of MLG in its development and implementation. Using data from interviews with stakeholders in Guyana along with data from local media sources, validated with previous studies, it analyses whether the governance of REDD+ has met the criteria stipulated by authors for the MLG that is postulated to provide effective, efficient and equitable REDD+.

The Chapter finds that there is mixed evidence for the emergence of an MLG-like governance structure in Guyana. Although there have been some moves toward such governance, through the creation of institutions such as a Multi-Stakeholder Steering Committee (MSSC), the dominant perception is that governance is still dominated by a state-centric approach. This may be a consequence of the huge political importance placed on REDD+ in Guyana that has helped it move to the forefront of REDD+ frameworks around the world.

Section 6.2 provides an outline of the theoretical structure of governance and MLG, and its prescription as a governance mode for REDD+. Section 6.3 outlines the key research aims of the chapter. Section 6.4 discusses the methodology used with Section 6.5 discussing the results of the study. Section 6.6 concludes.

6.2 Governance and Multi-level Governance

Governance differs conceptually from government. Governance has been defined by Enderlein, Walti, & Zurn (2010) as *'the sum of regulations brought about by actors, processes as well as structures and justified with reference to a public problem'*.¹⁵⁹ It encompasses the totality of regulations including policies, programmes and decisions designed to remedy a public problem via a collective course of action, including political negotiations, coalition building, lobbying, persuasion and threats that accompany the policy making and implementation process. It is thus a more inclusive concept than that of government.

MLG is a theory that has emerged in recent years to describe governance modes relating to a wide variety of problems and jurisdictions. It is a form of governance that can be contrasted with previous state-centric models. These state-centric models posit states as the ultimate decision-makers, devolving some limited authority to other actors to achieve specific policy goals (Marks, Hooghe, & Blank, 1996). The overall direction of policy-making is consistent with state control even if not every detail of policy-making is determined by national governments (Marks et al., 1996). These state-centric models follow neo-realistic theory with the state acting as a pure agent having the ultimate right to decide within a given territory (Caporaso, 1996). One of the first authors to move away from

¹⁵⁹ Enderlein, Walti, & Zurn (2010) pp.2.

state-centric, neo-realism models of governance was Robert Putnam who, in his seminal 1988 paper developed a model to help understand some of the interaction between the domestic and international spheres when negotiating agreements (Putnam, 1988). This movement helped to spark more nuanced models of governance.

The theory of MLG was first put forth by Gary Marks, growing out of Foucault's seminal concept of governmentality (Lemke, 2002; Stubbs, 2005),¹⁶⁰ to explain the emerging dynamics in the governance of the European Union (Hooghe & Marks, 2001) and the interactions amongst local government in the US (Hooghe & Marks, 2003). It '*reflects a shared concern with increased complexity, proliferating jurisdictions, the rise of non-state actors, and the related challenges to state power*'.¹⁶¹

In the MLG model decision-making competencies are shared by actors at different levels rather than monopolised by national governments (Hooghe & Marks, 2001). Coordination between actors occurs both horizontally and vertically. Horizontal coordination refers to how stakeholders at the same level collaborate to implement policy, whilst vertical coordination refers to how stakeholders at different levels can work together to negotiate how policies are formulated and implemented (Forsyth, 2009). These interactions and collaborations create a complex network of decision-making, across and between scales. Figure 6.1 provides a visual representation of the type of linkages that MLG involves, showing interaction between actors at each of the different scales of government, along with linkages between each of these scales.

The importance of MLG to the discussion of the governance of environmental problems is clearly highlighted by Betsill & Bulkeley (2006) who enunciated: '*The concept of multilevel governance, with its emphasis on the connections between vertical tiers of government and horizontally organised forms of governance, provides a useful starting point for understanding the ways in which environmental problems are governed within and across scales.*'¹⁶²

¹⁶⁰ Foucault defined governmentality as the art of governance, bringing in a wide sense of governance beyond the narrow range of state politics but also encompassing self-control, and social control in other institutions (Burchell, Gordon, & Miller, 1991).

¹⁶¹ Bache & Flinders, (2004) pp. 4-5.

¹⁶² Bulkeley & Betsill, (2005) pp. 49.

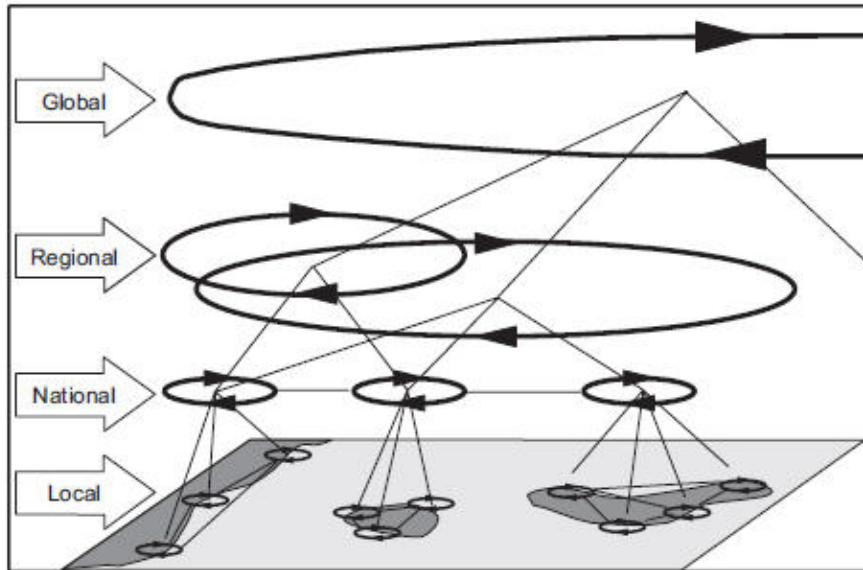


Figure 6.1: Conceptualisation of multi-level governance highlighting both vertical and horizontal linkages

Source: Fanning et al.(2007)

Andonova & Mitchell (2010) highlight the importance of using an MLG lens to understand both the horizontal and vertical rescaling of environmental governance – focusing on the range of non-state actors now engaged in global environmental politics and the increasing interaction between international and national levels, and national and sub-national levels in addressing environmental problems.

MLG has been highlighted as present in a number of climate change initiatives notably the Cities for Climate Protection program (Betsill & Bulkeley, 2006). It has been highlighted as a form of governance that can deal with the different agents involved, at different scales, with different interests that characterise both climate change generally and REDD+ in particular (Thompson et al., 2011). An example of the multi-level nature of the actors involved with REDD+ can be seen in Figure 6.2. This highlights the multitude of stakeholders likely to be involved in REDD+ in any jurisdiction, and also the importance of actors at both the supra-national, national and sub-national scales.

Supranational	<u>Donors/Funders/Buyers</u> UNFCCC, FCPF, World Bank, Norway	<u>NGOs/Policy Actors</u> Global NGOs (e.g. CI, WWF) Policy Advisors (e.g. McKinsey)
National	<u>Governmental Actors</u> Presidential Offices, Ministries of Finance, Ministries of Forest/Environment/ Agriculture, etc.	<u>Non-governmental actors</u> Local NGOs, Industry associations, Civil Society
Sub-national	<u>Governmental Actors</u> Regional government, community governments/leaders	<u>Non-governmental actors</u> Local NGOss, Local industry associations, Local leaders/individuals

Figure 6.2: Multi-level actors participating in REDD+

Source: Author

The majority of work relating to MLG and REDD+ has focused on a normative approach with MLG being prescribed as a suitable governance structure for the implementation of REDD+. Forsyth (2009) highlights the potential for MLG to deliver REDD+ policy that can meet the 3Es – effectiveness, equity and efficiency. Doherty & Schroeder (2011) focus on the importance of MLG as a concept to understand the issues that arise in relation to REDD+ and tenure issues, focusing specifically on the horizontal linkages that are needed for effective implementation of REDD+. Skutsch & Van Laake, (2009) highlights issues for REDD+ at both horizontal and vertical levels of coordination. They focus their attention on the range of discourse on REDD+ at the UNFCCC level between member states, identifying two key issues that may arise concerning vertical coordination – issues between regulators, producers and carbon purchasers, and the disconnect that can occur between the local level and the state, especially regarding the distribution of financial benefits for REDD+.

Beyond REDD+ Mwangi & Wardell, (2012) provide an outline of MLG as a concept in forestry management more generally, and provide a summary of a special issue that focuses on country-level examples of MLG. They highlight the move towards viewing MLG as a normative goal for forestry policy – quoting Stubbs (2005) *‘The slippage from seeking to understand how multi-level governance works to seeking to judge normatively how well multi-level governance works is highly pronounced in*

*the literature.*¹⁶³ The normative concept of MLG for REDD+ is again highlighted in Bushley & Pokharel (2010) in their discussion of learning from PES schemes for REDD+ policy in Nepal.

The normative nature of the literature relating to MLG and REDD+ is reflected in the general policy discussions regarding the governance of REDD+ more generally as discussed in Chapter 2. This chapter extends the normative literature relating to MLG and REDD+ and the literature on REDD+ governance by conducting an evaluative study at the country level, and examining to what extent the governance that has emerged for REDD+ in Guyana fits into the MLG model proposed by various authors. It is the first such academic study of the governance of Guyana's emerging REDD+ programme.

6.3 Research objectives

This chapter aims to describe the nature of governance of REDD+ in Guyana and analyse to what extent the governance reflects the normative MLG concept put forward by authors such as Forsyth as key for REDD+ to satisfy the three 'E's.

Forsyth's definition of MLG as '*the implementation of public policy across diverse spatial scales and by actors who have dissimilar influence and values*'¹⁶⁴ is used as the overall reference point for comparison to Guyana's governance of REDD. Further Forsyth identifies three important components of multilevel, multi-actor governance that could be used for assessment:

- Actors
 - o '*Multilevel, multi-actor governance ... requires ready and coherent collaboration among actors*'¹⁶⁵
- Scales
 - o '*Inclusive and successful vertical governance, therefore, could maximise equity and effectiveness by ensuring the willing participation of different actors at different scales*'.¹⁶⁶
- Interests
 - o '*Similarly, agreement on REDD+ can only be achieved when different actors have a common understanding of its objectives, or are willing to accept compatible forms of REDD+ alongside each other.*'¹⁶⁷

¹⁶³ Stubbs (2005) pp. 69.

¹⁶⁴ Forsyth (2009) pp. 114.

¹⁶⁵ *ibid* pp. 115.

¹⁶⁶ *ibid* pp. 115.

¹⁶⁷ *ibid* pp. 115.

These three statements are used in this Chapter to assess the governance of REDD+ in Guyana against the MLG concept. The focus of this chapter is on the internal governance within Guyana, focusing on the interactions at the national scale, and between the national and sub-national scale. These interactions do encompass the involvement of international and supranational actors, but here the discussion of these actors is limited to their role in national and sub-national processes.

In order to understand the REDD+ governance environment and how well it has embodied the principles of MLG the following questions are posited.

- How has REDD+ policy in the guise of the LCDS in Guyana developed?
- Who has driven the policy choices for the LCDS in Guyana?
- How has this driven the policy outcomes that are emerging?
- How well does the governance environment fit into the MLG framework that has been posited as important for REDD+?
- What does the experience in Guyana tell us about how effective MLG can be built for REDD+ more generally?

6.4 Methodology

The chapter build on two types of data to answer the identified research questions: primary and secondary qualitative data. The use of qualitative data has both strengths and weaknesses. As described by Miles & Huberman (1994) well-collected qualitative data focuses on '*naturally occurring, ordinary events in natural settings*'¹⁶⁸ helping researchers to take into account the local context, whether political, economic, social or cultural. This is crucial for such a detailed analysis of the policy process for REDD+ in Guyana where local context and the historical nature of governance (as discussed in Chapter 3) is vital.

Qualitative data also allows a degree of flexibility that quantitative techniques often lack (Miles & Huberman, 1994). This feature is crucial for a study in a potentially shifting policy and governance environment such as that in Guyana for REDD+, especially one conducted in the aftermath of an electoral event (such is the case here).¹⁶⁹ One important feature of qualitative data that is both a strength and a weakness is it emphasises peoples' assumptions and perceptions, prejudgments and presuppositions (van Manen, 1977). This implies that qualitative techniques can help to locate the meanings that people place on events and processes that occur in their lives (Miles & Huberman, 1994). It does imply however that the data collected may better reflect perceptions of events rather

¹⁶⁸ Miles & Huberman, (1994) pp. 9.

¹⁶⁹ The study was conducted in the period immediately following the 2011 elections in Guyana.

than the true nature. Thus in a study such as this the focus is on the perceptions of the policy process and governance relating to REDD+ and the LCDS itself rather than drawing any firm conclusions upon the true nature of the process that occurred.

Primary qualitative data for the study is drawn from a series of elite semi-structured interviews conducted in Guyana between November 2011 and June 2012 in the period post the 2011 elections and a database of media articles related to the LCDS, with secondary data from a series of external evaluation reports of the LCDS and related policies in Guyana.

As described by Kvale (2007) a semi-structured interview is '*neither an open everyday conversation nor a closed questionnaire*'.¹⁷⁰ It generally follows a pre-designed interview guide, with an outline of topics and suggested questions. It allows space for follow-up questions, changes in sequences and diversions into new but related areas. This allows both for the same questions to be asked across interviewees, helping generalizability and clear conclusions to be drawn, and also for new and unexpected research avenues to be explored. The interviews were with elite individuals: leaders or experts in their field. Although this eases some methodological issues, as it reduces some potential power asymmetries between the interviewer and the interviewee, and means the majority of interviewees are generally familiar with the format and being interviewed, it raises other issues as obtaining access can be difficult, and interviewees may have pre-defined speeches or talks prepared to promote their particular viewpoint (Hertz & Imber, 1995).

Interviews were conducted with thirty-two (32) participants, twenty-two of which were non-government, seven government and three international actors. Interviewees were selected using initial judgment sampling followed by opportunistic and snowball sampling. Judgment sampling builds on pre-existing knowledge of the topic and the area (Harrell & Bradley, 2009). An initial list of contacts was identified for the study based on the membership of the MSSC (identified in Appendix 1). Initial contact was made with pre-identified government contacts in key ministries and agencies, along with key non-governmental actors. In addition from the pre-existing knowledge of the author a list of important non-governmental actors lying outside the formal policy process were identified. As these interviews progressed snowball and opportunistic sampling were used to identify additional contacts of interest who could provide validation of emerging themes (Miles & Huberman, 1994). Interviews were conducted until a saturation of views were found and a redundancy of data was achieved (Kvale, 2007).

¹⁷⁰ Kvale, (2007) pp. 11.

The initial use of a theoretically-based judgment sample helps to strengthen the generalizability of the study (Harrell & Bradley, 2009). The use of snowball and opportunistic sampling allowed the study to move beyond those formally involved in the policy process, to a wider set of actors. The key is to balance both of these elements: an over-focus on initial judgments does not allow for the study group to evolve as new information on the ground becomes available. In contrast an over-focus on snowball sampling techniques risk drawing wider conclusions from one small, networked group (Harrell & Bradley, 2009). This mix of techniques is common in similar qualitative studies (Marshall & Rossman, 2006).

Interviews were conducted in a number of locations, including both the respondent's and interviewees' office, and were of approximately an hour's duration.¹⁷¹ Questions were drawn from pre-prepared interview guides. Four such guides were prepared, reflecting the different nature of the interviewees: Government, Non-government, Amerindian and Industry.¹⁷² Interview guides, were constructed and tested through a series of pilot interviews conducted with suitable test interviewees, both in the UK and Guyana.¹⁷³ They were initially structured in line with previous similar studies in the forestry arena (Hugosson & Ingemarson, 2004) with guidance from general work on the methodology (Kvale, 2007). The actual composition of the interview varied between participants, with secondary questions being used by the interviewer to enquire, clarify and to examine previously unidentified subject material.

As the interview material was potentially sensitive an interviewee consent form was used to ensure that the participants were fully informed of the purpose and nature of the interview.¹⁷⁴ A brief verbal description of the interview and the research was given at the beginning of the interview. The majority of the interviews were audio-recorded, although some participants requested that no recording be made. Two interviewees requested that they complete the interview in writing, for which the interview guide and consent form was supplied to the interviewees. The audio-recorded interviews were transcribed and stored in Nvivo 9.

The data from interviews is complemented with primary and secondary data. A database of newspaper articles from the Guyanese media was compiled for the period January 2011 to December 2012. These news stories were drawn from the online portals of:

¹⁷¹ Interviews ranged between 35 minutes and 2 ½ hours.

¹⁷² Interview guides are available in Appendix 11.

¹⁷³ Two test interviews were conducted with anonymous test subjects in the UK prior to fieldwork, with an additional test interview conducted in Guyana with a Guyanese stakeholder prior to the commencement of interviews.

¹⁷⁴ The consent form is available in Appendix 10.

- Demerara Waves – Privately owned online news site¹⁷⁵
- Stabroek News – Privately owned newspaper¹⁷⁶
- Kaieteur News – Privately owned newspaper¹⁷⁷
- Guyana Times – Privately owned newspaper¹⁷⁸
- Guyana Chronicle – Government owned newspaper¹⁷⁹

Stories relating to the LCDS, use of the forest, forest policy and the political situation in Guyana were extracted. In total 1,526 stories were identified, stored in Nvivo 9 and coded.

The advantage of the mix of media sources is it provides a representation across the political spectrum in Guyana. The relative political balance of each of the newspapers can be seen in the Commonwealth Election Observers' Report of the 2011 General and Regional elections (Commonwealth Secretariat, 2011). The report found that in the run-up to the election the Guyana Chronicle's election coverage supported the incumbent People's Progressive Party-Civic (PPP-C) with a 9-1 advantage. The report found that the Stabroek News generally supported all political parties fairly, whilst the Kaieteur News, although providing generally positive coverage for all parties, had run some stories that were negative regarding state institutions. The Guyana Times on the other hand provided positive election coverage at 2-1 in favour of the PPP-C. These findings reflect an opinion expressed to the author by interviewees that the Guyana Chronicle and the Guyana Times generally reflect government opinion, whilst Stabroek News and Kaieteur News provide a less-pro government stance, with perhaps Kaieteur News providing the most coverage of the opposition. Demerara Waves is a newer, online only, media platform, with no obvious partisanship in any political direction.

The database of newspaper articles is complemented with a review of reports from both the Government of Guyana (GoG) and independent non-governmental organisations (NGOs) and research organisations. These include but are not limited to:

- International Institute of Environment and Development's (IIED) Independent Review of the Stakeholder Consultation Process for Guyana's Low Carbon Development Strategy (Dow, Radzik, & Macqueen, 2009)
- Rainforest Alliance Verification of Progress Related to Indicators for the Guyana-Norway REDD+ Agreement 2012 (Donovan, Moore, & Stern, 2012)

¹⁷⁵ www.dememerawaves.com.

¹⁷⁶ www.stabroeknews.com.

¹⁷⁷ www.kaieteurnews.com.

¹⁷⁸ www.guyanatimes.gy.

¹⁷⁹ www.guyanachronicle.com.

- Minutes of the MSSC available on the Guyana LCDS website¹⁸⁰

The use of secondary data in combination with the primary evidence allows an element of triangulation of data sources that provides verification of the main themes emerging from the interview data.¹⁸¹ It provides broader evidence for how the LCDS, and the policy process behind it, is perceived in the Guyanese society. It allows validation of some of the stories, themes and viewpoints expressed by the interviewees.

Analysis of the data is through Applied Thematic Analysis (ATA). ATA, as described by Guest, MacQueen, & Namey (2012), *'comprises a bit of everything – grounded theory, positivism, interpretivism and phenomenology – synthesised into one methodological framework'*.¹⁸² ATA is suitable for the aims of the study because, as described by Guest et al., (2012), it allows for the study of topics other than merely individual experiences – such as broad perceptions of the governance process studied here. This is a key strength of the technique, along with the fact that assertions are strongly supported by broad sets of evidence. A key drawback of the technique is that, unlike other more in-depth qualitative techniques, such as grounded theory¹⁸³ or phenomenology¹⁸⁴, ATA may miss some of the more nuanced data that falls between the cracks of the identified themes used by the technique. ATA is effectively an umbrella term for a set of analysis tools and techniques that have been used for many years by qualitative authors, brought together in one banner by the seminal work of Guest et al., (2012). The methodology adopted here follows the structure proposed by those authors.

Directed content analysis was used to identify three key coding categories: actors, scales and interests (Hsieh & Shannon, 2005), based upon Forsyth's description of MLG for REDD+. Directed content analysis allows for testing of pre-existing theories, but may introduce bias as pre-existing notions and biases may be imposed upon the data, whilst sub-conscious cues may be introduced by the researcher. To control for some of these effects evidence from secondary sources was used to cross-validate findings from the interview data (Hsieh & Shannon, 2005).

¹⁸⁰ These are available at

http://lcds.gov.gy/index.php?option=com_content&view=article&id=340&Itemid=166.

¹⁸¹ This follows one of the key categories of triangulation by Denzin (1978): that of triangulation by data source. It also builds on the extra category given by Miles & Huberman (1994) of triangulation by data type.

¹⁸² Guest et al., (2012) pp. 15.

¹⁸³ Grounded theory is a technique whereby patterns in collected data are collated together into new theoretical models (Charmaz, 2006).

¹⁸⁴ Phenomenology is a technique with its roots in humanistic psychology that focuses on the subjective human experience, focusing on participants perceptions, emotions and experiences (Giorgi, 2009).

Within each of the key categories ATA was conducted using the methodology formulated by Guest, MacQueen, & Namey, (2012) whereby the main themes are identified based upon initial readings of the text. The definition of themes used here is the one adopted by Ryan & Bernard, (2003) who define them '*as abstract constructs that link not only expressions found in texts but also expressions found in images, words and objects*'.¹⁸⁵ Within each of the identified categories text relating to the main themes was identified and coded using codes developed within each theme. A code book was developed for each theme and coding trees produced under each area.¹⁸⁶ The code book evolved throughout the initial coding exercise as text that raised key themes and could not be categorised was given a new code (Hsieh & Shannon, 2005). This process left a series of key themes coded within each major category. Coding of interviews was undertaken by the author on two separate occasions, and only those sections that were coded both times were retained. The next section discusses each of the major categories: actors, scales and interests with the major themes arising in each presented.

6.5 The Governance of the LCDS

6.5.1 Actors

Five key themes were identified from interview data relating to the role of actors in the governance of the LCDS (Figure 6.3). Themes focused on which actors had most power and how collaboration occurred between actors. The proportion of interviewees who made reference to each theme during the course of the interviews is outlined in Table 6.1. They are discussed in turn, with reference to their relationship to MLG and the key hypotheses postulated by Forsyth.

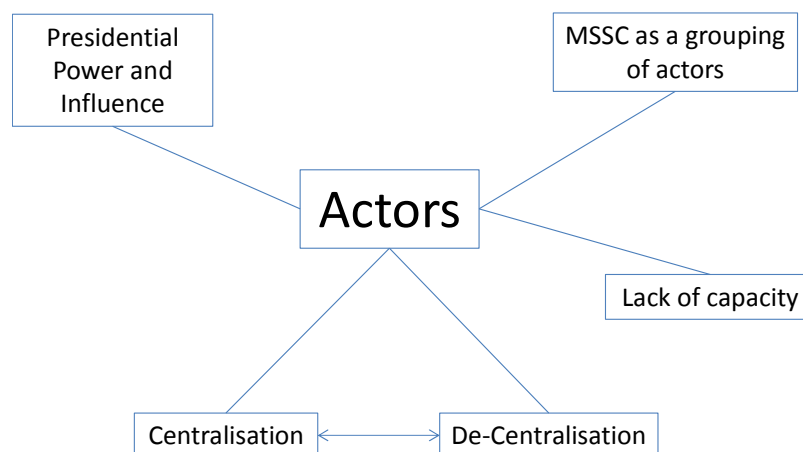


Figure 6.3: Themes related to actors

Source: Author

¹⁸⁵ Ryan & Bernard, (2003) pp. 87.

¹⁸⁶ These are shown in the relevant sections of Section 6.5.

Table 6.1: Occurrence of themes relating to Actors among respondents

Themes	Respondents
Presidential power and influence	36%
Centralisation vs Decentralisation	29% vs 4%
MSSC as a grouping of actors	32%
Lack of capacity	11%

Presidential power and influence

A consistent theme that emerged throughout the interviews is the key role of former President Jagdeo in driving the whole REDD+ process, from the very inception of the LCDS and the birth of the agreement with Norway. At the level of the LCDS the perception of many of the actors involved was that he was the driving force behind many of the policy choices. In response to a question on the initial driving forces behind the first draft of the LCDS a leading Guyanese academic responded:

‘Because if you notice the President has been around, always in the background and I think to a large extent it’s been driven by him’.

In response to a similar question the then Head of the National Toshias Council (NTC)¹⁸⁷, responded:

‘I think the brainchild of the whole thing came from President Jagdeo.’¹⁸⁸

A further interviewee commented:

‘Also with the government you have a man like the past President Jagdeo - he knows what it is he wants out of this. So he would sell it like that. While you might question he will tell you why it got to work like this and hold you to go against him - and you support’.

These statements indicate a strong perception that the LCDS was developed, led and pushed through by former President Jagdeo. Indeed it was perceived by many actors as essentially being his initiative. This strong influence of the role of the President in the LCDS is not unique in the historical context of Guyana.¹⁸⁹ The Constitution of 1980 established a strong role for the Executive President and previous initiatives such as the National Competitiveness Strategy have been directly led by the

¹⁸⁷ The National Toshias Council is a quasi-governmental body representing all the Toshias (chiefs) of the Amerindian villages.

¹⁸⁸ Pearson, Y. (personal communication, February 21, 2012).

¹⁸⁹ See the discussion in Section 3.2.5.

President.¹⁹⁰ Thus the strong influence of the President upon the LCDS is not unexpected; however the large international attention and prestige that has been attached to Guyana's leadership in REDD+ and low carbon development more generally may have attracted the President to play such a strong role in the programme. Due to his efforts he has awarded the UN's Champion of the Earth in 2010 (Kaieteur News, 2010a), and he has subsequently become a major figure in the international climate change policy arena taking on positions at the International Union for the Conservation of Nature (Stabroek News, 2012b) and the Global Green Growth Institute (Stabroek News, 2012g). How large these potential legacy benefits were to his role in pushing forward and developing the LCDS is unclear but may have played some role.

This presidential power and influence may be a double-edged sword. On the one hand the importance the President placed upon the endeavour, and the focus he put on the LCDS, placed the low-carbon issue, and REDD+ more specifically, at the very top of the political agenda. However, looking through the MLG lens, the power and influence of the President may have stymied the involvement and ready collaboration of the multitude of actors potentially affected by REDD+. The perception of the dominance of Presidential power in the process, to the detriment of influence either from the international sphere, or arising from sub-national actors via a bottom-up process may reflect a more state-dominant mode of governance of REDD+ in Guyana, rather than one reflecting MLG.

The fact that the two main implementing agencies for the LCDS in Guyana, the Office of Climate Change (OCC)¹⁹¹ and the Project Management Office (PMO)¹⁹² sit within the Office of the President has helped to continue the close presidential interest, and control of, the LCDS and its related projects. The fact that the OCC did not form part of the newly created Ministry of Natural Resources and the Environment (MNRE) may have strengthened the perception that the governance process of the LCDS has been controlled strongly by the Office of the President.¹⁹³

The critical role that the President, and his Office, has played in driving forward REDD+ policy in Guyana, and defining policy choices under the LCDS raises interesting questions regarding the MLG

¹⁹⁰ For example as per the Constitution of Guyana the President can dissolve the Parliament (s70) but there are no provisions for the Parliament to replace the President, except in the case of mental incapacity or gross constitutional violations (s93).

¹⁹¹ The OCC is described by its Head as *'the focal point for the preparations for the LCDS, the process which we went through in having the LCDS prepared, launched, the extensive national stakeholder engagements, and now the implementation phase of the LCDS.'* (Nokta, S. personal communication December 16, 2011).

¹⁹² The PMO is described by the Head of the OCC in the following manner *'The PMO is responsible for the implementation of the LCDS projects, or the implementation process for that. So we have the GRIF which is the body that approves projects. Projects are submitted jointly by the implementing agency and a partner entity. The PMO would facilitate this process.'* (Nokta, S. personal communication December 16, 2011).

¹⁹³ The MNRE is discussed in more detail in Chapter 3, Section 3.2.6.

model of governance for REDD+. On the one hand the attention given to the programme by the President and his ability to devote the government's resources towards mainstreaming the programme in the country as a whole has played a major role in helping Guyana become a world-leader on REDD+. However It may also have led to a state-centric mode of governance rather than one that was reflective of MLG – with only limited involvement of other actors, especially sub-national, and non-governmental actors in Guyana. This may raise an interesting trade-off between harnessing the type of political influence that can drive REDD+ to the top of the policy agenda, and the implementation of REDD+ through the type of MLG hypothesised as being crucial for equitable, effective and efficient REDD+.

Centralisation vs. decentralisation

To further understand how well the governance process of the LCDS in Guyana has embraced multiple actors, and fostered collaboration between them, two related themes were identified: centralisation and decentralisation.

REDD+ has been highlighted for both its potential to foster decentralised forest governance (Larson & Ribot, 2009) and also for its potential to reverse recent decentralisation trends (Phelps, Webb, & Agrawal, 2010). As highlighted in Hinds, (2010) governance in Guyana has generally been centralised in a small number of predominantly state actors.¹⁹⁴ To what extent the LCDS has embodied this centralisation phenomenon or has helped to reverse it, in the manner prescribed by proponents of MLG, is examined here.

The theme of centralisation was observed more frequently than decentralisation (Table 6.1). In answering a question regarding the perceived centralisation of the process a member of the mining industry commented:

'Yes it was more centralised. It wasn't bottom-up. We know what's best for you. But then people feel that these guys don't think what's best for us, it's what best for them.... Now with the LCDS the funds are going to be centrally disbursed, you have to go to somebody and make a proposal. Before you can get anything. Now in mining everybody gets their own buck. So there's a feeling there in it that there's too much governmental control in the LCDS. Too centralised.'

The centralisation process can also be seen if the LCDS is tracked back to its inception. A first draft was presented to the public in June 2009 with a perception of very little engagement with stakeholders prior to launch. The views of two stakeholders highlight this issue. The first is the

¹⁹⁴ See discussion in Chapter 3.2.5.

opinion of a former head of the Guyana Gold and Diamond Miners Association (GGDMA), a crucial constituent given mining's importance in the economy and its use of the forest. He responded when questioned about the Association's involvement with the LCDS:

*'First of all we were not involved in the setting up of the LCDS in the beginning. The association got involved after the [Memorandum of Understanding] was signed between the government of Norway and the government of Guyana.'*¹⁹⁵

The second is the view of an independent member of the MSSC, an Amerindian lawyer with large experience in the field of indigenous rights, who, when asked about their involvement in the formation of the LCDS, responded:

*'Well it's a bit of a strange thing because what happened when government came up with that draft policy they didn't include too many people in it. But what they did later on was to have some consultations which was meant to have some input from all the stakeholders across Guyana, especially the indigenous people.'*¹⁹⁶

These comments highlight the perception in Guyana of the centralisation of REDD+ governance - more in line with traditional state-centric views of governance and the historical situation in Guyana, rather than the MLG posited by authors as necessary for REDD+. It reflects the perception of the dominance of national level government in controlling both the material within the LCDS, but also the mechanism for implementing the strategy.

In a similar fashion to that of presidential power and influence centralisation may also have been a double-edged sword. Centralisation has been seen by some actors as excluding them from the decision process, leading to inappropriate policy choices. However the centralisation may be a natural result of the interest of the President in the endeavour, without which the push to put REDD+ on the top of the policy agenda may have proved tricky. Thus although the governance of the LCDS in Guyana reflects more strongly state-centric governance, rather than MLG, this may be a natural consequence of the importance placed on it by the top of the political hierarchy in Guyana, and the leverage that REDD+ has subsequently achieved at the top levels of government.

MSSC as a grouping of actors

One of the key themes that emerged in both interview evidence and external reviews of the governance process in Guyana was the establishment of the MSSC for the LCDS. The broader

¹⁹⁵ Shields, E. (personal communication, March 12, 2012).

¹⁹⁶ James, D. (personal communication, February 28, 2012).

perceptions of the nature and effectiveness of this institution in the governance of the LCDS are discussed in greater depth in Section 6.5.2, but key in relation to the discussion of collaboration of actors for the LCDS is the perception of the MSSC as a body that brought together a wide range of government and non-governmental actors to help shape and guide development of the policy.

The MSSC is a unique institution in Guyanese policy-making in acting as such a high-level policy forum with both government and non-government members. Although there are some historic parallels with similar committees established for the National Competitiveness Strategy and the National Development Strategy,¹⁹⁷ generally the inclusion of any non-governmental actors in policy-making at the highest level is unusual within Guyana. A notable exception has also arisen out of the LCDS – the Special Land Use Committee (SLUC) consisting both of government and non-government participants which was implemented to address land-use conflicts between mining and forestry.¹⁹⁸

The potential strength of the MSSC in serving to bring together actors is highlighted in the following response to a question regarding the interviewee's perception of the MSSC:

'And so because of the diversity of persons on the MSSC really it should bring to the table a lot of knowledge and expertise and experience and so forth.'

This role of the MSSC in working to bring together diverse actors to help shape the LCDS and REDD+ policy is a potentially an embodiment of the type of MLG postulated by Forsyth - providing a horizontal linkage through which actors across the national level can collaborate and shape policy. These horizontal linkages are crucial parts of the MLG mode of governance bringing together actors at similar scales to inform and develop policy. Whether or not the MSSC has served this function effectively needs to be examined in order to identify whether it played a role as a horizontal linkage in practice rather than just on paper – this will be discussed in Section 6.5.2.

Lack of capacity

A theme that emerges from both primary and secondary evidence is a lack of capacity of actors in Guyana generally, and in civil society in particular, to play an active and key role in the policy process, hindering the development of MLG. One interviewee highlighted their frustration at the lack of capacity in civil society in Guyana:

¹⁹⁷ A public-private National Competitiveness Council was established to take ownership of the Strategy and act as the central point of policy leadership (<http://www.competitiveness.org.gy/index.php/initiative/ncs-strategy>). For the National Development Strategy 23 technical working groups were established consisting of private sector, government agencies, non-government agencies and the University of Guyana to provide input into the Strategy (http://www.guyana.org/NDS/nds_about.htm).

¹⁹⁸ Stabroek News (2010, 2012b). See Section 6.5.3 and 3.2.3 for more detail on the SLUC.

'So that is what you have is, everything is exchanged, by and large, in the level of the newspapers, but there is no rigour in the sense, at the civil society, to how it is how these things are implemented.'

A member of the MSSC highlighted the importance of the issue in relation to the relatively new area of REDD+ and low-carbon development, highlighting that although there was a perception of a willingness to engage with a wide group of actors, there was not sufficient knowledge amongst those actors to fully participate:

'To put it this way it is asking for inputs in subject areas that we know very little of. So basically asking for stuff that I really don't know much about.'

These views highlight the importance of capacity and help to show that, for MLG for REDD+ as envisaged by writers such as Forsyth, it is not just the will to set up a collaborative network of actors that is crucial but also improving the capacity and knowledge of the relevant actors in order that they may meaningfully participate in the policy process. In Guyana for REDD+ particularly this capacity is low especially in civil society, hindering the full involvement of actors at all levels in the policy process. The focus on capacity by the interviewees highlights the importance of reducing such capacity constraints, both human and financial, in order to help bring all actors effectively into the REDD+ policy process.

Summary

Examining the involvement of actors in the governance of the LCDS leads to a greater sense of state-centric governance rather than MLG for REDD+ in Guyana. The dominant source of policy, and control, has remained the Executive Presidency following the historical precedence in Guyana. The huge involvement of the Presidency has helped drive the policy forward and helped instil it with the political will needed to mainstream it across government, however such centralisation may hinder full and collaborative participation of all relevant actors in Guyana. The MSSC is one important institution that has attempted to create this collaboration, and its effectiveness is discussed in more depth below. The Committee, along with other institutions, and actors and stakeholders more generally, are hindered by a lack of capacity, human and financial, to fully participate in a wide and inclusive policy process. These findings raise question marks, from a perspective of actors, to the extent that MLG has arisen as the mode of governance for REDD+ in Guyana. It also raises doubts over the extent to which it is realistic to think that it could emerge, given capacity constraints, and may even be desirable, given the apparent trade-off that Guyana has experienced between presidential influence helping to drive REDD+ policy forward and the state-centric model of governance that such presidential influence seems to imply. These findings indicate that a

refinement in the proposed mode of governance may be required, including the desirable elements of MLG, bringing in considerations of lack of capacity and the need for large political buy-in.

6.5.2 Scales

MLG, as conceptualised for REDD+ by authors such as Forsyth and Skutsch & van Laake, involves the cooperation of actors between scales (vertical linkages), and also the ready collaboration of actors across the same scale (horizontal linkages). Thus in order to analyse how well governance in Guyana has fitted the MLG model one example of a horizontal linkage at a national scale, the MSSC, and one of a vertical linkage, the initial consultations between national and sub-national actors, have been chosen to analyse. Following a similar methodology as above key themes relating to each of these examples have been extracted from the primary and secondary data. Figure 6.4 shows the coding tree used to analyse both the MSSC and the consultative process.

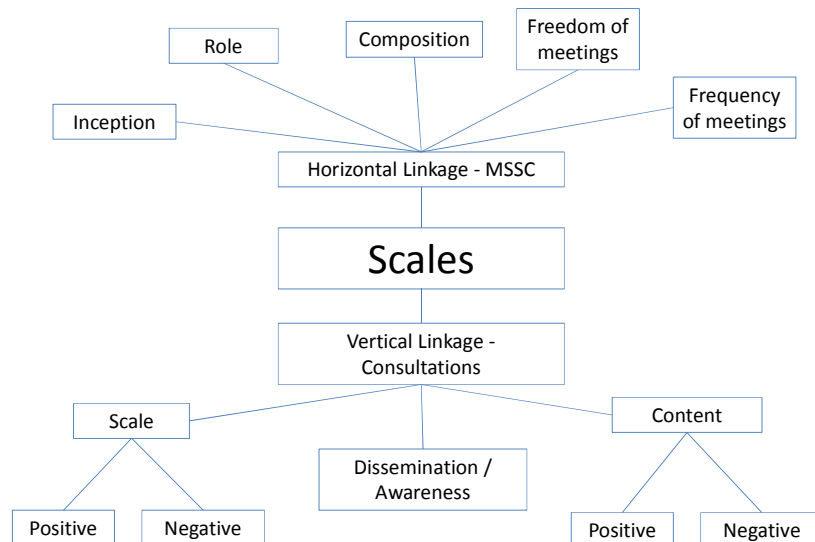


Figure 6.4: Themes related to scales

Source: Author

MSSC

The MSSC has been introduced in Chapter 3, and discussed in its role with regard to actors in Section 6.5.1 above. This section will analyse the perceptions of its effectiveness as a governance body, linking together national actors, and shaping REDD+ and the LCDS in Guyana.

Five key themes have been identified from the data collected, of which the most common are the role of the MSSC in relation to the LCDS, and its composition as a multi-stakeholder body (Table 6.2).

Table 6.2: Occurrence of themes relating to the MSSC among respondents

Themes	Respondents
Role	39%
Freedom of meetings	21%
Inception	14%
Composition	32%
Frequency of meetings	14%

Inception

The first MSSC meeting was held on June 11, 2009. This was just after the official launching of the LCDS on June 8, 2009 and five months before the official signing of the Memorandum of Understanding (MOU) with Norway on November 9, 2009, but subsequent to the first Joint Statement on the commitment of Guyana and Norway to work together to ensure the establishment of a REDD+ mechanism under the UNFCCC (Dow et al., 2009).

The minutes of the first meeting reflect the initial purpose of the MSSC with the Chair, President Jagdeo, reported as saying:

'He explained the purpose of the Steering Committee to provide input and feedback on the consultations and awareness programme for Guyana's Low Carbon Development Strategy'.¹⁹⁹

Two contrasting opinions were expressed during the interviews regarding the reasons for the inception of the MSSC. The first is that the MSSC was established to create an inclusive institution to bring together government and non-government actors at a national level for the management of the LCDS. As expressed by a key government official:

'Well the MSSC was established at the time when we were developing the LCDS, because we really wanted to make the LCDS a national effort, and to involve all the key important stakeholders from this inception of the process.'²⁰⁰

This view of the MSSC shows it being a key institution for creating horizontal linkages between actors at the national level, as envisaged by Doherty & Schroeder, (2011). An alternative view, though not necessarily mutually exclusive, is that the MSSC was formed as a response to early criticism that the LCDS was being produced without consultation. This is a view expressed by a private sector actor involved in the MSSC:

¹⁹⁹ MSSC Minutes June 11, 2009.

²⁰⁰ Nokta, S. (personal communication, December 16, 2011).

'Let me start with this - the government only formed the MSSC because people were saying that they were not being consulted.'

This view does not preclude the MSSC being an effective horizontal governance linkage, bringing together different stakeholders. It does however raise questions as to why the MSSC was formed, its initial objective and its purpose in the policy process. Depending on which viewpoint is adopted either the MSSC has been an embodiment of the principles of MLG since the very start of REDD+ in Guyana, or was a move towards an MLG mode of governance in the wake of public criticism. From either viewpoint the establishment of the MSSC has been a positive development in the establishment of an inclusive governance mode for REDD+ in Guyana. The use of similar institutions in other REDD+ countries may be a positive step in the widespread development of MLG for REDD+.

Role

The most common theme raised in relation to the MSSC relates to the role that it plays, or is perceived to play, with regard to the LCDS. With the initial purpose of the MSSC to provide input and feedback to the consultation process once this process was completed the overall role of the MSSC became unclear. This perception of lack of clarity was raised by one interviewee who raised the issue that at no stage has the MSSC had a formal terms of reference to outline their work, and to fully define their role in the policy process. This perception of a lack of clarity of the role of the MSSC is not confined to non-governmental actors. A senior governmental member of the committee commented:

'the MSSC to my dismay has not characterised itself what role to play now in moving forward'.

Expanding their thoughts on the possible role that the MSSC could play the same interviewee commented:

'it would be my hope that the MSSC ... wants to play a critical role in shaping ... projects, so essentially act as the name the Steering Committee for those funds and targeting them in a principled way toward projects'.

This lack of a clear role for the MSSC raises two main issues: first it may highlight reluctance on the behalf of the national government to cede power away from its central organisations. This view however seems to be disputed by the comments of the senior government official quoted above. There may also be a key role played by the lack of capacity of those involved, and civil society as a whole in seizing the opportunity to play a critical role in driving the LCDS forward, possibly hindered by the lack of opportunities to do the same in relation to other policies in Guyana. The lack of a

clearly defined role for the MSSC may have limited it becoming a strong horizontal linkage helping to bind together actors into a MLG framework. The experience of Guyana in this regard highlights the importance of clearly defining the role of such critical institutions in order for them to play their full part in creating effective, equitable and efficient REDD+.

Composition

The formation of the MSSC was a unique step towards MLG in Guyana, being the first high-profile governance institution that brings together such a wide-ranging group of government, and crucially, non-government actors. Invitation is at the request of the OCC or the President directly. Across its 55 meetings 69 different individuals have attended meetings, from 27 institutions.²⁰¹ Figure 6.5 below shows the governmental and non-governmental composition of the committee across its existence.

The uniqueness of such a strong horizontal linkage at the national scale for REDD+ in Guyana is highlighted by a statement from the Head of the OCC in response to a question regarding the similarities of the process with previous policies in Guyana:

*'The MSSC itself is a very novel and innovative mechanism. The fact that you can bring such a diverse grouping of people together to be part of this process, is in itself I would rate it as one of the strengths of the LCDS.'*²⁰²

Issues have been raised however as to the composition of the committee. Although it includes a wide range of relevant stakeholders there are two key exceptions. The first of these is through the choice of the stakeholder themselves. The largest, and most vocal, of the Amerindian NGOs is the Amerindian Peoples Association (APA). It was invited to sit on the MSSC but after attending the first meeting it made the decision to withdraw itself from the committee on the basis that there was no clear terms of reference for the committee, and the short timescale required for a decision to undertake membership.²⁰³ The absence on the committee of one of the key representatives of a group likely to be significantly affected by the LCDS has been commented upon as disappointing by a number of interviewees.

The voluntary absence of such a prominent organization representing a key constituency that will both affect the success, and be affected by the implementation of, REDD+ policy is surprising. It represents a major limitation in the development of the MSSC into a fully inclusive horizontal linkage, pulling together the key national-level actors. The absence can be partially explained by the

²⁰¹ See Chapter 3 Appendix 1 for the current list of MSSC members. Data correct up to June 30, 2013.

²⁰² Nokta, S. (personal communication, December 16, 2011).

²⁰³ Personal communication from the APA.

history of relations between the APA and the Government of Guyana. The APA has been prominent opponents of the government in a major land rights dispute in the Upper Mazaruni area of Guyana (Bulkan, 2013; Hennessy, 2002). There has been an increasing level of animosity between the two parties and the APA has developed a level of mistrust regarding the government's intentions. This historical animosity has been partnered with a general scepticism towards REDD+ from some of the APA's international partners such as the Forest People's Programme.²⁰⁴ The combination of these factors, along with the administrative reasons stated above, seem to have combined to lead to the self-imposed exclusion from the MSSC. This experience highlights a major issue in the rapid establishment of government/non-government governance bodies for REDD+ in the light of previous acrimony between parties and without the resolution of previous disputes regarding communities and natural resources. The voluntary exclusion from these bodies of such disputing parties risks turning the types of institutions that may otherwise link together all parties together into merely forums for just one type of opinion, reducing their effectiveness in building truly representative governance for REDD+.

