

Payments, Ecosystems and Development: Payments for Environmental Services (PES) in the Mexican Lacandona Rainforest

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by

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St Cross College

For my source of endless inspiration and admiration. For a sacred soul, an intuitive genius, a stoic teacher of life and death. For my model of justice and generosity, my foundation, my heroine, my angel, my ally, my all. For my mother, Nina.

In loving memory of my father, Raúl. I wish you were here and I hope this makes you proud.

Abstract

Payments for Environmental Services (PES) emerged as a popular forest conservation policy across the Global South since the 1990s, first in Latin America and then elsewhere. PES aim to reduce deforestation and degradation by providing payments to participants conditional on forest protection. PES attracted much attention among policy-makers as a potentially cost-effective and efficient conservation alternative, and for their poverty-alleviation prospects when operating among ‘poor’ forest-dwellers. This rising agenda has been accompanied by significant scholarly efforts to understand PES and their socioenvironmental effects. However, such understandings have overlooked local stakeholder perspectives, and evaluations have mostly examined short-term effects. Thus, less is known about PES’ long-term effects, their determinants, and how local stakeholders perceive them.

Using a multidisciplinary, multi-level, and dynamic livelihood approach combining geospatial and socioeconomic data collected from 2013-2017, this thesis helps to fill this gap by examining PES’ role in the broader livelihood strategies of six communities in the Mexican Lacandona Rainforest. The thesis makes three main contributions to PES literature. Methodologically, it presents a novel lens to understand PES effects, one that brings to the fore the voice of local stakeholders, while paying attention to evolving context and design aspects. Empirically, it shows that participants think about their livelihoods at broader temporal and spatial scales than short-term policies, which allows them to exert some control on the various policies they encounter. This longer-term thinking is reflected in the three analytical chapters in this thesis that examine how people engage with PES among other land uses, how communities devise payment distribution mechanisms, and how people combine multiple policies to pursue various goals. Conceptually, it shows that unless aspects of ‘context’, ‘design’, and ‘decision-making’ are examined simultaneously, PES’ manifold, multi-level, and evolving effects will not be sufficiently understood. Overall, the thesis shows that there are real implications for conceptualising rural development policy as an integrated ‘policy matrix’, instead of individual and self-contained policies.

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Abbreviations

ARIC	Asociación Rural de Interés Colectivo – Collective Interest Rural Association
ATREDD+	Acciones Tempranas REDD+ – Early Actions for REDD+
CCT	Conditional Cash Transfer
CFE	Comisión Federal de Electricidad – Federal Electricity Commission
CI	Conservation International
CIDE	Centro de Estudio y Docencia Económica – Centre for Economic Research and Teaching
CIFOR	Center for International Forestry Research
CNC	Confederación Nacional Campesina – National Peasant Confederation
CODESSMAC	Consejo Para el Desarrollo Sustentable de la Selva de Marqués de Comillas, S.C. – Council for the Sustainable Development of the Forest of Marqués de Comillas
COFOLASA	Compañía Industrial Forestal de la Lacandona, S.A. – Industrial Forestry Company of the Lacandona
COMAR	Comisión Mexicana de Apoyo a Refugiados – Mexican Refugee Support Commission
CONABIO	Comisión Nacional para el Conocimiento y Uso de la Biodiversidad – National Commission for the Knowledge and Use of Biodiversity
CONAFE	Consejo Nacional de Fomento Educativo – National Educational Promotion Council
CONAFOR	Comisión Nacional Forestal – National Forestry Commission
CONANP	Comisión Nacional de Áreas Naturales Protegidas – National Commission of Protected Natural Areas
COP	Conference of the Parties of the UNFCCC
CPR	Common-Pool Resources
DAAC	Departamento de Asuntos Agrarios y Colonización – Department of Agrarian Issues and Colonisation
DFID	Department for International Development (UK)
EFC	Esquema de Fondos Concurrentes – Matching Funds Scheme
ENAREDD+	Estrategia Nacional REDD+ – National Strategy for REDD+
ENGO	Environmental Non-Governmental Organisation
ES	Environmental Services
ESPA	Ecosystem Services and Poverty Alleviation
EZLN	Ejército Zapatista de Liberación Nacional – Zapatista Army for National Liberation
FAO	Food and Agriculture Organization of the United Nations
FONAES	Fomento Nacional de Apoyo para las Empresas de Solidaridad – National Support Fund for Social Enterprises