The second major group not represented on the MSSC is the parliamentary opposition. This absence has been highlighted as 'unsatisfactory' by a report from the Norwegian development cooperation, which recommended a more solid bipartisan approach (NORAD, 2010). The absence highlights the political nature of the LCDS and REDD+ policy in Guyana and further shows the difficulties in creating fully inclusive national-level horizontal linkages in the context of political pressures and natural resources rights disputes.

The formation of the MSSC has been a significant development in creating horizontal linking institution between the key actors involved in the governance of the LCDS. Its wide composition has helped to create networks between government and non-government actors. The fact that membership is at the request of the government may however have hindered the attempt to create strong collaboration between national actors – either through the lack of government invitation in the case of the exclusion of the parliamentary opposition, or because of a reticence of certain actors to be involved in such government-led processes. These difficulties in creating a fully inclusive horizontal national linkage that can encompass the full range of relevant actors are unlikely to be specific to Guyana. They may be common to many REDD+ implementing countries and may be a

²⁰⁴ The APA is recognised as a key partner of the Forest People's Programme on their partner page at <http://www.forestpeoples.org/partners/amerindian-peoples-association-apa>. The Forest Peoples Programme have produced a series of reports that have critically analysed the development of REDD+. See Dooley, Griffiths, Martone, & Ozinga, (2011) for a critical review of the FCPF and Freudenthal, Nash, & Kenrick, (2011) for a critical review of the treatment of the treatment of indigenous people with regard to REDD+ in Cameroon.

major hindrance to the emergence of the type of institutions necessary to implement the type of MLG posited as vital for REDD+ that meets the 3Es criteria.

Freedom of Meetings

A key theme that emerged, and was opened up through questioning, was how members of the MSSC perceived the freedom of the institution. The freedom for people to express their views is crucial for the effectiveness of the MSSC to serve as a tool to bring together actors at the national level. Two main opinions were raised regarding the freedom of this forum for members to fully express their views. The first was expressed most eloquently by a government representative:

'It's a pretty free open discussion forum; the opportunity is there for all the members of the MSSC to air views, to make contributions'.

An alternative opinion was expressed by a number of non-governmental actors, not necessarily in response to their own freedom to speak, but the perception that other actors, mainly government representatives, were reticent to give their opinions, and provide full feedback on policy matters. This view was expressed by an individual non-governmental member of the MSSC:

'especially the persons representing the government agencies were very careful and cautious in whatever they said and in some cases probably not saying anything'

This perception of a lack of freedom of government individuals to freely express themselves in the forum may be a reflection of two key themes identified with regard to Actors: centralisation and Presidential power and influence. A combination of the huge power of the Presidency in Guyana generally, and with regard to the LCDS in particular, and the fact that key decisions are predominantly centralised in a few key actors, may have hindered the MSSC becoming a full forum discussing all the relevant issues relating to the LCDS. A lack of capacity in the actors involved, regarding REDD+ issues may also have contributed to this issue.

Whether this perception of the freedom to participate and air views in meetings is true, is difficult to verify but does raise question marks regarding the effectiveness of the institution to play a key role in the governance process. A key element that has to be highlighted is the fact that all the minutes of the MSSC meetings are freely available on the website of the LCDS. This is a first for any institution in Guyana and provides a significant amount of transparency.

The requirement to not just create horizontal linkages, but to ensure that they are full, participatory bodies is necessary for the type of full, inclusive governance for REDD+ as embodied in a MLG framework. In Guyana doubts have been raised as to the extent to which the MSSC has emerged as

this type of linkage – with concerns over how freely participants have been in engaging through the forum. This highlights the importance of assessing not only the existence of governance institutions for REDD+ but also their effectiveness in truly linking together actors at similar scales.

Frequency of Meetings

One final theme that emerged in relation to the MSSC was the frequency of meetings. Meetings are held at the request of the OCC and a common thread was that at the time of interviews question marks were being raised about their lack of frequency, especially in relation to their previous regularity. One interviewee commented:

'The steering committee does not meet as regular as it did before when we were during the formation, but we meet as the government requests. But before that we met on a regular basis to discuss how far we are progressing.'

Plotting the dates of each individual meeting on a timeline identifies four distinct phases of MSSC meetings (Figure 6.5). The first phase of the MSSC ran from the inception of the committee in June 2009 until approximately the end of that year. Meetings were held extremely frequently, as often as once a week, and there was a high level of attendance with an above average involvement of NGO actors. During this period the LCDS was in a consultation period (discussed more below) and the MSSC discussed and oversaw this process.

The second phase ran from the end of 2009 until mid- 2011. Meetings were held less frequently than the start of the LCDS - approximately once a month. The composition of the committee changed slightly with a greater involvement of government actors. During this phase the initial consultations had ended, a second draft of the LCDS was being prepared, and the LCDS was moving towards implementation. A number of delays to finance and project implementation marked this phase, and the minutes of the MSSC reflect general discussions and updates regarding the movement of projects towards funding.²⁰⁵

The third phase from mid-2011 to the end of the first quarter of 2012 coincided with the conducting of interviews, and thus most perceptions of the MSSC collected for this study relate to that period. During this period no MSSC meetings were held. The period was characterised by the run-up to the November 2011 elections, the elections themselves, and the aftermath of the elections, involving the new President taking office, and the new parliamentary situation.²⁰⁶

²⁰⁵ These issues are discussed in greater depth in Chapter 7.

²⁰⁶ The election results and the aftermath are discussed in Chapter 3 Section 3.2.4.

When questioned regarding the change in frequency of the meetings there was a general lack of information relating to the status of the committee, and indeed the role of individual representatives. Two responses highlight this clearly:

‘What has happened is that Jagdeo has gone, and we have not had a meeting for ages.’

‘I don't know if I'm still the representative because that committee has not met for the last 6-7 months. So I don't know what is the situation with that.’²⁰⁷

The first of these responses harks back to the earlier themes of presidential power and centralisation: it highlights the perception that the lack of frequency of meetings was related to former President Jagdeo's personal involvement in the project.

During this period the Rainforest Alliance conducted an audit of the progress towards the verification of the Indicators of Enabling Activities for REDD+ set out in the Joint Concept Note (JCN) (Donovan et al., 2012). In relation to the MSSC it found that in this period the MSSC *‘was not an effective mechanism for regular communication and consultation between “all stakeholders” interested in the LCDS and REDD+ activities as envisioned in the JCN’.*²⁰⁸

Phase 4, the latest phase of the MSSC, started with a meeting of the committee in May 2012, following the decision of the parliamentary majority opposition to cut allocations from the national budget for the LCDS (Stabroek News, 2012c). This led to the highest attended MSSC meeting, and the first held by the new President Donald Ramotar. Subsequent to this meeting a press release from the MSSC (which some members refused to endorse) was issued condemning the budget cuts (Guyana Chronicle 2012). This action was commented on by the Rainforest Alliance in their verification report finding that it:

*‘appears to have been led by political and technical government representatives on the MSSC, is not consistent with the JCN reference to a “representative multi-stakeholder steering committee” reflecting the views of all stakeholders in Guyana’.*²⁰⁹

These statements, and the actions that led to them, reinforce the conclusion that the LCDS and REDD+ in Guyana has taken on a political nature, both from the perspective of the incumbent government and the opposition.

²⁰⁷ The first of these responses was from an independent member of the MSSC and the second from a representative of an industry body.

²⁰⁸ Rainforest Alliance (2012) pp. 6.

²⁰⁹ Rainforest Alliance (2012) pp. 6.

The May 2012 meeting restarted the MSSC with meetings held approximately monthly. There was another small change in composition with the removal of some independent members and greater NGO involvement, with discussion focusing on the status of the projects now entering implementation, and also on the role of the committee going forward. It should be noted that the resumption of MSSC meetings was identified as a key indicator of progress achieved by the GoG subsequent to the Rainforest Alliance verification report with a regular schedule established for the meetings to be held on the third Wednesday of every month, or more often if required (Office of Climate Change, 2012).

The change in frequency of the meetings of the MSSC raises questions as to its effectiveness as a constant forum for bringing together different national-level actors to contribute to the policy process for the LCDS and serve as a horizontal linkage between actors. The shifting frequency of meetings reflects the confusion regarding the role of the MSSC, and its changed function over the timeline of the LCDS. The fact that meetings are scheduled at the request of the government reflects the fact that the committee has remained a government-led institution, possibly hindering it from becoming a clear horizontal linkage between both government and non-government actors as envisaged by the authors professing MLG for REDD+. The distinct phases of the evolution of the MSSC highlight the crucial role of electoral cycles upon the governance environment for REDD+, even without a full change in the party holding power.

Summary

The creation and functioning of the MSSC has been a major step in creating ready and coherent collaboration between national level actors for REDD+ in Guyana. Questions marks have been raised by both members and non-members over the effectiveness of the institution, and therefore whether it plays the role of a strong horizontal linkage between actors at a national level for the governance of the LCDS.

Questions have been raised regarding the role that the MSSC is now intended to play, its frequency and administrative arrangements. Its initial formation focused on managing the consultation phase of the LCDS, however from the end of that phase the committee has not moved on to create a well-defined role in the LCDS policy process. The frequency that it meets reflects this slightly confused role, and has been affected by the change in Presidency, and the new political situation in Guyana. The fact that the institution is chaired solely by a government official (the President or his representative in his absence), is hosted at the Office of the President and membership is by

invitation of the President may have hindered its establishment as a strong robust institution that can harness the collaboration of all stakeholders.

The MSSC represents a potentially important horizontal linkage – bringing together national actors, both government and non-government, in one forum specifically designed to advise on, and inform the LCDS and REDD+ policy in Guyana. It thus serves as a key embodiment of the implementation of the type of MLG proposed by authors such as Forsyth for REDD+. However doubts have been raised as to whether the institution has realised its full potential. Capacity constraints and government centralisation have limited the participation of a wide variety of actors into the policy process. These types of constraints are unlikely to be unique to Guyana and thus may prove major barriers to establishing horizontal national level linkages for REDD+ governance. Helping to reduce capacity constraints could prove to be a vital policy tool in establishing REDD+ that can satisfy the 3Es. The issue of centralisation may be more problematic. In Guyana the strong influence of Presidential power has helped push the LCDS forward, but may have hindered the moves to establish a MLG framework to govern the Strategy and the lack of capacity of actors generally in Guyana. This is a trade-off that may be inherent in REDD+ - political support may limit the wide involvement of the full spectrum of national level actors, both government and non-government.

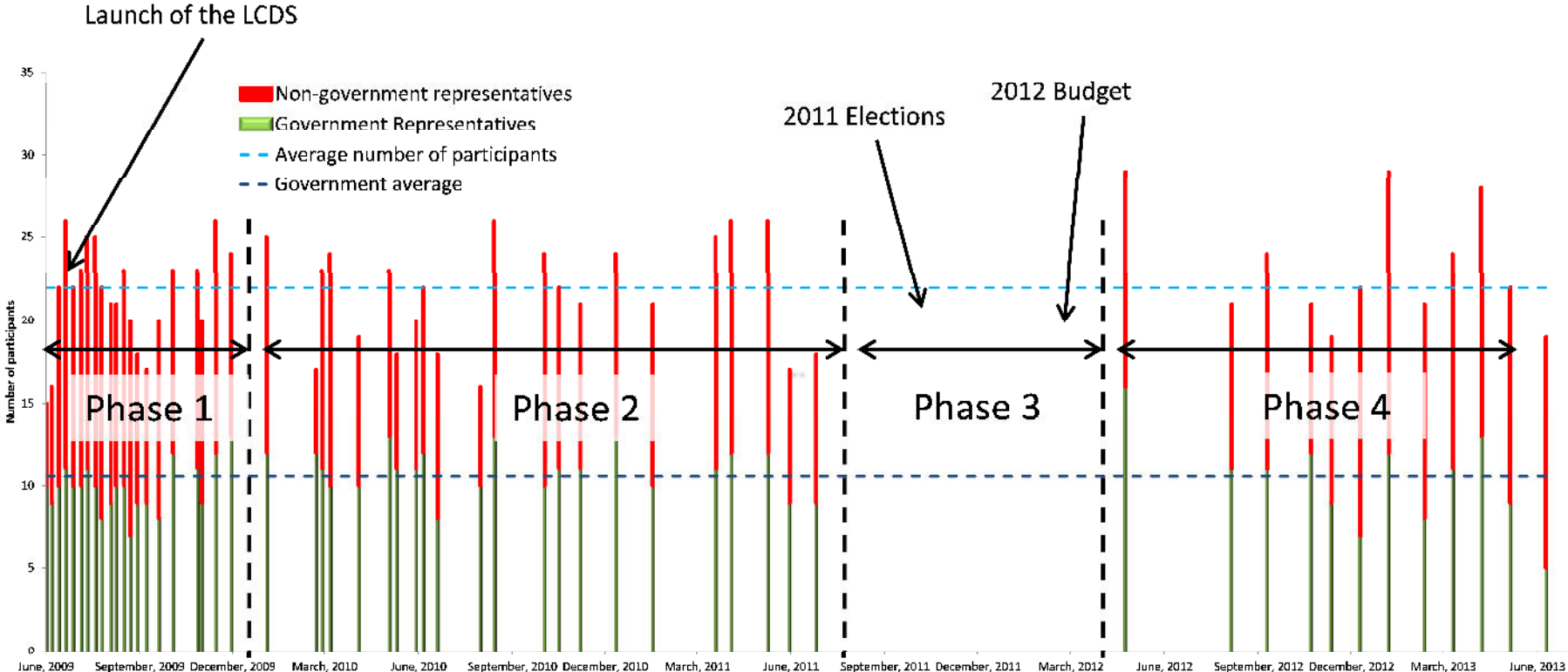


Figure 6.5: Timeline of MSSC Meetings

Source: Minutes of the MSSC, Office of Climate Change

Consultation Process

REDD+ in Guyana will involve, and affect, actors at both the national and sub-national level, across the entirety of the country. Forsyth postulated that inclusive and successful vertical governance could lead to equitable and effective REDD+. The initial consultative process that was undertaken in Guyana with the launching of the LCDS is the best example so far of such vertical governance, linking nationally defined policies with sub-national actors, with the aim of reflecting sub-national interests in national policy. The stated objective of the consultations was to:

*'encourage local and national conversations and sharing of opinions and positions in an attempt to find common ground for optimal proposals and solutions for a low carbon development strategy that will grow our economy, wisely utilise and manage our natural and human resources and support partnerships and initiatives that are committed to provide revenues to keep our forests standing and intact.'*²¹⁰

The official consultative process began on June 8 2009 with the national launching of the LCDS and continued with stakeholder consultations across the length and breadth of the country.²¹¹ According to government figures around 0.5% of the population were physically present in the meetings.²¹² In addition to these physical consultations the LCDS website was launched as a virtual consultative entity,²¹³ a stream of radio, TV and newspaper stories were published, and a set of non-governmental consultations and awareness sessions were conducted by actors such as Conservation International (CI)²¹⁴ and Amerindian NGOs.²¹⁵ The following analysis focuses however on the official consultative process and the sessions that formed part of that process.

There were three overall themes identified from the material collected and analysed, relating to the scale of the consultation process, the content of the process, and the perception that the process was merely a dissemination or awareness programme. For the first two of these themes there were positive, neutral and negative responses, thus these themes were split into these three codes. The occurrence of these themes among respondents is highlighted in Table 6.3.

²¹⁰ Dow et al., (2009) pp. 109

²¹¹ See Appendix 9 for a full list of consultations.

²¹² Based on the reported numbers from the IIED report and an approximate total population for Guyana of 750,000.

²¹³ See http://www.lcds.gov.gy/index.php?option=com_content&view=section&id=19&Itemid=183.

²¹⁴ A review of these sessions is available in The Consultancy Group, (2009).

²¹⁵ Sessions have been held by both the APA and The Amerindian Action Movement of Guyana (TAAMOG) as per personal communication with both organisations.

Table 6.3: Occurrence of themes relating to the consultative process among respondents²¹⁶

Themes	Respondents
Scale	75%
Positive	29%
Neutral	14%
Negative	46%
Content	56%
Positive	18%
Neutral	14%
Negative	29%
Dissemination / Awareness	25%

Scale

The consultative process was one of the most extensive undertaken in Guyana, at least in terms of geography, encompassing all administrative and geographic regions, and covering a large number of very remote communities. Despite this doubts have been raised about the scale of the consultative effort, especially subsequent to this first large undertaking. The scale of the consultative process was raised by three-quarters of the interviewees with a slightly greater share of interviewees reflecting negative opinions, though significant shares expressing positive or neutral opinions.

A clear example of the positive opinions expressed regarding the consultation is given by the Head of the OCC:

*‘our stakeholder engagement for the LCDS is probably one of the most extensive that has happened anywhere. We had it independently monitored by IIED, and you can look at their reports’.*²¹⁷

The consultative phase represents the largest national-subnational linkage so far with regard to the LCDS. It represented a huge effort by the national government to engage a wide variety of stakeholders. However there was a perception among certain interviewees that the consultative process started too late and was inadequate. A leading member of the GGDMA commented:

‘The Association holds the position that very little consultation was done prior to the government engaging Norway with the LCDS and it is only after when some of these concerns arose that there will be some consultations’.

²¹⁶ Percentages for the three codes within the scale and content themes do not sum to the total for the themes as a whole as some respondents presented a combination of positive, neutral and negative views regarding the theme.

²¹⁷ Nokta, S. (personal communication, December 16, 2011).

The IIED in their evaluation of the consultative process generally concluded that the scale of the consultations was commendable but did highlight one particular negative regarding the non-engagement of the opposition members of Parliament and political parties in the process, mirroring the above experience with the MSSC and the politicisation of REDD+ in Guyana (Dow et al., 2009).

One key message that emerged in relation to the consultations concerned the lack of financial and technical support to undertake the exercise. This is amplified in the period post the initial consultative exercise and may help to explain the general lack of engagement subsequent to the initial effort. It was identified by the Rainforest Alliance as an issue, especially in relation to consultation with remote villages:

*'during this audit period government officials made few visits to forest-dependent Amerindian villages in the hinterlands, according to the government largely due to lack of funding.'*²¹⁸

The perspective was highlighted cogently by the then Head of the NTC:

*'In fact we have a project proposal that we worked out that we would have liked to promote awareness - breakdown to the people but because of lack of financial support we were unable to do it.'*²¹⁹

The issue of lack of financial resources was also raised by another interviewee who has involved in the implementation of LCDS projects. They highlighted the intrinsic trade-off between wide and extensive consultative activities and cost-effective projects:

'Let's take for example meeting with some of the Amerindian groups that wanted this information to be translated into the local language with people with no schooling to have a chance in time to understand all the intricate details of it, which are all important but then you might never have an LCDS. So the strategy is what is the optimal way of having a level of consultation that is actually good, against having a project that can be implemented in a cost-effective way.'

This focus on the cost constraints regarding the scale of consultative activities highlights a major issue with the establishment of a MLG framework for REDD+ in Guyana - that of capacity, an issue already explored in relation to actors. Here it is the lack of domestic, and crucially international, financial capacity and support that may have contributed to the lack of clear, strong vertical linkages being established between sub-national and national actors. The consultative initiative that Guyana embarked on regarding the establishment of the LCDS was a laudable attempt to incorporate the

²¹⁸ Rainforest Alliance, (2012) pp. 6.

²¹⁹ Pearson, Y. (personal communication, February 21, 2012).

views of a huge range of sub-national actors into the national policy framework. It thus represented a firm attempt to establish the type of vertical linkage that forms the foundation of MLG. The constraints that Guyana faced in pushing forward this programme of consultation – especially the lack (or at least slowness of disbursement) of international finance and geographic constraints – are likely to be key features of any national level consultation exercises in other REDD+ environments. They may thus provide crucial barriers to the establishment of an MLG framework for REDD+.

Content

A second major theme that emerged in the material relates to the content of the consultative process. The process consisted of a number of sub-elements as identified by the IIED (Dow et al., 2009): 50 face-to-face nationwide stakeholder sessions; 15 sub-national consultations and over 30 awareness sessions with specific stakeholder groups. Sub-national consultations consisted of a series of introductory remarks by both the consultative team members, and also the local delegations, a presentation regarding the LCDS, and then time for open discussion.²²⁰ A process was put in place whereby comments from the consultative process would feedback into the revised version of the LCDS. A sub-committee of the MSSC was formed to analyse the comments. This process is described by the Head of the OCC:

‘There is a sub-committee of the MSSC called the drafting committee. This drafting committee is responsible for reviewing all of the comments that have been received, of course the OCC facilitates this - I have a team within the OCC that tracks all of the comments. The drafting committee analyses and reviews them. What needs to be taken forward in the revised LCDS this committee would do so - and we would take this back to the wider MSSC.’²²¹

However as one member of this sub-committee commented:

‘The feedback from that was supposed to inform the second draft of the LCDS document. And in some ways it did and in some ways it did not because a lot of information, in my view, was not taken on board.’

The perceptions of the consultative process follow a similar thread as that relating to the scale of the consultations. There was a greater communication of negative opinions regarding the content of the consultations, although almost a third of the interviewees who raised the broad theme communicated positive opinions. These positive opinions were not solely expressed by governmental actors with one non-governmental member of the MSSC expressing the opinion:

²²⁰ The outline for meetings was drawn from Office of Climate Change, (2009).

²²¹ Nokta, S. (personal communication, December 16, 2011).

'in my view given the over-arching conditions they were the best consultations I have been involved in.'

The evaluative report of the consultations conducted by the IIED (Dow et al., 2009) highlighted that the consultations had *'broadly followed principles derived from international best practice'*²²² and to the extent that the process would inform a revised LCDS it was considered *'credible, transparent and inclusive'*.²²³ The general findings of this report support the positive perceptions of the content of the consultative process.

The negative opinions focused on the type of material communicated to the participants, and the scope to provide feedback. One such opinion was expressed by a participant of a regional consultation:

'It started with Shyam Nokta going around about carbon credits, and how much money and funds - you know. The whole design of the consultation was a mix-up.'

With both strong positive and negative perceptions given for the consultation process in terms of both scale and content no clear message arises as to how effective the consultative process has been as acting as a vertical linkage between the national and sub-national level, facilitating the communication of policy messages downwards, and allowing feedback on, and input into, the process upwards. The extent to which it fully performed as an inclusive and successful tool of vertical governance is thus unclear. Although the consultative exercise seems to have covered many of the broad issues of concern regarding REDD+ and built on international standards question marks were raised regarding the extent to which feedback from the consultations was fed into revisions of the policy. This highlights that the type of vertical governance institutions required for MLG need not to just consult and collect feedback, they must adequately encompass processes that allow for the results of these consultations and feedback to be fully incorporated into REDD+ policy. This highlights the need for REDD+ policy to be an evolutionary instrument, with clear avenues where sub-national actors can feed their views into national policy dialogues.

Awareness and Dissemination

A particular view of the consultative process can be seen in the final theme. A quarter of interviewees communicated views that the process was predominantly a dissemination or awareness programme, rather than a consultative process. This view is clearly enunciated by a private sector stakeholder:

²²² Dow et al., (2009) pp. 5.

²²³ Ibid pp. 5.

‘We should have been having the consultations before you agree to anything - not after you agree. And those were chaired by the President and the objectives of the stakeholders was mostly awareness programmes’.

The view is not necessarily negative to the consultative effort as such dissemination or awareness programmes can be seen as a vital precursor to a future consultative process. But it does raise the question as to how effective the consultative process was in serving as the type of two-way vertical governance linkage required for the type of inclusive and successful vertical governance proposed by Forsyth. Rather it reflects the perception that the process acted instead as a one-way flow of information downwards from the national government, falling short of the vertical linkage envisaged by Forsyth in his characterization of MLG for REDD+. This again highlights the importance of creating institutions for the governance of REDD+ that not only channel critical information to sub-national actors, but also allow and ensure that feedback and views on that information be incorporated into policy revisions. It is only this type of bi-directional governance institution that can ensure that fully inclusive and successful vertical governance of REDD+ is realised.

6.5.3 Interests

Forsyth opined that successful REDD+ could only be achieved when different actors have a common understanding of the objectives or show a willingness to accept compatible forms of REDD+. In examining to what extent such shared interests exist, or were at least taken into account in the formation and implementation of the LCDS in Guyana four themes were identified from the collected data (Figure 6.6). The occurrence of these themes among respondents is highlighted in Table 6.4.

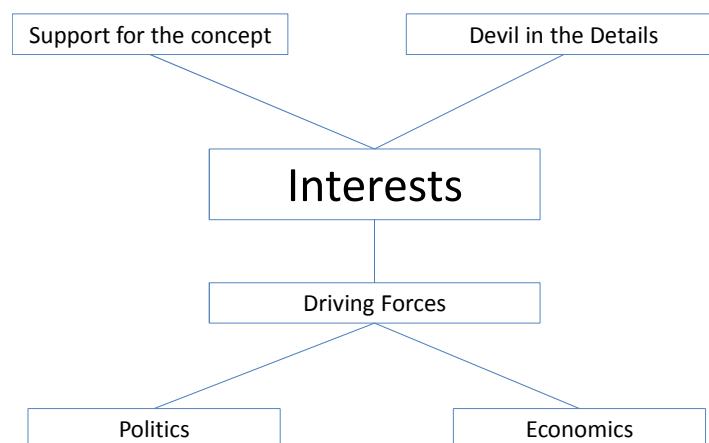


Figure 6.6: Themes related to Interests

Source: Author

Table 6.4: Occurrence of themes relating to Interests

Themes	Respondents
Support for the concept	54%
Devil in the details	32%
Driving interests: Politics	50%
Driving interests: Economics	25%

Support for the concept

The most commonly raised theme amongst interviewees with regard to shared interests is that of overall support for the concept of the LCDS. As a general principle, the movement toward a green, low-carbon economy, and the harnessing of finance by conserving Guyana’s tropical forests, receives widespread support from the stakeholders interviewed and from the populace more generally (Dow et al., 2009). This general support may be intrinsically linked to the importance placed on it at the very top of the political ladder in Guyana. It may also reflect the work accomplished on communicating the benefits of the concept to the population, and the overall objectives of the strategy. Two key examples of this general support for the concept come from interviewees who have been publically critical of aspects of government policy:

‘But of course, in a sense, an informed population I mean why would anyone being opposed to anything that gives you money for standing trees it would baffle me’

‘nobody in Guyana would argue against going towards a green economy, nobody would.’

The overall support for the concept highlights that the overall objective of the LCDS has been mainstreamed into Guyanese society, and to some degree reflects longer term trends in Guyana and its government for forest conservation, as reflected in other unique policy initiatives such as the creation of the Iwokrama Rainforest Conservation Centre and the establishment of the Upper Essequibo Conservation Concession.²²⁴ The sense that the overall objective is shared by the Guyanese populace as a whole, and importantly those directly involved in the policy process is a good reflection that there is a broad understanding, and acceptance, of the overall objectives of the policy – and bodes well for a move toward an MLG framework for the governance of REDD+ in Guyana, and implementation of REDD+ that can meet the 3Es. Such general support is likely to be a pre-condition for the successful adoption of REDD+ and is an important platform on which to build horizontal and vertical governance linkages.

²²⁴ These are discussed in more depth in Section 3.3.3.

Devil in the details

Despite the broad support for the overall objective of the LCDS an important theme that has emerged in unison, is that of ‘devil in the details’. This is a phrase repeated by a number of interviewees and its sense is also raised by a number of others. The phrase represents the perception that although there is overall support for the concept, there is a questioning of the concrete details of the implementation of the strategy – both in how finance is being distributed, and how individual projects are being managed. This theme is clearly shown by the following two quotes from interviewees:

‘So you can all agree that this is a fine concept, the devil is in the detail. How is this being implemented?’

‘So the concept is a good one, the details were bad, the manner with which Jagdeo went about it was typically Jagdeo.’

These quotes encapsulate this theme, in that they express their overall support, but raise questions as to the details, and its implementation. The second expressed the opinion that it reflected wider governance issues associated with the era of former President Jagdeo.²²⁵

This second theme helps to qualify the first of broad support of the concept. Although Guyana has been successful in building support for the concept of REDD+ the details of the implementation of the programme has received less overall backing. Some of this may be symptomatic of the choices implied in the formation of REDD+ programmes, supporting some stakeholders over others.²²⁶ It may also be symptomatic of the nature of governance of the LCDS – and some of the earlier perceptions expressed, that both in relation to involvement of a wide network of actors, and also governance across scales Guyana has faced limitations and difficulties.

A crucial point to note with regard to the earlier discussion of the features of MLG is a general sense across actors that their interests are not necessarily being represented in the final policy details of the LCDS and REDD+. Although many of these interests may be mutually exclusive the fact that there is a lack of recognition of other competing interests, and a sense that the LCDS has not fully taken into account such considerations may indicate a lack of emergence of the type of MLG as proposed by Forsyth for REDD+.

²²⁵ See Section 3.2.5 for a greater discussion of governance issues.

²²⁶ For example see the results of the theoretical model presented in Chapter 4.

Building strong and robust horizontal and vertical governance mechanisms that can help translate the broad understanding and acceptance of the overarching objectives of REDD+ into policy choices supported by a broad range of actors who can understand the competing interests involved may be a crucial part for the movement toward an MLG framework. This highlights the importance of all the component parts of the MLG framework working together to build an inclusive and successful governance regime. A difficulty may arise, however, where due to extraneous circumstances these horizontal and vertical linkages are unable to be created. In these cases there may be dissatisfaction with the type of governance created, with incomplete consultation and incorporation of stakeholder views, both horizontally and vertically. This raises questions as to what pre-conditions are required for the establishment of MLG regimes for REDD+ and whether it is realistic to expect those pre-conditions to be satisfied.

Driving forces

In order to pick out further nuances behind the perception that the details of the LCDS are not supported by at least some elements of the policy-making process, two themes were identified relating to the perceived driving interests: politics and economics.

Driving forces: Politics

Half of all the interviewees identified political forces as a key factor in determining the details of the LCDS. Guyana is a democratic country, and like any other such country policies are often determined, or at least guided, via political and electoral considerations. There is a general perception that many of the decisions underlying the LCDS were chosen by political forces, rather than via a wide and inclusive governance process. This is illustrated by the following response from a member of the MSSC:

'I always felt that those ideas were not based on pure economic and scientific benefits to the people but it was done for more political gain.'

This general perception of politics driving decisions was extended on by some who identified one key political group for whom LCDS projects were specifically targeted: namely Amerindians. As discussed in Section 3.2.4 and 3.2.7 Amerindian votes are crucial to obtaining the Presidency and a parliamentary majority in Guyana for either of the two main parties. Thus with the LCDS mainly affecting Amerindian areas, and a number of projects targeted to the development of those communities (for example the Amerindian Development Fund) there is a perception that some of these are targeted for political reasons. This perception may have been amplified by the timing of the study immediately subsequent to the November 2011 elections.

'The President had his pet projects, which is Amerindian votes, Amaila Hydro. Nothing wrong with it, some of those are good things'

The above quotation highlights both the broad perception that characterizes this theme, but also qualifies that, even with political considerations driving policy this does not necessarily lead to policies that were not in the wider public interest.

The importance of Amerindian votes and the perception that the LCDS has been targeted, at least to some extent, towards the winning of those votes, does raise interesting questions regarding the scope of input into the policy process that Amerindians have had. This is especially the case given the self-imposed exile from the MSSC from the largest Amerindian NGO, the APA. The apparent incongruence here can be explained by the ongoing conflict between the APA and the government (discussed in Section 6.5.2 above), and the perception that support is targeted towards villages that provide electoral support to the government (Bulkan, 2013). This may imply that government is more willing to engage with actors who are generally supportive, and vice versa, although it should be noted that the government did open the invite to the APA who then refused the offer. These political dimensions highlight the difficulties in bringing all actors together to understand and accept the different views, interests and requirements of different actors. Given the pervasive nature of politics in REDD+ recipient countries, these findings from Guyana raise question marks over how best to create an inclusive governance framework that requires the willing and active involvement of all stakeholders, such as MLG.

Driving forces: Economics

The second major theme relating to what was perceived as to have driven the decisions underlying the LCDS is economics - both in the choice of whether to move toward such a strategy, and also in the choice to undertake policies under the strategy.

The initial justification for Guyana undertaking a path towards a low-carbon future via REDD+ payments was couched in the language of economics via the McKinsey report on the Economic Value to the Nation of Guyana's forests produced before the LCDS and the agreement with Norway (Office of the President, 2008).²²⁷ Subsequent to that study however Guyana's economy has shifted dramatically as the international gold price has driven a rush into gold mining and an increasing dependence on the extraction of the metal (see Section 3.2.3). This natural resource boom has affected both the justification for the overall strategy and also which groups have had influence upon the evolution of the policy.

²²⁷ The key findings of the report are outlined in Section 3.3.2.

The changing economic climate is highlighted through a response from a senior government official who emphasises the dilemma increasingly facing Guyana as the economy moves more and more towards a dependence on gold, especially given some of the constraints Guyana has faced with accessing REDD+ payments²²⁸:

'The risk you run is exactly that cost benefit, of is it worth a country jumping through hoops for years now to access funds when it has a massive natural resource boom underway'

This is the trade-off that faces Guyanese politicians looking to continue the LCDS and any future REDD+ programme. The rapid rise of the mining industry and its conversion from a livelihood activity for a minority to a major economic force may be affecting how the LCDS develops and is being implemented. It was certainly the perception of some interviewees that the new power that the miners have, thanks to their economic muscle, has led to some policy changes by Government bodies. There are two clear examples of this. The first occurred in February 2010 when, in response to proposed new regulations, the mining community of Bartica, plus representatives from elsewhere, shut down the town (Stabroek News, 2010a). The perception of the following miner is that this demonstration led to the establishment of the SLUC comprised of miners and government officials to address land-use conflicts in the forest:

'That led to a very mass demonstration by the miners, I think it was the first time that the government ever saw us as a mass demonstration. As a matter of fact the President met with miners at the National Cultural Centre there was a couple of thousand people there. Because of that he formed a committee called the SLUC.'

The second example occurred in July 2012 when in the space of a few short days the MNRE announced a suspension of new river mining claims, before a vote of no-confidence in the Minister by the GGDMA, which led to a clarification that the suspensions was merely temporary while a review was undertaken, before the suspension was removed completely.²²⁹

This second example further highlights the new political power of the mining lobby attributable to their new economic power. How this new political power translates into impacts upon the policies and projects under the LCDS remains to be seen. However it is clear that economics, along with politics, has been a driving force behind the policy choices under the strategy. This raises interesting questions for the MLG model for REDD+ - whether robust horizontal and vertical governance linkages can be created to allow all actors to come together to create policy that both creates and

²²⁸ The issues with accessing REDD+ payments via the Guyana REDD+ Investment Fund (GRIF) are discussed in more depth in Chapter 7.

²²⁹ Guyana Times, (2012), Kaieteur News, (2012a, 2012b), Stabroek News, (2012c, 2012d).

builds collective interest in REDD+, and also builds collaborative policy in the light of differential power and access due to political and economic concerns. How these frameworks can be constructed given the constraints highlighted in Sections 6.5.2 is an important question for academics and policy-makers. Incorporating political and economic power dimensions, along with capacity issues, into proposed governance models for REDD+ is crucial in order to produce workable, and realistic frameworks that can produce REDD+ that meets the 3Es criteria. The experience of Guyana shows, that even with widespread general domestic support, intervening circumstances, and especially interests, can limit the move from a state-centric governance approach towards an MLG approach, even if horizontal and vertical linkages are established.

Free Prior and Informed Consent and Opting-in to REDD+

As highlighted in Section 2.4.4 the principle of Free, Prior and Informed Consent (FPIC) has become a key principle for REDD+ governance generally. The principle is designed to ensure that stakeholders are sufficiently informed and no decisions are made without their interests and consent being taken into account. The principle is also enshrined in various Articles of the United Nations Declaration on the Rights of Indigenous People (UNDRIP) in relation to indigenous peoples rights.²³⁰ The use of FPIC would form a crucial part of any MLG framework for REDD+ as it is a mechanism that ensures that communities' interests are represented in any decision that directly affects them and helps to build a common understanding regarding REDD+. It also creates a guaranteed vertical linkage between these communities and those instituting REDD+ projects, whether that be national governments or international actors. Whether Guyana has managed to implement FPIC is thus an important litmus test for the emergence of MLG for REDD+ in the country.

FPIC is included in all major documentation relating to REDD+ in Guyana, the LCDS, the Readiness Preparation Proposal (RPP), the REDD Governance Development Plan and the JCN governing the MOU with Norway. The focus has been on two key elements: one the interaction between FPIC and the project to demarcate and title Amerindian communities; and two the establishment of a mechanism for Amerindian communities to opt-in to the Norway agreement. In addition the RPP recognises that the entire Stakeholder Consultation and Participation Plan will be enacted in accordance with the principles of FPIC.

The clearest embodiment of FPIC in Guyana is through the proposed opt-in mechanism for Amerindian communities. As described by a senior Amerindian leader: *'we have our time if we want*

²³⁰ For example Articles 10, 11, 19 32 have particular relevance to REDD+.

to opt-in or not, we see that as FPIC.²³¹ The basic concept is a firm embodiment of FPIC in that Amerindian communities will only participate in REDD+ with their full consent. Two crucial challenges however arose in the interviews relating to the opt-in provision representing full FPIC. The following quote sums up both the positive developments relating to FPIC in Guyana, and also these two challenges.

'Yes I was concerned that along with the LCDS the government was saying very clearly that they would respect the rights of indigenous people to their FPIC in opting in to the LCDS. So on the face of it that's excellent because I think that complies with international law even with our domestic law to some extent. But then in the absence of guidelines or protocols for FPIC the community nor the state, the government, are sure whether they are adhering to the principle of FPIC, and so one of the things I was concerned about was the draft that the government developed was simply saying that they would only respect FPIC where it affects titled land.'

This quote from a major Amerindian figure shows the positive nature of the establishment of an opt-in mechanism in Guyana, complying with both its legal commitments and helping the establishment of a MLG framework in Guyana. The lack of clear guidelines for FPIC has however made it tricky for the government, or external auditors, to fully assess how effectively Guyana has complied with the process. The second issue is that the opt-in mechanism, as proposed, only relates to titled Amerindian communities, and although as part of the LCDS the Government is planning to move toward full titling and demarcation, it does raise question marks as to the extent of full involvement of non-titled Amerindian communities, and indeed non-Amerindian communities in the REDD+ process. The omission of other forest-dependent (and indeed non-forest using) communities from the discussion of FPIC for REDD+ in Guyana has been raised by the independent verifiers of the progress indicators relating to governance of the LCDS. They commented that it was the opinion of a number of individuals involved in the process of REDD+ in Guyana that FPIC *'should clearly not just apply to Amerindian communities, but to all communities'*²³². This issue relates not just to Guyana but applies to the literature on FPIC more generally. It has mainly been proposed as an engagement tool for indigenous communities but the principles contained within its scope are applicable for engagement with all stakeholders for REDD+ - and indeed embody many of the concepts proposed in relation to MLG for REDD+.

²³¹ The proposed opt-in mechanism has been outlined in Section 3.4.2.

²³² Donovan, Clarke, & Sloth, (2011) pp. 26.

Summary

The common understanding of the competing interests of different actors is essential for MLG to arise. In Guyana there has been broad support for the overall concept of the LCDS – indicating that these competing interests have been balanced in the overall objective. There is however less broad support for the details of the policy, both in its design and implementation, with a perception that the policy is being driven by political forces and economic power. There have been laudable attempts to introduce tools such as FPIC to help consider the different interests of affected groups, but a lack of specificity regarding guidelines for the process and a focus on indigenous people may have restricted its effectiveness. These tools are crucial to the success of REDD+ and the implementation of an MLG framework.

There have however been serious limitations as to the full implementation of FPIC in Guyana – one due to the difficulties in establishing clear guidelines, partially due to the lack of guidance from the international sphere, and also as FPIC has only been applied to Amerindian communities – how it applies to other affected stakeholders and communities is currently unclear. These drawbacks are important obstacles to overcome in driving forward FPIC – and allowing it to become the clear inclusive, successful vertical governance linkage for REDD+ that it has the potential to be.

6.6 Discussion/Conclusion

Evaluating Guyana against the type of MLG proposed for REDD+ by authors such as Forsyth and Doherty and Schroeder leads to a mixed picture. The type of governance that has underpinned REDD+ in Guyana, through the governance of the LCDS, represents a move towards the type of governance envisaged by those authors, however the dominant theme remains state-centric control, with the national government remaining the dominant actor.

The perception is that the LCDS was introduced, developed and led by the then President, and his Office. This represents a strong sense of state-centric control, but it may also have been critical to the leadership that Guyana has shown internationally and nationally on REDD+. The country has become one of the pioneers of the endeavour and this may be attributable to the fact that the item has been placed at the very top of the political agenda. This highlights a potential trade-off between the type of governance implemented for REDD+ and its ability to gain traction within the political sphere.

The dominance of presidential power may also have helped the wide general support for the concept of the LCDS which is seemingly evident amongst the Guyanese populace. This combination of presidential control, political importance and wide public support has helped Guyana move to the

front of REDD+ activity internationally. The downsides to this combination can be seen however in the widespread perception of a lack of satisfaction with the details underpinning the LCDS. This dissatisfaction may be hindering the subsequent implementation of the LCDS and REDD+ in Guyana. This highlights a potential down-side of the type of state-centric governance that has dominated REDD+ in the country.

Despite the mainly state-centric approach to the LCDS steps have been taken towards a more open and inclusive governance regime, more consistent with the type of MLG envisaged for REDD+. The establishment of the MSSC to build a horizontal linkage between national-level actors, and the implementation of a series of consultative and awareness sessions to bridge national and sub-national levels represent movements towards MLG for REDD+. The perception of both of these initiatives however, seems to hint at a failure of both to fully fulfil their objectives. The MSSC has suffered from a lack of a clear role in the process, and the fact that its sitting, and its composition, is fully in the domain of central government may have hindered its establishment as a fully inclusive independent governance body. The lack of capacity in civil society generally in Guyana may also have contributed to the inability of the MSSC to fully establish itself. There is a lack of strong NGOs in the domain of environmental issues and indigenous rights, especially since the strongest in the latter refused to participate. This lack of domestic capacity to play a full role in the governance of REDD+ may make the establishment of the type of MLG envisaged by Forsyth, at least in Guyana but also beyond in other potential REDD+ countries, very difficult.

The lack of capacity, both human and financial, may also have hindered the establishment of the type of consultative activity that would have built a strong vertical linkage between sub-national actors and national actors working on REDD+ in Guyana. The geographical and logistical difficulties in undertaking such a wide consultative activity in Guyana are immense given the lack of roads and the scale of the forested interior of the country. The lack of international financial support for such endeavours may hinder the establishment of fully inclusive governance processes for REDD+. The commitment of GoG to fully embody the principles of FPIC throughout the LCDS, and notably through the formation of an opt-in provision for Amerindian communities, is laudable, however its implementation has been made difficult due to two conceptual issues, common to the use of FPIC across the globe. The first is the lack of clear guidelines for FPIC to assess implementation against, the second is the focus on the use of FPIC for just indigenous communities, rather than all affected stakeholders. Both of these issues were raised in the Guyanese experience and provide valuable lessons for the wider implementation of REDD+.

Guyana's experience in undertaking and designing the LCDS has emphasised two key elements that have been highlighted in previous chapters as crucial for REDD+: namely REDD+'s effect on the wider economy, and political economy factors. There is a perception amongst some of the key stakeholders in Guyana that both wider economic factors and politics has played a crucial role in the shaping the details and the governance of, REDD+ in Guyana. For countries such as Guyana where REDD+ may play a role in changing the economic conditions of key industries, such as mining, as was highlighted in Chapter 4 it should be expected that rational national decision-makers factor in the economic impacts on such sectors when making REDD+ policy. The fact that electoral forces have also been perceived to have shaped REDD+ policy also validates the discussions in Chapter 4. The perception that REDD+ policy has been shaped to benefit important electoral constituents highlights the importance of factoring in political economy factors when understanding how REDD+ is likely to evolve on the ground in countries across the world.

This study provides a snapshot of REDD+ policy formation and governance in Guyana. It should be noted that REDD+ is at an early stage both internationally and in Guyana and the governance framework is still developing and evolving. The data for the study came from a small number of participants in the programme, validated with media reports and secondary evidence, and focused on their perceptions of the policy process. Thus the conclusions that have arisen should be seen as only relating to the perceptions in Guyana of the governance of the mechanism, and may be affected by biases in the sample and the timing of the study. An option for future developments would be to repeat the exercise with repeated interviews and a wider sample of participants as the REDD+ mechanism in Guyana develops to capture a wider picture of its governance and its development over time, as capacities grow and institutions and actors develop.

REDD+ is a nascent mechanism and the lessons regarding its governance are only starting to emerge from the initiatives being implemented in various countries across the world. MLG has been proposed as a suitable governance mechanism for REDD+ by various authors, but this is the first study that has evaluated an existing REDD+ programme against the criteria set out for MLG. Guyana's LCDS has not fully embodied such a governance mechanism, but represents a step towards such a regime. The initial success of the strategy in achieving political traction however may be intertwined with the state-centric approach adopted. Whether such political mainstreaming can be achieved without such a central role for national governments is a crucial question for REDD+ programmes elsewhere and for future research.

Chapter 7: REDD+ in Guyana – How well does it fit the standard model?

7.1 Introduction

Guyana's Reducing Emissions from Deforestation and Forest Degradation (REDD+) agreement with Norway, and the associated architecture, form one of the most developed national-level REDD+ frameworks in the world. The agreement has been described by both Guyana and Norway as a model for the world and has introduced a series of innovative mechanisms and institutions. The agreement embodies much of the spirit of the initial proposals for rewarding reduced deforestation in developing countries (Moutinho et al., 2005, Santilli et al., 2005, Schlamadinger et al., 2005). Norway offers a performance-related payment to Guyana for keeping its deforestation rate low. Finance can then be used by Guyana to move its overall economy on to a low-carbon development path. It thus serves to correct (at least to some extent) the market failure associated with tropical deforestation, discussed in Chapter 2.1. By providing a performance related payment Norway is helping to internalize the externality – it provides a bridge between the 'Economic Value to the Nation' (EVN) and the 'Economic Value to the World' (EVW).²³³ This is at least how the original agreement was conceptualized and how implementation began. It thus represented, at least to some degree, the basic model of REDD+ - where incentive payments are offered to countries (or landowners) for reducing their deforestation rate. As the agreement has evolved and moved from design to implementation, however the extent to which the framework represents the type of initial REDD+ hypothesized has come into question.

This Chapter will examine the extent to which the initial agreement, and related documents, set up a 'pure' REDD+ framework in Guyana, i.e. offering reduced deforestation performance-related payments to Guyana, which gives Guyana the freedom to use the finance to reduce deforestation in the most nationally appropriate fashion. It will then assess the extent to which the nature of the agreement and the framework it established has evolved and changed and whether the nature of that change has altered the scope of the agreement, moving it away from a 'pure' REDD+ agreement towards other forms of international assistance, such as Overseas Development Assistance (ODA).

REDD+ has been proposed as a paradigm-shifting policy mechanism, a step-change from previous types of forest intervention, in scale, scope and design. The fact that payments will only be made if the environmental objective is achieved is one of the most important developments. First it gives security to the donor or funder country that finance will only be disbursed if specific environmental goals are achieved, helping to minimise the risk that finance will be wasted. Second it gives control to the recipient country to implement the most relevant policies and projects to meet those

²³³ These are concepts introduced by the McKinsey study that outlined a future deforestation scenario for Guyana (Office of the President, 2008). See the discussion in Section 3.3.2 for more details.

environmental objectives with as little interference from external actors as possible –allowing flexible and locally-appropriate solutions to be implemented. These are two important features that traditional ODA finance lacks, and have been notable failures of previous forest policy interventions (see Chapter 2.2.2). A derogation of REDD+ to previous ODA policy support may compromise the effectiveness and efficiency of the scheme. The implications from nascent REDD+ programmes such as that in Guyana are crucial for assessing how and why such derogation may occur, and understanding what mechanisms could be put into place to reduce a return to previous forms of support.

This Chapter draws upon evidence from the interviews conducted in Guyana, the database of media sources discussed in Chapter 6 and secondary evidence from reports and reviews of the programme. It uses this evidence to answer the research question identified in Chapter 1:

- To what extent has the agreement between Guyana and Norway embodied REDD+ in its purest form?

In order to answer this question this Chapter answers two key sub-questions:

- What were the original aims of the agreement, and how far did the original structure of the agreement fit into the standard model of REDD+?
- How has the agreement evolved, and how does that evolution affect how well the agreement fits into the broad principles of REDD+?

The Chapter builds on the outline of the architecture of Guyana's REDD+ framework given in Chapter 3, notably the discussion on the Memorandum of Understanding (MOU) and the Guyana REDD+ Investment Fund (GRIF) in Section 3.4.1 and the LCDS in Section 3.4.2.

The Chapter builds on the existing literature assessing the architecture of existing REDD+ programmes notably Wertz-Kanounnikoff & Kongphan-apisak, (2010) internationally, May, Millikan, & Gebara, (2011) in Brazil, Almeida, Salomao, & Wertz-kanounnikoff, (2012) in Mozambique and Dkamela, (2011) and Somorin, Visseren-Hamakers, Arts, Sonwa, & Tiani, (2013) in Cameroon. It provides an important contribution to this literature, adding to the emerging third-generational research on REDD+, highlighted in Chapter 2. By evaluating how well the second-largest national level REDD+ scheme, and the first to reach the stage of performance-related payments, has embodied the principles of the new type of international incentive mechanism that REDD+ is proposed to be, it provides a unique evaluative study on the progress of national level REDD+. It helps to highlight some of the difficulties faced by other countries progressing down the same path

as Guyana, and helps to highlight the ability or otherwise of such ‘pure’ REDD+ national-level frameworks to emerge, given the set of institutional constraints facing REDD+ countries.

The chapter finds that although on the surface much of Guyana’s agreement with Norway represents ‘pure’ REDD+ - digging below shows issues such as increasing conditionality regarding both earning money and how it is to be spent, the classification of finance as ODA, a lack of capacity on the part of both Norway and Guyana leading to the heavy involvement of international development institutions and the requirement for a wide variety of safeguards and standards. These have combined to mean that the pure REDD+ component of the agreement – with Guyana being clearly rewarded for environmental performance has been watered down, and instead the agreement has evolved to look more similar to previous forest policy interventions.

Section 7.2 outlines the key features of the agreement at the time of its inception, focusing on how the agreement fits into the model of REDD+. Section 7.3 discusses the motivations of Guyana and Norway, Section 7.4 discusses the evolution of the agreement and how the implementation of the agreement, and the changes made throughout its progression have affected how the agreement fits into the standard model of REDD+. Section 7.5 draws lessons for the implementation of national-level REDD+ in other jurisdictions and concludes.

7.2 The structure of the arrangement

REDD+ in Guyana follows a national-level approach. As described in Chapter 3 a national reference level is set and the Government of Guyana (GoG) is rewarded for keeping deforestation in its State Forest Estate (SFE) below this level, via a payment mechanism established in a Memorandum of Understanding (MOU) with Norway, with the details outlined in an accompanying Joint Concept Note (JCN). These documents establish the conditions that Guyana must meet in order to receive payment. The payments that Guyana receives are placed into a World Bank administered fund called the Guyana REDD+ Investment Fund (GRIF). GRIF funds are then used to implement projects from Guyana’s Low Carbon Development Strategy (LCDS) via an approval mechanism involving multi-lateral entities such as the World Bank and the Inter-American Development Bank (IDB). This Section will discuss each of these steps in turn and how they fit into the basic model of REDD+.

7.2.1 The Memorandum of Understanding

The MOU between Guyana and Norway, signed on November 9, 2009, outlines the structure for the international component of REDD+ in Guyana. It provides the framework under which Norway will provide finance to Guyana, on what terms, and on what conditions. It has a stated objective to:

‘foster partnership between Guyana and Norway on issues of climate change, biodiversity and sustainable, low carbon development.’

and *‘Of particular interest is ... close cooperation regarding Guyana’s REDD-plus efforts, including the establishment of a framework for result-based Norwegian financial support to Guyana’s REDD-plus efforts.’*²³⁴

Further the MOU outlines how:

*‘Financial support will be linked to Guyana’s success in limiting greenhouse gas emissions from deforestation and forest degradation and establishing institutions and practices to strengthen Guyana’s ability to reduce deforestation and forest degradation’*²³⁵

These statements highlight three key elements to the agreement between Guyana and Norway, and its relationship to the original conceptualisation of REDD+, as outlined in Section 2.1, as a means of internalising the externality associated with the carbon emissions related to deforestation. The MOU embodies the key elements of the basic model of REDD+ - payments offered for results in reducing deforestation and forest degradation – serving to give the Guyanese government a ‘cost’ of deforestation closer to the overall global social cost, inclusive of the damage from the associated greenhouse gas emissions, (analogous to the EVW used in the McKinsey study to justify payments to Guyana, Office of the President, 2008), than the domestic costs of deforestation (or the EVN as described by McKinsey, Office of the President, 2008). The language of the second and third quotes shows that these elements are intrinsic to the key objectives of the MOU.

The first quote, and the latter part of the third quote, however speaks to a broader objective for the MOU. The first quote highlights that the MOU is designed to embody, and foster, broader collaboration between the two countries, inclusive of, but bigger than, REDD+. It speaks to a broader set of objectives regarding climate change, biodiversity and crucially low-carbon development (this set of objectives becomes important when discussing how Guyana is utilising the finance see Section 7.2.3). The latter part of the third quote speaks to a broader objective regarding REDD+ than merely compensating the opportunity cost of deforestation as early models of REDD+ proposed. Instead it speaks to building the relevant institutions and practices to strengthen Guyana’s ability to reduce deforestation. This indicates a broader, institutional perspective of REDD+, with REDD+ finance from Norway used to support the institutional framework for Guyana to address the underlying causes of deforestation. In this way the agreement, at least on paper, speaks to a broader conceptualisation of

²³⁴ The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), (2009) pp. 2

²³⁵ *ibid* pp. 3

REDD+ than merely a set of compensatory payments designed to cover the opportunity costs of deforestation.

The broader objective can be seen, at least to some extent in the original JCN that accompanied the MOU. This outlines, in the absence of a UNFCCC compliance grade monitoring, reporting and verifying (MRV) framework, interim arrangements that will be used to calculate the level of financial support (Government of Guyana & Government of Norway, 2012). The level of support depends on Guyana's delivery of results against two metrics:

- **Indicators of enabling activities** – essentially progress towards a set of policies and safeguards that will ensure that REDD+ in Guyana is inclusive, consultative, respects indigenous rights, transparent, accountable, ensures environmental integrity and protects biodiversity. These indicators have changed and evolved over the timeline of the agreement – this shifting nature is discussed in more depth in Section 7.4.
- **REDD+ Performance Indicators** – a set of interim indicators for measuring greenhouse gas emissions from Guyana's forests – both through deforestation and forest degradation. These indicators are intended to evolve into a full MRV system as capacity develops.

The second of these metrics represents perhaps REDD+ in its purest form – Guyana receives finance directly proportional to the reduction in its greenhouse gas emissions from deforestation and forest degradation (as far as can be measured using the current capacity and methodologies). Thus the MOU internalises the externality of the carbon emissions that Guyana's deforestation creates.

Guyana's payment is also determined, however, on the basis of an extra set of indicators essentially operating to ensure that along with deforestation reductions other social and environmental objectives are met, and the process of REDD+ implementation is as consultative and inclusive as possible. This second set of indicators essentially introduces a second layer of conditionality into the agreement. Guyana must both meet sets of conditions: reducing emissions, and also implementing REDD+ in line with a set of safeguards and recommended policies in order to access finance. This extends the agreement beyond a basic payment for reducing emissions as REDD+ was originally conceived. It also raises questions as to the policy freedom that Guyana has with regard to REDD+.

Jurisdictional and national level REDD+ (JNR) has been envisaged to be flexible enough for local governments to shape and create the most suitable policy environment to address the particular causes of deforestation in their jurisdiction. Added conditionality reduces this freedom and may reduce the ability of jurisdictions to shape effective policy. The flipside of this is that conditionality is imposed, as in this case, to provide safeguards for financiers that REDD+ will respect social and

environmental standards and ensure that environmental integrity and human rights are respected. Finding the right balance between policy freedom and sufficient safeguards will be crucial for producing JNR that is both effective and equitable.

The agreement between Guyana and Norway, as set out in the MOU and the JCN, forms a partnership between the two countries of which a clear REDD+ mechanism forms a key part. However the partnership is greater than just a ‘pure’ REDD+ agreement, touching on wider low-carbon development and aiding Guyana’s REDD+ readiness. Payments depend on Guyana’s performance on both reducing deforestation and forest degradation, but also on establishing a policy environment that is REDD+ ready. In this way payment is contingent on not just environmental performance but also on policy and institutional reform, broadening the scheme beyond a mere emissions reduction scheme. This second component moves the agreement away from the simple model of REDD+, where actors are compensated for reducing deforestation, towards a policy and institutional supportive framework. Thus from its inception the agreement seems to have been formulated as an agreement that encompasses REDD+ but has broader aims and scope.

7.2.2 The Guyana REDD+ Investment Fund

The Guyana REDD+ Investment Fund (GRIF) is the mechanism through which finance earned by Guyana via the MOU with Norway is invested, managed and disbursed for projects and policies within Guyana. Its role in the finance disbursement and project approval process is outlined briefly in Section 3.4.

The World Bank was invited by Guyana and Norway to serve as a Trustee for the GRIF,²³⁶ with responsibility for holding, managing, investing and disbursing the finance within.²³⁷ The proposed role for an independent trustee for the GRIF was established from the signing of the MOU which states: *‘The GRIF will be a multi-contributor financial mechanism run by a reputable international organization’.*²³⁸ One of the purposes of such a structure was to *‘ensure full national and international oversight of financial flows’*²³⁹ reducing the potential for corruption and mis-use of finance.

²³⁶ The World Bank operates the fund as a Financial Intermediary Fund (The World Bank Group, 2012a).

²³⁷ The World Bank also served initially as the Delivery Partner for Guyana for the Forest Carbon Partnership Facility (FCPF); however in 2011 this was transferred to the IDB.

²³⁸ The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), (2009) pp. 4.

²³⁹ Ibid pp. 4.

An Administrative Agreement establishing the World Bank's role was signed in 2010 (Norwegian Ministry of Foreign Affairs & International Development Association, 2010). For its services the World Bank charges a fee, the total of which was US\$0.96 million as of June 2013 (The World Bank Group, 2012b), while it has earned US\$0.7 million for the fund from its investment strategy of: *'holding the fund balances in a liquid portfolio in anticipation of Steering Committee funding decisions and requests to the Trustee for funds transfers to Partner Entities.'*²⁴⁰ The investment strategy of the World Bank is clearly precautionary – the funds that Guyana receives is basically held in cash – meaning that the GRIF essentially serves as a glorified bank account, with the World Bank acting as the signatory. The World Bank's role in relation to the GRIF has encountered some criticism, especially with regard to the delays that it took to establish the mechanism; this is discussed in more depth in Section 7.4.1 below.

The GRIF is designed to be a multi-contributor investment fund, harnessing REDD+ demand from public donors and private actors. Indeed as discussed in the Low Carbon Development Strategy (LCDS) by 2020 it is planned that the fund will be wholly funded via the private sector (Office of the President, 2013). The institutional architecture of the fund, and the way in which finance is disbursed is designed to be compatible with this goal. It is thus intended to be a repository for more than just the payment received from Norway, but serve in a fashion analogous to a sovereign wealth fund for Guyana's income from REDD+ as a whole, whether from public or private sources. As Norway is to date the only benefactor to the fund whether the institutional arrangements could cope with different donor or funder requirements is unclear.²⁴¹

The GRIF, and the World Bank's role in relation to it is intended to be an intermediary step with financial management planned to pass to Guyana's national systems once a method of *'independent verification of Guyana's adherence globally (sic) accepted financial, environment and social safeguards can be implemented'*.²⁴² It is anticipated that progress on REDD+ in the UNFCCC negotiations will help to outline such a verification process helping to streamline the approval process. The fact that such an intermediary step was necessary raises two important issues with regard to Guyana's REDD+ framework. First is it highlights the degree to which Guyana has been a first-mover in this space. Guyana and Norway required a new institution to take on financial management, and had to create a system somewhat from scratch. Secondly it shows that there were

²⁴⁰ The World Bank Group, (2013) pp.8.

²⁴¹ Although Norway is the only donor to the GRIF both the IDB and Germany's KfW have both provided finance in recent years to support Guyana's REDD+ Readiness, while the UK's Department for International Development (Dfid) provided initial finance for the McKinsey study, discussed in Section 3.3.2 that underpins the arrangement.

²⁴² Government of Guyana & Government of Norway, (2012) pp. 14.

doubts that Guyana's existing national systems for financial management would be sufficient to ensure that REDD+ met relevant standards. This highlights the substantial amount of institutional strengthening, in all areas, that countries moving ahead with REDD+ such as Guyana, require before 'pure' REDD+ performance-related payment schemes can be established. International oversight and conditionality beyond environmental performance may be required to ensure that REDD+ is both effective and efficient, and also equitable.

Finding the balance between ensuring compliance with international standards regarding finance, environment and wider social impacts, whilst ensuring country-level ownership of the finance that REDD+ provides is a difficult task that the GRIF has had to face. Indeed a stated objective of the GRIF is that it:

'balances national sovereignty over investment priorities with ensuring that REDD+ funds adhere to the Partner Entities' financial, environmental and social safeguards'.²⁴³

The extent to which ensuring the latter has compromised the former is discussed in more depth below in Section 7.4.2. But achieving this balance is crucial for ensuring that REDD+ funds remain a payment for an environmental service, with some stipulated standards attached, rather than aid given by donors for implementing projects that aim to achieve deforestation reductions. Ensuring that ownership of the finance remains in the hands of national governments may be crucial to ensuring that REDD+ incentives properly translate to policy makers in forested countries.

The GRIF is essentially the embodiment of how REDD+ in Guyana was conceptualised – a payment for results agreement – focusing on emissions reduction from reduced deforestation but with a strong social and environmental component. It thus serves as an institution that provides a conduit for pure REDD+ finance, but also allows provides an extra set of conditionality that helps protect REDD+ financiers in their investment. It is however an institution that has its origins, structure and management in standard development assistance. This raises the question of whether the extra conditionality that the GRIF brings regarding how finance is to be disbursed has moved the agreement towards a standard ODA approach, rather than a paradigm shifting REDD+ agreement. This question will be returned to when discussing the evolution of the GRIF in Section 7.4.1.

7.2.3 The Low Carbon Development Strategy

The original JCN that accompanied the MOU outlined how financial support from Norway was to be used:

²⁴³ www.guyanareddfund.org

The support will finance two sets of activities:

- *The implementation of Guyana’s Low Carbon Development Strategy (LCDS)*
- *Guyana’s efforts in building capacity to improve overall REDD+ and LCDS efforts.*²⁴⁴

This highlights that finance is earmarked for two main areas: aiding Guyana’s transition to a low-carbon economy (this may or may not involve payments, compensation or supporting projects designed to directly reduce deforestation); and supporting Guyana’s capacity building efforts for REDD+ and low-carbon more generally – essentially helping Guyana’s REDD+ Readiness.²⁴⁵ The clause has two main implications for REDD+ finance in Guyana, and how close the agreement is to pure REDD+. On the one hand the agreement gives, on the surface, tremendous scope to Guyana in how it can use the money, allowing the country to utilise the money in whatever way it seems fit to keep deforestation low. It can choose to address the problem directly, by offering payments to different types of forest user to change behaviour, or indirectly by supporting alternative livelihoods. Guyana has chosen the latter path, as can be seen by the projects under the LCDS such as the Amaila Falls Hydroelectric project and the support for Micro and Small Enterprises (see Section 3.4.2). This fits neatly into a pure conceptualisation of REDD+ where a payment is provided to a provider of reduced deforestation, conditional only upon results of that reduced deforestation, and that provider can use that payment in any manner it sees fit – it is merely an incentive payment.

The second implication however starts to move the agreement away from such a pure form of REDD+. With finance being provided to help Guyana to build its REDD+ capacity – its REDD+ readiness – at least some aspect of the finance provided starts to look like upfront financing to help Guyana prepare for REDD+, albeit based on some initial performance indicators.

The manner in which finance from Guyana’s MOU with Norway was proposed to be spent mirrors the way in which it is to be earned, in the regard that REDD+ is an important component of the process, but the overall agreement represents something broader. Finance is to be used for projects designed to aid Guyana’s movement towards a low-carbon economy, and also to support Guyana’s capacity to implement REDD+. Thus mirroring the way in which Guyana earns money, the programme is designed to support reductions in deforestation, and the policy and institutional structure to do so. Therefore the agreement looks like a combination of both REDD+ performance finance, but also REDD+ readiness finance. The specific choices regarding which projects will be implemented, especially regarding the transition towards a low-carbon economy lie predominantly in the hands of the Guyanese government, giving significant ownership and control to Guyana, at

²⁴⁴ Government of Guyana & Government of Norway, (2009) pp. 1

²⁴⁵ See Section 2.3 for a definition of REDD+ Readiness.

least at the start of the process. To understand whether this remains the case throughout the span of the project approval cycle – the process that a project must go through in order for funds to be disbursed from the GRIF must be understood.

The Project Process

In order to access the money that it has earned through the MOU with Norway from the GRIF where it is held Guyana must seek approval for projects that it proposes from a GRIF Steering Committee. The process is outlined in Chapter 3.4.1 and illustrated in Figure 3.9. Norway's only role in the disbursement process is via seats on this GRIF Steering Committee.²⁴⁶ In this way Norway's role is minimised, allowing a structure that other donors can easily join. In creating this structure Norway has also ensured that it has a predominantly hands-off role in the REDD+ agreement, at least in theory, merely providing finance, once results have been calculated and verified. It does not have a direct role in choosing projects, or implementing them.

The nature of the institutional structure created helps Norway cope with its lack of capacity regarding Guyana, as its role is merely to calculate and facilitate payment and be part of a wider project approval process. As highlighted in Chapter 2, deforestation drivers are often country-specific, and affected by a set of domestic institutional conditions. The hands-off approach adopted by Norway allows Guyana to design a specific set of projects and policies to address these country-specific issues, using local knowledge and expertise.

Even though Norway has created a relatively hands-off role for itself this is not necessarily the case for all international actors. The partner entities, currently the World Bank, the IDB and the UNDP play an important role in the policy process, working closely with GoG agencies to turn what are project concepts spelt out in the LCDS into fully-fledged project design documents, for approval by the GRIF Steering Committee. The partner entities are also the bodies who receive the money directly from the GRIF and then work with GoG agencies to implement projects (Government of Guyana & Government of Norway, 2012). They provide operational services for the LCDS investments which must meet each partner entity's own operational procedures and safeguards. Of the seven projects currently in the pipeline the IDB are partner entities for three, and the World Bank and the UNDP two each (Table 7.1).

²⁴⁶ The GRIF Steering Committee consists of representatives of Guyana, Norway and international observers. It reviews the project concept notes and project proposals and is required to approve them before finance from the GRIF can be disbursed to prepare project documents and implement projects. See Chapter 3 Section 3.4.1 for the project and finance process under the GRIF.

Which partner entity takes responsibility for each project is determined on the basis of negotiations with the government. Factors that have played a role in determining these decisions are historical responsibility for the project, previous projects in the area, or the comparative advantage of the institution involved. For example the Cunha Canal Rehabilitation project was a project that had previously been handled by the World Bank in an earlier format,²⁴⁷ and the Amerindian-related projects of land titling and the Amerindian Development Fund fall closely within the expertise of the UNDP. This decision-making process is highlighted by a statement from a former UNDP employee who worked on LCDS projects:

'UNDP looked to see where it had its comparative advantage in working on the projects that were proposed. So it had to consult even with its own headquarters and regional counterparts to see well hey we can give you support on things'.

The partner entities operate as a conduit for the finance and also serve as project developers and implementing partners. For these services the partner entities charge an administrative fee, to reclaim management costs, payable out of the GRIF. These fees vary from project-to-project and from entity-to-entity depending on the scale of the administrative burden. For the three fully approved projects they vary between 3% for the Micro and Small Enterprise Development Fund,²⁴⁸ to 26% for the Amerindian Land Titling project (The World Bank Group, 2012b). Project fees in total account for 15% of current disbursement from the GRIF, rising to 19% if the World Bank's fee as Trustee is taken into account (Table 7.1).

The high percentage of the current GRIF expenditure that has gone to the partner entities in the form of fees may help explain some of the dis-satisfaction with the progress of the projects under the LCDS seen amongst some elements of Guyanese society (Abraham et al., 2011). The level of fees is likely to fall as projects receive approval and finance, but the delays in this process (discussed more in Section 7.4.1) may have eroded trust in the REDD+ agreement, and undermined consultative efforts, especially when a large share of the finance disbursed has gone to administrative fees. This difficulty has been clearly acknowledged by the GoG who state that: *'consultation is also sometimes*

²⁴⁷ The Cunha Canal is an adaptation initiative under the LCDS which involves rehabilitating a key canal that is used to drain agricultural land in Guyana. It had been developed under a slightly different format previously by the World Bank. For more information see:

http://www.guyanareddfund.org/index.php?option=com_content&view=article&id=105&Itemid=132.

²⁴⁸ The Micro and Small Enterprise Development Fund is a project that will provide finance and training to small businesses in low carbon sectors. For more information see:

http://www.guyanareddfund.org/index.php?option=com_content&view=article&id=99&Itemid=129.

*viewed with suspicion in the absence of flowing resources*²⁴⁹ in their lessons learned from the partnership (Office of Climate Change, 2013).

Table 7.1: Status of GRIF funded projects

Source: The World Bank Group, (2013)

Project	Status	Partner Entity	Implementing Agency	Project fees	Total finance disbursed from the GRIF
Institutional Strengthening	In process, approved	IDB	Office of Climate Change and Guyana Forestry Commission	0.45	6.39
Micro and Small Enterprise Development Fund	In process, approved	IDB	Small Business Bureau, Ministry of Tourism, Industry and Commerce	0.13	5.13
Amerindian Land Titling	Project Document Approved	UNDP	Ministry of Amerindian Affairs	2.8	10.76
Cunha Canal Rehabilitation	PCN approved	World Bank	Ministry of Agriculture	0.07	0.07
Amerindian Development Fund	PCN Approved	UNDP	Ministry of Amerindian Affairs	0.12	1.88
Amaila Falls Hydro	Uncertain	IDB	Project Management Office, NICIL ²⁵⁰		
Biodiversity Research Centre	Feasibility study to be completed	World Bank	University of Guyana		
Totals				3.45	22.35

²⁴⁹ Office of Climate Change, (2013) pp. 2.

²⁵⁰ NICIL is National Industrial and Commercial Investment Ltd. which is a corporate body that acts as the holding company for government owned minority and majority interests.

The process that projects need to undertake in order for GRIF finance to be released has built on the existing institutions and architecture of traditional development finance. Multi-lateral development institutions play a crucial role in project design, management and implementation, and their social and environmental safeguards have become important conditions in the project approval process. The system relies on their skills and capacity to move projects swiftly from the concept phase to implementation on the ground – and they have received a substantial share of the finance that has so far been disbursed from the GRIF. This process has not necessarily been a speedy or smooth one (see the discussion Section 7.4.1 below) and has led to criticism over the conditionality imposed (see Section 7.4.2).

The process also represents a move away from the pure REDD+ model of finance in a number of important directions. It places some limits on the freedom of the Guyanese government to spend the finance it has earned via the MOU with Norway reducing, to some degree, the level of national ownership over the finance. With projects requiring the approval of the GRIF Steering Committee, along with meeting partner entity standards it is harder for the Guyanese government to implement policies and projects. This adds layers of transparency and accountability – but may threaten the ability of the government to choose the policies that it thinks best to address the particular domestic conditions driving deforestation. By bringing in actors with wider development objectives into the project design, approval and implementation stages there is a risk that priorities from these actors may be inserted into the projects that utilise REDD+ finance. These steps represent movements away from a pure payment-on-performance system.

The reliance of the Guyana-Norway agreement on existing development institutions and the framework of the World Bank and other partner entities risks moving the agreement away from the paradigm shifting pure REDD+ framework that was originally envisaged back towards previous ODA models of forest finance. This raises the issue of path dependency. The need to establish a framework in a speedy manner implies building on existing institutional structures. International financial support may however become stuck on a development path, and attempts to move support to other models with greater national-level ownership become more difficult. The extent to which this has occurred over the evolution of the agreement will be seen in Section 7.4.

This section has examined the extent to which the structure of the agreement between Guyana and Norway, at its inception, represented a pure REDD+ agreement. There is some mixed evidence from this examination. Further evidence for the nature of the agreement can be drawn from an investigation of the motivations of the two parties – understanding why they engaged in the

agreement, what were their expectations regarding the agreement, and into what wider policy context does the agreement fit.

7.3 The motivations of the key participants

The key REDD+ donor in Guyana is Norway, through the agreement set out in the MOU outlined in Section 3.4.1. Norway's finance to Guyana is part of its International Climate and Forest Initiative (NICFI) that provides finance through multi-lateral channels such as UN-REDD, the Forest Carbon Partnership Facility (FCPF) and the African Development Bank's Congo Basin Forest Fund and through bilateral agreements with Brazil, Tanzania and Indonesia in addition to Guyana. Up to NOK 3 billion (approximately US\$517 million) has been pledged to the fund each year,²⁵¹ however the 2014 budgetary allowance has been proposed to be cut by NOK 400 million, due to delays in projects getting up and running in recipient countries including Guyana (Stabroek News, 2013d). This reduction may be symptomatic of a change in political will for NICFI from the new Norwegian government, who despite a commitment to the overall programme, have been thought to be looking to reduce the scale of committed finance (Lahn, 2013).

The objective of Norway's programme is: *'to play a part in establishing a global, binding, long-term post-2012 regime that will ensure deep enough cuts in global greenhouse gas emissions'*.²⁵² It has three specific goals (Norwegian Ministry of Foreign Affairs, 2010):

- *To work towards the inclusion of emissions from deforestation and forest degradation in a new international climate regime;*
- *To take early action to achieve cost-effective and verifiable reductions in greenhouse gas emissions; and,*
- *To promote the conservation of natural forests to maintain their carbon storage capacity.*

The programme serves to work towards a full international REDD+ framework, but in the absence of such an agreement it works to help take early action on the REDD component of REDD+ (in the second goal), and also the plus component (in the third goal).

Norway's motivation for such an ambitious climate and forest initiative has been much discussed in the grey literature and in a series of online discussions,²⁵³ with no clear conclusion. There is little academic work on the area with just two Masters' thesis discussing the topic: Nilsen, (2010)

²⁵¹ For full information on the NICFI fund see: <http://www.climatefundupdate.org/listing/norway-s-international-climate-and-forest-initiative>.

²⁵² Norwegian Ministry of Foreign Affairs, (2010) pp. 56.

²⁵³ The website REDD Monitor has written a number of articles regarding the motivation for Norway's involvement in REDD+ and the establishment of the NICFI (Lang, 2011, 2012).

attributed the initiative to a desire to green the country's image, while Bade, (2012) highlighted the possibility that REDD+ was seen as a quick-fix to achieve this desire.

Where Guyana fits into this programme is shown by two statements, one by President Jagdeo, and one by the Norwegian Minister of Environment and International Development at the time, Erik Solheim:

'Tropical deforestation must receive the same level of attention, resources, intellect and innovation as other global problems and partnership is the key to achieving this. Guyana is prepared to be a model for the world in devising these partnerships,' President Jagdeo (GINA, 2008)

'We are giving the world a workable model for climate change collaboration between North and South. It's not perfect, but it's good, and it will be improved upon as we learn and develop together.' Minister Solheim (Norwegian Ministry of the Environment, 2009)

Guyana, according to these statements, has helped Norway learn lessons for how a REDD+ model might develop, crucial lessons for Norway's other partnerships and for the wider implementation of REDD+ through the UNFCCC and initiatives such as UN-REDD and the FCPF. Guyana's status as a High Forest Cover, Low Deforestation (HFLD) country may also be crucial in this decision-making, as these countries offer potential for stopping the high rates of deforestation predicted by models such as the Forest Transition Curve (discussed in Chapter 2) (Bade, 2012), providing potential low-cost future carbon abatement opportunities.

The historical context may also be important to understand the rapid emergence of the agreement. The Guyana-Norway agreement emerged in the run-up to the key Copenhagen UNFCCC Conference of Parties (COP) in late 2009. Both countries were keen to make global commitments, and to promote the cause of REDD+ (Bade, 2012). In this way the agreement worked to bring together the interests of both parties, and provide a solid example for the world for a REDD+ partnership.

The speed and scope of the partnership was surprising given Norway's lack of experience and presence in Guyana. There were no strong historical ties between the two countries and no permanent Norwegian representatives present in country. A possible explanation for the partnership of the countries is the work done by facilitators such as the Clinton Foundation, the Carter Centre, the UK's Department for International Development (Dfid) and Prince Charles to bring the parties together.²⁵⁴ There then followed a close personal relationship between the key individuals on both sides, notably President Jagdeo and Norway's Minister Solheim (Bade, 2012). Trust formed a key

²⁵⁴ Baker, D.J. (personal communication, August 13, 2013).

part of the development of the programme, and helped overcome the lack of capacity that Norway had regarding Guyana and Guyanese affairs. The strength of this trust is highlighted from a letter written by President Jagdeo to Minister Solheim in 2011, regarding the progress of the partnership:

*'Your personal dedication has been a major reason why we have travelled this far. Ours is a five-year partnership, we knew that we would have problems – and the two countries can fix them, especially the financing mechanism. We can prove to the world that it is possible to enshrine national ownership and adherence to world-class financial, social and environmental safeguards within climate finance mechanisms,'*²⁵⁵

This personal relationship adds to the key areas highlighted in Chapter 6 regarding the crucial role played by President Jagdeo in the governance process for REDD+ in Guyana, both on the domestic and international planes. It tends to move against the proposed multi-level governance (MLG) model of governance discussed in Chapter 6, rather it works to centralise power in a few individuals and state-based institutions. It may however highlight how, and why, Guyana was able, and willing, to move more quickly on REDD+ than other countries – President Jagdeo, by taking such a strong leading role, was able to push forward the agreement with Norway, and put REDD+ on top of the policy agenda in Guyana.

The trust felt between the higher echelons of political power in Guyana and Norway helped to move the partnership forward despite doubts in other governmental bodies within Norway about the lack of institutional capacity that Norway had regarding Guyana (Bade, 2012). There were, however, other institutional issues that the trust between individuals could not overcome. Responsibility for NICFI is split between a number of different ministerial bodies in Norway. The Secretariat for the Initiative is located within the Ministry of Environment however the Ministry of Foreign Affairs is responsible for how the money is spent. The implications of this for the budget for NICFI, and thus the finance given to the GRIF, is that it comes out of Norway's aid budget, and is classified as ODA, carrying the relevant stipulations and conditions. This represents a major role-back from NICFI, and therefore Norway's agreement with Guyana, fitting into a pure REDD+ model.

The stipulations and conditions associated with the ODA classification imply that full ownership of the finance does not transfer to Guyana – and thus the money is not 'earned' in a manner consistent with standard models of payment for ecosystem services, and not in the manner expected by the Guyanese government. It implies that NICFI as a whole, and the Guyana-Norway agreement in particular, does not necessarily represent a paradigm shifting REDD+ agreement, but instead

²⁵⁵ Stabroek News, (2012a).

represents an incremental improvement on previous forest policy ODA-funded interventions, merely adding layers of environmental conditionality to such programmes. The classification of ODA has raised issues of disagreement and confusion between Guyana and Norway regarding the nature of the finance, and its ownership. These issues have arisen as the agreement has evolved from design through to implementation and are discussed in more depth in Section 7.4 below.

The motivations of the key parties to be engaged in the REDD+ agreement in Guyana can give a sense of the nature of the agreement itself, and how well it represented pure REDD+. The agreement has grown out of Norway's broader commitment to building an international agreement on REDD+ and demonstrate and learn from early action. This highlights that Norway's intentions seem to be to experiment with different models and institutions for REDD+ - and the agreement with Guyana fits into this experimentation *modus operandi*. The agreement is seen by both parties as a model that can be rolled out to other jurisdictions, with the lessons learnt crucial for wider deployment of REDD+. Trust between key participants helped to push this innovative model forward – perhaps more quickly than the implementing institutions of either country, or the international organisations could cope with. The fact that Norwegian finance was routed through the Ministry of Foreign Affairs, and was thus classified as ODA – with all the relevant stipulations and conditions – may be an example of this failure to match overall political motivations with day-to-day institutional structures. The roll-back from pure REDD+ to a more ODA centred approach may thus be due to institutional constraints and issues of path dependency as much as it is to do with the overall motivations of the key actors involved.

7.4 Evolution of the agreement

Guyana's MOU with Norway was signed in November 2009 and is now in its fifth year. At its signing it was a ground-breaking REDD+ agreement, and was the first such agreement to offer the beneficiary country performance-related REDD+ payments. It was an innovative arrangement that tested the boundaries of the current institutions, and required the rapid development of new ones. It had bold aims, to both create a new REDD+ agreement, and also to support Guyana's REDD+ readiness. The four years of experience has seen the agreement grow and develop, encounter challenges and evolve. These years of experience have helped highlight the extent to which the agreement can be thought of as paradigm shifting pure REDD+, and how much it has to be seen as an incremental step forward from previous forest policy interventions. This section will discuss the evolution of the agreement in two main areas: first the delays that the agreement has suffered in finance being disbursed, and projects being implemented; second the change in the conditions, safeguards and standards that Guyana is required to meet in order to access finance.

7.4.1 Delays

Guyana's REDD+ programme is approaching the end of the time period of finance offered by the sole major donor, Norway. To date, however actual REDD+ finance hitting the ground in Guyana has been relatively small, with few major projects reaching the implementation stage. As of June 2013 only 20% of the received finance had been disbursed and just 5% of the total pledged amount (Figure 7.1).²⁵⁶ It took almost two years for the first major disbursement of finance for a project to take place,²⁵⁷ and subsequently finance has flowed out of the GRIF at a trickle.

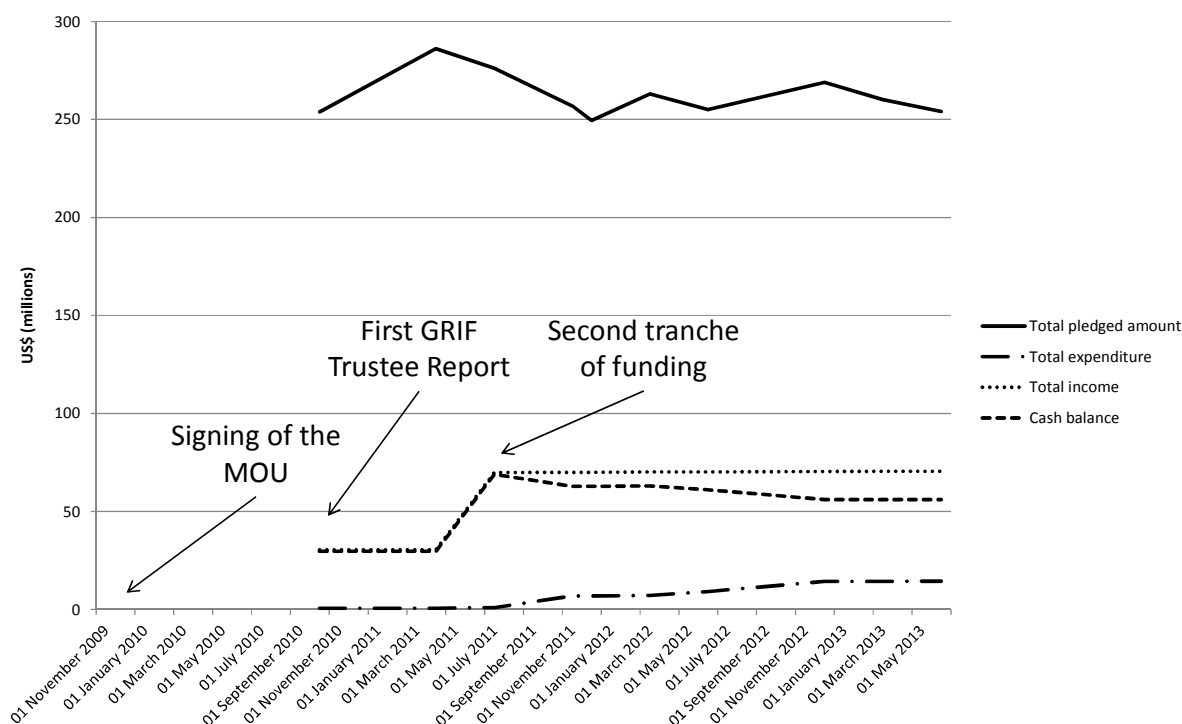


Figure 7.1: The finances of the GRIF: pledged amount, expenditure, income and cash balance

Sources: (The World Bank Group, 2010, 2011a, 2011b, 2012b, 2012c, 2012d, 2013)

Two major reasons have been put forth to explain the delays in REDD+ finance reaching the ground in Guyana. The GoG official explanation focuses on the institutional delays associated with the establishment of the GRIF (Office of Climate Change, 2013), while other observers have commented on the slowness of the project pipeline, through the design phase by GoG agencies to the approval phase of the partner entities and the GRIF Steering Committee (Abraham et al., 2011). The

²⁵⁶ It should be noted that a substantial share of the finance under the MOU had been earmarked for government equity in the Amaila Falls Hydroelectric project. This project has stalled due to the withdrawal of the private sector partner, Sithe Global. The status of the project and the earmarked finance is currently unclear.

²⁵⁷ This was the implementation finance for the Institutional Strengthening project, designed to strengthen the capacity of the OCC, the GFC and the REDD+ Secretariat that was released from the GRIF in 2010.

verification report of the Indicators of Enabling Activities for REDD+ required to release payment of REDD+ funds conducted by the Rainforest Alliance in 2012 concluded that:

'on evidence reviewed it appears that there is a shared responsibility amongst various parties for these delays'.²⁵⁸

The agreement to establish the GRIF was made at the inception of the MOU in 2009. The architecture of the GRIF was not completed until a year later however, with the full Administration Agreement signed on October 9, 2010. The year delay in establishing the framework, including setting up the bank account in which finance would be deposited, has delayed the implementation process, and is the main reason given by GoG for the delays in project activity (Office of Climate Change, 2013).

President Jagdeo has been one of the most vocal critics of the delays in the implementation of REDD+ in Guyana, and the disbursement of finance. Through a series of public statements he placed the blame solely at the door of the World Bank, and their delay in establishing the GRIF. In 2010 at around the time that the World Bank finally opened the account for the GRIF the President made the following two statements at the national meeting of Amerindian chiefs:

'Let us send a clear message to the international community that they must get out of the way and allow us to move forward with our development.'²⁵⁹

'I hope that whilst you are here that you also send a clear signal to the international community who sometimes, because of distance, and sometimes because they have some real silly, useless people, don't care'.²⁶⁰

This received major attention on the national and international scene (Holmgren, 2010; Kaieteur News, 2010b), however there is a perception among some stakeholders in Guyana that the actions of the President reflected some of the driving forces already identified domestically in Chapter 6, notably making a play in order to release funds before the upcoming 2011 elections. One interviewee responded:

'imagine the President going internationally and cussing up the World Bank and everybody else, cussing them down, not up, down because you want the money to come before elections, it was a ploy for elections, get the money before elections.'

²⁵⁸ Donovan et al., (2012) pp. 5.

²⁵⁹ Kaieteur News, (2010).

²⁶⁰ Ibid.

The delays in establishing the GRIF, a standard trustee bank account, to act as repository of finance, did create delays in initial financing of activity in Guyana, and highlights the difficulties of using ODA relevant instruments, for inherently different climate-finance. The reliance on such institutions in the Guyana-Norway agreement may have hindered its progress towards a pure REDD+ framework. Instead the continued reliance on existing development architecture and institutions such as the World Bank, although potentially aiding transparency, seems to have failed in creating speedy disbursement of finance for REDD+. Although on one hand the use of such existing institutions may look attractive for quick disbursement of finance relative to creating new institutions, the experience of Guyana seems to point to the fact that this may not always be the case.

Although there were substantial delays in establishing the GRIF it has now been in place for over three years however, yet finance is still slow to reach the ground, implying a role for other factors. For finance to be disbursed from the GRIF to the partner entities for either project development or project activities approval must be given by the GRIF Steering Committee consisting of representatives of Guyana, Norway, the Trustee (the World Bank), the Partner Entities (IDB, UNDP, World Bank), and observers from national and international NGOs.²⁶¹ This process happens in addition to approval from the partner entities. There is therefore a complicated approval process for REDD+ finance, and potentially a requirement for multiple sets of safeguards and procedures to be met. Suitable project proposals must be drafted by a combination of GoG agencies and partner entities that meet both the partner entity's and the World Bank's social, environmental and financial safeguards, and also meets with the approval of the GRIF Steering Committee. This process has been criticised by actors from a variety of perspectives, including GoG and Norway who stated that the mechanism was not *'fit for purpose'*.²⁶² This criticism has been supported by the MSSC which:

'readily acknowledge that there has been an "inordinate and unwelcome delay" in the implementation of the REDD+ programme and in meeting the requirements for the disbursement of the funds to specific projects which will benefit the development of the Amerindian communities.

The MSSC, therefore, holds the view that, while the internal procedures of these multilateral institutions may contribute to slowing the process, we do not share the view that the credibility of these organisations to provide essential fiduciary, social and environmental oversight for project implementation is questionable' (Demerara Waves, 2011).

²⁶¹ The last publicly available minutes of the GRIF Steering Committee in May 2011 give these observers as representatives of the Rainforest Foundation Norway, World Wildlife Fund Norway and four members of the MSSC, including representatives of the IIED and a member of an Amerindian NGO.

²⁶² Office of Climate Change, (2013) pp. 6.

The question that arises from these statements is whether the large oversight of the partner entities and the World Bank that contributed to some of the delays in REDD+ implementation in Guyana, was sufficient to change the nature of the overall agreement itself – did it change it from a paradigm-shifting REDD+ agreement, to merely a conditional ODA agreement – implemented with the same conditionality that ODA operates, by the same institutions?

Or was it merely a case that the extra safeguards and oversight that the partner entities provided helped the development of ‘safeguarded’ REDD+ in Guyana – with the safeguards and oversight merely delaying implementation of REDD+? The difference between these two views may be small – but may be crucial in determining whether the agreement is generating sufficient incentives within the Guyanese government to amend overall deforestation activity, and whether it grants sufficient freedom to the Guyanese to design and implement country-specific policy.

The differences between such views can be seen if the question of ownership of the finance disbursed by Norway. The question has arisen due in part to the classification of Norwegian finance as ODA. As per OECD’s definition of ODA it must be *‘administered with the promotion of the economic development and welfare of developing countries as its main objective’*.²⁶³ This stipulation implies that ownership, to some degree, of the finance provided under the MOU rests with Norway. On the other hand Guyana clearly sees the finance ‘earned’ under the MOU as solely within its ownership. This is shown by a press briefing given by Guyanese Cabinet Secretary Dr Roger Luncheon in 2011 where he stated:

‘the money is ours.’,

‘They are still outstanding issues, annoying, frustrating exercise and has caused us not to access money that is Guyana’s money.’

*‘But this is our money...we have earned this money and we have difficulties in continuing to see frustration along the way.’*²⁶⁴

President Jagdeo has re-iterated this point stating:

*‘They (the World Bank and the IDB) want to treat it as though it is their money; this is our money.’*²⁶⁵

The question of ownership of finance was further complicated in 2012 when Norway announced that due to budgetary rules regarding ODA the third tranche of payments that Guyana had earned

²⁶³ OECD, (2008).

²⁶⁴ Kaieteur News, (2011).

²⁶⁵ Ibid.

through its performance under the MOU and in line with the stipulations of the JCN was unable to be paid to Guyana. Minister Solheim was quoted in the Guyanese media as saying:

'Norwegian rules and regulations demand that a significant portion [of] the money currently in the GRIF are spent before a new payment can be made. Norwegian rules also require that [the]... need for funding is justified in terms of new projects'

and

'Everyone receiving Norwegian contributions both outside of Norway and within has to adhere to these rules. In a simpler world it would of course be solely Guyana's performance that triggered the payments,'²⁶⁶

These conditions clearly emphasise that although on one level the MOU establishes a framework for performance-related payments, the institutional arrangements that currently exist for REDD+ in Guyana still follow a standard development model, with Norway granting ODA to Guyana as it sees fit. This limits two key elements of a pure REDD+ model: the first being Norway's requirement to pay Guyana based purely on environmental performance, and the second being Guyana's ability to use the money as it sees fit once environmental performance has been achieved. Both of these are crucial elements of any REDD+ arrangement, and give guarantees to both the funder and the funded that payments will result if, and only if, environmental targets are met; creates sufficient incentives for recipient countries to reduce deforestation; and creates the space for these countries to develop nationally appropriate strategies. The fact that finance now depends in part on other grounds, not purely environmental performance, reduces the environmental conditionality inherent in the arrangement, potentially reducing incentives and the freedom to choose policy.

It should be clearly noted that this institutional arrangement has arisen despite key members of the Norwegian government notably, Minister Solheim, desiring a different arrangement as can be seen in the quotes above. This highlights the strength of institutional lock-in in the existing arrangements, the problem of path dependency and the general unsuitability of those arrangements for REDD+ finance. It highlights the difficulties in creating the types of performance-related payment structures that REDD+ requires, even if the wider motivation to do just that is in place. This reiterates that it may be difficult to develop pure REDD+ frameworks if a reliance on the modes and mechanisms of development assistance are relied upon.

²⁶⁶ Stabroek News, (2012b).

The reliance on development assistance institutions may not be the only reasons behind some of the confusion over ownership of finance. There is a perception among some elements of the Guyanese populace that the reasons behind this confusion over ownership of finance are directly attributable to a lack of capacity within GoG to conduct negotiations with Norway in this area. One interviewee commented when questioned on the reason behind the delay to REDD+ implementation:

'Then we have the breakdown in negotiations, I wouldn't say a breakdown, the medicority that was part of the Guyana negotiations which allowed a situation of the money not being sent directly to the government in this country and placed in our central bank, but rather being treated as some sort of project loan and being placed in the World Bank, although the Norwegian government have released over \$70 million within the agreement and they have started to place additionalities, where does these conditionalities come from, just because you have the money'

This perception of lack of capacity within GoG (mirrored by earlier discussions of lack of capacity within the Norwegian government) echoes the findings of the previous Chapter with regard to the implementation of REDD+ at a national-level in Guyana.

The GRIF followed the basic institutional structure that has been used for a set of previous ODA ventures for example the Debt Relief Trust Fund, the Global Fund to Fight AIDS, Tuberculosis and Malaria and the Haiti Reconstruction Fund (The World Bank Group, 2012). Its experience highlights the importance of creating suitable and relevant institutional structures for REDD+, focusing on the differences between REDD+ and previous international policy mechanisms in both the development and environment arena. Guyana teaches a lesson regarding the need to deal with thorny institutional questions such as the ownership of finance. The confusion on both sides regarding the exact nature of the payment, and who retains control over its use still remains today and has hindered the efficient and rapid implementation of REDD+ in Guyana. Such lessons are crucial for implementing national-level REDD+ elsewhere, and also for reforming the institutional structure in Guyana, a process currently being undertaken by Guyana and Norway in order to speed up implementation (Office of Climate Change, 2013; Stabroek News, 2013b).

7.4.2 Conditionality and safeguards

Safeguards have come to form a crucial part of the governance landscape for Guyana's REDD+ framework. Although on one hand they are a movement away from REDD+ in its purest form, i.e. payments made purely for performance in reducing emissions from deforestation and forest degradation, they have become a crucial component of the global REDD+ puzzle (see the discussion in Section 2.4.4).

Safeguards are mainstreamed into the governing document of the Guyana-Norway agreement, the MOU which states:

'Safeguards as well as fiduciary and operational policies of the organisation selected will apply as appropriate to all activities to be financed by GRIF'.²⁶⁷

This implies that any projects funded through the GRIF have to meet the financial, environmental and social safeguards of the World Bank. In addition projects have to meet the standards of the implementing partner entity. For example the Micro and Small Enterprise Development Fund project has to meet the safeguards of the IDB (Inter-American Development Bank, 2012), while the Amerindian Land Titling project must comply with the standards of the UNDP (United Nations Development Programme, 2013). This structure creates complications in the project design phase with the Project Management Office (PMO), the lead agency for GoG, required to create project documents that meet a range of different standards and safeguards. The PMO is a very small unit and has been described as being *'constrained by its human resources capacity and lack of budgetary resources to carry out its mandated duties'*.²⁶⁸

The burden of multiple safeguards, coupled with lack of capacity in the PMO may have helped contribute to the slow rate of project approval, and thus disbursement of REDD+ finance. The issue of competing safeguards and the struggles of GoG to form project documents that can pass the hurdle was commented on by a number of interviewees. When questioned about the speed of disbursement a member of the MSSC commented:

'I mean that the moneys have been transferred but not yet made available because the safeguards of the World Bank and the IDB are still issues that need to be resolved.'

Safeguards also form the basis of the set of Indicators of Enabling Activities used to judge whether Guyana is eligible to receive finance from Norway in any particular year.²⁶⁹ The indicators are based on the following:

- That Guyana's LCDS MSSC and other arrangements to ensure systematic and transparent multi-stakeholder consultations will continue and evolve, and enable the participation of all affected and interested stakeholders at all stages of the REDD+/LCDS process
- Protect the rights of indigenous peoples

²⁶⁷ The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), (2009) pp. 4.

²⁶⁸ Inter-American Development Bank, (2011) pp. 5.

²⁶⁹ The process of deciding payment to the GRIF is discussed in greater depth in Chapter 3.

- Ensure environmental integrity and protect biodiversity
- Ensure continual improvements in forest governance
- Provide transparent, accountable oversight and governance of the financial support received.²⁷⁰

These criteria have led to the formation of five indicators that Guyana’s REDD+ framework is judged against (Government of Guyana & Government of Norway, 2012):

- Strategic Framework
- Continuous multi-stakeholder consultation process
- Governance
- The rights of indigenous peoples and other local forest communities as regards to REDD+
- Integrated land-use planning and management.

In each year the Guyanese government is assigned a number of actions for each indicator for which it has to show progress. Examples of these actions for each indicator are shown in Table 7.2.

Table 7.2: Indicators of Enabling Activities and examples of action for 2012/2013

Source: Government of Guyana & Government of Norway, (2012); Government of Guyana, (2013)

Indicator	Example of Action
Strategic Framework	Guyana will publish its LCDS Addendum which will highlight its updated REDD+ strategy, including learnings to date from the Guyana-Norway partnership and an outline plan for advancement on the FCPF programme.
Continuous multi-stakeholder consultation process	Monthly meetings of the MSSC, with comprehensive minutes of every meeting made publicly available immediately upon approval from the following MSSC meeting.
Governance	Application for Extractive Industries Transparency Initiative(EITI) Candidacy at EITI board meeting in May 2013
The rights of indigenous peoples and other local forest communities as regards to REDD+	Present the Amerindian Land Titling project to the GRIF steering committee, after the normal GRIF public hearing period for new project notes is concluded
Integrated land-use planning and management	Strategic Approach to land use planning publicly communicated by March 2013

²⁷⁰ The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway), (2009) pp. 4.

The actions undertaken by Guyana and those outlined in the JCN that is updated periodically, have understandably changed and amended as REDD+ has developed in Guyana, as priorities have changed and as international negotiations have developed. The requirements for Guyana to move toward membership of international standards such as the EU's Forest Law Enforcement, Governance and Trade (FLEGT) and the EITI are notable additions to the original actions under the governance indicator.

These indicators and actions effectively form a set of evolving safeguards for Guyana's REDD+ programme that provide ongoing assurance for Norway as to the effectiveness and equitable nature of REDD+ in Guyana. They also provide a mechanism for Norway to provide input into the REDD+ process in negotiation with Guyana and help shape its development in a formal fashion. This is in contrast to its hands-off role (at least on paper) with regard to the choice of projects for funding from the GRIF. The use of these safeguards mirrors, to some degree, the use of loan conditionality for forest funding that was discussed in Chapter 2. It provides a mechanism for Norway to influence policy in Guyana through adding external conditions to the provision of finance. The use of these safeguards starts to raise further question-marks as to the ownership of finance. Although carbon offset arrangements often involve exacting standards, and in this way the arrangement is mirroring private sector transactions, a question arises as to whether the safeguards enacted go beyond merely applying standards to a transaction and into the realm of applying policy conditionality.

Safeguards provide a tool to ensure that REDD+ occurs in an equitable and efficient manner, protecting both vulnerable communities from exploitation and donors from misuse of their finance. The REDD+ framework in Guyana has had safeguards mainstreamed into it since its very inception. For projects to be approved, and REDD+ finance to be spent, a number of hurdles need to be overcome, with multiple sets of safeguards and standards required to be met. The overall progress of REDD+ must also meet a set of safeguards relating to governance and consultation. The use of this myriad of safeguards and standards does provide a safety-net to Norway that its finance will be used in an equitable manner, however it also adds a range of conditionality that moves REDD+ finance away from a performance-related payment mechanism towards a traditional development assistance model, and may be partially responsible for the delays encountered by the REDD+ framework in Guyana. Safeguards help to ensure that various institutional conditions such as rent-seeking do not affect REDD+, but can also introduce rigidity into the system that can reduce the flexibility that REDD+ requires to adapt to shifting deforestation conditions. One proposed method that could streamline the use of safeguards globally, and in Guyana in particular is a policy that has been implemented previously in the forest sector to overcome institutional difficulties: donor

coordination (see discussion in Chapter 2). Donors and the MLIs could work together to create one set of safeguards, meaning a more efficient use of the limited resources to develop, implement, monitor and evaluate projects.²⁷¹

7.5 Lessons and Conclusions

Guyana's REDD+ agreement with Norway has been put forward as a model for the world. At its inception it was hailed as a ground-breaking, paradigm-shifting agreement, being the first national-level REDD+ scheme to reach the performance-related payment stage. It was thus seen as perhaps the purest embodiment of national-level REDD+ implemented. Experience from its design and evolution provides valuable lessons to other countries embarking on JNR.

Despite the agreement being seen as a pure embodiment of REDD+ in fact, when delving below the surface, more complexity can be seen. In both how finance is earned and spent the agreement from its inception represented something broader than pure REDD+. Guyana was to earn payments both from meeting environmental conditions, but also by meeting a set of indicators relating to the country's REDD+ readiness and implementing suitable REDD+ policy. In addition finance was to be used to promote Guyana's wider low carbon development and also to support Guyana's capacity to implement REDD+. Therefore from both the perspective of how money is to be earned and spent from the very inception Guyana's agreement represented a hybrid of REDD+ and REDD+ readiness finance (albeit paid on results rather than upfront). This raises question marks regarding the extent to which the original agreement fits into the purest REDD+ model.

The intention at the beginning of the agreement was for the framework to evolve towards a purer REDD+ model. The GRIF was designed to be an intermediary step whilst the capacities of GoG to meet social, environmental and financial standards were built. Performance indicators were intended to evolve toward purer carbon measures. Whilst there has been progress on both of these fronts (though significantly more on the latter) in some senses the framework has moved further away from a pure REDD+ model – both from design issues which have only become apparent during implementation and an evolution of facets of the agreement. The stipulation that the Norwegian finance is classified as ODA, with standards, conditions and regulations attached lends credence to the view that the agreement is not paradigm-shifting REDD+ but standard development assistance in the model of previous international forest policy, albeit with stricter environmental conditionality.

²⁷¹ This is an approach proposed by one interviewee who had previously worked for one of the MLIs on projects under the LCDS.

The strong role played by existing development institutions such as the World Bank, the IDB and the UNDP, in designing, shaping, approving and implementing projects also adds credence to the argument that in practice Guyana's agreement with Norway looks much closer to standard development assistance than first anticipated. The requirement that partner entity standards must be complied with also adds a layer of conditionality. The discussion in Section 2.4.4 highlights the increasing importance of safeguards in ensuring the effective and equitable implementation of REDD+. The experience of Guyana however provides a warning that the use of safeguards bring a trade-off - they remove some aspects of the pure environmental incentive that REDD+ potentially offers, and can move the choice and design of policy back into the hands of development institutions, potentially limiting the ability of national or jurisdictional governments to freely define the most effective and efficient methods for reducing deforestation.

Conditionality and safeguards is a thorny issue for REDD+ - too much threatens the nature of REDD+ deals themselves and risks slow implementation and delays in project finance reaching the ground, as Guyana has experienced, too little threatens the equitable nature of REDD+ and risks mis-governance and expropriation of resources. Thus although conditionality may build in insurance that projects and policies will not adversely affect communities, that same conditionality can lead to a growing disquiet with REDD+ if it causes delays in finance actually reaching the ground.

The move away from pure REDD+ in Guyana's agreement with Norway may also be due to the speed in which the agreement has been implemented, the first-mover nature of the agreement and the relative lack of capacity that both Guyana and Norway had in implementing anything similar. These factors combined cause a reliance on the existing development institutions for support and capacity. Such reliance has meant that there has been less need to construct new institutions but risks path dependency with the same institutions responsible for previous forest policy interventions taking the lead on REDD+. Incorporating their systems and project approval processes into the REDD+ implementation framework explains, so some extent, the fall-back from the original intentions of the agreement towards the historical ODA approach.

The question that arises is how else the programme could have been implemented given the lack of capacity in the key actors (as highlighted in Section 6.5.1). Given the desire for both parties to push forward with REDD+ and be first-movers what other options were on the table given the lack of capacity in the relevant government actors of both donor and recipient? The experience from Guyana gives one more option that may offer interesting lessons for other countries moving to implement REDD+. To circumvent some of the complexities involved with accessing initial financing from the GRIF in the early stages of the agreement Norway routed money to the Guyana Forestry

Commission (GFC) for REDD+ readiness efforts via Conservation International (CI).²⁷² The flexibility, yet transparency, that CI offered against other funding sources provided a suitable avenue for such finance. The use of NGOs in this regard, and also in implementing projects related to the LCDS such as CI-Guyana's project to test models for the implementation of Guyana's LCDS at the local level in the Rupununi region,²⁷³ may offer an intermediate solution between creating new institutions for REDD+ and relying on existing development institutions. They may however introduce different risks as they have their own aims and objectives that may be introduced either consciously or sub-consciously into the design and implementation of any projects that fall within their domain. Where they may be especially beneficial however is in the speed in which they may be able to move and implement projects, requiring less safeguards and conditions to be met.

A key lesson that emerges from the Guyana-Norway agreement is the nature of the finance that is to be offered by the donor. REDD+ conceptually differs from standard ODA in that it is earned by the recipient country by delivering a service, namely carbon reductions from avoiding deforestation, rather than merely offered by the donor country. Therefore the ownership of the finance for REDD+ should lie with the recipient country, once the stipulated environmental conditions are met. This differs with ODA for which ownership generally rests with the donor country through the conditions that are usually attached. The fact that Norway's finance was designated as ODA has proved problematic in the agreement as it created confusion regarding the ownership of the money – and implicitly reduces the incentives that Guyana has to reduce deforestation as it removes the guarantee that finance will flow once that objective has been achieved. The key lesson that emerges is that new categories of international finance is required for REDD+ that better fits the incentives that it is intended to create, and better reflect the (conditional) ownership of finance by the recipient government. Depending on ODA to fulfil REDD+ finance would seem to be inappropriate.

Guyana's REDD+ agreement with Norway is built on significant trust between the major actors involved. This helped push forward the agreement and bring the two countries together despite a lack of experience and capacity in both countries. Trust has proved to be a vital element in helping REDD+ develop, but has not been enough to avoid lock-in to inappropriate institutional mechanisms for implementing REDD+ in Norway, Guyana and on the international plane. This highlights that although political will and trust between parties may be a necessary condition, it is not sufficient.

²⁷² In 2010 CI acted as a conduit for finance, partnering with KfW to provide US\$523,344 of support to the GFC to undertake work relating to carbon stock and forest degradation assessments. Information about this project is available on Guyana's LCDS website at:

http://www.lcds.gov.gy/index.php?option=com_content&view=article&id=433&Itemid=186

²⁷³ More information on the project is available at: <http://www.iadb.org/en/projects/project-description-title,1303.html?id=GY-M1021>

Building appropriate institutional structures to implement REDD+ is vital for it to be efficient, effective and equitable. A reliance on existing development institutions in the case of Guyana has limited its success. The question becomes however how can alternative institutions be created, and on what timescale, especially given the relative lack of speedy progress at the UNFCCC. Given the need to get REDD+ moving however what options may be available in the absence of REDD+ specific international institutions, and with limited local government capacity, becomes the important question, and it may be, as in the case of Guyana that a reliance on existing development institutions may be the only avenue.

Guyana and Norway set out to create a REDD+ model for the world, and their intentions seem to have been to create as pure a REDD+ model as possible, with payments linked to environmental performance, and Norway playing as hands-off a role as possible. However a reliance on existing development institutions, lock-in to previous institutional forms such as ODA, and an increasing role for extra conditions and safeguards has limited the extent to which such pure REDD+ has evolved in Guyana. The experience offers specific lessons for other countries looking to implement pure national level REDD+, but also raises sobering concerns for pure REDD+ to emerge at all.

Chapter 8: Conclusion

8.1 Introduction

This thesis set out to investigate how institutional conditions may, and have affected policy for Reducing Emissions from Deforestation and Forest Degradation (REDD+). REDD+ has recently emerged to form a crucial part of the climate change policy mix developing rapidly from a simple economic idea regarding the relatively low opportunity costs of avoiding deforestation in tropical countries, to a basket of policies, programmes and projects (Angelsen & McNeil, 2012).

REDD+ has been proposed as a radical alternative to previous forest policy interventions. A potentially paradigm-shifting intervention to prevent the major market failure associated with tropical deforestation (the gap between private costs and benefits to landowners and forested country government and the social costs and benefits to the rest of the world) it has rapidly emerged into a key climate change mitigation option. The extent to which it is fulfilling its potential, and emerging as a cheap and easy mitigation strategy, is however now open to question given the challenging institutional environment in which REDD+ operates.

Literature is light on investigating how these challenging institutional environments, including governance, property rights issues and political capture are affecting REDD+. This thesis adds to this literature, introducing a New Institutional Economic (NIE) perspective to the problem, using a multimethodological approach to examine how institutional conditions affect REDD+ policy. In doing so it also provides the first major academic evaluative study of Guyana's national level REDD+ programme. It provides insights to the governance of the programme, and also initial empirical evidence of the effect it is having on the deforestation landscape. In this way the thesis makes contributions to all three generations of REDD+ literature as identified by Angelsen, Brockhaus, Sunderlin, & Verchot, (2012) and discussed in Section 2.3: the design of REDD+; the implementation of REDD+ and assessing the impact of REDD+.

Theoretical modelling has been combined with quantitative and qualitative data in answering the following four research questions:

- What are the impacts on policy choice for REDD+ of taking into account its potential economy-wide effects, and the scope for political influence upon decision-making?
- Have election cycles and the introduction of a REDD+ framework in Guyana changed the landscape of deforestation, through changing how mining property rights are held?
- How well does the governance framework for REDD+ that has evolved in Guyana fit into the multi-level governance (MLG) framework that has been posited as important for REDD+?

- To what extent has the agreement between Guyana and Norway embodied REDD+ in its purest form?

In analysing these research questions this thesis makes contributions to a number of other literatures. The Grossman-Helpman framework (Grossman & Helpman, 1994) that is applied to answer the first research question is extended to the analysis of a policy instrument that changes relative prices and also provides unequal income transfers to sectors that lobby the government. Previously the framework had only been applied to the narrower group of policy instruments that just undertake the former. The extension of the literature in this area helps to move the framework towards types of policy instruments more often found in the environmental policy space.

The empirical analysis of mining property rights in Guyana conducted to answer the second question provides a valuable extension to a literature that has previously been qualitative in nature. The collection of a globally unique data-set of mining property rights is an important addition to the tools available to study small-scale mining activity. The answering of the third research question provides an analysis of whether MLG is actually evolving with regard to REDD+ in one of the leading national-level REDD+ frameworks, and provides lessons for REDD+ governance in other countries, helping to extend the literature relating to this form of governance, especially in its application outside the EU. These contributions serve alongside the extensions that this thesis provides to the REDD+ policy literature.

Chapters 4, 5, 6 and 7 have answered the research questions in turn, presenting their individual findings and conclusions. This Chapter draws together the conclusions of each of these chapters to understand more generally the impact of a set of institutional conditions upon REDD+ policy. Section 8.2 brings together the evidence to draw lessons for the formation of REDD+ policy for Guyana and the wider world. Section 8.3 discusses the limitations of this study. Section 8.4 discusses directions for future research. Section 8.5 concludes.

8.2 Impact of institutional conditions upon REDD+: Lessons for implementation

This thesis has highlighted the importance of three different institutional conditions, property rights, governance and politics, upon how REDD+ policy should be, and is being, designed; how it is being implemented; and its effectiveness. Cognisance of these factors and the impact that they could, and are having, on REDD+ leads to a number of lessons for REDD+ design and implementation. This section provides key lessons from the theory and empirical analysis of Guyana developed in the previous chapters in this thesis.

8.2.1 Institutions matter

The first key lesson is the crucial nature of institutions in forming, shaping and implementing REDD+ policy. This is not a unique finding to this thesis:- what has emerged from this work however is how different types of property rights, governance institutions and political environments combined with the (limited) capacity of national and international government and civil society actors can and has shaped REDD+ policy. What is clear from both the theoretical and empirical work in this thesis however is that institutions, their capacity, and how they have been used by actors can be, and has been, crucial to how REDD+ will actually emerge on the ground.

In contrast to the simple economic model from which REDD+ was born, it is becoming a wider basket of policies, projects and programmes, with multiple objectives, engaging a plethora of actors and involving a wide group of institutions. It has moved from a small-scale project-level mechanism, similar to the Clean Development Mechanism (CDM), with funding from private companies, predominantly from the voluntary market, towards a national or jurisdictional-level mechanism with funding provided by donors to national or regional governments. The move solves some design issues relating to REDD+ such as leakage, and allows for underlying policy drivers of deforestation to be tackled. It raises other issues however: it brings REDD+ more closely into the hands of politicians for good or for bad (see 8.2.4), and introduces an extra institutional layer between funders and actors on the ground – potentially problematic if there is a lack of capacity at this level (see 8.2.5).

The move to jurisdiction and national based REDD+ (JNR) from project-based models also reflects a change in those providing finance – with an overall movement from voluntary purchasers of credits toward bilateral national-level arrangements. Although this process may be reversed if REDD+ entered widely into compliance markets – bringing new firm-level demand, it seems to be the overall trend in REDD+ finance today. As highlighted in Chapter 7 bilateral national level arrangements may bring challenges to the very nature of REDD+ - as shown in Guyana's experience with Norway during which a reversion to previous forms of forestry policy support funded by ODA has occurred due to institutional difficulties in Guyana, Norway and the supporting international actors.

Understanding REDD+'s new institutional context, the consequences for design and how it may affect implementation is crucial for academics, policy-makers and donors alike. This thesis has assisted this understanding with its work on the importance of political influence on REDD+ policy design, the importance of understanding REDD+ from a general equilibrium perspective, the role that REDD+ has had in affecting property rights relating to the forest in Guyana, the importance of institutional strength and politics in shaping domestic REDD+ policy in Guyana and the role that

institutional capacity has played in shaping overall REDD+ policy in Guyana. These collective lessons stress the overall importance of understanding the institutional context for REDD+ - the nature and capacity of the existing institutions, the political context and the implications of implementing REDD+. They show the importance of moving away from a simple micro-economic understanding of REDD+ and the benefit from moving towards a New Institutional Economic perspective. Such a move helps to understand the benefit of developing new models and frameworks for REDD+ that take cognisance of the challenging institutional environment in which REDD+ operates. These advances will be especially crucial for developing REDD+ in even more complicated institutional environments such as Brazil, Indonesia and Congo which encounter differences in property rights, governance and politics at sub-national level as well as national level. Understanding that these different institutional contexts will affect how REDD+ is designed and implemented will assist in developing the different types of REDD+ that will be required for these different institutional contexts – assisting it to become more efficient, equitable and effective.

8.2.2 Importance of scale and its related impacts

REDD+'s evolution away from a CDM-style project based approach towards JNR brings a number of important lessons (Angelsen & McNeil, 2012). First of all it introduces, more heavily, the role of politics and politicians (discussed more in 8.2.4). Secondly it implies a much larger possible impact for REDD+ policy – with REDD+ policy potentially having effects across the wider economy and society. REDD+ could shift wages, prices and the distribution of inputs such as labour and forest between sectors. This could lead to dampened or heightened effects upon deforestation depending upon local market conditions. As shown in Chapter 4 rational governments will take these wider effects into account when deciding whether to engage in REDD+ policy, and how to distribute incentives and revenues between sectors and therefore so most international donors in predicting the effect of their finance upon deforestation levels.

The movement to JNR based approaches means that it is increasingly relevant to examine REDD+ policy through a general equilibrium rather than a partial equilibrium approach. REDD+'s impacts on economies become larger with the move to a national level due to the scale of finance offered. The fact that decisions are now taken by national governments who are likely to factor in the types of effects highlighted in the modelling in Chapter 4 has implications for the balance of policy that may emerge. Incentives may be passed through to sectors unequally in relation to their economic and political importance. Important sectors may be shielded from REDD+ policy by governments – reducing the impact that REDD+ finance may have on deforestation. On the other hand REDD+'s effects on economic variables such as wages and prices may lead to 'positive leakage' as reductions in forest-destructive activities causes increases in the returns from, and thus further growth in,

sustainable forest management. These impacts show the complications that may arise from the movement from project to JNR approaches. They show the need to understand the full dynamics of REDD+ finance when estimating its impacts, and its overall costs. These effects may increase (or decrease) the costs of REDD+ compared to estimates based on opportunity costs highlighting the unsuitability of opportunity cost estimates for situations where REDD+ finance may have wider effects across the economy. They show the importance of new models to estimate the costs of implementing REDD+, especially in those jurisdictions where it could have large economic effects. They also raise question marks over the proposed 'cheapness' of REDD+ as an abatement option compared to other carbon mitigation strategies.

The scale of impacts that national-level REDD+ frameworks may have compared to project-based approaches can be seen in the evidence from Guyana presented in this thesis. REDD+ may create changes in the overall policy environment that may have impacts on the deforestation landscape above and beyond formal policy. Initial evidence from Guyana, shown in Chapter 5, hints at an effect of the introduction of REDD+ upon the holding of property rights - by creating policy uncertainty and changing long-term revenue expectations REDD+ may affect investment environments, although this may not necessarily be detrimental to the aim of reducing deforestation. What it does imply is that it is necessary to understand the full dynamics of all the sectors that work in and around forests in potential REDD+ countries before deciding upon the most relevant policy tools such as whether direct compensation to miners, regulation or the provision of incentives to move toward more sustainable mining practices would be the right policy for REDD+. Guyana's experience of attempting to control the major driving of deforestation, small-scale mining, through increasing regulation, has yet to have had significant effects in reducing, or even stabilising deforestation, however given the insecure property rights environment, highlighted by the findings in Chapter 5, other policy options such as direct compensation may not have been available – perhaps however offering stronger incentives could have proved more effective given the lack of capacity within Guyana to implement regulations in the mining sector.

REDD+'s move from a project-based approach to a jurisdictional and national based approach raises a series of important questions including the potential impact of politics and adopting an economy-wide approach on the types of policy choice made with REDD+ finance and the unintended consequences of national-level policy framework on forest-related industries, for which this thesis has started to present some analysis, and others such as the attractiveness of jurisdictional REDD+ credits to private sectors funders, for which future research is required. What is clear however is

that the move from project-based to JNR requires further research for REDD+ to fulfil its potential as a climate change mitigation option.

8.2.3 Security of all types of property rights

Property rights have been highlighted in the literature as a crucial institution in relation to REDD+ policy design and implementation (see the discussion in Section 2.4 and Cotula & Mayers, 2009 and Palmer, 2010). This thesis has shown is that it is not just property rights regarding forest tenure that are important for REDD+ implementation, evidence indicates that creating secure and clear property rights to all aspects of property relating to REDD+ from property rights that give usage rights to elements of the forest, such as mineral rights, and to ownership of the finance that REDD+ recipient countries receive from donors is also crucial.

Chapter 5 analysed how REDD+ policy has affected the holding of forest-related property rights in Guyana, important as it also allows for an early assessment of how REDD+ is affecting long-term natural resource extraction investment decisions and operational patterns. The analysis found initial evidence for an impact of the introduction of the REDD+ in Guyana, and also from elections, upon the holding of mining property rights. The work highlights that the introduction of REDD+ seems to have impacted the holding of property rights, but that these property rights are also sensitive to changes in wider policy and political environments.

Such insecure property rights relating to deforesting activities can make unstable environments, meaning that the investment climate reacts rapidly to the increases in policy uncertainty that REDD+ can bring. This could lead to potential deforestation spikes as property rights holders exploit the forest before their rights can be rescinded. Secure property rights in this area would allow government to implement policy that can create longer-term incentives for these rights holders to change their activity and introduce more sustainable production processes. These findings also raise question marks about direct compensation of mineral rights holders – in the absence of secure rights it is hard to clearly define the rights holders that should be compensated. This highlights the need to establish secure rights as a pre-cursor to directly compensating rights holders such as via a payments for environmental services programme. In the absence of such secure rights alternative policy instruments, such as tightening and enforcing regulation, such as has been adopted in Guyana, might be more appropriate.

A further question arises if rights are given up in response to underlying policy uncertainty beyond REDD+: should countries be compensated for increased policy uncertainty in response to REDD+? A large amount of literature has emerged discussing relevant baselines for REDD+ (Angelsen, 2008b) and the questions of additionality for carbon offset activities more generally (Grubb et al., 2010;

Wara & Victor, 2008). The findings here raise further questions regarding baselines and additionality – should countries be rewarded if their deforestation (and therefore carbon emissions) falls in the face of policy uncertainty – or electoral instability? This raises thorny questions regarding additionality, and how best to measure REDD+ policy success. This issue is paralleled in the EU at the moment with the discussion of how to deal with the surplus in the EU ETS as a result of the industrial collapse (Taschini, Kollenberg, & Duffy, 2014), and is an issue for environmental policy more generally. Baselines should adapt to external circumstances that affect the wider economy – and business as usual deforestation and emissions levels. Deforestation reductions that occur as a result of REDD+ policy, direct or otherwise, however should be included. Differentiating the two however and creating dynamic baselines that adapt to all different circumstances may prove too complex.

The issue may however motivate the use of intermediate indicators rather than the outcome indicators of carbon emissions (Neuhoff, Cooper, Laing, Lester, & Rysanek, 2009) –allowing intermediate performance to be assessed and used as the result for payment. This may however water-down some of the pure incentives that REDD+ was designed to create with governments working to achieve the intermediate indicators, whether or not they actually lead to deforestation reductions or not.

Beyond property rights to the forest, clearly defining whether REDD+ is purchasing any assets, transferring any rights, and bestowing any duties upon sellers is crucial. REDD+ is meant to be a payment for an environmental service– with the ‘purchaser’ buying the right to carbon from the land-owner, or country, in exchange for a payment – with the purchaser given the right to the benefit stream from that carbon and the seller given the duty to ensure that the carbon is locked into the forest. However in its MOU with Guyana, there is no explicit transfer of carbon rights, and no clear duties for Guyana to maintain low deforestation long-term beyond the life of the agreement. Norway also retains important rights to the finance – how and when it is disbursed – above and beyond any payment for carbon rights. These retained rights by Norway may have contributed to the delays in finance that has held up implementation of REDD+ in Guyana. Clarifying these issues and creating clearer rights and responsibilities (removing confusion such as REDD+ finance being classified as ODA) would create a more robust REDD+ environment, helping to reduce the sorts of delays in implementation that Guyana has experienced. Creating a clearer structure where payment is conditional on some transfer of carbon rights would create extra clarity for both parties and would more clearly embody the type of REDD+ first envisaged.

The confusion over the extent to which the agreement between Guyana and Norway represented a pure payment for environmental services, and how much it was similar to previous forest policy

interventions, structured as ODA, was examined in Chapter 7. It raises questions as the nature of REDD+ itself, and the aims and objectives of the programme in general, and Norway's engagement in particular. Are the Norwegians purchasing a service from Guyana, or are they providing aid to establish a future REDD+ programme? At the moment the agreement is a combination of the two, with added conditionality regarding policy performance and Norway's tight control of disbursing expenditure hinting it is more toward the latter. This raises question marks as to whether publically funded national level REDD+ can be structured as a pure payment for environmental performance – raising questions for REDD+ as a whole and Norway's International Climate and Forest Initiative (NICFI). Moving away from implementation by the existing development institutions would help, as would avoiding classifying REDD+ finance as ODA as both Norway (Westholm, Ostwald, Henders, & Mattsson, 2011) and the UK (Stephenson, 2011) have done. Public sector finance can play an important role in proof of concept and building the institutions for REDD+ - but for REDD+ to emerge as a pure payment for environmental services mechanism, as it was first envisaged, it needs to transition away from previous forest policy and its related institutions. To attract private sector finance and/or demand for REDD+ credits it needs to be built on institutions suitable for the purpose. As highlighted in this thesis a reliance on existing development institutions are unlikely to be suitable.

This thesis has built on existing literature and shown the importance of security and clarity in a range of property rights relating to the forest for REDD+ design and implementation. Tenure is crucial, but as is usage rights to all aspects of the forest. Clarity over which rights and responsibilities are being transferred in exchange for finance would also assist – and would ensure that REDD+ maintains its ability to act to internalise the underlying market failure associated with deforestation creating appropriate incentives for forested countries to reduce their deforestation.

8.2.4 Politics will play a role

REDD+ has become, and is likely to increasingly become, a political phenomenon. As REDD+ moves to an increasingly national or jurisdictional-level mechanism it will increasingly fall into the hand of politicians, both in terms of the finance on offer, and in the policies implemented.

This can be clearly seen in the early-movers for REDD+ such as in the evidence presented in Chapter 6 for Guyana that shows that politics have played a huge role in pushing forward, shaping and at times hindering the progress of REDD+. Further as highlighted in Chapter 5 elections in Guyana have helped to shape the evolving deforestation environment, as well as influencing the choices of policies for REDD+.

Guyana has benefited from enormous political support for REDD+ from the very top – and this support has pushed the country to be a world-leader for REDD+. Although it is unlikely that Guyana’s innovative programme would not have emerged without this support at times this huge presidential interest in the scheme may have hindered development. A possible result of this support (along with other factors) has been the centralisation of REDD+ in Guyana, leading to a perception of exclusion from the policy process of a number of stakeholders. It may also have contributed to the delays that occurred in and around election times as the main driver behind the policy became involved in party activities. The issue that emerges for wider implementation of REDD+ is the potential trade-off between high political will and the centralisation that it may bring – allowing REDD+ to be driven forward rapidly, and a lack of inclusion of all relevant and affected actors due to the highly centralised process. If this trade-off can be validated from other REDD+ experiences it raises questions for models of governance for REDD+, such as MLG, that are predicated on inclusion. It also raises questions regarding a potential trade-off between speed of implementation and inclusion. Is there an acceptable level of exclusion for REDD+ to be implemented in an expedient manner? It also raises questions regarding the level of safeguards that should be imposed on REDD+. Understanding such trade-offs and building new models of governance for REDD+ that take into account these trade-offs is a useful avenue for future research. Proposed existing models such as MLG are useful frameworks to build upon – although, as highlighted in Chapter 6, they have been limited in their full application on the ground. Building new models to describe the governance modes for REDD+ that are emerging on the ground are an important first step – and could grow out of the types of empirical work presented in Chapter 6.

Elections have also shaped the deforestation landscape in Guyana, changing the way that property rights have been taken out and held. These findings indicate that understanding the political and electoral landscape in REDD+ countries is vital to both how REDD+ should be designed and implemented, and also in assessing the effects that REDD+ is actually having upon deforestation. These factors are likely to be even more important in large REDD+ countries that have both national and regional level politics and elections such as Indonesia and Brazil. This raises the spectre of politicking and the use of REDD+ as a political tool at both national and state level, and increases the chances that elections will disrupt the progress of REDD+ schemes.

In providing large scale financial transfers to governments REDD+ will inherently become a political animal. The move to JNR increases the involvement of national and regional governments and has the potential for REDD+ to become locally politically important. Politicians can bring benefits for REDD+ - helping to mainstream it across government, and as has been shown in Guyana place it at

the top of countries' priorities. However such political support may also restrict the full inclusiveness that is proposed for REDD+ to be efficient, equitable and effective – as politicians look to centralise power and decision-making. The differential costs and benefits that REDD+ may bring, to forest actors and wider society may also make it a possible election tool. There is some initial evidence from Guyana as to this effect. Elections may also affect the deforestation landscape on to which REDD+ is imposed. Understanding that forest use may fluctuate with political economy factors along with pure economic concerns can assist policy makers in understanding the evolution of deforestation – and potential policies to assist. Understanding that REDD+ can, and most likely will, be used for political ends will help international donors build in safeguards to minimise this impact – and also be realistic in their expectations for REDD+. Generally an inclusion of political concerns into models of REDD+ policy design (such as that undertaken in Chapter 4), and proposed models of governance for REDD+ such as MLG would be beneficial and would assist in designing and implementing REDD+ and allow for more realistic assessments of its potential and success.

8.2.5 Capacity is crucial

The governance of REDD+ is likely to be crucial in defining its efficiency, equity and effectiveness. In Chapters 6 and 7 this thesis has provided lessons from evaluative work of the REDD+ programme in Guyana that can inform the refinement of previously normative frameworks.

A key lesson from this evaluative work has been the lack of capacity on all sides to implement REDD+. This is not limited to the Guyanese government, but also in the civil society in Guyana, the government of Norway and also the multi-lateral development institutions. The lack of human and financial capacity in Guyana has hindered laudable efforts to create multi-actor governance, and wide consultative processes.

This lack of capacity is particularly highlighted in the experience of the Multi-Stakeholder Steering Committee (MSSC). A lack of capacity hindered the development of this institution into the strong actor envisaged by the Government of Guyana (GoG). It hindered its evolution into a full horizontal linkage required for the emergence of Multi-Level Governance (MLG). This lack of capacity in actors at all levels has been a major constraint behind the full emergence of an inclusive multi-level, multi-actor governance mode for REDD+ in Guyana. The capacity of actors to engage seems to be an important pre-condition for the emergence of MLG for REDD+. This raises question marks as to the suitability of MLG as a normative governance mode for REDD+ given the lack of capacity inherent in many REDD+ countries. Should MLG be thought of more as an aspirational model of governance for REDD+ - to which best practice can aspire, rather than a realistic short-term mode of governance? If

this is the case the question becomes how can REDD+ move towards such governance modes? What frameworks need to be put in place?

This raises the issue of how 'governance' conditional REDD+ should be. Should donors and funders add conditionality beyond environmental performance to ensure that at least REDD+ is on a path towards inclusive governance modes such as MLG? The experience of Guyana is that a certain level of 'governance conditionality' was inserted into the original agreement with Norway, but this level seems to have expanded as the agreement has evolved, and Norway has become perhaps more aware of the capacity constraints, and governance environment present in Guyana. The wider question for REDD+ is therefore to what extent governance conditionality should be built into REDD+ programmes, the extent to which such conditionality undermines the environmental-performance aspect of REDD+ and the extent to which such conditionality risks the speed of implementation of REDD+ and the purity of incentives that it is hypothesised to create.

The issue of capacity, governance and the nature of REDD+ can also be seen in Guyana's experience with safeguards. As shown in Chapter 7 Guyana's lack of capacity with regard to reporting on social, environmental and financial safeguards led to the establishment of a complicated and time-consuming process of approval for projects. However this same lack of capacity has meant that the project approval process has encountered delays – meaning that little REDD+ finance has hit the ground in Guyana. Safeguards thus bring a trade-off between ensuring inclusion, and wider social and environmental benefits, and delaying implementation. The question for REDD+ more generally is therefore what is the right balance between safeguards and speed of implementation? Again it raises the issue of conditionality – how much non-environmental conditionality should be included in REDD+ programmes? The experience from Guyana shows that high levels of conditionality – in the face of a lack of capacity in both the host country and the intermediary institutions such as the World Bank can cause severe delays in the implementation of REDD+.

Lack of capacity with regard to REDD+ implementation is not just in forested countries – donor countries may also suffer a lack of capacity with regard to both implementing REDD+ generally and also to the conditions in REDD+ countries. Norway's lack of capacity with respect to Guyana was a worry to some government ministries and may have added to confusion such as issues of ownership of finance, and speed of implementation. Understanding where the capacity constraints are in both donor countries and REDD+ recipient countries will be crucial in developing appropriate REDD+ governance models.

A lack of capacity in key actors has hindered the progress of REDD+ in Guyana, stunted the development of robust, inclusive institutions for the governance of REDD+ and has slowed the pace of implementation for REDD+ in the country. Designing projects that can strengthen the capacity of the relevant actors, both government and non-government, is crucial to establishing suitable conditions for REDD+. Building human and financial capacity in REDD+ countries, donors and intermediary institutions is thus an important first step in moving countries forward with REDD+ - and forms an important part of REDD+ readiness activities currently going on around the world. However this needs to be partnered with the availability of international finance to sustain these activities (witness the drop-off in consultation activity in Guyana due in part to a lack of international support discussed in Chapter 6) and a sense of what countries are becoming 'ready' for. Already in Guyana there is some sense of growing dis-satisfaction with the speed of implementation of REDD+ and perhaps a loss of will to engage in REDD+ in the future – despite the massive overall support for the concept. A balance between REDD+ readiness – building capacity in the relevant institutions for REDD+ - and actually providing finance for results is required to keep political will and interest high, and help ensure that REDD+ is delivered in as an effective, equitable and efficient manner as possible.

8.2.6 Need for REDD+ specific institutions and models

REDD+ is rapidly emerging into a unique international forest policy mechanism. It is larger than previous international interventions, and although it has at its heart a singular objective to reduce greenhouse gas emissions, it has grown to encompass wider environmental and developmental goals. Its offering of performance-related financial payments to not only private actors but also national and regional level governments is unique in the field of environmental policy. Despite this unique nature many of the institutions that are being used to implement the policy, such as the Guyana REDD+ Investment Fund (GRIF), are drawn straight from development policy experience. The categorisation of REDD+ finance as ODA in the Guyana-Norway agreement highlights the domination of the standard development paradigm in the implementation of REDD+. Chapter 7 highlights the potential inappropriateness of these institutions to provide the timely results-based finance that REDD+ is predicated upon.

The question arises however as to how else finance could be structured. REDD+ is categorised by a lack of private sector demand (Conservation International, 2013) and at the moment it seems that public sector finance is the only cash on the table (GCP, IPAM, FFI, & FI, 2014). The experience of Guyana shows the difficulty of public sector finance classified as ODA being used as environmental results-based finance. This implies that a new category of finance is required for public sector finance to truly offer all the incentives and domestic country ownership that REDD+ potentially

offers. Whether such new types of finance can be created through potential sources of REDD+ finance such as the Green Climate Fund (Schalatek, Nakhooda, & Bird, 2012) is an important topic of both academic and policy research. Designing new models of REDD+ finance is a crucial pathway for future research and learning from the experience of programmes such as Guyana's agreement with Norway is vital in this regard.

The lessons presented in this thesis highlight the benefits of taking an institutional perspective on REDD+. It has highlighted the importance of factoring in institutional conditions in understanding how REDD+ is being designed and implemented. It has also highlighted the unsuitability of many of the existing institutions and models being used for REDD+. There is a need to extend the third generational evaluative REDD+ research, such as the work conducted in this thesis, to construct new theoretical and practical institutional structures to implement effective, efficient and equitable REDD+. These structures need to be cognisant of, and work to overcome the previous five findings relating to the importance of institutional conditions to the implementation of REDD+.

8.2.7 REDD+ and extractive industries

The evidence presented in this thesis has highlighted the importance of understanding the economic and political landscape in which REDD+ policy is to be implemented, especially with regard to extractive industries. As highlighted in Chapters 3 and 6 mining has become economically vital for Guyana, politically important, and also contributing to the majority of deforestation. There thus seems on one level a disconnect between REDD+ and the continuation of mining in Guyana. In fact, however, there may be a number of policy levers available that could be used to move the mining sector towards a low-carbon pathway, whilst retaining the sector as a key engine of economic growth. To date there has been little emphasis in Guyana on specific policy to incentivise the mining sector to reduce its deforestation, beyond the implementation of existing regulation. The findings of this thesis however highlight a number of policy options that may be available that would allow mining to continue, but be incentivised to reduce its impact upon the forest, although there is large scope for more research in this area, following work such as Singh et al., (2013)

The importance of the interaction of mining property rights and REDD+ was highlighted in the empirical work in Chapter 5. Strengthening property rights regimes could benefit the move to an eco-friendly mining sector in a number of dimensions. By providing clear and secure property rights to mineral resources the types of conflict with other forest-using industries such as forestry, highlighted in Section 3.3 could be reduced, as could conflict between miners over disputed land. Reducing this conflict would allow for forestry and mining to work together to minimise the overall impact on the forest by, for example, allowing forestry to extract commercially valuable timber

before mining clear-cuts the forest. This could potentially reduce the overall impact on the forest. Creating longer term property rights to land containing minerals may also reduce the pressure on the forest. As highlighted in Chapter 5 currently claim owners only have a guaranteed right for one year – giving rise to the high level of taking out and giving up of rights. This means that there is little incentive for claim holders to invest and manage the land on their claim. They have no long-term incentive to sustain the ecosystem on their land – rather they have an incentive to extract whatever minerals are present as quickly as possible and then move on to the next area. Creating longer-term property rights – and a property right bundle that involved all the services from the land, whether that be mineral, forestry or agriculture - could create stronger incentives for longer-term management and rehabilitation of mined out areas.

The findings from Chapter 6 show the importance of inclusion of key actors in the policy process for REDD+ design. Guyana has made some progress to include the mining sector in the design of the LCDS, through the MSSC, albeit subsequent to the initial design of the strategy. A key limitation in the process, however, has been the lack of capacity in civil society as a whole, inclusive of the mining sector. Building the capacity of the mining sector, through organisations such as the Guyana Gold and Diamond Miners Association, to engage in REDD+ policy design could assist in the incorporation of suitable policy into the LCDS for helping the mining sector form a key part of Guyana's low carbon economy.

The empirical evidence from Chapter 5 shows the importance of commodity price in determining the holding of mining property rights in Guyana. This provides evidence of a potential tool that could be used to help incentivise the mining sector to improve its environmental performance. The current system of royalties is set out in Chapter 3 – and a small change to the structure could help incentivise changes within the sector. A system of differentiated taxes or royalties for mining operators who undertake improved environmental management, such as rehabilitation and reforestation could be introduced which would create strong price incentives for miners to improve environmental performance, where possible. Such a system would require improvements to the current monitoring framework – and extra capacity in key government institutions such as the Guyana Geology and Mines Commission. Utilising finance earned through the agreement with Norway could help to set-up a potentially self-financing system of incentives for small-scale miners. Such a mechanism could utilise the initial REDD+ finance from Norway to establish a policy model that allows complementarity between REDD+ and mining, but does not require large amounts of international finance.

8.2.8 REDD+ going forward?

This thesis raises several questions for the design and implementation of REDD+ going forward. By focusing on the institutional dimensions of REDD+ it helps to factor in some of the complexities faced by REDD+ on the ground.

An inclusion of institutional conditions into REDD+ models and analysis raises the question as to whether REDD+ can be as cheap, easy and effective as proposed by authors such as Stern, (2006). Seeing that REDD+ can affect whole economies and REDD+ policy design can be influenced by political and economic concerns may increase the overall expected costs of REDD+ - beyond initial opportunity cost estimates. This is not to say that it is not a potentially worthwhile and affordable mitigation option – however it should not be seen as a cheap ‘magic bullet’ solution. The experience from early REDD+ movers such as Guyana shows that it is not nearly as easy as first envisaged and issues such as lack of capacity in all actors concerned, a lack of suitable institutions and political and electoral issues can slow and hinder progress even in a country with support of the top politicians and the wider populace. Understanding that in some institutional environments, where political concerns are especially strong, and capacity is extremely weak, REDD+ may not be effective, can help target finance to areas where it can make the most difference – helping REDD+ to be most efficient.

REDD+ as originally envisaged was a mechanism designed to internalise the major externality associated with deforestation - carbon emissions - and in doing so correct one of the key market failures that leads to socially in-optimal levels of deforestation. By providing performance-related payments it creates a price signal for countries and land-owners – moving decision-making away from private costs and benefits, towards social costs and benefits. Due however to the range of institutional issues discussed in this thesis in practice REDD+ in Guyana has failed to fully play this role. Increased conditionality introduced by Norway, a dependence on previous development institutions and modes of governance, such as providing ODA finance has hindered REDD+ in Guyana embodying a pure payment for environmental services arrangement. Instead it has evolved to more closely mirror previous forest policy interventions. This reduces the incentives it creates for the host country to work to reduce deforestation, and the effectiveness and efficiency of the mechanism.

The question to answer in light of this experience is what types of institutions should be created to help REDD+ move towards its original intention? An avoidance of classifying REDD+ finance as ODA and a clearer transfer of rights and responsibilities would be beneficial. The experience from Guyana’s agreement with Norway also teaches us that it may be important to walk before you can run. The agreement set out to move straight away to performance-related payments perhaps before

there was the full understanding of the institutions required to do so. As the scheme evolves, and other schemes emerge across the world, these lessons are well learnt.

REDD+ was built out of basic microeconomic thought, environmental economic theory and experience from previous climate and forest policies. It built mostly on adopting models and frameworks from other areas. Now however, given that there is an increasing amount of experience and literature examining the mechanism there is much greater scope for REDD+ specific models and frameworks to be developed. Models have been proposed for the most effective forms governance of REDD+ - including the MLG model examined in this thesis. What has been lacking has been evaluative evidence of whether these models are practical for REDD+ and are emerging on the ground. The evidence from Guyana hints at the fact that these models, although useful as a starting point, perhaps need to be extended to include REDD+ specific concerns and institutional conditions, in order to provide a valuable normative framework for policy-makers to form REDD+ policy. Understanding, and building in, issues relating to capacity constraints, political interference (for good or for bad), electioneering and insecure property rights would strengthen such models and help to create understanding in policy-makers in the trade-offs inherent in the governance of REDD+ such as those between safeguards and speed of implementation, and political support and centralisation.

REDD+ has evolved extremely rapidly into a burgeoning policy across many developing countries. It has experienced booms and busts in interest, research and finance, but is likely to remain an important component of the global effort to limit climate change. Building in emerging lessons from evidence on the ground and from REDD+ specific theory is vital for policy makers to make REDD+ as effective, efficient and as equitable as possible. What this thesis has highlighted is that institutions play crucial roles in defining REDD+'s success and are vital to factor to into policy-making, design and implementation. Understanding that REDD+ is more complicated than merely rewarding opportunity cost to landowners will help REDD+ itself develop into an effective tool to reduce global greenhouse gas emissions and also help to keep expectations realistic as to what can be achieved in short time frames with limited resources.

8.3 Limitations

This thesis has undertaken a theoretical and empirical analysis of the impact of various institutional conditions upon REDD+ policy, focusing on a case-study of Guyana's national-level REDD+ programme. Although this work provides a series of contributions to the literature, and a set of theoretical and policy recommendations, there are a number of limitations to the work that should be understood when analysing its conclusions. The methodological limitations of each chapter have

been highlighted in their individual conclusions such as the limiting assumptions of the general equilibrium modelling undertaken in Chapter 4, the scarcity of data and specific econometric issues in Chapter 5 and the limited sample and rapid timeframe of the qualitative data used for Chapters 6 and 7. This section will focus on the limitations of the overall framework adopted to answer the research questions.

As described in Chapter 1 the term institutions is extremely broad, encompassing a wide variety of societal constructs. Many of these constructs will be relevant to the implementation of REDD+, affecting both design of policy and its effectiveness. This thesis however chooses to focus on just three constructs: property rights; governance; and the political process. This narrow focus limits the conclusions that can be drawn about the impact that institutional conditions as a whole could have upon REDD+. The choice of these three institutions allows for a focused approach, allowing each to be examined through different methodological lenses, in different situations relating to REDD+. Extending the analysis to cover other institutional conditions such as transaction costs would be a valuable addition to the literature, as would be the investigation of the institutions studied at different stages of the REDD+ policy process. Both however lie beyond the scope of this work, providing avenues for future research.

In Chapter 4 an analytical general equilibrium model is constructed to examine the decisions regarding REDD+ policy that national level policy-makers face with regard to sharing costs and benefits. Although the model provides valuable insights it should be clearly noted that it does not fully portray either the forest economy in developing countries, or the complexity of decision-making facing policy makers. Although in some ways the model builds in the types of trade-offs behind national-level REDD+ policy, such as those inherent in Guyana's LCDS, its findings are stylised and only indicative. Like any theory it abstracts heavily from reality and findings should be used with caution. It may indicate the types of factors that policy makers may include, and even the direction of policy that such factors may imply, but its limitations and implicit and explicit assumptions should be clearly noted before the conclusions of the model are applied. It also excludes the decision-making of actors such as international donors who are likely (and have) played a key role in influencing REDD+ policy. Although extending the model to include some of these elements is possible, and an interesting direction for future research, many of the assumptions will have to remain for tractability and, as with all theory, it should be used with caution.

The thesis has aimed to provide an evaluative account of the progress of REDD+ in Guyana through both quantitative and qualitative analysis. It is one of the first such evaluative works of national-level REDD+ for a very good reason –REDD+ is still at a very early stage and national level schemes are

only embryonic in countries like Brazil, Indonesia and Tanzania. The early stages of such schemes make them very hard to evaluate, and although Guyana is more advanced than other countries, similar limitations apply. The full policy frameworks of such schemes are only just starting to emerge and as such the full effects of these schemes are still to fully appear. This problem is made more difficult by the lack of available data. REDD+'s primary objective is to reduce the carbon emissions associated with deforestation and forest degradation, however in Guyana there is very little deforestation data available, making assessing the impact of the scheme on its primary objective extremely difficult. The data that Norway use to assess Guyana's environmental performance is only starting to emerge, and little of it is publically available. This has added to the complications that Norway has had in assessing Guyana's progress, and has also meant that independent validation of results has proved tricky. Norway use of intermediate indicators for components such as degradation attests to these troubles. Until more complete data becomes publically available full evaluative exercises relating to Guyana's LCDS are difficult.

Evaluating the scheme's success at affecting proxies, that may in turn affect deforestation, is one potential method, however even data for such proxies is generally unavailable in Guyana. This study uses one variable which is related to deforestation, mining property rights, to start this evaluation process. The relationship between the variable and deforestation however, is not completely clear meaning that although conclusions can be drawn between REDD+ policy and these property rights, concluding the effect of the policy upon deforestation using this technique is not possible. Although the data on mining property rights is the best available, and the first such data-set collected on this topic, it is relatively small limiting the power of its findings, and the type of econometric analysis that can be conducted. This limitation should be borne in mind when analysing the findings of Chapter 5.

The thesis as a whole has based its main empirical findings on a singular REDD+ programme in Guyana. Such an approach limits the generalizability of the findings of the study. Conditions such as the strength of political will and widespread support of the populace are found in Guyana but may generally not be present in other potential REDD+ countries. Guyana is also smaller in terms of population and economy, and more forested than the average REDD+ country. The main driver of deforestation in Guyana, small-scale mining, is also different from the main drivers in most other countries. All these factors make the lessons that emanate from Guyana and this thesis difficult to apply en masse to other REDD+ programmes. What is important however is whether institutional frameworks, and incentives created, are suitable for countries to be able to develop effective, equitable and efficient REDD+ policy. By focusing on the specific institutional conditions that have helped and hindered the development of REDD+ in Guyana lessons can be drawn regarding these

over-arching conditions, even if generalisation regarding specific policies, projects or initiatives is difficult.

This thesis has approached the question of how institutional conditions could affect REDD+ through a series of methodological lenses, theoretical, quantitative and qualitative. As highlighted in Chapter 1 this approach brings a series of benefits; however it also brings limitations in that each method is only applied to a single case, reducing generalizability. It also reduces verifiability across the thesis as a whole. Although the overall framework sets out to answer one specific research question, each methodology answers a slightly more nuanced version of the overall objective due to data and methodological constraints, implying that no one sub-question is answered using two different techniques, limiting the verification of the findings.

8.4 Directions for future research

The limitations of the thesis discussed in the Section above, the methodological limitations highlighted in each individual chapter and the key lessons from Section 8.2 help to outline an agenda for future research.

The analytical general equilibrium model presented in Chapter 4 provides the first such theoretical economy-wide model for REDD+. Extension of the model to include political lobbying formed a key part of this thesis, but provides just one possible addition to the basic model. The inclusion of more realistic modelling of the type of insecure property rights experienced in REDD+ countries, such as that presented by Engel, López, & Palmer, (2005), would provide a valuable contribution to the understanding of property rights in national-level REDD+ programmes. The model could also be extended to include external events that could shock REDD+ programmes such as changes in international commodity prices or levels of demand. An interesting extension would be the development of a dynamic component to more accurately model the changing of forested land between extractive and non-extractive sectors. All of these extensions would provide contributions to the theoretical modelling of REDD+ policy in a general equilibrium environment.

The quantitative work in Chapter 5 provides an early evaluation of the impacts of REDD+ policy on the deforestation landscape in Guyana. As more data becomes available there is considerable scope for future research in this area. The globally unique data-set on mining property rights can be extended over time, as data emerges, to help improve the robustness of the econometric findings. The collection of more accurate cost data would also allow for a more detailed model to be constructed and tested, allowing an understanding of how inputs, outputs and regulatory factors are affecting forest-related extractive industries in Guyana. The collection of a similar data set on

forestry concessions in Guyana may also provide an interesting study to compare the effect of REDD+ policy on different types of extractive industry. Crucially the extension of the model to include deforestation data, which is slowly becoming available (for example see Hansen et al., 2013), could help elicit the connection between mining and deforestation, and how this relationship may have changed over time in response to both electoral cycles and the introduction of REDD+ policy. Should more spatially explicit mining data become available, allowing the location of each claim to be known, there is wide scope for investigating the impact of spatial conditions, such as the location of roads and river courses, upon the deforestation environment in Guyana, and potentially how they may interact with institutional conditions such as elections and the introduction of REDD+ policy. Collecting similar property rights data for other REDD+ countries would also allow for the generalizability of some of the conclusions of this Chapter to be understood.

Chapters 6 and 7 provide key early evidence on the evolution of the governance environment for REDD+ in Guyana, at both a national and international level. There exists considerable scope to extend the analysis, both within Guyana and to other countries. This thesis provides a snap-shot of the governance of REDD+ in the period after the 2011 elections. Undertaking a follow-up study with the participants of the original study at a later date would provide a longitudinal data set that could investigate questions such as how REDD+ policy in Guyana has evolved over time in response to changes in both the national and international environment. Undertaking a repeat study in a time period away from election events may help to clarify the full effect that such events has had on the formation of REDD+ policy in Guyana. Extending the size of the study group to include additional participants in remote, interior locations that were not logistically possible to study in this work, would allow for capturing of different governance perspectives beyond the range of stakeholders questioned in this thesis. The data-set collected for the Chapters also has potential for further analysis. The database of media articles related to REDD+ in Guyana is a rich and unique data source for Guyana and could be used to undertake further studies such as the type of media analysis relating to REDD+ conducted by CIFOR in Brazil and Indonesia (Cronin & Santoso, 2010; P. H. May et al., 2011).

The work undertaken in Chapters 6 and 7 provides a framework that could be adopted to provide similar work in other REDD+ countries. Repeating the study in similar countries such as Cameroon, Gabon or Cambodia could help both the generalizability of the work, and also help to highlight regional-specific institutional issues that may only affect particular areas of the globe. This would help pin-point the key issues at a global, regional and national level. Analysing whether MLG has emerged more or less strongly in other REDD+ countries could provide valuable lessons on whether

such a governance framework is realistic for REDD+, and what constraints exist internationally and which that are country-specific.

The three strands of work undertaken in this thesis, theoretical, quantitative and qualitative all offer considerable scope for extension and refinement. They open different potential strands of REDD+-related literature that could provide an overall contribution to the development, design, implementation and evaluation of REDD+ policy both in Guyana and globally.

8.5 Conclusions

This thesis set out to investigate the importance and the effect that a set of institutional conditions could have, and is having on REDD+. REDD+ emerged as a simple economic policy, focusing on compensating forest-owners for keeping their forest standing rather than undertaking economically beneficial forest-destructive activities. As REDD+ has mushroomed however, it has evolved into a national-level programme drawing in government and non-government actors, and making the role of institutions even more important. By applying an NIE perspective and a multimethodological framework this thesis has provided a valuable lesson that understanding these institutions will be vital for creating effective, efficient and equitable REDD+. It is at the cutting edge of research for REDD+ drawing evidence from the world's most advanced national level REDD+ programme in Guyana. Caution must be taken when generalising all of its lessons to REDD+ in every situation given the single case study approach, the relatively lack of available data and the limiting assumptions made throughout. The thesis does provide however crucial lessons for academics and policy-makers alike regarding the importance of recognising the role that property rights, governance, politics and capacity are all likely to play in shaping REDD+.

Bibliography

- Abraham, D., Ali, M., Beharry, S., Bulkan, J., Chung Tiam Fook, T., Daljeet, A., ... Yhann, D. (2011). *Open letter to Minister Erik Solheim, Minister for Environment and International Development, Norway, 24 March 2011.*
- Adeney, J. M., Christensen, N. L., & Pimm, S. L. (2009). Reserves protect against deforestation fires in the Amazon. *PloS One*, 4(4), e5014.
- Alder, D., & Kuijk, M. Van. (2009). *A baseline assessment of forest carbon in Guyana*. Prepared for Guyana Forestry Commission.
- Alexander, E., Singh, D., Killeen, T., Steininger, M., Godoy, F., Famolare, L., ... Wielaand, N. (2009). *Biodiversity Mainstreaming through Avoided Deforestation Guyana Case Study: (Bmad-Gcs) Project (Gy-T1058) Technical Document.*
- Allan, T., & Baylis, K. (2006). Who Owns Carbon? Property Rights Issues in a Market for Greenhouse Gases. *Current Agriculture, Food and Resource Issues*, 7, 104–112.
- Almeida, S., Salomao, A., & Wertz-kanounnikoff, S. (2012). *O contexto de REDD+ em Mozambique: Causas, actores e institutiocoes*. CIFOR.
- Alston, L., Libecap, G., & Mueller, B. (1999). *Titles, Conflict and Land Use: The Development of Property Rights and Land Reform on the Brazilian Amazon Frontier*. Ann Arbor: University of Michigan Press.
- Amacher, G. S. (2006). Corruption: A challenge for economists interested in forest policy design. *Journal of Forest Economics*, 12(2), 85–89.
- Andam, K. S., Ferraro, P. J., Pfaff, A., Sanchez-Azofeifa, G. A., & Robalino, J. A. (2008). Measuring the effectiveness of protected area networks in reducing deforestation. *Proceedings of the National Academy of Sciences of the United States of America*, 105(42), 16089–94.
- Anderson, P. (2011). *Free, Prior, and Informed Consent in REDD+: Principles and Approaches for Policy and Project Development*. RECOFTC.
- Andonova, L. B., & Mitchell, R. B. (2010). The Rescaling of Global Environmental Politics. *Annual Review of Environment and Resources*, 35(1), 255–282.
- Angelsen, A. (1999). Agricultural expansion and deforestation: modelling the impact of population, market forces and property rights. *Journal of Development Economics*, 58(1), 185–218.
- Angelsen, A. (2008a). *Moving Ahead with REDD: Issues, Options and Implications*. Options. Bogor, Indonesia: CIFOR.
- Angelsen, A. (2008b). REDD models and baselines. *International Forestry Review*, 10(3), 465–475.
- Angelsen, A. (2009). Policy Options to Reduce Deforestation. In A. Angelsen (Ed.), *Realising REDD+: National strategy and policy options* (pp. 125–138). Bogor, Indonesia: CIFOR.

- Angelsen, A. (2010). Policies for reduced deforestation and their impact on agricultural production. *PNAS*, *107*(46), 19639–19644.
- Angelsen, A., Brockhaus, M., Kanninen, M., Sills, E. O., Sunderlin, W., & Wertz-Kanounnikoff, S. (2009). *Realising REDD+: National strategy and policy options. Africa*. CIFOR.
- Angelsen, A., Brockhaus, M., Sunderlin, W. D., & Verchot, L. V. (2012a). *Analysing REDD+ Challenges and choices*. CIFOR.
- Angelsen, A., Brockhaus, M., Sunderlin, W., & Verchot, L. V. (2012b). Introduction. In *Analysing REDD+ Challenges and Choices* (pp. 1–12). Bogor, Indonesia: CIFOR.
- Angelsen, A., & McNeil, D. (2012). The evolution of REDD+. In A. Angelsen, M. Brockhaus, W. D. Sunderlin, & L. V. Verchot (Eds.), *Analysing REDD+ Challenges and Choices*. Bogor, Indonesia: CIFOR.
- Angelsen, A., Streck, C., Peskett, L., Brown, J., & Luttrell, C. (2008). *What is the right scale for REDD ? The implications of national , subnational and nested approaches*. CIFOR infobriefs.
- Araujo, C., Bonjean, C. A., Combes, J.-L., Combes Motel, P., & Reis, E. J. (2009). Property rights and deforestation in the Brazilian Amazon. *Ecological Economics*, *68*(8-9), 2461–2468.
- Arturo Sanchez-Azfeifa, G., Daily, G., Pfaff, A., & Busch, C. (2003). Integrity and isolation of Costa Rica's national parks and biological reserves: examining the dynamics of land-cover change. *Biological Conservation*, *109*(1), 123–135.
- Aryee, B. N. A., Ntibery, B. K., & Atorkui, E. (2003). Trends in the small-scale mining of precious minerals in Ghana: a perspective on its environmental impact. *Journal of Cleaner Production*, *11*(2), 131–140.
- Atkeson, A. (1991). International Lending with Moral Hazard and Risk of Repudiation. *Econometrica*, *59*(4), 1069–1089.
- Atmadja, S., & Verchot, L. (2011). A review of the state of research, policies and strategies in addressing leakage from reducing emissions from deforestation and forest degradation (REDD+). *Mitigation and Adaptation Strategies for Global Change*, *17*(3), 311–336. Retrieved from <http://link.springer.com/10.1007/s11027-011-9328-4>
- Axford, B., Browning, Gary, K., Huggins, R., Rosamond, B., Grant, A., & Turner, J. (2002). *Politics: An Introduction*. London: Routledge.
- Bache, I., & Flinders, M. (2004). *Multi-level Governance* (pp. 1–19). Oxford, UK: Oxford University Press. Retrieved from <http://www.oxfordscholarship.com/view/10.1093/0199259259.001.0001/acprof-9780199259250>
- Bade, H. (2012). *Aid in a rush: A case study of the Norway-Guyana REDD+ partnership*. University of Oslo.
- Baker, J. (1997). *Poverty Reduction and Human Development in the Caribbean: A Cross-Country Study* (No. 366). World Bank.

- Baldry, J. C. (1980). *General Equilibrium Analysis*. London: Croom Helm.
- Ballinger, G. A. (2004). Using Generalized Estimating Equations for Longitudinal Data Analysis. *Organizational Research Methods*, 7(2), 127–150.
- Barbier, E. B. (2004a). Agricultural Expansion, Resource Booms and Growth in Latin America: Implications for Long-run Economic Development. *World Development*, 32(1), 137–157.
- Barbier, E. B. (2004b). Explaining Agricultural Land Expansion and Deforestation in Developing Countries. *American Journal of Agricultural Economics*, 86(5), 1347–1353.
- Barbier, E. B., & Burgess, J. C. (1996). Economic analysis of deforestation in Mexico. *Environment and Development Economics*, 1, 203–239.
- Barbier, E. B., Burgess, J. C., & Grainger, A. (2010). The forest transition: Towards a more comprehensive theoretical framework☆. *Land Use Policy*, 27(2), 98–107. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0264837709000131>
- Barbier, E. B., & Tesfaw, A. T. (2012). Can REDD+ Save the Forest? The Role of Payments and Tenure. *Forests*, 3(4), 881–895.
- Barreto, P., Souza, C., Nogureon, R., Anderson, A., Salomao, R., & Wiles, J. (2006). *Human Pressure on the Brazilian Amazon Forest*. WRI.
- Beck, N. (2001). Time-series-cross-section data. *Statistica Neerlandica*, 55(2), 111–133.
- Beck, N., & Katz, J. N. (1995). What to do (and not to do) with Time-Series Cross-Section Data. *The American Political Science Review*, 89(3), 634–647.
- Beck, N., & Katz, J. N. (1996). Nuisance vs. Substance: Specifying and Estimating Time-Series-Cross-Section Models. *Political Analysis*, 6(1), 1–36.
- Becker, G. S. (1983). A Theory of Competition Among Pressure Groups for Political Influence. *The Quarterly Journal of Economics*, 98(3), 371–400.
- Bernheim, B. D., & Whinston, M. D. (1986). Menu Auctions, Resource Allocation and Economic Influence. *The Quarterly Journal of Economics*, 101(1), 1–32.
- Besley, T. (1995). Property Rights and Investment Incentives : Theory and Evidence from Ghana. *Journal of Political Economy*, 103(5), 903–937.
- Betsill, M. M., & Bulkeley, H. (2006). Cities and the Multilevel Governance of Global Climate Change. *Global Governance*, 12(2), 141–159.
- Bhappu, R., & Guzman, J. (1995). Mineral Investment Decision Making: A Study of Mining Company Practices. *Engineering and Mining Journal*, (July), 36–38.
- Bhattarai, M., & Hammig, M. (2001). Institutions and the Environmental Kuznets Curve for Deforestation: A Crosscountry Analysis for Latin America, Africa and Asia. *World Development*, 29(6), 995–1010.

- Biodiversity Indicators Partnership. (2010). *Coverage of Protected Areas*.
- Blaser, J., & Robledo, C. (2007). *Initial Analysis on the Mitigation Potential in the Forestry Sector*. UNFCCC Secretariat.
- Bohn, H., & Deacon, R. T. (2000). Ownership Risk , Investment , and the Use of Natural Resources. *The American Economic Review*, 90(3), 526–549.
- Bonham, C. A., Sacayon, E., & Tzi, E. (2008). Protecting imperiled “paper parks”: potential lessons from the Sierra Chinajá, Guatemala. *Biodiversity and Conservation*, 17(7), 1581–1593.
- Boone, C. (2009). Electoral Populism Where Property Rights Are Weak: Land Politics in Contemporary Sub-Saharan Africa. *Comparative Politics*, 41(2), 183–201.
- Borges, A. (1986). *Applied General Equilibrium Models: An Assessment of their Usefulness for Policy Analysis*. OECD.
- Bosello, F., Eboli, F., Parrado, R., & Rosa, R. (2010). *REDD in the Carbon Market: A General Equilibrium Analysis*. FEEM Sustainable Development Series.
- BP. (2013). *BP Statistical Review of World Energy*.
- Brandt, P. T., & Williams, J. T. (1999). Time Series Models for Event Count Data.
- Brandt, P. T., & Williams, J. T. (2001). A Linear Poisson Autoregressive Model : The Poisson AR (p) Model. *Political Analysis*, 9(2), 164–184.
- Brandt, P. T., Williams, J. T., Fordham, B. O., & Pollins, B. (2000). Dynamic Modelling for Persistent Event-Count Time Series. *American Journal of Political Science*, 44(4), 823–843.
- Breitung, J. (2000). The Local Power of Some Unit Root Tests for Panel Data. In B. H. Baltagi (Ed.), *Advances in Econometrics, Volume 15: Nonstationary Panels, Panel Cointegration and Dynamic Panels* (pp. 161–178). Amsterdam: JAY Press.
- Breusch, T. S., & Pagan, A. R. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica*, 47(5), 1287–1294.
- Brockhaus, M., & Angelsen, A. (2012). Seeing REDD+ through 4Is: A political economy framework. In A. Angelsen, M. Brockhaus, W. D. Sunderlin, & L. V Verchot (Eds.), *Analysing REDD+ Challenges and Choices*. Bogor, Indonesia: CIFOR.
- Bromley, D. W. (1991). *Environment and Economy: Property Rights and Public Policy*. Oxford, UK: Blackwell.
- Bruner, A. G., Gullison, R. E., Rice, R. E., & da Fonseca, G. A. (2001). Effectiveness of parks in protecting tropical biodiversity. *Science (New York, N.Y.)*, 291(5501), 125–8.
- Bryceson, D. F., & Jønsson, J. B. (2010). Gold Digging Careers in Rural East Africa: Small-Scale Miners’ Livelihood Choices. *World Development*, 38(3), 379–392.

- Bulkan, J. (2013). The Struggle for Recognition of the Indigenous Voice: Amerindians in Guyanese Politics. *The Round Table*, 102(4), 367–380. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/00358533.2013.795009>
- Bulkan, J., & Palmer, J. (2008). Breaking the rings of forest corruption : Steps towards better forest governance. *Forests, Trees and Livelihoods*, 18, 103–131.
- Bulkeley, H., & Betsill, M. M. (2005). Rethinking Sustainable Cities : Multilevel Governance and the ' Urban ' Politics of Climate Change. *Environmental Politics*, 14(1), 42–63.
- Bulte, E., & Engel, S. (2006). Conservation of Tropical Forests: Addressing Market Failure. In R. Lopez & M. Toman (Eds.), *Economic Development and Environmental Sustainability: New Policy Options*. Oxford: Oxford University Press.
- Burchell, G., Gordon, C., & Miller, P. (1991). *The Foucault Effect: Studies in Governmentality*. Chicago: University of Chicago Press.
- Burgess, R., Hansen, M., Olken, B., Potapov, P., & Sieber, S. (2010). *The Political Economy of Deforestation in the Tropics. Policy*. London School of Economics.
- Bushley, B., & Pokharel, B. (2010). *From watershed to REDD : Multilevel governance of PES schemes in Nepal*. UN-REDD.
- Cadman, T., & Maraseni, T. (2011). The Governance of Climate Change: Evaluating the Governance Quality and Legitimacy of the United Nations' REDD-plus Programme. *The International Journal of Climate Change:Impacts and Responses*, 2(3), 103–124.
- Capitol News. (2013, June 13). Price for gold continues to slide, downward, Guyana Gold Board still to cash more than 60 thousand ounces. Retrieved from <http://www.capitolnewsline.com/2013/06/13/price-for-gold-continues-to-slide-downward-guyana-gold-board-still-to-cash-more-than-60-thousand-ounces-13th-jun-2013/>
- Caporaso, J. a. (1996). The European Union and Forms of State: Westphalian, Regulatory or Post-Modern? *JCMS: Journal of Common Market Studies*, 34(1), 29–52.
- Carino, J. (2005). Indigenous Peoples' Right to Free Prior, Informed Consent: Reflections on Concepts and Practice. *Arizona Journal of International and Comparative Law*, 22(1), 19–39.
- Cattaneo, A. (2010). Incentives to Reduce Emissions from Deforestation: A Stock-Flow Approach with Target Reductions. In V. Bosetti & R. Lubowski (Eds.), *Deforestation and Climate Change: Reducing Carbon Emissions from Deforestation and Forest Degradation*. Cheltenham, UK: Edward Elgar Publishing Limited.
- Cedergren, J. (2009). *Measurement and Reporting of Forest Guyana : Carbon in Guyana Preparing for REDD Implementation*. UN-REDD Programme.
- Chagas, T. (2010). *Forest Carbon Rights in Brazil*. REDDnet Case Study.
- Charmaz, K. (2006). *Grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, California: SAGE Publications.

- Chege, M. (2008). Kenya: Back from the brink? *Journal of Democracy*, 19(4), 125–139.
- Chene, M. (2010). *Overview of corruption and anti-corruption in Guyana, with reference to natural resource sectors*. U4: Anti-Corruption Resource Centre.
- Chhatre, A., & Agrawal, A. (2008). Forest commons and local enforcement. *Proceedings of the National Academy of Sciences of the United States of America*, 105(36), 13286–91.
- Chomitz, K. M. C., & Gray, D. A. (1996). Roads , Land Use , and Deforestation : A Spatial Model Applied to Belize. *The World Bank Economic Review*, 10(3), 487–512.
- Chomitz, K. M. C., & Thomas, T. S. T. (2003). Determinants of Land Use in Amazonia: A Fine-Scale Spatial Analysis. *Agricultural Economics*, 85(November), 1016–1028.
- Ciriacy-Wantrup, S., & Bishop, R. (1975). “Common Property” as a Concept in Natural Resources Policy. *Natural Resources Journal*, 15.
- Clark, E. (1997). Valuing political risk. *Journal of International Money and Finance*, 16(3), 477–490.
- Clarke, G. (2006). *Law Compliance and Prevention and Control of Illegal Activities in the Forest Sector in Guyana*. Current. Washington D.C.
- Clements, T. (2010). Reduced Expectations: the political and institutional challenges of REDD+. *Oryx*, 44(03), 309–310. Retrieved from http://www.journals.cambridge.org/abstract_S0030605310000712
- CNN. (2001). Uncertainty hangs over elections in Guyana, pp. 3–4.
- Coase, R. (1960). The Problem of Social Cost. *Journal of Law and Economics*, 3, 1–44.
- Coase, R. (1992). The Institutional Structure of Production. *The American Economic Review*, 82(4), 713–719.
- Coase, R. (1998). The New Institutional Economics. *The American Economic Review*, 88(2).
- Combes Motel, P., Pirard, R., & Combes, J.-L. (2009). A methodology to estimate impacts of domestic policies on deforestation: Compensated Successful Efforts for “avoided deforestation” (REDD). *Ecological Economics*, 68(3), 680–691.
- Commonwealth Secretariat. (2011). *Guyana National and Regional Elections: Report of the Commonwealth Secretariat*. Commonwealth Secretariat.
- Conference of the Parties. (2011). Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to December 2010.
- Conservation International. (2008). *The Upper Essequibo Conservation Concession*. Conservation International.
- Conservation International. (2013). *REDD+ Market: Sending out an SOS*.

- Cotula, L., & Mayers, J. (2009). *Tenure in REDD - Start-point or afterthought? Russell The Journal Of The Bertrand Russell Archives*. London, UK: Natural Resources Issue No. 15 International Institute for Environment and Development.
- Council on Ethics: The Government Pension Fund Global. (2010). *To the Ministry of Finance Recommendation of 22 February 2010 . Management*.
- Creswell, J. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approach*. London: SAGE Publications.
- Cronin, T., & Santoso, L. (2010). *REDD + politics in the media A case study from Indonesia*. CIFOR.
- Cropper, M., Puri, J., & Griffiths, C. (2001). Predicting the Location of Deforestation: The Role of Roads and Protected Areas in North Thailand. *Land Economics*, 77(2), 172.
- Cui, J. (2007). QIC program and model selection in GEE analyses. *The Stata Journal*, 7(2), 209–220.
- Culas, R. (2007). Deforestation and the environmental Kuznets curve: An institutional perspective. *Ecological Economics*, 61(2-3), 429–437.
- Curran, L. M., Trigg, S. N., McDonald, A. K., Astiani, D., Hardiono, Y. M., Siregar, P., ... Kasischke, E. (2004). Lowland Forest Loss in Protected Areas of Indonesian Borneo. *Science*, 303(5660), 1000–1003.
- Da Fonseca, G. a B., Rodriguez, C. M., Midgley, G., Busch, J., Hannah, L., & Mittermeier, R. a. (2007). No forest left behind. *PLoS Biology*, 5(8), e216. Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1945070&tool=pmcentrez&rendertype=abstract>
- Dalgety, W. T. (2010). Placer Mining and the Guyana Environment. In *The 4th International Conference on Appropriate Technology*. Accra, Ghana.
- Damania, R. (2002). Environmental controls with corrupt bureaucrats. *Environment and Development Economics*, 7(03), 407–427.
- Daviet, F. (2009). *Beyond Carbon Financing : The Role of Sustainable Development Policies and Measures in REDD* (pp. 1–16).
- De Soto, H. (1989). *The Other Path: The Economic Answer to Terrorism*. New York: Basic Books.
- Deacon, R. T. (1995). Assessing the Relationship between Government Policy and Deforestation. *Journal of Environmental Economics and Management*, 28, 1–18.
- Deacon, R. T. (1999). Deforestation and Ownership: Evidence from Historical Accounts and Contemporary Data. *Land Economics*, 75(3), 341–359.
- DeFries, R. S., Rudel, T., Uriarte, M., & Hansen, M. (2010). Deforestation driven by urban population growth and agricultural trade in the twenty-first century. *Nature Geoscience*, 3(3), 178–181.
- Demerara Waves. (2011, March 30). LCDS body raps Norway \$\$\$ critics. *Demerara Waves*.

- Denzin, N. K. (1978). *Sociological methods: A source book* (2nd ed.). New York: McGraw-Hill.
- Di Gregorio, M., Brockhaus, M., Cronin, T., & Muharrom, E. (2012). Politics and power in national REDD+ policy processes. In A. Angelsen, M. Brockhaus, W. Sunderlin, & L. Verchot (Eds.), *Analysing REDD+ Challenges and Choices*. Bogor, Indonesia: CIFOR.
- Didia, D. (1997). Democracy, political instability and tropical deforestation. *Global Environmental Change*, 7(1), 63–76.
- Diggle, P. J., Heagerty, P., Liang, K.-Y., & Zeger, S. L. (2002). *Analysis of longitudinal data* (2nd ed.). Oxford: Oxford University Press.
- Diggle, P. J., Liang, K. Y., & Zeger, S. L. (1994). *Analysis of Longitudinal Data*. Oxford, UK: Oxford Science.
- Dinda, S. (2004). Environmental Kuznets Curve Hypothesis: A Survey. *Ecological Economics*, 49(4), 431–455.
- Djelic, M.-L. (2010). Institutional Perspectives - Working Towards Coherence or Irreconcilable Diversity. In *The Oxford Handbook of Comparative Institutional Analysis*. Oxford, UK: Oxford University Press.
- Dkamela, G. P. (2011). *The context of REDD+ in Cameroon : drivers, agents and institutions*. CIFOR.
- Doherty, E., & Schroeder, H. (2011). Forest Tenure and Multi-level Governance in Avoiding Deforestation under REDD. *Global Environmental Politics*, 11(4), 66–88.
- Donovan, R. Z., Clarke, G., & Sloth, C. (2011). *Verification Of Progress Related To Enabling Activities For The Guyana-Norway REDD + Agreement*. Forestry. Rainforest Alliance.
- Donovan, R. Z., Moore, K., & Stern, M. (2012). *Verification Of Progress Related To Indicators For The Guyana-Norway REDD + Agreement 2nd Verification audit covering the period October 1, 2010 - June 30, 2012*. Rainforest Alliance.
- Dooley, K., Griffiths, T., Martone, F., & Ozinga, S. (2011). *Smoke and mirrors: A critical assessment of the Forest Carbon Partnership Facility*. *Nature* (Vol. 496, pp. 269–70). FERN and Forest Peoples Programme. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/24471185>
- Dow, J., Radzik, V., & Macqueen, D. (2009). *Independent Review of the Stakeholder Consultation Process for Guyana's Low Carbon Development Strategy (LCDS)*.
- Earthtrends. (2003). *Forests, Grasslands, and Drylands-- Guyana*.
- Eckert, S., & McKellar, R. (2008). Securing Rights to Carbon Sequestration : The Western Australian Experience. *Sustainable Development Law and Policy*, 8(2), 30–33.
- Ecosystem Marketplace. (2012). *Leveraging the Landscape State of the Forest Carbon Markets 2012*.
- Eerola, E. (2004). Forest Conservation – Too Much or Too Little? A Political Economy Model. *Environmental and Resource Economics*, 27(4), 391–407.

- Ehrhardt-Martinez, K., Crenshaw, E. M., & Jenkins, J. C. (2002). Deforestation and the Environmental Kuznets Curve: A Cross-National Investigation of Intervening Mechanisms. *Social Science Quarterly*, 83(1), 226–243.
- Electoral Assistance Bureau. (2007). *EAB Final Report: General and Regional Elections, 28th August 2006, Co-operative Republic of Guyana, 7 March*. Georgetown: Electoral Assistance Bureau.
- Electoral Assistance Bureau. (2011). *Report on the Conduct of Polls: 2011 General and Regional Elections, Co-Operative Republic of Guyana*. Georgetown: Electoral Assistance Bureau.
- Eliasch, J. (2008). *Climate Change: Financing Global Forests: The Eliasch Review*. London, UK: Earthscan.
- Enderlein, H., Walti, S., & Zurn, M. (2010). *Handbook on Multi-level Governance*. (H. Enderlein, S. Walti, & M. Zurn, Eds.). Cheltenham, UK: Edward Elgar Publishing Limited.
- Engel, S., López, R., & Palmer, C. (2005). Community–Industry Contracting over Natural Resource use in a Context of Weak Property Rights: The Case of Indonesia. *Environmental & Resource Economics*, 33(1), 73–93.
- Engel, S., Pagiola, S., & Wunder, S. (2008). Designing payments for environmental services in theory and practice: An overview of the issues. *Ecological Economics*, 65(4), 663–674.
- Fanning, L., Mahon, R., McConney, P., Angulo, J., Burrows, F., Chakalall, B., ... Toro, C. (2007). A large marine ecosystem governance framework. *Marine Policy*, 31(4), 434–443.
- FAO. (1989). *Basic principles of the TFAP*. Rome: FAO.
- FAO. (1991). *1990 Global Forest Resources Assessment*. Rome: FAO.
- FAO. (2005). *Global Forest Resources Assessment 2005. Organization*. Food and Agriculture Organization of the United Nations.
- FAO. (2010a). *Global Forest Resources Assessment 2010*. FAO, Rome.
- FAO. (2010b). *Global Forest Resources Assessment: Country Reports Guyana*. Food and Agriculture Organization of the United Nations.
- Fearnside, P. M. (2001). Saving tropical forests as a global warming countermeasure: an issue that divides the environmental movement. *Ecological Economics*, 39(2), 167–184.
- Fearnside, P. M. (2005). Deforestation in Brazilian Amazonia: History, Rates, and Consequences. *Conservation Biology*, 19(3), 680–688.
- Ferraro, P. J., & Pattanayak, S. K. (2006). Money for nothing? A call for empirical evaluation of biodiversity conservation investments. *PLoS Biology*, 4(4), e105.
- Ferraro, P. J., & Simpson, R. D. (2002). The Cost-Effectiveness of Conservation Payments. *Land Economics*, 78(3), 339–353.

- Fitzherbert, E. B., Struebig, M. J., Morel, A., Danielsen, F., Brühl, C. a, Donald, P. F., & Phalan, B. (2008). How will oil palm expansion affect biodiversity? *Trends in Ecology & Evolution*, 23(10), 538–45.
- Forsyth, T. (2009). Multilevel, multiactor governance in REDD+: Participation, integration and coordination. In A. Angelsen (Ed.), *Realising REDD+: National strategy and policy options* (pp. 113–122). Bogor, Indonesia: CIFOR.
- Fredriksson, P. G. (1997). The Political Economy of Pollution Taxes in a Small Open Economy. *Journal of Environmental Economics and Management*, 33(1), 44–58.
- Freudenthal, E., Nash, S., & Kenrick, J. (2011). *REDD and Rights in Cameroon: A review of the treatment of indigenous peoples and local communities in policies and projects*. Forest Peoples Programme.
- Füss, R., & Bechtel, M. M. (2007). Partisan politics and stock market performance: The effect of expected government partisanship on stock returns in the 2002 German federal election. *Public Choice*, 135(3-4), 131–150.
- Gafar, J. (2003). *Guyana: From State Control to Free Markets*. New York: Nova Science Publishers.
- Gardner, E. (2012). Peru battles the golden curse of Madre de Dios. *Nature*, 486(7403), 306–7.
- Gauvin, C., Uchida, E., Rozelle, S., Xu, J., & Zhan, J. (2010). Cost-effectiveness of payments for ecosystem services with dual goals of environment and poverty alleviation. *Environmental Management*, 45(3), 488–501.
- Gaveau, D. L. A., Wich, S., Epting, J., Juhn, D., Kanninen, M., & Leader-Williams, N. (2009). The future of forests and orangutans (*Pongo abelii*) in Sumatra: predicting impacts of oil palm plantations, road construction, and mechanisms for reducing carbon emissions from deforestation. *Environmental Research Letters*, 4(3), 034013.
- GCP, IPAM, FFI, & FI, U. (2014). *Stimulating Interim Demand for REDD + Emission Reductions : The Need for a Strategic Intervention from 2015 to 2020*. Global Canopy Programme, Oxford, UK; the Amazon Environmental Research Institute, Brasillia, Brazil; Fauna and Flora International, Cambridge, UK; and UNEP Finance Initiative, Geneva, Switzerland.
- Geiger, L. (1989). Expropriation and External Capital Flows. *Economic Development and Cultural Change*, 37(3), 535–556.
- Geist, H. J., & Lambin, E. F. (2001). *What Drives Tropical Deforestation? Biology letters* (Vol. 5).
- GINA. (2008, May 20). Guyana ready to be a model for the world in devising partnerships. *GINA*.
- Giorgi, A. (2009). *The descriptive phenomenological method in psychology*. Pittsburgh, PA: Duquesene University Press.
- Gouldson, A. (2008). Understanding business decision making on the environment. *Energy Policy*, 36(12), 4618 – 4620.
- Government of Guyana. Guyana Gold Board Act. , Pub. L. No. 66:01 (1994). Guyana.

- Government of Guyana. (2000). *National Development Strategy*.
- Government of Guyana. (2013). *REDD+ Enabling Activities Report: Annual Performance July 1st 2012 - June 15th 2013*.
- Government of Guyana, & Government of Norway. (2009). Joint Concept Note on REDD+ cooperation between Guyana and Norway.
- Government of Guyana, & Government of Norway. (2011). *Joint Concept Note*.
- Government of Guyana, & Government of Norway. (2012). *Joint Concept Note*.
- Government of Western Australia. (2005). Carbon rights in WA - a new interest in the land. *Carbon. State of Western Australia*.
- Grainger, A. (1995). The forest transition: an alternative approach. *Area*, 27, 242–251.
- Greene, W. H. (1994). *Accounting for Excess Zeros and Sample Selection in Poisson and Negative Binomial Regression Models* (No. EC 94-10). *Biology & Philosophy* (Vol. 9).
- Greenpeace. (2011a). *Bad Influence: How McKinsey-inspired plans lead to rainforest destruction*.
- Greenpeace. (2011b). *REDD : A Common Approach to Safeguards*.
- Griffiths, T., & Anselmo, L. (2010). *Indigenous Peoples and Sustainable Livelihoods in Guyana : an overview of experiences and potential opportunities. Development*.
- Groom, B., Grosjean, P., Kontoleon, A., Swanson, T., & Zhang, S. (2009). Relaxing rural constraints: a “win-win” policy for poverty and environment in China? *Oxford Economic Papers*, 62(1), 132–156.
- Groom, B., & Palmer, C. (2008). *Direct vs Indirect Payments for Environmental Services : The Role of Relaxing Market Constraints* (No. 36.2008). University of Cambridge.
- Groom, B., & Palmer, C. (2010). Cost-effective provision of environmental services: the role of relaxing market constraints. *Environment and Development Economics*, 15(02), 219–240.
- Grossman, G., & Helpman, E. (1994). Protection for Sale. *The American Economic Review*, 84(4), 833–850.
- Grossman, G., & Helpman, E. (1996). Electoral Competition and Special Interest Politics. *The Review of Economic Studies*, 63(2), 265–286.
- Grubb, M., Laing, T., Counsell, T., & Willan, C. (2010). Global carbon mechanisms: lessons and implications. *Climatic Change*, 104(3-4), 539–573.
- Guest, G., MacQueen, K., & Namey, E. (2012). *Applied Thematic Analysis*. Los Angeles: SAGE Publications.
- Guyana Bureau of Statistics. (2002). Population and Housing Census 2002 - Guyana National Report. Retrieved from <http://www.statisticsguyana.gov.gy/census.html#popcenfinal>

- Guyana Bureau of Statistics. (2012). Imports and Exports 2012. Retrieved from <http://www.statisticsguyana.gov.gy/trade.html#partners1>
- Guyana Bureau of Statistics. (2013). Guyana Rebased Gross Domestic Product (GDP) Series. Retrieved from <http://www.statisticsguyana.gov.gy/nataccts.html#natdiv>
- Guyana Chronicle. (2010). National Toshias Council pickets outside APA sensitisation workshop. *Guyana Chronicle*.
- Guyana Chronicle. (2012a, May 3). Climate change multi-stakeholder committee appalled at LCDS cut. *Guyana Chronicle*.
- Guyana Chronicle. (2012b, October 8). Mechanisation direct response to sugar industry labour shortage:- Minister Ramsammy. *Guyana Chronicle*.
- Guyana Chronicle. (2013, April 25). Opposition guts \$31.4 B from 2013 budget ... equity for Amaila Falls Hydro Electric Project falls victim. *Guyana Chronicle*.
- Guyana Forestry Commission. (2012). *Forest Sector Information Report: Half Year Review January-June 2012*.
- Guyana Forestry Commission, & Indufor. (2012). *Guyana Forestry Commission Guyana REDD + Monitoring Reporting & Verification System (MRVS) Interim Measures Report 01 October 2010 – 31 December 2011*.
- Guyana Forestry Commission, & Indufor. (2013). *Guyana Forestry Commission Guyana REDD+ Monitoring Reporting & Verification System (MRVS) Year 3 Interim Measures Report*.
- Guyana Forestry Commission, & Poyry Forest Industry. (2010). *Guyana REDD + Monitoring Reporting and Verification System: Interim Measures Report*.
- Guyana Geology and Mines Commission. Order under Section 10 of the Mining Act 1989 for Prospecting and mining for minerals and metals (2009).
- Guyana Geology and Mines Commission. (2012). *2012 Mineral Industry Review*.
- Guyana Times. (2012, July 11). No ban on river mining. *Guyana Times*.
- Guyana Times. (2013, April 29). Budget cuts make country unattractive to foreign investment - Nandlall. *Guyana Times*.
- Hammond, D. S., Gond, V., de Thoisy, B., Forget, P.-M., & DeDijn, B. P. E. (2007). Causes and consequences of a tropical forest gold rush in the Guiana Shield, South America. *Ambio*, 36(8), 661–70.
- Hanley, J. A., Negassa, A., deB Edwardes, M. D., & Forrester, J. E. (2003). Statistical Analysis of Correlated Data Using Generalized Estimating Equations: An Orientation. *American Journal of Epidemiology*, 157(4), 364–375.

- Hansen, M. C., Potapov, P. V, Moore, R., Hancher, M., Turubanova, S. a, Tyukavina, A., ... Townshend, J. R. G. (2013). High-resolution global maps of 21st-century forest cover change. *Science (New York, N.Y.)*, 342(6160), 850–3.
- Hardin, G. (1968). The Tragedy of the Commons. *Science*, 162(3859), 1243–1248.
- Hardin, J., & Hilbe, J. (2013). *Generalized Estimating Equations* (Second.). New York: CRC Press.
- Harrell, M., & Bradley, M. (2009). *Data Collection Methods: Semi-Structured Interviews and Focus Groups*. RAND Corporation.
- Harris, N. L., Brown, S., Hagen, S., Baccini, A., & Houghton, R. (2012). *Progress toward a Consensus on Carbon Emissions from Tropical Deforestation: Policy Brief*. Winrock International, Woods Hole Research Center.
- Harstad, B. (2012). *The Market for Conservation and Other Hostages* (No. 17409). NBER Working Paper.
- Harvey, A. (1990). *The econometric analysis of time series* (2nd ed.). New York: Phillip Allan.
- Hayes, T. (2006). Parks, People, and Forest Protection: An Institutional Assessment of the Effectiveness of Protected Areas. *World Development*, 34(12), 2064–2075.
- Heal, G., & Conrad, K. (2006). Incentive to reduce tropical deforestation. *Journal of Forest Economics*, 11(4), 201–203.
- Heemskerk, M. (2001). Do international commodity prices drive natural resource booms? An empirical analysis of small-scale gold mining in Suriname. *Ecological Economics*, 39(2), 295–308.
- Helmer, O. (1966). *Social Technology*. New York: Basic Books.
- Hennessy, L. A. (2002). *Amerindian Environmental Politics and Resource Justice in Guyana*. U.C. Berkeley.
- Hertz, R., & Imber, J. B. (1995). *Studying Elites Using Qualitative Methods*. Thousand Oaks, California: SAGE Publications.
- Hilbe, J. (2008). *Brief Overview on Interpreting Count Model Risk Ratios: An Addendum to Negative Binomial Regression*. Cambridge, UK: Cambridge University Press.
- Hilson, G., & Potter, C. (2003). Why Is Illegal Gold Mining Activity so Ubiquitous in Rural Ghana? *African Development Review*, 15(2-3), 237–270.
- Hilson, G., & Vieira, R. (2007). Challenges with minimising mercury pollution in the small-scale gold mining sector: experiences from the Guianas. *International Journal of Environmental Health Research*, 17(6), 429–41.
- Hinds, D. (2005). Problems of Democratic Transition in Guyana: Mistakes and Miscalculations in 1992. *Social and Economic Studies*, 54(1), 67–82.

- Hinds, D. (2010). *Ethno-Politics and Power Sharing in Guyana: History and Discourse*. Washington DC, USA: New Academia Publishing.
- Hinova, D., & Khemraj, T. (2011). *Elected Oligarchy and Economic Underdevelopment : The Case of Guyana* (No. 29733). University Library of Munich.
- Hite, K. (2010). Safeguards and REDD+. The Center for International Environmental Law.
- Hodgson, G. M. (2004). *The Evolution of Institutional Economics: Agency, structure and Darwinism in American Institutionalism*. London, UK: Routledge.
- Hogan, W., & Sturzenegger, F. (2010). *The Natural Resources Trap: Private Investment without Public Commitment*. Cambridge, MA: Massachusetts Institute of Technology.
- Holloway, V., & Giandomenico, E. (2009). *The History of REDD Policy. History*.
- Holmgren, P. (2010). World Bank not ready for REDD+ claims President Jagdeo. *FAO Climate Change Blog*. Retrieved from <http://faoclimatechange.wordpress.com/2010/12/08/world-bank-is-not-ready-for-redd-says-president-jagdeo/>
- Hooghe, L., & Marks, G. (2001). *Multi-Level Governance and European Integration*. Oxford: Rowman and Littlefield.
- Hooghe, L., & Marks, G. (2003). Unraveling the Central State, but How? Types of Multi-level Governance. *American Political Science Review*, 97(02), 233–243.
- Houghton, R. A. (1991). Tropical Deforestation and Atmospheric Carbon Dioxide. *Climatic Change*, 19, 99–118.
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–88.
- Hugosson, M., & Ingemarson, F. (2004). Objectives and Motivations of Small- scale Forest Owners ; Theoretical Modelling and Qualitative Assessment. *Review Literature And Arts Of The Americas*, 38(May), 217–231.
- Hula, K. W. (1999). *Lobbying Together: Interest Group Coalitions in Legislative Politics*. Washington DC, USA: Georgetown University Press.
- Ibarraran, M. E., & Boyd, R. (2010). *Multiplier and Distributive Effects of Large-Scale REDD+ Policies in Mexico* (pp. 1–31).
- Indufor Oy, & STCP Engenharia de Projectos Ltda. (2000). *Revisao de Meio Termo do Programma Piloto de Conservacao da Floresta Tropical Brasileira*. Curitiba.
- Inter-American Development Bank. (2011). *Institutional Strengthening in Support of Guyana's Low Carbon Development Strategy (LCDS) - Grant Proposal*.
- Inter-American Development Bank. (2012). *Micro and Small Enterprise (MSE) Development and Building Alternative Livelihoods for Vulnerable Groups - Proposal for Operation Development*.

- International Human Rights Clinic. (2007). *All that Glitters: Gold Mining in Guyana The Failure of Government Oversight and the Human Rights of Amerindian Communities*. Harvard Law School.
- International Monetary Fund. (2013). *World Economic Outlook 2013*. ESIS International, University of Manchester.
- IPCC. (2000). *Land Use , Land-Use Change , and Forestry: A Special Report of the Intergovernmental Panel on Climate Change*.
- IWG-IFR. (2009). *Report of the Informal Working Group on Interim Finance for REDD+: Discussion Document*.
- Jacome, F. (2011). *Petrocaribe: The Current Phase of Venezuela's Oil Diplomacy in the Caribbean**. Programa de Cooperacion en Seguridad Regional.
- Jagger, P., Lawlor, K., Brockhaus, M., Gebara, M. F., Sonwa, D. J., & Resosudarmo, I. A. P. (2012). REDD+ safeguards in national policy discourse and pilot projects. In *Analysing REDD+ Challenges and Choices*. Bogor, Indonesia: CIFOR.
- Jenkins, M. (2008). Who Murdered the Virunga Gorillas ? *National Geographic*, July, 34–65.
- Jensen, N. (2008). Political Risk, Democratic Institutions, and Foreign Direct Investment. *The Journal of Politics*, 70(04), 1040.
- Jønsson, J. B., & Fold, N. (2011). Mining “From Below”: Taking Africa’s Artisanal Miners Seriously. *Geography Compass*, 5(7), 479–493.
- Joppa, L. N., & Pfaff, A. (2011). Global protected area impacts. *Proceedings. Biological Sciences / The Royal Society*, 278(1712), 1633–8.
- Joppa, L., & Pfaff, A. (2010). Reassessing the forest impacts of protection: the challenge of nonrandom location and a corrective method. *Annals of the New York Academy of Sciences*, 1185, 135–49.
- Julio, B., & Yook, Y. (2012). Political Uncertainty and Corporate Investment Cycles. *The Journal of Finance*, LXVII(1), 45–84.
- Jussila, J. (2003). Political economy of land use and logging in presence of externalities. In *European Summer School in Resources and Environmental Economics*.
- Kaieteur News. (2010a, April 23). UN gives President Jagdeo “Champion of the Earth” award. *Kaieteur News*.
- Kaieteur News. (2010b, October 26). Jagdeo says “silly, useless” World Bank Officials stalling Norway funds. *Kaieteur News*.
- Kaieteur News. (2011, December 23). Guyana banks on Ramotar administration to draw down on Norway Funds. *Kaieteur News*.
- Kaieteur News. (2012a, July 8). Halt to new river mining licences... Severe threat to livelihoods, environment prompted decision – Govt. *Kaieteur News*.

- Kaieteur News. (2012b, July 11). Suspension of new riving mining licenses ... Miners support no confidence vote in Minister. *Kaieteur News*.
- Kaieteur News. (2013, April 27). GuySuco runs low on cash, salaried workers to be paid Monday. *Kaieteur News*. Retrieved from <http://www.kaieteurnews.com/2013/04/27/guysuco-runs-low-on-cash-salaried-workers-to-be-paid-monday/>
- Kaimowitz, D., & Angelsen, A. (2001). *Economic Models of Tropical Deforestation A Review*. Bogor, Indonesia: CIFOR.
- Kanowski, P. J., McDermott, C. L., & Cashore, B. W. (2011). Implementing REDD+: lessons from analysis of forest governance. *Environmental Science & Policy, 14*(2), 111–117.
- Karsenty, A., & Ongolo, S. (2011). Can “fragile states” decide to reduce their deforestation? The inappropriate use of the theory of incentives with respect to the REDD mechanism. *Forest Policy and Economics*.
- Keohane, R. O., & Levy, M. A. (1996). *Institutions for environmental aid: pitfalls and promise* (Vol. 0, p. 419). MIT Press. Retrieved from <http://books.google.com/books?hl=en&lr=&id=qVS2-GTIUIQC&pgis=1>
- Kindermann, G. E., Obersteiner, M., Sohngen, B., Sathaye, J., Andrasko, K., Rametsteiner, E., ... Beach, Robert, H. (2008). Global cost estimates of reducing carbon emissions through avoided deforestation. *Proceedings of the National Academy of Sciences of the United States of America, 105*(30), 10302–7.
- King, G. (1988). Statistical Models for Political Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model. *American Journal of Political Science, 32*(3), 838.
- Kmenta, J. (1986). *Elements of Econometrics* (2nd ed.). New York: MacMillian Press Ltd.
- Kobrin, S. (1984). Expropriation as an Attempt to Control Foreign Firms in LDCs : Trends from 1960 to 1979. *International Studies Quarterly, 28*(3), 329–348.
- Koh, L. P., & Wilcove, D. S. (2008). Is oil palm agriculture really destroying tropical biodiversity? *Conservation Letters, 1*(2), 60–64.
- Koyuncu, C., & Yilmaz, R. (2008). The Impact of Corruption on Deforestation: A Cross-Country Evidence. *The Journal of Developing Areas, 42*(2), 213–222.
- Kruger, D. J. (2003). Integrating quantitative and qualitative methods in community research. *The Community Psychologist, 36*, 18–19.
- Kuznets, S. (1955). Economic Growth and Income Inequality. *The American Economic Review, 45*(1), 1–28.
- Kvale, S. (2007). *Doing Interviews*. SAGE Publications.

- Lahn, B. (2013, September 8). Will Norway's climate ambition continue under Erna Solberg. *Responding to Climate Change*. Retrieved from <http://www.rtcc.org/2013/09/15/will-norways-climate-ambition-continue-under-erna-solberg/>
- Laing, T., & Trines, E. (2011). *The role of mining and metals in land use and adaptation*.
- Lang, C. (2011). Norway: Saving rainforests with one hand, destroying with the other. *REDD Monitor*. Retrieved from <http://www.redd-monitor.org/2011/11/16/norway-saving-rainforests-with-one-hand-destroying-with-the-other/>
- Lang, C. (2012). Norway and deforestation: "Offering its little finger to help, while using its fist to destroy." *REDD Monitor*. Retrieved from <http://www.redd-monitor.org/2012/04/03/norway-and-deforestation-offering-its-little-finger-to-help-while-using-its-fist-to-destroy/>
- Larson, A. M., & Ribot, J. C. (2009). Lessons from forestry decentralisation. In *Realising REDD+: National strategy and policy options* (pp. 175–187). Bogor, Indonesia: CIFOR.
- Larson, A. M., & Soto, F. (2008). Decentralization of Natural Resource Governance Regimes. *Annual Review of Environment and Resources*, 33(1), 213–239.
- Laurance, W. F. (2008). Can Carbon Trading Save Vanishing Forests. *BioScience*, 58(4), 286. doi:10.1641/B580402
- Laurance, W. F., Albernaz, A. K. M., Schroth, G., Fearnside, P. M., Bergen, S., Venticinqu, E. M., & Da Costa, C. (2002). Predictors of deforestation in the Brazilian Amazon. *Journal of Biogeography*, 29(5-6), 737–748.
- Lawson, M. L. (2013). *Foreign Aid : International Donor Coordination of Development Assistance*. Congressional Research Service.
- Lemke, T. (2002). Foucault, Governmentality, and Critique. *Rethinking Marxism*, 14(3), 49–64.
- Leon, P. (2009). Creeping Expropriation of Mining Investments : an African Perspective. *Journal of Energy and Natural Resources Law*, 27(4), 597–644.
- Levi-Faur, D. (2012). From "Big Government" to "Big Governance." In D. Levi-Faur (Ed.), *Oxford Handbook of Governance*. Oxford, UK: Oxford University Press.
- Li, J., & Born, J. A. (2006). Presidential Election Uncertainty and Common Stock Returns in the United States. *The Journal of Financial Research*, XXIX(4), 609–622.
- Liang, K.-Y., & Zeger, S. L. (1986). Longitudinal Data Analysis Using Generalized Linear Models. *Biometrika*, 73(1), 13.
- Linkie, M., Smith, R. J., Zhu, Y., Martyr, D. J., Suedmeyer, B., Pramono, J., & Leader-Williams, N. (2008). Evaluating biodiversity conservation around a large Sumatran protected area. *Conservation Biology : The Journal of the Society for Conservation Biology*, 22(3), 683–90.
- Lopez, R. (1994). The Environment as a Factor of Production: The Effects of Economic Growth and Trade Liberalisation. *Journal of Environmental Economics and Management*, 27, 163–184.

- Lowe, S. (2006). *Situation Analysis of the Small-Scale Gold Mining Sector in Guyana*. World Wildlife Fund.
- Lowe, S. (2013). Examining Lijphart's favourable factors for consociational democracy: Guyana. *Commonwealth & Comparative Politics*, 51(3), 362–376.
- Lubowski, R. N., & Rose, S. K. (2013). The Potential for REDD+: Key Economic Modeling Insights and Issues. *Review of Environmental Economics and Policy*, 7(1), 67–90.
- Luttrell, C., Resosudarmo, I. A. P., Muharrom, E., Brockhaus, M., & Seymour, F. (2012). The political context of REDD+ in Indonesia: Constituencies for change. *Environmental Science & Policy*, 1–9.
- Lyster, R. (2011). REDD+, transparency, participation and resource rights: the role of law. *Environmental Science & Policy*, 14(2), 118–126.
- Mabry, L. (2008). Case Study in Social Research. In P. Alasuutari, L. Bickman, & J. Brannen (Eds.), *The SAGE Handbook of Social Research Methods*. London, UK: SAGE Publications.
- Mahar, D. J. (1989). *Government Policies and deforestation in Brazil's Amazon region*. World Bank.
- Marks, G., Hooghe, L., & Blank, K. (1996). European Integration from the 1980s: State-Centric v. Multi-level Governance. *Journal of Common Market Studies*, 34(3).
- Marshall, C., & Rossman, G. (2006). *Designing Qualitative Research*. Thousand Oaks, California: SAGE Publications.
- Mather, A. S. (1992). The Forest Transition. *Area*, 24, 367–79.
- Mather, A. S., & Needle, C. L. (1998). The forest transition: a theoretical basis. *Area*, 30(2), 117–124.
- May, P. H., Calixto, B., & Gebara, M. F. (2011). *REDD + politics in the media A case study from Brazil*. CIFOR.
- May, P., Millikan, B., & Gebara, M. F. (2011). *The context of REDD + in Brazil: Drivers, agents and institutions*.
- Mayer, W., & Mourmouras, A. (2005). *On the Viability of Conditional Assistance Programs*. IMF Working Paper.
- Mayrand, K., & Paquin, M. (2004). *Payments for Environmental Services : A Survey and Assessment of Current Schemes*. Unisfera International Centre.
- McFadden, D. (1974). Conditional Logit Analysis of Qualitative Choice Behavior. In *Frontiers in Econometrics*. New York: Academic Press.
- Mcgee, B. (2009). The Community Referendum : Participatory Democracy and the Right to Free , Prior and Informed Consent to Development. *Berkeley Journal of International Law*, 27(2), 570–635.

- Megevand, C., Mosnier, A., Hourticq, J., Sanders, K., Doetinchem, N., & Streck, C. (2013). *Deforestation Trends in the Congo Basin: Reconciling Economic Growth and Forest Protection*. Washington D.C.
- Mena, C. F., Bilsborrow, R. E., & McClain, M. E. (2006). Socioeconomic drivers of deforestation in the Northern Ecuadorian Amazon. *Environmental Management*, 37(6), 802–15.
- Menard, C., & Shirley, M. (2005). *Handbook of New Institutional Economics*. Dordrecht: Springer.
- Mendelsohn, R. (1994). Property Rights and Tropical Deforestation. *Oxford Economic Papers*, 46, 750–756.
- Metz, B., Davidson, O., Bosch, P., Dave, R., & Meyer, L. (2007). *Climate Change 2007: Mitigation of Climate Change Working Group III Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change.
- Meyer, J. W., & Rowan, B. (1977). Institutional organisations: formal structure as myth and ceremony. *American Journal of Sociology*, 83, 340–363.
- Miles, M. B., & Huberman, M. (1994). *Qualitative Data Analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, California: SAGE Publications.
- Mills, J. H., & Waite, T. a. (2009). Economic prosperity, biodiversity conservation, and the environmental Kuznets curve. *Ecological Economics*, 68(7), 2087–2095.
- Mingers, J. (1997). Multi-paradigm Multimethodology. In J. Mingers & A. Gill (Eds.), *Multimethodology: The Theory and Practice of Combining Management Science Methodologies*. Chichester: John Wiley and Sons.
- Mingers, J., & Gill, A. (1997). *Multimethodology: The Theory and Practice of Combining Management Science Methodologies*. Chichester: John Wiley and Sons.
- Moutinho, P., Santilli, M., Schwartzman, S., & Rodrigues, L. (2005). Why ignore tropical deforestation? A proposal for including forest conservation in the Kyoto Protocol. *Unasylva*, (56), 27–30.
- Muller, J., & Albers, H. (2004). Enforcement, payments, and development projects near protected areas: how the market setting determines what works where. *Resource and Energy Economics*, 26(2), 185–204.
- Murphy, D. (2011). *Safeguards and Multiple Benefits in a REDD + Mechanism*. IISD.
- Mwangi, E., & Wardell, A. (2012). Multi-level governance of forest resources. *International Journal of the Commons*, 6(2), 79–103.
- Myers, E. C. (2007). *Policies to Reduce Emissions from Deforestation and Degradation (REDD) in Tropical Forests: An examination of the issues facing the incorporation of REDD into market-based climate policies*. Resources for the Future.

- Nepstad, D., Carvalho, G., Cristina Barros, A., Alencar, A., Paulo Capobianco, J., Bishop, J., ... Prins, E. (2001). Road paving, fire regime feedbacks, and the future of Amazon forests. *Forest Ecology and Management*, 154(3), 395–407.
- Nepstad, D., Schwartzman, S., Bamberger, B., Santilli, M., Ray, D., Schlesinger, P., ... Rolla, A. (2006). Inhibition of Amazon Deforestation and Fire by Parks and Indigenous Lands. *Conservation Biology*, 20(1), 65–73. Retrieved from <http://doi.wiley.com/10.1111/j.1523-1739.2006.00351.x>
- Neuhoff, K., Cooper, S., Laing, T., Lester, S., & Rysanek, A. (2009). *Indicator Choices and Tradeoffs: Facilitating the Success of International Climate Policies and Projects. Communications.*
- Nguyen Van, P., & Azomahou, T. (2007). Nonlinearities and heterogeneity in environmental quality: An empirical analysis of deforestation. *Journal of Development Economics*, 84(1), 291–309. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0304387806001064>
- Nilsen, T. T. (2010). *Landscape of Paradoxes: The Norwegian Climate and Forest Initiative*. University of Oslo.
- NORAD. (2010). *Real-Time Evaluation of Norway's International Climate and Forest Initiative Contributions to National REDD + Processes 2007-2010 Country Report : Guyana.*
- North, D. (1981). *Structure and Change in Economic History*. New York: W.W. Norton and Company.
- North, D. (1990). *Institutions, institutional change and economic performance*. Cambridge, UK: Cambridge University Press.
- Norwegian Ministry of Foreign Affairs. (2010). *Towards greener development: A coherent environmental and development policy.*
- Norwegian Ministry of Foreign Affairs, & International Development Association. (2010). *Administration Agreement (Guyana REDD-Plus Investment Fund) between Royal Norwegian Ministry of Foreign Affairs and International Development Association.*
- Norwegian Ministry of the Environment. (2009, November 9). Guyana and Norway enter into partnership to protect Guyana's tropical forests.
- Obersteiner, M., Kindermann, G. E., Rametsteiner, E., & Sohngen, B. (2006). Economics of Avoiding Deforestation. Trieste, Italy: ICTP.
- OECD. (2008). *Is it ODA?*
- OECD. (2010). *Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services*. OECD Publishing.
- Office of Climate Change. (2009). *Draft Report: Sub National Consultations, Regions 1,2,6,7,8,9,10.*
- Office of Climate Change. (2012). *REDD + Enabling Actions Self Assessment and Action Plan for discussion with the Government of Norway and Rainforest Alliance.*
- Office of Climate Change. (2013). *Key Lessons from the Guyana-Norway Partnership.*

- Office of the President. (2008). *Creating Incentives to Avoid Deforestation*.
- Office of the President. (2010a). *Developing a Framework for an “ Opt in ” Mechanism for Amerindian Communities Concept Paper*.
- Office of the President. (2013). *Transforming Guyana’s Economy While Combating Climate Change*.
- Office of the President, R. of G. (2009). *Transforming Guyana’s Economy While Combating Climate Change. Office*.
- Office of the President, R. of G. (2010b). *Transforming Guyana’s Economy While Combating Climate Change. Office*.
- Ollivier, H. (2012). Growth, deforestation and the efficiency of the REDD mechanism. *Journal of Environmental Economics and Management*, 64(3), 312–327.
- Osborne, T., & Kiker, C. (2005). Carbon offsets as an economic alternative to large-scale logging : a case study in Guyana. *Ecological Economics*, 52, 481 – 496.
- Ostrom, E. (1991). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, UK: Cambridge University Press.
- Ostrom, E. (2005). Doing Institutional Analysis: Digging Deeper than Markets and Hierarchies. In C. Menard & M. Shirley (Eds.), *Handbook of New Institutional Economics*. Dordrecht: Springer.
- Ouliaris, S. (2011). What are Economic Models? *Finance and Development*, 48(2).
- Pahoona Corbin, H. (2007). *Brazilian Migration to Guyana as a Livelihood Strategy: A Case Study Approach*. Universidade Federal do Para.
- Pallante, G., & Zoppoli, P. (2013). How Forest Area Data Reliability May Influences Tropical Deforestation Drivers Identification? *Environment and Natural Resources Journal*, 11(2), 58–80.
- Palmer, C. (2005). The Nature of Corruption in Forest Management. *World Economics Journal*, 6(2), 1–11.
- Palmer, C. (2010). Property rights and liability for deforestation under REDD+: Implications for “permanence” in policy design. *Ecological Economics*, 70(4), 571–576.
- Palmer, C. (2011). Property rights and liability for deforestation under REDD+: Implications for “permanence” in policy design. *Ecological Economics*, 70(4), 571–576.
- Palmer, C., & Engel, S. (2009). *Avoided deforestation: prospects for mitigating climate change*. New York: Routledge.
- Pan, W. (2001). Akaike’s Information Criterion in Generalized Estimating Equations. *Biometrics*, 57(March), 120–125.
- Pan, Y., Birdsey, R. a, Fang, J., Houghton, R., Kauppi, P. E., Kurz, W. a, ... Hayes, D. (2011). A large and persistent carbon sink in the world’s forests. *Science (New York, N.Y.)*, 333(6045), 988–93.

- Park, S., & Matunhire, I. I. (2011). Investigation of factors influencing the determination of discount rate in the economic evaluation of mineral development projects. *The Journal of The Southern African Institute of Mining and Metallurgy*, 111(November), 773–779.
- Parks, R. W. (1967). Efficient Estimation of a System of Regression Equations when Disturbances are Both Serially and Contemporaneously Correlated. *Journal of the American Statistical Association*, 62(318), 500–509.
- Parry, M., Canziani, O., Palutikof, J., van der Linden, P., & Hanson, C. (2007). *Climate Change 2007 Impacts, Adaptation and Vulnerability Working Group II Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Intergovernmental Panel on Climate Change.
- Peskett, L., Schreckenber, K., & Brown, J. (2011). Institutional approaches for carbon financing in the forest sector: learning lessons for REDD+ from forest carbon projects in Uganda. *Environmental Science & Policy*, 14(2), 216–229.
- Petkova, E., Larson, A., & Pacheco, P. (2010). Forest Governance, Decentralization and REDD+ in Latin America. *Forests*, 1(4), 250–254.
- Pfaff, A., Sills, E. O., Amacher, G. S., Coren, M. J., Lawlor, K., & Streck, C. (2010). *Policy Impacts on Deforestation Lessons Learned from Past Experiences to Inform New Initiatives*. Management. Nicholas Institute.
- Phelps, J., Webb, E. L., & Agrawal, A. (2010). Does REDD+ threaten to recentralize forest governance? *Science (New York, N.Y.)*, 328(5976), 312–3.
- Pistorius, T. (2012). From RED to REDD+: the evolution of a forest-based mitigation approach for developing countries. *Current Opinion in Environmental Sustainability*, 4(6), 638–645. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S1877343512000899>
- Purnomo, H., Suyamto, D., Abdullah, L., & Irawati, R. H. (2012). REDD + actor analysis and political mapping : an Indonesian case study. *International Forestry Review*, 14(1), 74–89.
- Putnam, R. D. (1988). Diplomacy and Domestic Politics : The Logic of Two-Level Games. *International Organization*, 42(3), 427–460.
- Rathfon, R., Filmore, S., & Groninger, J. (2004). *Status of Reforested Mine Sites in Southwestern Indiana*. Forestry and Natural Resources, Purdue University.
- Rethemeyer, K. (2007). Outlies and DFBETA. Rockefeller College, University of Albany.
- Rice, R. (2002). *Conservation Concessions - Concept Description*.
- Robinson, E. J. Z., Albers, H. J., Meshack, C., & Lokina, R. B. (2013). Implementing REDD through community-based forest management: Lessons from Tanzania. *Natural Resources Forum*, 37(3), 141–152. Retrieved from <http://doi.wiley.com/10.1111/1477-8947.12018>
- Ross, M. (1996). Conditionality and logging reform in the tropics. In R. O. Keohane & M. A. Levy (Eds.), *Institutions for environmental aid*. Cambridge, MA: Massachusetts Institute of Technology.

- Ryan, G., & Bernard, H. (2003). Techniques to identify themes. *Field Methods*, 15(1), 85–109.
- Samuelson, P. A., Koopmans, T. C., & Stone, J. R. N. (1954). Report of the Evaluative Committee for Econometrica. *Econometrica*, 22(2), 141–146.
- Santilli, M., Moutinho, P., Schwartzman, S., Nepstad, D., Curran, L., & Nobre, C. (2005). Tropical Deforestation and the Kyoto Protocol. *Climatic Change*, 71(3), 267–276. Retrieved from <http://link.springer.com/10.1007/s10584-005-8074-6>
- Sasaki, N., & Putz, F. E. (2009). Critical need for new definitions of “forest” and “forest degradation” in global climate change agreements. *Conservation Letters*, 2(5), 226–232.
- Schalatek, L., Nakhoda, S., & Bird, N. (2012). *Climate Finance Fundamentals Brief 11*. Heinrich Boll Stiftung, ODI.
- Schlager, E., & Ostrom, E. (1992). Property-Rights Regimes and Natural Resources : A Conceptual Analysis. *Land Economics*, 68(3), 249–262.
- Schlamadinger, B., Ciccamese, L., Dutschke, M., Fearnside, P. M., Brown, S., & Murdiyarso, D. (2005). Should we include avoidance of deforestation in the international response to climate change? *Carbon Forestry Who Will Benefit Proceedings of Workshop on Carbon Sequestration and Sustainable Livelihoods*, 1–12.
- Schleich, J. (1997). *Environmental Protection with Policies for Sale* (No. 97-2). International Agricultural Trade Research Consortium.
- Schneider, L. (2009). Assessing the additionality of CDM projects: practical experiences and lessons learned. *Climate Policy*, 9(3), 242–254.
- Scott, R. (2008). *Institutions and Organisations*. London, UK: SAGE Publications.
- Scricciu, S. S. (2007). Can economic causes of tropical deforestation be identified at a global level? *Ecological Economics*, 62(3-4), 603–612. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0921800906003806>
- Seawright, J., & Gerring, J. (2008). Case Selection Techniques in Case Study Research: A Menu of Qualitative and Quantitative Options. *Political Research Quarterly*, 61(2), 294–308.
- Senauth, F. (2009). *The Making of Guyana: From a Wilderness to a Nation*. Bloomington, IN: AuthorHouse.
- Seymour, F. J., & Dubash, N. K. (2000). *The Right Conditions: The World Bank, Structural Adjustment and Forest Policy Reform*. Washington D.C.: World Resources Institute.
- Shapiro, S. S., & Wilk, M. B. (1965). An Analysis of Variance Test for Normality (Complete Samples). *Biometrika*, 52(3/4), 591–611.
- Shepsle, K. A. (1986). Institutional Equilibrium and Equilibrium Institutions. In H. F. Weisberg (Ed.), *Political Science: The Science of Politics* (pp. 51–82). New York: Agathon.

- Shively, G. E. (2001). Agricultural Change , Rural Labor Markets , and Forest Clearing : An Illustrative Case from the Philippines. *Land Economics*2, 77(2), 268–284.
- Sierra, R., & Russman, E. (2006). On the efficiency of environmental service payments : A forest conservation assessment in the Osa Peninsula , Costa Rica. *Ecological Economics*, 9, 131–141.
- Silva, E. (2004). The Political Economy of Forest Policy in Mexico and Chile. *Singapore Journal of Tropical Geography*, 2(3), 63–280.
- Silva-Chavez, G., & Petsonik, A. (2005). Rainforest credits. *Carbon Finance*, (December2005/January 2006).
- Singh, D., Bernard, C., Rampersaud, P., Laing, T., Balraj, D., Priester, M., ... Watson, L. C. (2013). *Guyana's Extractive Industry Sector (EIS): A synopsis of Issues and Recommendations for the mining sector as a Sustainable Element of Guyana's Low Carbon Development Strategy*. Conservation Interantional Guyana, Projekt-Consult GmbH, WWF Guianas.
- Skutsch, M. M., & Van Laake, P. E. (2009). REDD as Multi-Level Governance in-the-making. *Energy and Environment*, 19(6), 831–844.
- Slade, M. E. (2001). Valuing Managerial Flexibility: An Application of Real-Option Theory to Mining Investments. *Journal of Environmental Economics and Management*, 41(2), 193–233.
- Somorin, O. A., Visseren-Hamakers, I. J., Arts, B., Sonwa, D. J., & Tiani, A.-M. (2013). REDD+ policy strategy in Cameroon: Actors, institutions and governance. *Environmental Science & Policy*, 1–11.
- Stabroek News. (2007, October 16). Offer of entire forest in climate fight stands – Jagdeo tells Commonwealth meet. *Stabroek News*.
- Stabroek News. (2008, February 15). Loggers to mount legal challenge to Forestry Commission fines. *Stabroek News*.
- Stabroek News. (2010a, January 30). Gov't scrambles to quell Bartica Protest. *Stabroek News*.
- Stabroek News. (2010b, October 27). Land use committee wraps up work. *Stabroek News*.
- Stabroek News. (2012a, February 12). Jagdeo raised sloth in release of LCDS funds in letter to Solheim. *Stabroek News*.
- Stabroek News. (2012b, March 19). International conservation union announces role for Jagdeo. *Stabroek News*.
- Stabroek News. (2012c, April 26). \$2.23B cut from budget. *Stabroek News*.
- Stabroek News. (2012d, July 12). One-month halt to river claims – GGMC. *Stabroek News*.
- Stabroek News. (2012e, September 2). Miners force authorities to step back on proposed regulations. *Stabroek News*.

- Stabroek News. (2012f, September 23). Cash in GRIF must be spent before replenishment. *Stabroek News*.
- Stabroek News. (2012g, October 25). Jagdeo elected head of Global Green Growth Institute. *Stabroek News*.
- Stabroek News. (2013a, March 25). 2013 Budget Speech. *Stabroek News*.
- Stabroek News. (2013b, August 25). Norway pay-outs delayed until financing mechanisms improved. *Stabroek News*.
- Stabroek News. (2013c, September 22). Use miners environmental bonds to rehabilitate Konawaruk - GGDMA coordinator. *Stabroek News*.
- Stabroek News. (2013d, November 13). Norway proposes to cut US\$65M from forest protection budget. *Stabroek News*.
- Stephenson, S. (2011). Does ODA Grow on Trees? A Legal Analysis of REDD-ODA Finance. *European Journal of Legal Studies*, 4(1), 81–101.
- Stern, D. I. (1998). Progress on the environmental Kuznets curve ? *Environment and Development Economics*1, (2), 173–196.
- Stern, D. I. (2004). The Rise and Fall of the Environmental Kuznets Curve. *World Development*, 32(8), 1419–1439.
- Stern, N. (2006). *Stern Review on the Economics of Climate Change*. Cambridge, UK: Cambridge University Press.
- Stern, N. (2008). *Key Elements of a Global Deal on Climate Change*. Cambridge University Press, Cambridge, UK.
- Stocker, T., Dahe, Q., & Plattner, G.-K. (2013). *Working Group 1 Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*. Inter-Governmental Panel on Climate Change.
- Stokke, O. (2013). *Aid and Political Conditionality*. Oxford, UK: Routledge.
- Strassburg, B., Turner, R. K., Fisher, B., Schaeffer, R., & Lovett, A. (2009). Reducing emissions from deforestation—The “combined incentives” mechanism and empirical simulations. *Global Environmental Change*, 19(2), 265–278.
- Streck, C., & Parker, C. (2012). Financing REDD+. In *Analysing REDD+ Challenges and Choices*2. Bogor, Indonesia: CIFOR.
- Stubbs, P. (2005). Stretching Concepts Too Far ? Multi-Level Governance , Policy Transfer and the Politics of Scale in South East Europe. *Southeast European Politics*, VI(2), 66–87.
- Sunderlin, W., Larson, A., & Cronkleton, P. (2009). Forest tenure rights and REDD+: From inertia to policy solutions. In *Realising REDD+: National strategy and policy options*.

- Sussman, G. (2005). *Global Electioneering: Campaign Consulting, Communications and Corporate Finance*. Oxford, UK: Rowman and Littlefield.
- Svensson, J. (1998). Investment, property rights and political instability: Theory and evidence. *European Economic Review*, 42(7), 1317–1341.
- Taschini, L., Kollenberg, S., & Duffy, C. (2014). *System responsiveness and the European Union Emissions Trading System*. Grantham Research Institute on Climate Change and the Environment.
- The Consultancy Group. (2009). *Session Report on the Stakeholder Dialogue Series*.
- The Council of Freely Elected Heads of Government. (1993). *Observing Guyana's Electoral Process, 1990-1992*.
- The Government of the Cooperative Republic of Guyana (Guyana) and the Government of the Kingdom of Norway (Norway). (2009). Memorandum of Understanding between the Government of the Cooperative Republic of Guyana and the Government of the Kingdom of Norway.
- The World Bank Group. (2010). *Trustee Report on the Financial Status of the Guyana REDD-Plus Investment Fund (GRIF) November 3, 2010*.
- The World Bank Group. (2011a). *Trustee Report on the Financial Status of the Guyana REDD-Plus Investment Fund (GRIF) August 15, 2011*.
- The World Bank Group. (2011b). *Trustee Report on the Financial Status of the Guyana REDD-Plus Investment Fund (GRIF) December 15, 2011*.
- The World Bank Group. (2012a). *2012 Trust Fund Annual Report*.
- The World Bank Group. (2012b). *Guyana REDD-Plus Investment Fund Trust Fund Financial Report*.
- The World Bank Group. (2012c). *Trustee Report on the Financial Status of the Guyana REDD-Plus Investment Fund (GRIF) January 30, 2012*.
- The World Bank Group. (2012d). *Trustee Report on the Financial Status of the Guyana REDD-Plus Investment Fund (GRIF) May 14, 2012*.
- The World Bank Group. (2013). *Guyana REDD-Plus Investment Fund Trust Fund Financial Report Prepared by the Trustee As of March 31, 2013*.
- Thomas, C. Y. (2009). *Too Big to Fail: A Scoping Study of The Small and Medium Scale Gold and Diamond Mining Industry in Guyana*.
- Thomas, J., & Worrall, T. (1994). Foreign Direct Investment and the Risk of Expropriation. *The Review of Economic Studies*, 61(1), 81–108.
- Thompson, M. C., Baruah, M., & Carr, E. R. (2011). Seeing REDD+ as a project of environmental governance. *Environmental Science & Policy*, 14(2), 100–110.

- Tole, L., & Koop, G. (2011). Do environmental regulations affect the location decisions of multinational gold mining firms? *Journal of Economic Geography*, 11, 151–177.
- Toni, F. (2011). Decentralization and REDD+ in Brazil. *Forests*, 2(4), 66–85.
- Transparency International. (2012). *Corruption Perceptions Index 2012*.
- Trevin, J., & Nasi, R. (2009). *Forest Law Enforcement and Governance and Forest Practices in Guyana*. CIFOR, Iwokrama.
- Trines, E., Hohne, N., Jung, M., Petsonk, A., Silva-Chavez, G., Smith, P., ... Schlamadinger, B. (2006). *Integrating agriculture, forestry and other land use in future climate regimes: Methodological issues and policy options*. Netherlands Programme on Scientific Assessment and Policy Analysis Climate Change.
- Tropical Forest Group. (2007). *A History of Climate Change and Tropical Forest Negotiations*.
- Trotz, D. A. (2004). Between Despair and Hope: Women and Violence in Contemporary Guyana. *Small Axe*, 8(15), 1–20.
- UNDP. (2013). *Human Development Report 2013*.
- United Nations Development Programme. (2013). *Amerindian Land Titling Project - Draft Project Document*.
- United Nations Sustainable Development. (1993). *Agenda 21*.
- United States Department of Homeland Security. (1999). *Yearbook of Immigration Statistics*.
- United States Department of Homeland Security. (2009). *Yearbook of Immigration Statistics*.
- United States Department of Homeland Security. (2012). *Yearbook of Immigration Statistics*.
- UN-REDD. (2013). *Guidelines on Free, Prior and Informed Consent*.
- Valatin, G. (2011). *Forests and carbon: a review of additionality*. Forestry Commission Research Report.
- Van der Werf, G. R., Morton, D. C., DeFries, R. S., Olivier, J. G. J., Kasibhatla, P. S., Jackson, R. B., ... Randerson, J. T. (2009). CO₂ emissions from forest loss. *Nature Geoscience*, 2(11), 737–738.
- Van der Werf, G. R., Randerson, J. T., Giglio, L., Collatz, G. J., Mu, M., Kasibhatla, P. S., ... van Leeuwen, T. T. (2010). Global fire emissions and the contribution of deforestation, savanna, forest, agricultural, and peat fires (1997–2009). *Atmospheric Chemistry and Physics*, 10(23), 11707–11735.
- Van Manen, M. (1977). Linking Ways of Knowing with Ways of Being Practical. *Curriculum Inquiry*, 6(3), 205–228.
- Vuong, Q. H. (1989). Likelihood Ratio Tests for Model Selection and Non-Nested Hypotheses. *Econometrica*, 57(2), 307–333.

- Walras, L. (1954). *Elements of Pure Economics; or, The Theory of Social Wealth*. London: Allen & Unwin.
- Wara, M. W., & Victor, D. G. (2008). *A Realistic Policy on International Carbon Offsets*. Program on Energy and Sustainable Development.
- Watkins, G. G. (2005). The Iwokrama Centre and Forest : Introduction to Special Papers. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 154, 1–5.
- Weinhold, D., & Reis, E. J. (2008). Transportation costs and the spatial distribution of land use in the Brazilian Amazon. *Global Environmental Change*, 18(1), 54–68. Retrieved from <http://linkinghub.elsevier.com/retrieve/pii/S0959378007000477>
- Wertz-Kanounnikoff, S., & Kongphan-apirak, M. (2010). *Emerging REDD+: A preliminary survey of demonstration and readiness activities* (No. 46). CIFOR.
- Westholm, L., Ostwald, M., Henders, S., & Mattsson, E. (2011). *Learning from Norway - A Review of Lessons Learned for REDD+ Donors*. Focali.
- White, A., & Martin, A. (2002). *Who owns the World's Forests? Forest Tenure and Public Forests in Transition*. Forest Trends and Center for International Environmental Law.
- White, A., Martin, A., & Jenkins, M. (2002). *Who Owns the World's Forests? Forest Tenure and Public Forests in Transition*. Forest Trends.
- Williams, M. (2001). The History of Deforestation. *History Today*, 51(7).
- Williamson, O. E. (1979). Transaction-Cost Economics : The Governance of Contractual Relations. *Journal of Law and Economics*, 22(2), 233–261.
- Winkelmann, R. (2008). *Econometric Analysis of Count Data*. Berlin: Springer.
- Woolridge, J. . M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.
- World Bank. (2012). Worldwide Governance Indicators. Retrieved from <http://info.worldbank.org/governance/wgi/index.asp>
- World Resources Institute, United Nations Development Programme, United Nations Environment Programme, & World Bank. (2005). *World Resources 2005: The Wealth of the Poor Managing Ecosystems to Fight Poverty*. World. Washington, DC: WRI.
- Wunder, S. (2007). The efficiency of payments for environmental services in tropical conservation. *Conservation Biology : The Journal of the Society for Conservation Biology*, 21(1), 48–58.
- Wunder, S. (2008). Payments for environmental services and the poor: concepts and preliminary evidence. *Environment and Development Economics*, 13(03), 279–297.
- Wunder, S., & Alban, M. (2008). Decentralized payments for environmental services: The cases of Pimampiro and PROFAFOR in Ecuador. *Ecological Economics*, 65(4), 685–698.

- Yu, Z. (2005). Environmental Protection: A Theory of Direct and Indirect Competition for Political Influence. *Review of Economic Studies*, 72(1), 269–286.
- Zeger, S. L., & Liang, K. Y. (1986). Longitudinal data analysis for discrete and continuous outcomes. *Biometrics*, 42(1), 121–30.
- Zheng, B. (2000). Summarizing the goodness of fit of generalized linear models for longitudinal data. *Statistics in Medicine*, 19(10), 1265–75.
- Zorn, C. (2001). Generalized Estimating Equation Models for Correlated Data: A Review with Applications. *American Journal of Political Science*, 45(2), 470–490.

Appendices

Appendix 1: Membership of the Multi-Stakeholder Steering Committee

His Excellency President Donald Ramotar	
Former President Dr. Bharrat Jagdeo	Individual Capacity
Dr. Roger Luncheon	Office of the President
Minister Leslie Ramsammy	Ministry of Agriculture
Minister Pauline Sukhai	Ministry of Amerindian Affairs
Minister Ashni Singh	Ministry of Finance
Minister Robert Persaud	Ministry of Natural Resources and Environment
Shyam Nokta	Office of the President
Andrew Bishop	Office of the President
Kapil Mohabir	Office of the President
Shereeda Yusuf	Office of the President
Alfred King	Ministry of Culture
James Singh	Guyana Forestry Commission
Pradeepa Bholanath	Guyana Forestry Commission
Indarjit Ramdass	Environmental Protection Agency
Rickford Vieira	Guyana Geology and Mines Commission
George Jarvis	Ministry of Agriculture
Derrick John	National Toshias Council (NTC)
Yvonne Pearson	National Toshias Council (NTC)
Peter Persaud	The Amerindian Action Movement of Guyana (TAAMOG)
Pamela Mendonca	The Amerindian Action Movement of Guyana (TAAMOG)
Jean La Rose	Amerindian People's Association (APA)
Ashton Simon	The National Amerindian Development Foundation (NADF)
Romel Simon	The National Amerindian Development Foundation (NADF)
Colin Klautky	Guyana Organisation of Indigenous People (GOIP)
George Norton	Guyana Organisation of Indigenous People (GOIP)
Michael Williams	North Rupununi Development Board (NRDDB)
Bertie Xavier	North Rupununi Development Board (NRDDB)
Hilbertus Cort	Forest Producers Association (FPA)
Edward Shields	Guyana Gold and Diamond Miners Association (GGDMA)
Ronald D. Webster	Private Sector Commission (PSC)
Gillian Burton	Trade Unions Congress (TUC)
Carvil Duncan	Federation of Independent Trade Unions of (FITUG)
Paulette Bynoe	University of Guyana (UG)
Hymawattie Lagan	Women's Affairs Bureau
David Singh	Conservation International (CI)
Charles Hutchinson	World Wildlife Fund (WWF)
Dane Gobin	Iwokrama International Centre for Rain Forest Conservation and Development
Joe Singh	Individual Capacity
David James	Individual Capacity
Raquel Thomas-Caesar	Individual Capacity
Annette Arjoon-Martin	Individual Capacity

Appendix 2: Derivation of results for input and output taxes

Input taxes

Input taxes, r , are levied on forest input so that:

$$z_\beta = z + r \quad (A1)$$

All revenues are recycled on a per-capita basis.

Welfare becomes:

$$W = w + zf_t^* + \pi_\beta + \pi_\gamma + rf_\beta^* + \chi(F^* - f_\beta^*) \quad (A2)$$

Input taxes, r , are derived by differentiating (A2) as:

$$r = \chi - \left(\frac{\partial w}{\partial f_\beta^*} + \frac{\partial z}{\partial f_\beta^*} f_t^* + \frac{\partial \pi_\beta}{\partial f_\beta^*} + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \frac{f_\beta^*}{\frac{\partial f_\beta^*}{\partial r}} \right) \quad (A3)$$

Under mining influence welfare of the mining sector becomes:

$$W_\beta = w_\beta + zf_\beta^* + \pi_\beta + l_\beta (rf_\beta^* + \chi(F^* - f_\beta^*)) \quad (A4)$$

The first differential of (A4) is:

$$\begin{aligned} \frac{\partial W_\beta}{\partial r} &= \frac{\partial w}{\partial r} l_\beta + \frac{\partial l_\beta}{\partial r} w + \frac{\partial f_\beta^*}{\partial r} z + \frac{\partial z}{\partial r} f_\beta^* + \frac{\partial \pi_\beta}{\partial r} + \frac{\partial l_\beta}{\partial r} (rf_\beta^* + \chi(F^* - f_\beta^*)) \\ &\quad + l_\beta \left(f_\beta^* + r \frac{\partial f_\beta^*}{\partial r} - \frac{\partial f_\beta^*}{\partial r} \chi \right) \quad (A5) \end{aligned}$$

Applying (28) the first order condition is thus:

$$\begin{aligned} 0 &= \frac{\partial w}{\partial r} + \frac{\partial z}{\partial r} f_t^* + \frac{\partial \pi_\beta}{\partial r} + \frac{\partial \pi_\gamma}{\partial r} + f_\beta^* + \frac{\partial f_\beta^*}{\partial r} r - \frac{\partial f_\beta^*}{\partial r} \chi \\ &\quad + \mu \left(\frac{\partial w}{\partial r} l_\beta + \frac{\partial l_\beta}{\partial r} w + \frac{\partial f_\beta^*}{\partial r} z + \frac{\partial z}{\partial r} f_\beta^* + \frac{\partial \pi_\beta}{\partial r} + \frac{\partial l_\beta}{\partial r} (rf_\beta^* + \chi(F^* - f_\beta^*)) \right) \\ &\quad + l_\beta \left(f_\beta^* + r \frac{\partial f_\beta^*}{\partial r} - \frac{\partial f_\beta^*}{\partial r} \chi \right) \quad (A6) \end{aligned}$$

Rearranging (A6) yields an input tax of:

$$r = \frac{\chi \left(\frac{\partial f_\beta^*}{\partial r} (1 + \mu l_\beta) - \frac{\partial l_\beta}{\partial r} \mu (F^* - f_\beta^*) \right) - \frac{\partial \pi_\beta}{\partial r} (1 + \mu) - \frac{\partial \pi_\gamma}{\partial r} f_\beta^* (1 + \mu l_\beta) - \mu \left(\frac{\partial l_\beta}{\partial r} w + \frac{\partial f_\beta^*}{\partial r} z \right) - (1 + \mu l_\beta) \frac{\partial w}{\partial r} - (f_t^* + \mu f_\beta^*) \frac{\partial z}{\partial r}}{\left(\frac{\partial f_\beta^*}{\partial r} (1 + \mu l_\beta) + \mu \frac{\partial l_\beta}{\partial r} f_\beta^* \right)} \frac{1}{\left(\frac{\partial f_\beta^*}{\partial r} (1 + \mu l_\beta) + \mu \frac{\partial l_\beta}{\partial r} f_\beta^* \right)} \quad (A7)$$

Under SFM influence welfare of the SFM sector is:

$$W_Y = wl_Y + zf_Y^* + \pi_Y + l_Y \left(rf_\beta^* + \chi(F^* - f_\beta^*) \right) \quad (A8)$$

Differentiating (A8) gives:

$$\begin{aligned} \frac{\partial W_Y}{\partial r} = & \frac{\partial w}{\partial r} l_Y + \frac{\partial l_Y}{\partial r} w + \frac{\partial f_Y^*}{\partial r} z + \frac{\partial z}{\partial r} f_Y^* + \frac{\partial \pi_Y}{\partial r} + \frac{\partial l_Y}{\partial r} \left(rf_\beta^* + \chi(F^* - f_\beta^*) \right) \\ & + l_Y \left(f_\beta^* + r \frac{\partial f_\beta^*}{\partial r} - \frac{\partial f_\beta^*}{\partial r} \chi \right) \quad (A9) \end{aligned}$$

Applying (28) and introducing (A9) gives the following condition:

$$\begin{aligned} 0 = & \frac{\partial w}{\partial r} + \frac{\partial z}{\partial r} f_t^* + \frac{\partial \pi_\beta}{\partial r} + \frac{\partial \pi_Y}{\partial r} + f_\beta^* + \frac{\partial f_\beta^*}{\partial r} r - \frac{\partial f_\beta^*}{\partial r} \chi \\ & + \mu \left(\frac{\partial w}{\partial r} l_Y + \frac{\partial l_Y}{\partial r} w + \frac{\partial f_Y^*}{\partial r} z + \frac{\partial z}{\partial r} f_Y^* + \frac{\partial \pi_Y}{\partial r} + \frac{\partial l_Y}{\partial r} \left(rf_\beta^* + \chi(F^* - f_\beta^*) \right) \right. \\ & \left. + l_Y \left(f_\beta^* + r \frac{\partial f_\beta^*}{\partial r} - \frac{\partial f_\beta^*}{\partial r} \chi \right) \right) \quad (A10) \end{aligned}$$

Rearranging (A10) yields an input tax of:

$$r = \frac{\chi \left(\frac{\partial f_\beta^*}{\partial r} - \mu \frac{\partial l_Y}{\partial r} (F^* - f_\beta^*) + \mu l_Y \frac{\partial f_\beta^*}{\partial r} \right) - \frac{\partial \pi_\beta}{\partial r} - \frac{\partial \pi_Y}{\partial r} (1 + \mu) - f_\beta^* (1 + \mu l_Y) - \mu \left(\frac{\partial l_Y}{\partial r} w + \frac{\partial f_Y^*}{\partial r} z \right) - (1 + \mu l_Y) \frac{\partial w}{\partial r} - (f_t^* + \mu f_Y^*) \frac{\partial z}{\partial r}}{\frac{\partial f_\beta^*}{\partial r} (1 + \mu l_Y) + \mu \frac{\partial l_Y}{\partial r} f_\beta^*} \quad (A11)$$

The following directions of partial derivatives result from the assumptions made in the model set-up:

$$\frac{\partial f_\beta^*}{\partial r} < 0, \frac{\partial \pi_\beta}{\partial r} < 0, \frac{\partial \pi_Y}{\partial r} > 0, \frac{\partial l_Y}{\partial r} > 0, \frac{\partial l_\beta}{\partial r} < 0, \frac{\partial^2 \pi_\beta}{\partial r^2} < 0$$

Output tax

An ad-valorem tax, t , is levied on output so that:

$$p_\beta = p_\beta^* + t \quad (A12)$$

Again revenues are redistributed on a per-capita basis.

Total social welfare becomes:

$$W = w + zf_t^* + \pi_\beta + \pi_Y + ty_\beta^* + \chi(F^* - f_\beta^*) \quad (A13)$$

Following the same steps as for input taxes, output taxes are derived as:

$$t = \chi \frac{\partial f_{\beta}^*}{\partial y_{\beta}^*} - \frac{\partial w}{\partial f_{\beta}^*} - \frac{\partial z}{\partial f_{\beta}^*} f_t^* - \frac{\partial \pi_{\beta}}{\partial y_{\beta}^*} - \frac{\partial \pi_{\gamma}}{\partial y_{\beta}^*} - \frac{y_{\beta}^*}{\frac{\partial y_{\beta}^*}{\partial t}} \quad (A14)$$

Under mining influence mining sector welfare is:

$$W_{\beta} = w l_{\beta} + z f_{\beta}^* + \pi_{\beta} + l_{\beta} \left(t y_{\beta}^* + \chi (F^* - f_{\beta}^*) \right) \quad (A15)$$

Differentiating (A15) gives:

$$\begin{aligned} \frac{\partial W_{\beta}}{\partial t} &= \frac{\partial w}{\partial t} l_{\beta} + \frac{\partial l_{\beta}}{\partial t} w + \frac{\partial f_{\beta}^*}{\partial t} z + \frac{\partial z}{\partial t} f_{\beta}^* + \frac{\partial \pi_{\beta}}{\partial t} + \frac{\partial l_{\beta}}{\partial t} \left(t y_{\beta}^* + \chi (F^* - f_{\beta}^*) \right) \\ &\quad + l_{\beta} \left(y_{\beta}^* + t \frac{\partial y_{\beta}^*}{\partial t} - \frac{\partial f_{\beta}^*}{\partial t} \chi \right) \quad (A16) \end{aligned}$$

Applying (28) and introducing (A16) yields the condition:

$$\begin{aligned} 0 &= \frac{\partial w}{\partial t} + \frac{\partial z}{\partial t} f_t^* + \frac{\partial \pi_{\beta}}{\partial t} + \frac{\partial \pi_{\gamma}}{\partial t} + y_{\beta}^* + \frac{\partial y_{\beta}^*}{\partial t} t - \frac{\partial f_{\beta}^*}{\partial t} \chi \\ &\quad + \mu \left(\frac{\partial w}{\partial t} l_{\beta} + \frac{\partial l_{\beta}}{\partial t} w + \frac{\partial f_{\beta}^*}{\partial t} z + \frac{\partial z}{\partial t} f_{\beta}^* + \frac{\partial \pi_{\beta}}{\partial t} + \frac{\partial l_{\beta}}{\partial t} \left(t y_{\beta}^* + \chi (F^* - f_{\beta}^*) \right) \right. \\ &\quad \left. + l_{\beta} \left(y_{\beta}^* + t \frac{\partial y_{\beta}^*}{\partial t} - \frac{\partial f_{\beta}^*}{\partial t} \chi \right) \right) \quad (A17) \end{aligned}$$

Rearranging (A17) gives the output tax as:

$$t = \frac{\chi \left(\frac{\partial f_{\beta}^*}{\partial t} (1 + \mu l_{\beta}) - \frac{\partial l_{\beta}}{\partial t} \mu (F^* - f_{\beta}^*) \right) - \frac{\partial \pi_{\beta}}{\partial t} (1 + \mu) - \frac{\partial \pi_{\gamma}}{\partial t} - y_{\beta}^* (1 + \mu l_{\beta}) - \mu \left(\frac{\partial l_{\beta}}{\partial t} w + \frac{\partial f_{\beta}^*}{\partial t} z \right) - (1 + \mu l_{\beta}) \frac{\partial w}{\partial t} - (f_t^* + \mu f_{\beta}^*) \frac{\partial z}{\partial t}}{\frac{\partial y_{\beta}^*}{\partial t} (1 + \mu l_{\beta}) + \frac{\partial l_{\beta}}{\partial t} \mu y_{\beta}^*} \quad (A18)$$

Under SFM influence the welfare of the SFM sector is:

$$W_{\gamma} = w l_{\gamma} + z f_{\gamma}^* + \pi_{\gamma} + l_{\gamma} \left(t y_{\beta}^* + \chi (F^* - f_{\beta}^*) \right) \quad (A19)$$

Differentiating (A19) gives:

$$\begin{aligned} \frac{\partial W_{\gamma}}{\partial t} &= \frac{\partial w}{\partial t} l_{\gamma} + \frac{\partial l_{\gamma}}{\partial t} w + \frac{\partial f_{\gamma}^*}{\partial t} z + \frac{\partial z}{\partial t} f_{\gamma}^* + \frac{\partial \pi_{\gamma}}{\partial t} + \frac{\partial l_{\gamma}}{\partial t} \left(t y_{\beta}^* + \chi (F^* - f_{\beta}^*) \right) \\ &\quad + l_{\gamma} \left(y_{\beta}^* + t \frac{\partial y_{\beta}^*}{\partial t} - \frac{\partial f_{\beta}^*}{\partial t} \chi \right) \quad (A20) \end{aligned}$$

Applying (28) and introducing (A20) gives the following condition:

$$\begin{aligned}
 0 = & \frac{\partial w}{\partial t} + \frac{\partial z}{\partial t} f_t^* + \frac{\partial \pi_\beta}{\partial t} + \frac{\partial \pi_\gamma}{\partial t} + y_\beta^* + \frac{\partial y_\beta^*}{\partial t} t - \frac{\partial f_\beta^*}{\partial t} \chi \\
 & + \mu \left(\frac{\partial w}{\partial t} l_\gamma + \frac{\partial \gamma}{\partial t} w + \frac{\partial f_\gamma^*}{\partial t} z + \frac{\partial z}{\partial t} f_\gamma^* + \frac{\partial \pi_\gamma}{\partial t} + \frac{\partial l_\gamma}{\partial t} (t y_\beta^* + \chi (F^* - f_\beta^*)) \right) \\
 & + \gamma \left(y_\beta^* + t \frac{\partial y_\beta^*}{\partial t} - \frac{\partial f_\beta^*}{\partial t} \chi \right) \quad (A21)
 \end{aligned}$$

The output tax is therefore:

$$t = \frac{\chi \left(\frac{\partial f_\beta^*}{\partial t} (1 + \mu l_\gamma) - \frac{\partial l_\gamma}{\partial t} \mu (F^* - f_\beta^*) \right) - \frac{\partial \pi_\beta}{\partial t} - \frac{\partial \pi_\gamma}{\partial t} (1 + \mu) - y_\beta^* (1 + \mu l_\gamma) - \mu \left(\frac{\partial l_\gamma}{\partial t} w + \frac{\partial f_\gamma^*}{\partial t} z \right) - (1 + \mu l_\gamma) \frac{\partial w}{\partial t} - (f_t^* + \mu f_\gamma^*) \frac{\partial z}{\partial t}}{\frac{\partial y_\beta^*}{\partial t} (1 + \mu l_\gamma) + \frac{\partial \gamma}{\partial t} \mu y_\beta^*} \quad (A22)$$

The following directions of partial derivatives result from the assumptions made in the model set-up:

$$\frac{\partial f_\beta^*}{\partial t} < 0, \frac{\partial \pi_\beta}{\partial t} < 0, \frac{\partial \pi_\gamma}{\partial t} > 0, \frac{\partial y_\beta^*}{\partial t} < 0, \frac{\partial l_\gamma}{\partial t} > 0, \frac{\partial l_\beta}{\partial t} < 0, \frac{\partial^2 \pi_\beta}{\partial t^2} < 0$$

Appendix 3: Derivation of results under labour market constraints

When labour markets are perfectly sticky wages, w , in the three different sectors are not equalised and thus overall social welfare includes the labour income from the three sectors.

$$W = w_\alpha \alpha + w_\beta \beta + w_\gamma \gamma + z f_t^* + \pi_\beta' + \pi_\gamma' + CS + \lambda(\varphi_\beta + \varphi_\gamma - \chi) \quad (A23)$$

Following the same steps as for when labour markets are free the optimal payments can be derived:

$$\varphi_\beta = \chi - \left(\frac{\partial w_\beta}{\partial f_\beta^*} l_\beta + \frac{\partial w_\gamma}{\partial f_\beta^*} l_\gamma + \frac{\partial z}{\partial f_\beta^*} f_t^* + \frac{\partial \pi_\beta}{\partial f_\beta^*} + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \frac{f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \right) \quad (A24)$$

$$\varphi_\gamma = \frac{\partial w_\beta}{\partial f_\beta^*} l_\beta + \frac{\partial w_\gamma}{\partial f_\beta^*} l_\gamma + \frac{\partial z}{\partial f_\beta^*} f_t^* + \frac{\partial \pi_\beta}{\partial f_\beta^*} + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \frac{f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \quad (A25)$$

Under mining sector influence the welfare of the mining sector is amended to include the differential wage rate, becoming:

$$W_\beta = w_\beta l_\beta + z f_\beta^* + \pi_\beta + \varphi_\beta F^* \quad (A26)$$

Differentiating (A26) gives:

$$\frac{\partial W_\beta}{\partial \varphi_\beta} = \frac{\partial w_\beta}{\partial \varphi_\beta} l_\beta + \frac{\partial z}{\partial \varphi_\beta} f_\beta^* + \frac{\partial f_\beta^*}{\partial \varphi_\beta} z + \frac{\partial \pi_\beta}{\partial \varphi_\beta} + F^* \quad (A27)$$

Again following the same steps as above and applying (28) and introducing (A27) gives:

$$\varphi_\beta = \chi - \left(\frac{\partial w_\beta}{\partial f_\beta^*} l_\beta (1 + \mu) + \frac{\partial w_\gamma}{\partial f_\beta^*} l_\gamma + \frac{\partial z}{\partial f_\beta^*} (f_t^* + \mu f_\beta^*) + \frac{\partial \pi_\beta}{\partial f_\beta^*} (1 + \mu) + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \mu z + \frac{\mu F^* + f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \right) \quad (A28)$$

Under SFM influence the welfare of the SFM sector is:

$$W_\gamma = w_\gamma \gamma + z f_\gamma^* + \pi_\gamma + \varphi_\gamma (F^* - f_\beta^*) \quad (A29)$$

Following the same steps this gives the optimal payment rate of:

$$\varphi_\beta = \chi - \left(\frac{(1 + \mu l_\gamma) \frac{\partial w_\gamma}{\partial f_\beta^*} + (f_t^* + \mu f_\gamma^*) \frac{\partial z}{\partial f_\beta^*} + \frac{\partial \pi_\beta}{\partial f_\beta^*} + \frac{\partial w_\beta}{\partial f_\beta^*} l_\beta}{(1 + \mu)} + \frac{\partial \pi_\gamma}{\partial f_\beta^*} + \frac{f_\beta^*}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} - \frac{\mu(F^* - f_\beta)}{\frac{\partial f_\beta^*}{\partial \varphi_\beta}} \right) \quad (A30)$$

Appendix 4: Correlation of independent variables

	Real gold price	Real oil price	Change in real oil price	CPI	Real GDP per capita	Change in Real GDP per capita	LCDS
Real gold price	1						
Real oil price	0.9098	1					
Change in real oil price	0.1629	0.3661	1				
CPI	-0.1927	0.0119	0.2226	1			
Real GDP per capita	0.9614	0.9112	0.1345	-0.1344	1		
Change in Real GDP per capita	0.4322	0.3574	0.0419	0.0235	0.3694	1	
LCDS	0.8852	0.6628	-0.1699	-0.3639	0.8519	0.3724	1

Appendix 5: Model specifications

Takenout models

Model Number	Price	Costs	Production	Regulatory Risk
1 – No elections	Real gold prices		District effects, Age	
2 – Election year	Real gold prices		District effects, Age	Election years
3 – Election plus and minus	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2)
4 – Election and LCDS	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS
5 – LCDS price interaction	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS, LCDS*Price
6 – Costs (Real GDP per capita)	Real gold prices	Real GDP per capita	District effects, Age	Election years, plus lags (-1,+1,+2), LCDS
7 – Costs (Real gold change oil)	Real gold prices	Change in oil prices	District effects, Age	Election years, plus lags (-1,+1,+2), LCDS
8 – District*Price	Real gold prices, District *Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS
9 – Type * LCDS	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS, Type*LCDS
10 – Type*Price	Real gold prices, Type*Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS

Givenup models

Model Number	Price	Costs	Production	Regulatory Risk	Previous Production
1 – No elections	Real gold prices		District effects, Age		Duration
2 – Election year	Real gold prices		District effects, Age	Election years	Duration
3 – Election plus and minus	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2)	Duration
4 – Election and LCDS	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS	Duration
5 – LCDS price interaction	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS, LCDS*Price	Duration
6 – Costs (Real GDP per capita)	Real gold prices	Real GDP per capita	District effects, Age	Election years, plus lags (-1,+1,+2), LCDS	Duration
7 – Costs (Real gold change oil)	Real gold prices	Change in oil prices	District effects, Age	Election years, plus lags (-1,+1,+2), LCDS	Duration
8 – District*Price	Real gold prices, District *Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS	Duration
9 – Type * LCDS	Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS, Type*LCDS	Duration
10 – Type*Price	Real gold prices, Type*Real gold prices		District effects, Age	Election years, plus lags (-1,+1,+2), LCDS	Duration

Appendix 6: Model Results Claims Taken Out²⁷⁴

	(1) - No Elections			(2) - Election year only		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
<i>Real gold price</i>	0.0273*** (-3.67)	0.00116*** (-8.38)	0.000781*** (-4.7)	0.0276*** (-3.83)	0.00115*** (-8.48)	0.000781*** (-4.58)
<i>Age</i>	-3.372** (-3.14)	-0.280*** (-12.30)	-0.247*** (-7.00)	-3.422** (-3.19)	-0.280*** (-12.34)	-0.247*** (-7.00)
<i>Election</i>				-8.315 (-1.20)	-0.131 (-0.91)	0.0205 (-0.14)
District 2	62.96*** (-3.62)	2.954*** (-8.58)	4.022*** (-9)	63.44*** (-3.64)	2.926*** (-8.37)	4.022*** (-9)
District 3	75.41*** (-3.85)	3.087*** (-9.2)	4.424*** (-8.58)	75.92*** (-3.87)	3.059*** (-9.01)	4.423*** (-8.6)
District 4	43.14** (-3.13)	2.154*** (-6.47)	3.178*** (-6.97)	43.56** (-3.16)	2.121*** (-6.3)	3.178*** (-6.97)
District 5	56.81*** (-4.59)	2.420*** (-6.69)	3.337*** (-4.42)	57.02*** (-4.61)	2.386*** (-6.5)	3.339*** (-4.42)
District 6	29.76** (-3.29)	0.913** (-2.78)	2.729*** (-3.92)	29.78** (-3.26)	0.893** (-2.7)	2.729*** (-3.93)
Type 2	38.70** (-2.89)	0.466** (-3.06)	0.707 (-1.71)	38.59** (-2.88)	0.469** (-3.07)	0.706 (-1.71)
Type 3	-15.79** (-2.84)	0.133 (-0.53)	-1.169 (-1.81)	-15.85** (-2.87)	0.143 (-0.56)	-1.171 (-1.81)
Type 4	19.25 (-1.28)	0.355* (-2.04)	0.619 (-1.18)	19.36 (-1.28)	0.345* (-1.99)	0.621 (-1.19)
<i>N</i>	408	408	408	408	408	408
<i>R²</i>	0.462	0.114	0.360	0.464	0.114	0.359
<i>B-P test</i>	167.9 (0)			167.3 (0)		
<i>Woolridge test</i>	17.26 (0.000383)			17.64 (0.000342)		
<i>Vuong</i>		7.816			7.809	
<i>Zip</i>		11697.7			11450	

²⁷⁴ ***0.1% significance, ** 1% significance, *5% significance

	(3) - Election plus lags			(4) - Election plus lags, LCDS		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
<i>Real gold price</i>	0.0299*** (-4.17)	0.00118*** (-8.55)	0.000817*** (-4.7)	0.0593*** (-5.6)	0.00159*** (-5.97)	0.00132* (-2.25)
<i>Age</i>	-3.553** (-3.25)	-0.291*** (-12.33)	-0.252*** (-7.33)	-3.849*** (-3.54)	-0.293*** (-12.57)	-0.257*** (-6.73)
<i>Election</i>	-11.56 (-1.15)	-0.420* (-2.26)	-0.208 (-1.23)	-20.24* (-2.54)	-0.532** (-2.72)	-0.368 (-1.51)
<i>Election lag</i>	-2.654 (-0.26)	-0.301 (-1.83)	-0.113 (-1.18)	-6.197 (-0.79)	-0.340* (-2.08)	-0.178 (-1.47)
<i>Election plus</i>	-7.697 (-0.80)	-0.261 (-1.42)	-0.327* (-2.41)	-18.19* (-2.28)	-0.412* (-2.01)	-0.536* (-2.50)
<i>Election plus 2</i>	2.05 (-0.2)	-0.385* (-2.27)	-0.278 (-1.42)	-10.42 (-1.21)	-0.558** (-2.79)	-0.537*** (-3.34)
<i>LCDS</i>				-41.78*** (-3.40)	-0.574 (-1.84)	-0.737 (-0.99)
District 2	65.04*** (-3.93)	2.922*** (-8.23)	4.027*** (-8.92)	67.34*** (-4.06)	2.954*** (-8.21)	4.110*** (-9.27)
District 3	77.66*** (-3.99)	3.071*** (-8.94)	4.436*** (-8.59)	79.97*** (-4.1)	3.120*** (-8.83)	4.539*** (-8.78)
District 4	44.90** (-3.26)	2.117*** (-6.23)	3.177*** (-6.93)	47.14*** (-3.41)	2.166*** (-6.22)	3.274*** (-7.27)
District 5	57.97*** (-4.78)	2.335*** (-6.37)	3.292*** (-4.4)	58.41*** (-4.85)	2.358*** (-6.38)	3.341*** (-4.53)
District 6	32.01*** (-3.42)	0.881** (-2.67)	2.732*** (-3.94)	33.76*** (-3.61)	0.948** (-2.8)	2.825*** (-4.25)
Type 2	38.74** (-3.15)	0.435** (-2.88)	0.686 (-1.66)	38.08** (-3.09)	0.423** (-2.84)	0.683 (-1.66)
Type 3	-15.84** (-2.81)	0.152 (-0.62)	-1.187 (-1.84)	-15.20** (-2.70)	0.172 (-0.7)	-1.172 (-1.83)
Type 4	20.66 (-1.33)	0.349* (-1.98)	0.617 (-1.2)	21.27 (-1.37)	0.322 (-1.86)	0.582 (-1.13)
<i>N</i>	405	405	405	405	405	405
<i>R²</i>	0.467	0.118	0.375	0.474	0.118	0.414
<i>B-P test</i>	167.7 (0)			179.7 (0)		
<i>Woolridge Test</i>	17.72 (0.000334)			15.56 (0.000645)		
<i>Vuong</i>		8.592			8.613	
<i>Zip</i>		10971.8			10388.7	

	<i>(5) - Election, LCDS, LCDS-Price</i>			<i>(6) – Election, LCDS, Costs (GDP per capita)</i>		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
Real gold price	0.0741*** (6.33)	0.00206*** (6.56)	0.00186** (2.88)	0.0575*** (5.30)	0.00163*** (6.17)	0.00134* (2.30)
Age	-3.936*** (-3.61)	-0.294*** (-13.07)	-0.255*** (-6.91)	-3.848*** (-3.54)	-0.296*** (-12.34)	-0.257*** (-6.80)
Election	-12.07 (-1.70)	-0.294 (-1.35)	-0.189 (-1.04)	-21.61** (-2.67)	-0.468* (-2.17)	-0.333 (-1.27)
Election lag	-0.901 (-0.14)	-0.171 (-0.94)	-0.0629 (-0.67)	-6.095 (-0.80)	-0.311 (-1.88)	-0.164 (-1.28)
Election plus	-9.720 (-1.34)	-0.151 (-0.67)	-0.355* (-2.20)	-18.31* (-2.33)	-0.368 (-1.68)	-0.517* (-2.38)
Election plus 2	-5.112 (-0.71)	-0.414* (-1.99)	-0.459** (-2.93)	-9.918 (-1.17)	-0.541** (-2.69)	-0.537** (-3.27)
LCDS	11.65 (0.50)	1.109 (1.50)	0.714 (1.05)	-41.49*** (-3.44)	-0.559 (-1.78)	-0.727 (-0.97)
LCDS * Price	-0.0507* (-2.48)	-0.00163* (-2.48)	-0.00150* (-2.12)			
Real GDP per capita				0.000198 (0.64)	-0.0000058 (-0.77)	-0.0000040 (-0.89)
District 2	68.45*** (4.10)	2.942*** (8.24)	4.106*** (9.00)	67.31*** (4.05)	2.973*** (8.23)	4.117*** (9.28)
District 3	81.22*** (4.14)	3.122*** (8.94)	4.547*** (8.60)	79.94*** (4.09)	3.137*** (8.84)	4.545*** (8.75)
District 4	47.98*** (3.45)	2.197*** (6.30)	3.308*** (7.13)	47.11*** (3.40)	2.177*** (6.25)	3.276*** (7.26)
District 5	59.16*** (4.88)	2.366*** (6.37)	3.353*** (4.50)	58.38*** (4.85)	2.359*** (6.41)	3.339*** (4.52)
District 6	34.18*** (3.63)	0.932** (2.74)	2.837*** (4.15)	33.66*** (3.60)	0.947** (2.81)	2.827*** (4.25)
Type 2	38.33** (3.12)	0.476** (3.15)	0.746 (1.80)	38.04** (3.09)	0.406** (2.65)	0.673 (1.65)
Type 3	-15.26** (-2.71)	0.222 (0.90)	-1.129 (-1.75)	-15.23** (-2.71)	0.172 (0.70)	-1.174 (-1.84)
Type 4	21.48 (1.39)	0.314 (1.83)	0.558 (1.08)	21.25 (1.37)	0.319 (1.83)	0.580 (1.13)
N	405	405	405	405	405	405
R ²	0.477	0.119	0.423	0.474	0.118	0.418
B-P Test	189.3 (0)			179.8 (0)		
Woolridge Test	14.64 (0.00087)			15.59 (0.00064)		
Vuong		8.723			8.577	
Zip		10069.0			10389.1	

	<i>(7) – Election, LCDS, Costs (Oil prices)</i>			<i>(8) – Election, LCDS, District*Price</i>		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
Real gold price	0.0821*** (-5.88)	0.00192*** (-4.76)	0.00145* (-2.07)	0.0241 (1.96)	0.000319 (0.79)	0.000423 (0.59)
Age	-3.928*** (-3.60)	-0.294*** (-12.64)	-0.258*** (-6.73)	-4.630*** (-3.89)	-0.322*** (-12.30)	-0.279*** (-6.52)
Election	-17.44* (-2.48)	-0.507** (-2.58)	-0.361 (-1.48)	-20.92* (-2.56)	-0.584** (-3.06)	-0.373 (-1.57)
Election lag	3.617 (-0.45)	-0.245 (-1.28)	-0.144 (-1.31)	-6.326 (-0.79)	-0.378* (-2.34)	-0.178 (-1.39)
Election plus	-19.05** (-2.77)	-0.440* (-2.16)	-0.549* (-2.52)	-18.83* (-2.30)	-0.473* (-2.34)	-0.549* (-2.45)
Election plus 2	-6.534 (-0.85)	-0.543** (-2.73)	-0.537*** (-3.34)	-11.12 (-1.25)	-0.634*** (-3.33)	-0.540*** (-3.61)
LCDS	-70.21*** (-4.39)	-0.996* (-2.00)	-0.902 (-1.05)	-43.83*** (-3.47)	-0.650* (-2.09)	-0.784 (-0.96)
Change in oil prices	-0.566* (-2.39)	-0.00799 (-1.16)	-0.00256 (-0.39)			3.297*** (7.49)
District 2	68.15*** (-4.09)	2.943*** (-8.25)	4.112*** (-9.24)	35.21* (2.07)	2.136*** (5.43)	4.250*** (7.03)
District 3	80.85*** (-4.12)	3.113*** (-8.88)	4.543*** (-8.77)	49.18* (2.22)	2.607*** (6.53)	2.404*** (5.34)
District 4	47.81*** (-3.44)	2.173*** (-6.29)	3.282*** (-7.27)	19.26 (1.34)	1.293*** (3.35)	3.101*** (3.71)
District 5	58.82*** (-4.88)	2.362*** (-6.44)	3.347*** (-4.53)	37.59** (2.86)	2.207*** (4.63)	2.266** (2.85)
District 6	33.91*** (-3.62)	0.939** (-2.8)	2.828*** (-4.24)	14.23 (1.67)	0.0748 (0.19)	0.576 (1.47)
Type 2	38.08** (-3.09)	0.423** (-2.86)	0.682 (-1.66)	37.81** (3.10)	0.368* (2.49)	-1.109 (-1.79)
Type 3	-15.12** (-2.68)	0.196 (-0.8)	-1.165 (-1.82)	-15.15** (-2.66)	0.310 (1.25)	0.655 (1.27)
Type 4	21.56 (-1.4)	0.324 (-1.87)	0.583 (-1.13)	22.86 (1.51)	0.424* (2.43)	0.000423 (0.59)
District 2*Price				0.0568** (3.29)	0.00172*** (4.10)	0.00146*** (4.03)
District 3*Price				0.0558** (2.67)	0.00125*** (3.35)	0.000742 (1.58)
District 4*Price				0.0490*** (3.76)	0.00175*** (4.30)	0.00150*** (3.48)
District 5*Price				0.0347* (2.17)	0.000559 (1.19)	0.000564 (1.47)
District 6*Price				0.0340* (2.41)	0.00164*** (3.47)	0.00102* (2.49)

N	405	405	405	405	405	405
R2	0.476	0.118	0.417	0.488	0.120	0.321
B-P Test	179.4 (0)			197.9 (0)		
Woolridge Test	16.11 (0.0005)			16.71 (0.000452)		
Vuong		8.643			8.730	
Zip		10152.8			9549.1	

	<i>(9) – Election, LCDS, Type*LCDS</i>			<i>(10) – Election, LCDS, Type*Price</i>		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
Real gold price	0.0615*** (5.96)	0.00159*** (6.09)	0.00116* (1.99)	0.0319* (2.32)	0.00129** (2.97)	0.000793 (0.95)
Age	-4.222*** (-4.26)	-0.326*** (-11.42)	-0.288*** (-5.89)	-3.377*** (-3.62)	-0.297*** (-9.99)	-0.244*** (-4.67)
Election	-22.35** (-2.85)	-0.640** (-3.24)	-0.342 (-1.42)	-19.88* (-2.45)	-0.562** (-2.85)	-0.291 (-1.01)
Election lag	-8.064 (-1.05)	-0.437** (-2.68)	-0.189 (-1.53)	-6.605 (-0.82)	-0.384* (-2.42)	-0.142 (-0.99)
Election plus	-20.33** (-2.61)	-0.524* (-2.54)	-0.519* (-2.45)	-18.03* (-2.24)	-0.487* (-2.41)	-0.534* (-2.12)
Election plus 2	-12.95 (-1.55)	-0.710*** (-3.50)	-0.580*** (-3.33)	-10.52 (-1.21)	-0.613** (-3.14)	-0.515** (-2.87)
LCDS	-58.05*** (-3.31)	-0.582 (-1.69)	-0.433 (-0.86)	-38.80** (-3.17)	-0.560 (-1.78)	-0.580 (-0.68)
District 2	70.32*** (4.33)	3.196*** (8.44)	4.316*** (10.74)	64.40*** (4.16)	2.941*** (7.41)	3.896*** (9.07)
District 3	83.02*** (4.30)	3.407*** (9.14)	4.765*** (10.01)	77.30*** (4.21)	3.130*** (7.98)	4.311*** (8.80)
District 4	49.95*** (3.68)	2.376*** (6.63)	3.430*** (8.55)	43.82*** (3.40)	2.143*** (5.70)	3.046*** (7.17)
District 5	59.11*** (4.99)	2.499*** (6.78)	3.432*** (4.90)	58.82*** (4.93)	2.319*** (6.01)	3.163*** (4.56)
District 6	35.36*** (3.82)	1.013** (3.13)	2.873*** (4.48)	31.82*** (3.58)	0.938** (2.72)	2.658*** (4.46)
Type 2	21.41 (1.70)	0.231 (1.37)	0.480 (1.02)	-2.613 (-0.16)	-0.0156 (-0.06)	0.0413 (0.08)
Type 3	-15.56* (-2.53)	0.188 (0.72)	-1.056 (-1.63)	-21.88** (-2.59)	0.128 (0.34)	-0.941 (-1.48)
Type 4	25.19 (1.46)	0.504* (2.32)	0.851 (1.24)	-3.070 (-0.13)	0.266 (0.74)	0.0883 (0.11)
Type 2*LCDS	63.59** (2.61)	0.546 (1.52)	0.580 (1.26)			
Type 3*LCDS	3.814 (0.34)	0.532 (0.69)	-0.225 (-0.33)			
Type 4*LCDS	-13.64 (-0.41)	-0.672 (-1.63)	-0.827 (-0.88)			
Type 2*Price				0.0609** (3.20)	0.000618 (1.86)	0.000866* (2.08)
Type 3* Price				0.00708 (0.81)	-0.0000430 (-0.06)	-0.000629 (-1.68)
Type 4* Price				0.0336 (1.26)	0.0000870 (0.21)	0.000667 (1.33)

N	405	405	405	405	405	405
R2	0.496	0.119	0.336	0.496	0.118	0.350
Diagnostic tests						
B-P Test	182.5 (0)			192.7 (0)		
Woolridge Test	20.48 (0.000152)			11.04 (0.00297)		
Vuong		8.619			8.551	
Zip		9571.2			9849.9	

Appendix 7: Model Results Claims Given up²⁷⁵

	(1)- No Elections			(2) – Election year only		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
<i>Real gold price</i>	0.0290* (2.57)	0.000404** (3.00)	0.000139 (0.67)	0.0302** (2.72)	0.000402** (3.05)	0.000133 (0.65)
<i>Age</i>	-1.492* (-2.15)	-0.111*** (-3.56)	-0.00222 (-0.08)	-1.499* (-2.19)	-0.114*** (-3.69)	-0.00538 (-0.19)
<i>Duration</i>	-0.849 (-1.51)	-0.0224 (-1.43)	0.0200 (1.44)	-0.891 (-1.61)	-0.0230 (-1.46)	0.0197 (1.41)
<i>Election</i>				-13.27 (-0.92)	-0.172 (-1.46)	-0.169 (-1.33)
District 2	61.31** (3.03)	1.907*** (5.57)	2.623*** (4.78)	62.07** (3.08)	1.917*** (5.77)	2.651*** (4.87)
District 3	72.87** (3.09)	2.182*** (6.41)	2.886*** (5.37)	73.89** (3.16)	2.195*** (6.65)	2.915*** (5.46)
District 4	35.69** (2.63)	1.210*** (3.53)	1.955*** (3.88)	36.09** (2.67)	1.238*** (3.69)	1.996*** (3.98)
District 5	36.99** (3.13)	1.528*** (4.17)	2.232*** (3.71)	37.38** (3.18)	1.539*** (4.29)	2.251*** (3.76)
District 6	21.95** (2.96)	0.832* (2.13)	2.165*** (3.40)	22.22** (3.01)	0.831* (2.17)	2.166*** (3.42)
Type 2	35.60 (1.79)	0.396* (2.40)	0.791* (2.57)	35.75 (1.80)	0.365* (2.27)	0.770* (2.55)
Type 3	-17.58** (-2.80)	-0.414 (-1.71)	-1.516** (-3.22)	-17.82** (-2.83)	-0.410 (-1.70)	-1.512** (-3.26)
Type 4	0.693 (0.08)	-0.0585 (-0.33)	0.0258 (0.08)	0.568 (0.06)	-0.0726 (-0.42)	0.0205 (0.06)
<i>N</i>	384	384	384	384	384	384
<i>R</i> ²	0.336	0.0776	0.278	0.340	0.0774	0.278
<i>B-P test</i>	403.3 (0)			410.7 (0)		
<i>Woolridge test</i>	3.014 (0.0959)			2.886 (0.103)		
<i>Vuong test</i>		5.323			5.311	
<i>Zip test</i>		9900.5			9553.6	

²⁷⁵ ***0.1% significance, ** 1% significance, *5% significance

	(3) - Election plus lags			(4) - Election plus lags, LCDS		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
<i>Real gold price</i>	0.0281*** (3.87)	0.000285* (2.17)	0.00000979 (0.05)	0.0218 (1.31)	-0.000276 (-0.87)	-0.000947** (-2.62)
<i>Age</i>	-1.648** (-2.98)	-0.111*** (-3.93)	-0.00266 (-0.10)	-1.571** (-2.96)	-0.101*** (-3.42)	0.0117 (0.41)
<i>Duration</i>	-0.727* (-2.01)	-0.0127 (-0.89)	0.0267* (2.15)	-0.752* (-2.07)	-0.0101 (-0.67)	0.0324** (2.65)
<i>Election</i>	-11.33 (-0.89)	0.276 (1.22)	0.437 (1.90)	-9.383 (-0.71)	0.441 (1.67)	0.733* (2.46)
<i>Election lag</i>	-16.09 (-1.35)	0.266 (1.04)	0.191 (0.72)	-15.30 (-1.29)	0.332 (1.22)	0.323 (1.11)
<i>Election plus</i>	24.17 (1.96)	0.828*** (3.49)	1.009*** (4.13)	26.39* (1.99)	1.024*** (3.66)	1.350*** (4.29)
<i>Election plus 2</i>	-8.934 (-0.72)	0.141 (0.59)	0.222 (1.10)	-6.313 (-0.47)	0.323 (1.19)	0.572* (2.06)
<i>LCDS</i>				8.686 (0.41)	0.775 (1.94)	1.388*** (3.92)
District 2	61.90*** (4.23)	1.987*** (6.80)	2.709*** (4.98)	61.38*** (4.23)	1.964*** (6.63)	2.630*** (4.81)
District 3	73.18*** (4.27)	2.270*** (7.68)	2.963*** (5.56)	72.71*** (4.26)	2.275*** (7.48)	2.932*** (5.41)
District 4	36.46*** (4.20)	1.254*** (4.28)	2.014*** (3.99)	35.93*** (4.20)	1.238*** (4.17)	1.959*** (3.83)
District 5	37.28*** (4.41)	1.577*** (5.14)	2.333*** (3.80)	37.08*** (4.41)	1.605*** (5.19)	2.372*** (3.84)
District 6	25.09*** (4.17)	0.946** (2.70)	2.266*** (3.63)	24.65*** (4.15)	0.952** (2.67)	2.231*** (3.54)
Type 2	35.80*** (3.55)	0.335* (2.08)	0.718* (2.28)	35.91*** (3.56)	0.373* (2.30)	0.765* (2.38)
Type 3	-17.30** (-3.02)	-0.583* (-2.48)	-1.620*** (-3.49)	-17.38** (-3.03)	-0.630** (-2.61)	-1.671*** (-3.58)
Type 4	1.355 (0.24)	-0.197 (-1.16)	-0.0741 (-0.21)	1.205 (0.21)	-0.229 (-1.32)	-0.126 (-0.36)
<i>N</i>	384	384	384	382	382	382
<i>R²</i>	0.373	0.0828	0.198	0.374	0.0833	0.156
<i>B-P Test</i>	444.5 (0)			436.3 (0)		
<i>Woolridge test</i>	3.189 (0.0873)			3.169 (0.0883)		
<i>Vuong</i>		5.090			4.740	
<i>Zip</i>		8570.0			8572.6	

	(5) - Election, LCDS, LCDS-Price			(6) – Election, LCDS, Costs (Real GDP per capita)		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
Real gold price	-0.0172 (-0.97)	-0.00118** (-2.98)	-0.00192*** (-4.43)	0.0328 (1.94)	-0.000241 (-0.73)	-0.000965** (-2.63)
Age	-1.516** (-2.97)	-0.0942*** (-3.42)	0.0174 (0.64)	-1.491** (-2.84)	-0.101*** (-3.40)	0.0123 (0.43)
Duration	-0.652 (-1.80)	-0.00133 (-0.09)	0.0395** (3.06)	-0.822* (-2.27)	-0.0109 (-0.73)	0.0326** (2.65)
Election	-30.88* (-2.54)	0.127 (0.46)	0.505 (1.74)	-4.613 (-0.36)	0.480 (1.76)	0.711* (2.39)
Election lag	-28.98** (-2.80)	0.110 (0.43)	0.208 (0.72)	-15.88 (-1.40)	0.329 (1.21)	0.327 (1.13)
Election plus	4.336 (0.36)	0.655* (2.26)	1.080*** (3.54)	26.36* (2.08)	1.023*** (3.63)	1.353*** (4.30)
Election plus 2	-19.84 (-1.73)	0.102 (0.37)	0.447 (1.88)	-9.114 (-0.70)	0.311 (1.15)	0.583* (2.09)
LCDS	-132.2** (-3.18)	-1.816* (-2.18)	-1.050 (-1.70)	6.215 (0.31)	0.779 (1.95)	1.382*** (3.90)
LCDS * Price	0.134*** (3.72)	0.00264*** (3.56)	0.00256*** (4.17)			
Real GDP per capita				-0.00107 (-1.96)	-0.00000542 (-0.60)	0.00000320 (0.51)
District 2	61.82*** (4.29)	1.851*** (6.40)	2.500*** (4.70)	61.10*** (4.23)	1.983*** (6.86)	2.622*** (4.79)
District 3	73.42*** (4.35)	2.175*** (7.53)	2.832*** (5.38)	72.59*** (4.27)	2.294*** (7.73)	2.925*** (5.39)
District 4	35.63*** (4.25)	1.110*** (3.87)	1.824*** (3.69)	35.56*** (4.19)	1.257*** (4.34)	1.951*** (3.82)
District 5	37.85*** (4.51)	1.534*** (5.07)	2.326*** (3.77)	36.93*** (4.40)	1.619*** (5.36)	2.369*** (3.84)
District 6	25.12*** (4.07)	0.874** (2.60)	2.131*** (3.46)	24.52*** (4.16)	0.975** (2.85)	2.223*** (3.53)
Type 2	36.69*** (3.64)	0.314* (2.06)	0.719* (2.18)	36.01*** (3.55)	0.369* (2.27)	0.769* (2.40)
Type 3	-18.88** (-3.23)	-0.668** (-2.69)	-1.718*** (-3.72)	-17.38** (-3.06)	-0.625* (-2.56)	-1.675*** (-3.59)
Type 4	0.480 (0.09)	-0.371* (-2.15)	-0.232 (-0.66)	61.10*** (4.23)	-0.228 (-1.31)	-0.124 (-0.35)
N	382	382	382	382	382	382
R ²	0.397	0.0853	0.089	0.382	0.0828	0.160
B-P Test	520.0 (0)			437.9 (0)		
Woolridge Test	2.854			2.878		

	(0.105)			(0.103)		
Vuong		4.724			4.702	
Zip		7873.0			8459.5	

	<i>(7) – Election, LCDS, Costs (Change in oil prices)</i>			<i>(8) - Election, LCDS, District*Price</i>		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
Real gold price	0.0317 (1.24)	-0.000339 (-0.72)	-0.00135* (-2.49)	-0.0126 (-0.80)	-0.00220*** (-3.95)	-0.00216*** (-8.47)
Age	-1.590** (-2.99)	-0.100*** (-3.39)	0.0147 (0.51)	-2.048*** (-3.63)	-0.123*** (-4.15)	-0.00743 (-0.27)
Duration	-0.778* (-2.14)	-0.00978 (-0.64)	0.0344** (2.74)	-0.624 (-1.70)	-0.00246 (-0.17)	0.0348** (2.80)
Election	-8.000 (-0.59)	0.442 (1.68)	0.736* (2.50)	-8.825 (-0.65)	0.481 (1.86)	0.776* (2.42)
Election lag	-10.97 (-0.83)	0.314 (1.05)	0.212 (0.65)	-14.05 (-1.14)	0.436 (1.58)	0.402 (1.20)
Election plus	25.97 (1.93)	1.034*** (3.72)	1.404*** (4.57)	27.11* (2.01)	0.999*** (3.77)	1.291*** (3.94)
Election plus 2	-4.625 (-0.34)	0.320 (1.17)	0.560* (2.02)	-5.150 (-0.37)	0.437 (1.64)	0.627* (1.99)
LCDS	-3.824 (-0.12)	0.858 (1.50)	1.928** (3.27)	7.604 (0.36)	0.890* (2.28)	1.490*** (3.83)
Change in oil prices	-0.250 (-0.52)	0.00148 (0.18)	0.00877 (1.15)			
District 2	61.59*** (4.24)	1.963*** (6.64)	2.619*** (4.71)	21.84 (1.17)	0.805* (2.09)	1.842** (3.23)
District 3	72.96*** (4.27)	2.274*** (7.52)	2.919*** (5.29)	38.37 (1.64)	1.384*** (3.33)	2.358*** (4.31)
District 4	36.15*** (4.23)	1.236*** (4.17)	1.951*** (3.76)	8.224 (0.77)	0.00396 (0.01)	1.049* (2.05)
District 5	37.10*** (4.41)	1.605*** (5.19)	2.378*** (3.86)	7.863 (0.76)	0.690 (1.61)	1.343* (2.00)
District 6	24.57*** (4.17)	0.955** (2.65)	2.245*** (3.58)	14.15* (2.03)	0.324 (0.61)	1.892* (2.22)
Type 2	35.78*** (3.57)	0.375* (2.29)	0.774* (2.42)	35.40*** (3.54)	0.372* (2.32)	0.711* (2.16)
Type 3	-17.22** (-3.00)	-0.634** (-2.58)	-1.693*** (-3.63)	-17.13** (-2.94)	-0.569* (-2.35)	-1.667*** (-3.64)
Type 4	1.361 (0.24)	-0.233 (-1.32)	-0.151 (-0.44)	1.768 (0.30)	-0.194 (-1.13)	-0.146 (-0.40)
District 2*Price				0.0597*** (3.43)	0.00224*** (4.19)	0.00139*** (3.67)
District 3*Price				0.0524* (2.23)	0.00187*** (3.54)	0.00112* (2.56)
District 4*Price				0.0430*** (4.24)	0.00233*** (4.22)	0.00152*** (4.26)

District 5*Price				0.0423*** (4.01)	0.00187*** (3.70)	0.00160*** (7.06)
District 6*Price				0.0174* (2.39)	0.00131* (2.13)	0.000611 (0.93)
N	382	382	382	382	382	382
R2	0.374	0.0827	0.135	0.393	0.0864	0.325
B-P Test	434.3 (0)			475.1 (0)		
Woolridge Test	2.915 (0.101)			3.258 (0.0842)		
Vuong		4.704			4.668	
Zip		8559.0			8206.5	

	<i>(9) – Election, LCDS, Type*LCDS</i>			<i>(10) – Election, LCDS, Type*Price</i>		
	OLS PCSE with LDV	ZINB robust	GEE AR1 robust	OLS PCSE with LDV	ZINB robust	GEE AR1 robust
Real gold price	0.0210 (1.25)	-0.000397 (-0.96)	-0.00153*** (-3.51)	-0.00527 (-0.30)	-0.000394 (-0.97)	-0.00164** (-2.93)
Age	-1.214* (-2.21)	-0.0974* (-2.55)	0.0723* (2.35)	-1.034 (-1.88)	-0.0976** (-2.83)	0.0684* (2.20)
Duration	-0.631 (-1.72)	-0.00432 (-0.28)	0.0412*** (3.54)	-0.591 (-1.59)	-0.00303 (-0.19)	0.0465*** (3.70)
Election	-9.970 (-0.76)	0.448 (1.58)	0.848* (2.57)	-9.359 (-0.71)	0.425 (1.51)	0.836* (2.52)
Election lag	-16.39 (-1.40)	0.330 (1.18)	0.347 (1.14)	-16.15 (-1.39)	0.288 (1.03)	0.331 (1.09)
Election plus	25.68 (1.94)	0.991*** (3.35)	1.405*** (4.06)	26.14* (1.98)	0.961** (3.26)	1.382*** (3.96)
Election plus 2	-7.128 (-0.53)	0.308 (1.08)	0.648* (2.22)	-6.685 (-0.50)	0.283 (0.98)	0.635* (2.16)
LCDS	-15.79 (-0.72)	0.867 (1.85)	1.458*** (3.52)	10.03 (0.47)	0.834 (1.93)	1.646*** (3.83)
District 2	57.17*** (3.88)	1.921*** (6.19)	2.162*** (4.01)	55.41*** (3.77)	1.919*** (6.17)	2.138*** (4.26)
District 3	68.06*** (3.91)	2.242*** (6.94)	2.459*** (4.52)	66.19*** (3.80)	2.236*** (6.91)	2.441*** (4.87)
District 4	32.35*** (3.75)	1.194*** (3.94)	1.545** (3.11)	30.72*** (3.59)	1.180*** (3.87)	1.510** (3.27)
District 5	35.65*** (4.21)	1.570*** (5.11)	2.220*** (3.64)	35.10*** (4.15)	1.555*** (5.04)	2.188*** (3.64)
District 6	22.33*** (3.64)	0.919** (2.61)	1.942** (3.29)	21.25*** (3.46)	0.895* (2.53)	1.892*** (3.39)
Type 2	15.84 (1.09)	0.239 (1.36)	0.620 (1.93)	-19.23 (-0.86)	0.0157 (0.07)	0.255 (0.83)
Type 3	-16.56** (-2.63)	-0.549 (-1.93)	-1.743*** (-3.97)	-15.94* (-2.00)	-0.266 (-0.87)	-1.253* (-2.47)
Type 4	-6.845 (-0.93)	-0.242 (-0.94)	-0.777* (-2.16)	-20.04 (-1.82)	-0.218 (-0.70)	-1.083* (-2.37)
Type 2*LCDS	77.47** (2.67)	0.532 (1.52)	0.891* (2.57)			
Type 3*LCDS	-4.888 (-0.63)	-0.767 (-1.92)	-1.282*** (-4.52)			
Type 4*LCDS	27.33 (1.94)	-0.00469 (-0.01)	1.720*** (4.46)			
Type 2*Price				0.0772** (3.08)	0.000492* (1.97)	0.000792* (2.21)
Type 3* Price				-0.00312 (-0.49)	-0.000697* (-2.19)	-0.00123** (-2.84)

Type 4* Price				0.0276* (2.33)	-0.0000284 (-0.09)	0.00111* (2.40)
N	382	382	382	382	382	382
R2	0.406	0.0839	0.256	0.422	0.0848	0.332
B-P Test	533.6 (0)			566.4 (0)		
Woolridge Test	3.278 (0.0833)			3.108 (0.0912)		
Vuong		3.871			4.011	
Zip		8095.8			8039.7	

Appendix 8: Average prices and price volatility results

Table A81: Number of claims taken out – 3 year average gold prices

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>	<i>Model 9</i>	<i>Model 10</i>
Average gold price	0.000937* ** (4.49)	0.000938* ** (4.49)	0.000985*** (4.59)	0.00169* (2.24)	0.00255** (3.03)	0.00170* (2.27)	0.00171* (2.11)	0.000415 (0.49)	0.00147* (2.01)	0.000886 (0.86)
Age	-0.25*** (-6.98)	-0.247*** (-6.96)	-0.251*** (-7.30)	-0.258*** (-6.80)	-0.26*** (-7.07)	-0.258*** (-6.84)	-0.258*** (-6.80)	-0.279*** (-6.53)	-0.291*** (-6.03)	-0.240*** (-4.73)
Election		0.0422 (0.30)	-0.184 (-1.13)	-0.346 (-1.54)	-0.131 (-0.83)	-0.320 (-1.30)	-0.345 (-1.52)	-0.357 (-1.62)	-0.316 (-1.46)	-0.272 (-1.00)
Election lag			-0.113 (-1.20)	-0.183 (-1.53)	-0.0600 (-0.68)	-0.173 (-1.36)	-0.179 (-1.44)	-0.176 (-1.39)	-0.190 (-1.57)	-0.139 (-0.97)
Election plus			-0.330* (-2.53)	-0.566* (-2.57)	-0.382* (-2.29)	-0.551* (-2.47)	-0.568** (-2.64)	-0.544* (-2.34)	-0.532* (-2.48)	-0.538* (-2.01)
Election plus 2			-0.265 (-1.33)	-0.551*** (-3.51)	-0.477** (-2.96)	-0.550*** (-3.44)	-0.551*** (-3.52)	-0.527*** (-3.73)	-0.586*** (-3.43)	-0.506** (-2.85)
LCDS				-0.824 (-1.05)	0.678 (1.15)	-0.814 (-1.04)	-0.842 (-1.04)	-0.770 (-0.92)	-0.466 (-0.91)	-0.583 (-0.65)
LCDS*price					-0.00149** (-2.71)					
Change GDP per capita						-0.00000295 (-0.64)				
Change oil prices							-0.000290 (-0.05)			
District 2* Price								0.00153*** (4.69)		
District 3* Price								0.000818 (1.80)		
District 4* Price								0.00157*** (4.11)		
District 5* Price								0.000638 (1.93)		

District 6* Price								0.00109** (2.96)		
Type 2* LCDS									0.525 (1.15)	
Type 3*LCDS									-0.201 (-0.29)	
Type 4*LCDS									-0.895 (-0.96)	
Type2*Price										0.000915* (2.29)
Type 3*Price										-0.000555 (-1.57)
Type 4*Price										0.000759 (1.66)
District 2	4.011*** (9.02)	4.012*** (9.01)	4.014*** (8.93)	4.106*** (9.27)	4.097*** (8.93)	4.110*** (9.28)	4.106*** (9.33)	3.238*** (7.23)	4.331*** (10.84)	3.863*** (9.01)
District 3	4.412*** (8.60)	4.411*** (8.62)	4.422*** (8.62)	4.537*** (8.80)	4.546*** (8.60)	4.540*** (8.77)	4.537*** (8.85)	4.186*** (6.82)	4.782*** (10.10)	4.277*** (8.78)
District 4	3.170*** (6.97)	3.170*** (6.97)	3.166*** (6.93)	3.274*** (7.27)	3.317*** (7.10)	3.274*** (7.27)	3.275*** (7.32)	2.342*** (5.18)	3.449*** (8.62)	3.022*** (7.10)
District 5	3.336*** (4.42)	3.339*** (4.42)	3.291*** (4.41)	3.350*** (4.54)	3.370*** (4.53)	3.348*** (4.54)	3.351*** (4.55)	3.046*** (3.72)	3.447*** (4.92)	3.150*** (4.53)
District 6	2.716*** (3.90)	2.715*** (3.91)	2.716*** (3.92)	2.810*** (4.22)	2.819*** (4.10)	2.810*** (4.21)	2.810*** (4.22)	2.200** (2.75)	2.868*** (4.44)	2.637*** (4.40)
Type 2	0.697 (1.69)	0.696 (1.69)	0.675 (1.64)	0.657 (1.61)	0.720 (1.74)	0.651 (1.60)	0.657 (1.61)	0.569 (1.45)	0.470 (1.00)	-0.00375 (-0.01)
Type 3	-1.178 (-1.82)	-1.181 (-1.83)	-1.199 (-1.86)	-1.181 (-1.85)	-1.131 (-1.75)	-1.184 (-1.85)	-1.180 (-1.85)	-1.110 (-1.79)	-1.062 (-1.64)	-1.013 (-1.61)
Type 4	0.623 (1.19)	0.627 (1.20)	0.622 (1.21)	0.584 (1.14)	0.553 (1.07)	0.583 (1.14)	0.584 (1.14)	0.661 (1.28)	0.874 (1.27)	0.0184 (0.02)

Table A82: Number of claims taken out – 3 year average gold prices and price volatility

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>	<i>Model 9</i>	<i>Model 10</i>
Average gold price	0.000599 (0.76)	0.000491 (0.56)	0.000383 (0.40)	0.00203* (2.01)	0.00246* (2.43)	0.00220* (2.30)	0.00204* (2.00)	0.00123 (0.96)	0.00214 (1.82)	0.00169 (1.15)
Lagged price volatility	0.00362 (0.40)	0.00478 (0.49)	0.00639 (0.58)	-0.00309 (-0.46)	0.000883 (0.11)	-0.00447 (-0.67)	-0.00307 (-0.46)	-0.00748 (-1.15)	-0.00609 (-0.86)	-0.00724 (-0.88)
Age	-0.248*** (-6.85)	-0.247*** (-6.82)	-0.251*** (-7.17)	-0.258*** (-6.79)	-0.256*** (-7.08)	-0.259*** (-6.85)	-0.259*** (-6.79)	-0.281*** (-6.55)	-0.291*** (-6.02)	-0.242*** (-4.73)
Election		0.0626 (0.42)	-0.159 (-0.88)	-0.368 (-1.51)	-0.123 (-0.73)	-0.342 (-1.33)	-0.367 (-1.49)	-0.408 (-1.65)	-0.360 (-1.46)	-0.319 (-1.10)
Election lag			-0.108 (-1.11)	-0.189 (-1.56)	-0.0574 (-0.67)	-0.176 (-1.39)	-0.186 (-1.46)	-0.189 (-1.45)	-0.203 (-1.68)	-0.153 (-1.07)
Election plus			-0.336** (-2.67)	-0.578** (-2.61)	-0.377* (-2.30)	-0.563* (-2.50)	-0.579** (-2.68)	-0.570* (-2.38)	-0.559* (-2.54)	-0.565* (-2.08)
Election plus 2			-0.269 (-1.27)	-0.567*** (-3.57)	-0.472** (-2.89)	-0.574*** (-3.61)	-0.566*** (-3.58)	-0.567*** (-3.68)	-0.617*** (-3.48)	-0.545** (-3.04)
LCDS				-0.880 (-1.13)	0.706 (1.19)	-0.893 (-1.15)	-0.893 (-1.11)	-0.906 (-1.02)	-0.589 (-1.08)	-0.711 (-0.78)
LCDS*price					-0.00150** (-2.64)					
Change GDP per capita						-0.00000402 (-0.94)				
Change oil prices							-0.000206 (-0.03)			
District 2* Price								0.00155*** (4.56)		
District 3* Price								0.000826 (1.74)		
District 4* Price								0.00158*** (3.85)		
District 5* Price								0.000628 (1.88)		
District 6* Price								0.00111** (2.78)		

Type 2* LCDS									0.555 (1.21)	
Type 3*LCDS									-0.200 (-0.29)	
Type 4*LCDS									-0.875 (-0.94)	
Type2*Price										0.000916* (2.23)
Type 3*Price										-0.000578 (-1.56)
Type 4*Price										0.000721 (1.52)
District 2	4.018*** (9.14)	4.021*** (9.12)	4.025*** (9.07)	4.105*** (9.27)	4.097*** (8.93)	4.110*** (9.25)	4.105*** (9.33)	3.243*** (7.11)	4.325*** (10.81)	3.870*** (9.01)
District 3	4.423*** (8.71)	4.425*** (8.71)	4.439*** (8.73)	4.536*** (8.79)	4.546*** (8.60)	4.539*** (8.74)	4.536*** (8.84)	4.197*** (6.71)	4.775*** (10.07)	4.284*** (8.76)
District 4	3.178*** (7.07)	3.181*** (7.07)	3.180*** (7.04)	3.274*** (7.27)	3.318*** (7.11)	3.273*** (7.25)	3.274*** (7.32)	2.353*** (5.04)	3.441*** (8.60)	3.024*** (7.11)
District 5	3.340*** (4.45)	3.346*** (4.45)	3.300*** (4.44)	3.349*** (4.54)	3.371*** (4.53)	3.346*** (4.53)	3.350*** (4.54)	3.064*** (3.72)	3.444*** (4.91)	3.151*** (4.54)
District 6	2.724*** (3.95)	2.725*** (3.95)	2.729*** (3.99)	2.810*** (4.23)	2.819*** (4.10)	2.810*** (4.22)	2.810*** (4.23)	2.206** (2.71)	2.863*** (4.46)	2.638*** (4.42)
Type 2	0.690 (1.67)	0.685 (1.66)	0.661 (1.61)	0.663 (1.62)	0.719 (1.74)	0.657 (1.61)	0.663 (1.62)	0.580 (1.48)	0.474 (1.00)	0.00806 (0.01)
Type 3	-1.180 (-1.82)	-1.185 (-1.84)	-1.204 (-1.87)	-1.178 (-1.84)	-1.132 (-1.75)	-1.180 (-1.85)	-1.177 (-1.84)	-1.100 (-1.77)	-1.058 (-1.63)	-0.986 (-1.54)
Type 4	0.618 (1.18)	0.622 (1.19)	0.616 (1.20)	0.584 (1.14)	0.553 (1.07)	0.582 (1.13)	0.585 (1.14)	0.664 (1.29)	0.868 (1.26)	0.0498 (0.06)

Table A83: Number of claims given up – 3 year average gold prices

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>	<i>Model 9</i>	<i>Model 10</i>
Average gold price	0.000261 (1.02)	0.000249 (0.98)	0.0000875 (0.38)	-0.000836 (-1.72)	-0.00208*** (-3.76)	-0.000847 (-1.73)	-0.000745 (-1.10)	-0.00164* (-2.43)	-0.00151** (-2.74)	-0.00151* (-2.45)
Age	-0.00560 (-0.20)	-0.00835 (-0.30)	-0.00492 (-0.18)	0.00487 (0.17)	0.00891 (0.32)	0.00517 (0.18)	0.00463 (0.16)	-0.00479 (-0.17)	0.0575 (1.85)	0.0534 (1.69)
Duration	0.0221 (1.61)	0.0217 (1.57)	0.0279* (2.26)	0.0311* (2.58)	0.0368** (2.93)	0.0312* (2.56)	0.0307* (2.47)	0.0321** (2.64)	0.0388*** (3.39)	0.0434*** (3.50)
Election		-0.155 (-1.21)	0.433 (1.90)	0.655* (2.31)	0.460 (1.65)	0.642* (2.26)	0.658* (2.25)	0.723* (2.36)	0.756* (2.42)	0.760* (2.44)
Election lag			0.180 (0.68)	0.293 (1.01)	0.204 (0.72)	0.295 (1.03)	0.317 (1.02)	0.374 (1.17)	0.325 (1.08)	0.320 (1.07)
Election plus			0.992*** (4.02)	1.287*** (4.06)	1.091*** (3.60)	1.288*** (4.08)	1.276*** (3.96)	1.295*** (3.91)	1.356*** (3.92)	1.351*** (3.87)
Election plus 2			0.224 (1.11)	0.500 (1.82)	0.408 (1.70)	0.506 (1.83)	0.505 (1.78)	0.584 (1.87)	0.574* (1.98)	0.574* (1.98)
LCDS				1.090** (2.99)	-0.733 (-1.39)	1.086** (2.98)	0.990 (1.75)	1.203** (3.06)	1.214** (2.72)	1.402** (3.22)
LCDS*price					0.00193*** (4.32)					
Change GDP per capita						0.00000181 (0.29)				
Change oil prices							-0.00175 (-0.27)			
District 2* Price								0.000739 (1.53)		
District 3* Price								0.000487 (0.92)		
District 4* Price								0.000876 (1.85)		
District 5* Price								0.000974* (2.32)		
District 6* Price								-0.0000229 (-0.03)		

Type 2* LCDS									0.885** (2.69)	
Type 3*LCDS									-1.265*** (-4.62)	
Type 4*LCDS									1.500*** (4.03)	
Type2*Price										0.000613* (2.12)
Type 3*Price										-0.00139*** (-3.54)
Type 4*Price										0.000815* (2.14)
District 2	2.600*** (4.68)	2.627*** (4.77)	2.693*** (4.90)	2.661*** (4.77)	2.578*** (4.70)	2.657*** (4.75)	2.660*** (4.74)	2.273** (3.02)	2.267*** (4.16)	2.267*** (4.41)
District 3	2.870*** (5.27)	2.897*** (5.36)	2.953*** (5.48)	2.956*** (5.35)	2.898*** (5.35)	2.952*** (5.34)	2.955*** (5.32)	2.760*** (3.75)	2.557*** (4.69)	2.566*** (5.08)
District 4	1.928*** (3.77)	1.967*** (3.87)	1.996*** (3.91)	1.981*** (3.80)	1.892*** (3.71)	1.977*** (3.79)	1.980*** (3.79)	1.479* (2.09)	1.635** (3.26)	1.618*** (3.43)
District 5	2.197*** (3.63)	2.216*** (3.68)	2.307*** (3.75)	2.351*** (3.80)	2.329*** (3.77)	2.349*** (3.80)	2.349*** (3.79)	1.733* (2.11)	2.216*** (3.65)	2.190*** (3.69)
District 6	2.145*** (3.34)	2.147*** (3.37)	2.253*** (3.59)	2.242*** (3.53)	2.165*** (3.46)	2.238*** (3.53)	2.238*** (3.52)	2.308* (2.41)	1.991*** (3.35)	1.951*** (3.49)
Type 2	0.765* (2.48)	0.747* (2.46)	0.702* (2.23)	0.740* (2.33)	0.704* (2.18)	0.742* (2.34)	0.739* (2.32)	0.727* (2.25)	0.584 (1.88)	0.350 (1.10)
Type 3	-1.508** (-3.20)	-1.504** (-3.24)	-1.613*** (-3.48)	-1.645*** (-3.53)	-1.679*** (-3.64)	-1.646*** (-3.54)	-1.642*** (-3.52)	-1.668*** (-3.67)	-1.682*** (-3.85)	-1.086* (-2.10)
Type 4	0.00289 (0.01)	-0.000204 (-0.00)	-0.0879 (-0.25)	-0.118 (-0.34)	-0.204 (-0.58)	-0.118 (-0.34)	-0.114 (-0.33)	-0.116 (-0.32)	-0.675 (-1.90)	-0.832 (-1.86)

Table A84: Number of claims given up – 3 year average gold prices and lagged price volatility

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>	<i>Model 9</i>	<i>Model 10</i>
Average gold price	-0.00129 (-1.91)	-0.00114 (-1.41)	0.000416 (0.55)	-0.00191* (-2.17)	-0.00268** (-3.02)	-0.00199* (-1.99)	-0.00186 (-1.79)	-0.00370*** (-3.45)	-0.00270*** (-3.76)	-0.00282** (-2.90)
Lagged price volatility	0.0161 (1.83)	0.0146 (1.37)	-0.00351 (-0.36)	0.00971 (0.94)	0.00594 (0.64)	0.0103 (0.93)	0.00959 (0.93)	0.0172 (1.61)	0.0107 (1.27)	0.0117 (1.37)
Age	-0.00897 (-0.32)	-0.00960 (-0.35)	-0.00400 (-0.15)	0.00427 (0.15)	0.00863 (0.31)	0.00473 (0.17)	0.00418 (0.15)	-0.00866 (-0.32)	0.0574 (1.86)	0.0537 (1.73)
Duration	0.0241 (1.78)	0.0238 (1.77)	0.0275* (2.22)	0.0329** (2.78)	0.0375** (3.03)	0.0332** (2.77)	0.0327** (2.69)	0.0355** (3.02)	0.0408*** (3.63)	0.0455*** (3.75)
Election		-0.0509 (-0.32)	0.423 (1.90)	0.734** (2.70)	0.511 (1.95)	0.715** (2.64)	0.734** (2.65)	0.839** (2.92)	0.848** (2.90)	0.854** (2.85)
Election lag			0.186 (0.68)	0.307 (1.06)	0.214 (0.76)	0.312 (1.09)	0.316 (1.01)	0.393 (1.24)	0.346 (1.15)	0.336 (1.14)
Election plus			1.013*** (3.85)	1.295*** (4.11)	1.103*** (3.74)	1.298*** (4.13)	1.291*** (4.05)	1.300*** (3.99)	1.370*** (3.98)	1.362*** (3.91)
Election plus 2			0.232 (1.10)	0.538* (2.06)	0.431 (1.89)	0.550* (2.10)	0.539* (2.00)	0.639* (2.19)	0.623* (2.27)	0.624* (2.25)
LCDS				1.283*** (3.88)	-0.549 (-1.25)	1.287*** (3.87)	1.241* (2.28)	1.531*** (4.34)	1.440*** (3.97)	1.629*** (4.03)
LCDS*price					0.00185*** (4.29)					
Change GDP per capita						0.00000314 (0.43)				
Change oil prices							-0.000688 (-0.11)			
District 2* Price								0.000898* (2.03)		
District 3* Price								0.000630 (1.26)		
District 4* Price								0.00104* (2.43)		
District 5* Price								0.00112** (3.24)		

District 6* Price								0.000134 (0.19)		
Type 2* LCDS									0.833* (2.54)	
Type 3*LCDS									-1.295*** (-4.68)	
Type 4*LCDS									1.497*** (3.97)	
Type2*Price										0.000609* (2.10)
Type 3*Price										-0.00138*** (-3.44)
Type 4*Price										0.000848* (2.16)
District 2	2.591*** (4.65)	2.601*** (4.73)	2.696*** (4.91)	2.646*** (4.76)	2.572*** (4.70)	2.638*** (4.74)	2.646*** (4.73)	2.165** (3.05)	2.248*** (4.13)	2.241*** (4.38)
District 3	2.841*** (5.20)	2.853*** (5.31)	2.960*** (5.51)	2.935*** (5.33)	2.888*** (5.35)	2.928*** (5.32)	2.935*** (5.29)	2.653*** (3.82)	2.531*** (4.66)	2.531*** (5.03)
District 4	1.913*** (3.72)	1.927*** (3.80)	2.002*** (3.93)	1.961*** (3.78)	1.884*** (3.70)	1.953*** (3.76)	1.961*** (3.76)	1.358* (2.05)	1.611** (3.21)	1.588*** (3.38)
District 5	2.183*** (3.58)	2.191*** (3.61)	2.313*** (3.76)	2.344*** (3.77)	2.327*** (3.76)	2.341*** (3.77)	2.344*** (3.77)	1.634* (2.09)	2.210*** (3.62)	2.184*** (3.66)
District 6	2.126*** (3.30)	2.128*** (3.32)	2.258*** (3.60)	2.227*** (3.48)	2.160*** (3.44)	2.218*** (3.47)	2.226*** (3.48)	2.193* (2.28)	1.972*** (3.30)	1.929*** (3.42)
Type 2	0.740* (2.39)	0.736* (2.39)	0.705* (2.24)	0.739* (2.31)	0.705* (2.17)	0.742* (2.32)	0.738* (2.30)	0.714* (2.19)	0.598 (1.90)	0.355 (1.13)
Type 3	-1.499** (-3.18)	-1.498** (-3.19)	-1.616*** (-3.49)	-1.641*** (-3.50)	-1.677*** (-3.61)	-1.644*** (-3.50)	-1.640*** (-3.49)	-1.651*** (-3.60)	-1.674*** (-3.78)	-1.089* (-2.07)
Type 4	-0.0206 (-0.06)	-0.0190 (-0.06)	-0.0865 (-0.25)	-0.128 (-0.36)	-0.207 (-0.59)	-0.127 (-0.36)	-0.126 (-0.36)	-0.129 (-0.35)	-0.688 (-1.92)	-0.868 (-1.92)

Appendix 9: Consultations and Awareness Sessions

Consultations

Date	Region	Location	Persons Registered
26/06/2009	1	Mabaruma	179
27/06/2009	1	Port Kaituma	134
28/06/2009	1	Santa Rosa	431
29/06/2009	2	Anna Regina	234
10/07/2009	6	Port Mourant	365
12/07/2009	7	Kamarang	145
12/07/2009	7	Bartica	97
13/07/2009	8	Mahdia	84
13/07/2009	8	Kato	168
19/06/2009	9	Annai	250
20/06/2009	9	St Ignatius	301
21/06/2009	9	Aishalton	165
06/07/2009	10	Muritaro	134
06/07/2009	10	Hururu	134
15/07/2009	10	Linden	118
Total			2939

Awareness session

Name	Date	Location	Persons Registered	
Continuing Awareness and Outreach Sessions – LCDS Region 7 and 8	07/09/2009	Paruima	60	1
	08/09/2009	Waramadong	71	2
	09/09/2009	Warawetta	28	3
	10/09/2009	Kako	60	4
	11/09/2009	Jawalla	45	5
	16/09/2009	Kopinang	96	6
	19/09/2009	Kurukubaru	50	7
	21/09/2009	Paramakatoi	48	8
Awareness Sessions with Miners	18/07/2009	Aranka	28	9
	18/07/2009	Frenchman	26	10
	19/07/2009	Imbaimadai	34	11
	20/07/2009	Itaballi	10+	12
	22/07/2009	Jawalla	106	13
	29/07/2009	Mahdia	80	14
	18/07/2009	Arakaka	4	15
	22/07/2009	Matthews Ridge	16	16
	18/07/2009	Puruni	58	17
Awareness Session	30/07/2009	Georgetown	174	18

with Tshaos				
Federation of Independent Trade Unions of Guyana Awareness Session	30/07/2009	Georgetown	87	19
Forest Products Development Marketing Council	21/07/2009	Georgetown	7	20
Forest Producers Association (FPA) Awareness Session	13/07/2009	Georgetown	73	21
Progressive Youth Organisation Awareness Session	28/07/2009	Grove	23	22
Rotary Club Awareness Session	29/07/2009	Georgetown	15	23
Anna Regina Awareness Session with FPA				24
LCDS Awareness Session with Women's Organisations	21/07/2009	Georgetown	46	25
Port Mourant Awareness Session with FPA	24/07/2009	Port Mourant	26	26
Total			1261	

Appendix 10: Consent form for interviews

Assessing the impact of institutional conditions upon programme design for reducing emissions from deforestation and degradation

Tim Laing, London School of Economics,

t.j.laing@lse.ac.uk

Purpose of the study

This study intends to provide an understanding of the policy formation of Guyana's Low Carbon Development Strategy, and the policy choices contained therein. The primary research objective is

'To understand how a current REDD+ scheme has made policy choices in the face of institutional conditions;'

In order to provide this understanding interviews are to be undertaken with governmental and non-governmental actors in Guyana. The information in this study will be used to draw conclusions on the questions regarding the formation of REDD+ policy, and to draw wider lessons for future policy developments.

The process

Your participation in the study will involve an interview of approximately one hour's duration, and a short questionnaire of 10 questions. This interview will be audio taped, unless otherwise requested by the participant.

Subjects Understanding

- I give my consent to participate in this study and I understand that the study will be submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy at the London School of Economics and Political Science.
- I understand that my participation is voluntary
- I understand that if I so request I will not be identified by name in the final product.
- I am aware that all records will be kept confidential in the secure possession of the researcher.
- I acknowledge that the contact information of the researcher have been made available to me along with a duplicate copy of this consent form.
- I understand that I may withdraw from the study at any time with no adverse repercussions.

By signing below you agree that you have read and understood the above information, and would be interested in participating in this study.

Subject's Full Name: _____

Subject's Signature: _____ Date Signed: _____

Appendix 11: Interview guides

Governmental Interviewees

A Background to Forest Policy and Use

- A1. Could you describe the role that your agency plays in relation to natural resource management, and related policy?
- A2. Could you describe your personal experience with natural resource management in your career?
- A3. Has the LCDS changed how your agency manages natural resource management?

If so in what ways, and at what point has this changed?

B. Agencies role in the LCDS

- B1. Were you or another member of your agency involved on the Multi Stakeholder Steering Committee?
- B2. Do you have any other responsibilities in regard to the LCDS, for example providing comments?
- B3. Have you been lead in proposing any projects/policies under the LCDS?
- B4. Will you be the lead agency for any of the proposed projects under the LCDS?

C. Policy formation of the LCDS

- C1. Could you briefly describe your experience of the policy formation process of the LCDS?
- C2. How has the policy formation process of the LCDS differed from other policies/projects you have been involved in?
- C3. Could you describe the policy formation process of a previous environmental/development policy?
- C4. Which agency would you rate as having the greatest input into the formation of the LCDS?

In which way would you say this agency has had input?

- C5. Which non-governmental group/agency would you class as having the greatest input into the formation of the LCDS?

In which way would you say this organisation has had input?

D Classification of affected groups

- D1. Who would you describe as the main group/stakeholder affected by the LCDS in Guyana?
- D2. Could you describe any other groups/stakeholders you believe are affected?

Could you give reasoning behind the categories given?

E Future of the LCDS

E1. Do you expect to be affected by any future changes in forest policy, projects, funding, etc. as a result of the implementation of the LCDS?

F Specific Policies

F1. Has your agency been directly involved in the policy relating to competing mining and forest claims?

If yes could you describe your agencies role?

F2. Has your agency been directly involved in the policy relating to Opt-in provisions, and/or the Amerindian Development Fund?

If yes could you describe your agencies role?

F3. Has you agency been directly involved in the Amaila Falls project?

If yes could you describe your agencies role?

F4. Has you agency been directly involved in the work to establish a biodiversity centre at UG?

If yes could you describe your agencies role?

Non-governmental interviewees

A Background to Forest Policy and Use

A1. Could you describe the role that your organisation plays in relation to natural resource management, and related policy?

A2. Could you personally describe your experience with natural resource management in your career?

A3. Has the LCDS changed how your organisation deals with natural resource management?

If so in what ways, and at what point has this changed?

B. Organisations role in the LCDS

B1. Were you or another member of your organisation involved on the Multi Stakeholder Steering Committee?

B2. Do you have any other responsibilities in regard to the LCDS, for example providing comments?

B3. Have you been lead in proposing any projects/policies under the LCDS?

B4. Will you be involved in any of the proposed projects under the LCDS?

C. Policy formation process in Guyana

C1. How would you describe the general formation of a policy / law in Guyana?

C2. How would you describe the formation process of policies in the LCDS?

C3. Do you think that any particular group/organisation or individual has had more influence than others on the outcomes?

If so could you specify in what way this occurred?

C4. What would you identify as the main factors influencing the choice of policies in the LCDS / under REDD+?

C5. In relation to the specific policy surrounding mining/forestry competing property rights what would you identify as the main drivers of that policy?

C6. In relation to the Amaila Falls project – what would you identify as the main drivers of that policy?

D Classification of affected groups

D1. Who would you describe as the main group/stakeholder affected by the LCDS in Guyana?

D2. Could you describe any other groups/stakeholders you believe are affected?

Could you give reasoning behind the categories given?

E Affected by the LCDS

E1. Are you, personally or through your organisation, been affected by any changes in policy relating to natural resource management, etc. since the implementation of the LCDS?

If so – have these changes negatively or positively affected you?

E2. Do you expect to be affected by any future changes in policies relating to natural resource management, projects, funding, etc. as a result of the implementation of the LCDS?

If so – do you expect this to be positive or negative?

E3. Do you believe the LCDS has impacted on voting patterns in the recent elections?

If so – is this in any specific region, in any particular direction, and in what form has the impact been?

F Balance of the LCDS

F1. How well do you think the policies in the LCDS are balanced across different groups? Who are the winners/losers?

F2. How do you think political influence has affected this balance of policies within the LCDS?

If so what form has this influence been?

G Policy Preference

G. What would be your preference for policy in the LCDS?

Amerindian interviewees

A Background to Forest Policy and Use

A1. Could you describe your village and how it uses the forest and other natural resources?

- Name, Size, Location, Mining, Logging?, Titled/not, Applying for extension?

B. LCDS in the village

B1. How has the LCDS been discussed in the village?

B2. Was there inclusion in consultations?

B3. What was the process of informing the community?

C. Affected by LCDS

C1. Has the village been affected yet by the LCDS?

If so – have these changes negatively or positively affected you?

C2. Do you expect to be affected by any future changes as a result of LCDS?

If so – do you expect this to be positive or negative?

D. Forest use issues

D1. Are there any issues your village faces with respect to competition with other land owners/land users?

D2. Have there been any changes in those issues in the last 3 years, since the start of the LCDS?

E. CDPs

E1. What process has been followed for determining what is included in your villages CDP?

F. Policy Preference

E. What would be your preference for policy in the LCDS?

Industry interviewees

A Background to Forest Policy and Use

A1. Could you describe your operations in relation to use of the forest?

- Type, Size, Technologies, Duration, Investment, Location

A2. Did you operate before the inception of the LCDS?

If yes, Has the LCDS changed how your company operations operate?

Did you have any role in relation to the LCDS (comments, consultations, etc.)

If no, did the LCDS play any role in your decision to start operations in Guyana?

A3. Do you / Have you operated in any other countries undertaking REDD+, etc.?

If yes, Could you describe any differences you observe?

B. Operation in Guyana

B1. Could you describe your dealings with the government agencies of Guyana?

B2. Have you noticed any changes in policy, or government operation over the years since the LCDS has come about?

C. Affected by LCDS

C1. Are you, personally or through your organisation, been affected by any changes in policy relating to natural resource management, etc. since the implementation of the LCDS?

If so – have these changes negatively or positively affected you?

C2. Do you expect to be affected by any future changes in policies relating to natural resource management, projects, funding, etc. as a result of the implementation of the LCDS?

If so – do you expect this to be positive or negative?

D. Forest use issues

D1. Are there any issues your company face with respect to competition with other land owners/land users?

D2. Have there been any changes in those issues in the last 3 years, since the start of the LCDS?

E Policy Preference

E. What would be your preference for policy in the LCDS?