FONAFIFO	Fondo de Financiamiento Forestal de Costa Rica – Forestry Financial Fund of Costa Rica
GAIA	Grupo Autónomo para la Investigación Ambiental, A.C. – Autonomous Group for Environmental Research
GEF	Global Environment Facility
GPS	Global Positioning System
IADB	Inter-American Development Bank
ICDP	Integrated Conservation and Development Project
INE	Instituto Nacional de Ecología – National Ecology Institute
INEGI	Instituto Nacional de Estadística y Geografía – National Institute of Statistics and Geography
INI	Instituto Nacional Indigenista – National Indigenist Institute
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
ISI	Import Substitution Industrialisation
IUCN	International Union for Conservation of Nature
MA	Millennium Ecosystem Assessment
MBI	Market-Based Instruments for Conservation
MdC	Marqués de Comillas
MECNAM	Movimiento ¡El Campo No Aguanta Más! – The Countryside Cannot Stand Anymore! Movement
MOCRI	Movimiento Campesino Regional Independiente – Independent Regional Peasant Movement
NAFINSA	Nacional Financiera – Mexican Development Bank
NAFTA	North American Free Trade Agreement
NGO	Non-Governmental Organisation
PDRS	Programa de Desarrollo Rural Sustentable de Marqués de Comillas – Programa of Sustainable Regional Development in Marqués de Comillas
PEA	Departamento de Política y Economía Ambiental – Department of Policy and Environmental Economics
PES	Payments for Environmental Services
PESL	Programa Especial para la Conservación, Restauración y Aprovechamiento Sustentable de la Selva Lacandona – Special Programme for the Conservation, Restoration and Sustainable Use in the Lacandona Rainforest
PEMEX	Petróleos Mexicanos – National Petroleum Company
PIDER	Programa de Inversiones para el Desarrollo Rural – Programme of Investments for Rural Development
PIDSS	Programa Integral para el Desarrollo Sustentable de la Selva – Integral Programme for the Sustainable Development of the Forest
PPDSL	Programa de Protección y Desarrollo de la Selva Lacandona – Programme for the Protection and Development of the Lacandona Rainforest

PRI	Partido Revolucionario Institucional – Revolutionary Institutional Party
PROCAMPO	Programa de Apoyos Directos al Campo – Programme of Direct Support for the Countryside
PROCEDE	Programa de Certificación de Derechos <i>Ejidales</i> y Titulación de Solares – Certification Programme of <i>Ejido</i> Rights and Titling of Urban Plots
PRODESIS	Proyecto de Desarrollo Social Integrado y Sostenible – Project of Integrated and Sustainable Social Development
PROFEPA	Procuraduría Federal de Protección al Ambiente – Federal Agency for the Protection of the Environment
PROGAN	Programa de Producción Pecuaria Sustentable y Ordenamiento Ganadero y Apícola – Programme of Sustainable Ranching, and Cattle and Beehive Ordering
PROGRESA	Programa de Educación, Salud y Alimentación – Programme of Education, Health and Nutrition
PRONASOL	Programa Nacional de Solidaridad – National Solidarity Programme
PRONAFOR	Programa Nacional Forestal – National Forestry Programme
PSA	Pagos por Servicios Ambientales – Payments for Environmental Services (Costa Rica)
PSA-B	Pago de Servicios Ambientales de Biodiversidad – Programme of Payments for Biodiversity Environmental Services
PSA-CABSA	Programa para Desarrollar el Mercado de Servicios Ambientales por Captura de Carbono y los Derivados de la Biodiversidad y para Fomentar el Establecimiento y Mejoramiento de Sistemas Agroforestales — Programme of Payments for Carbon, Biodiversity and Agro-forestry Services
PSA-H	Pago de Servicios Ambientales Hidrológicos — Programme of Payments for Hydrological Environmental Services
RAN	Registro Agrario Nacional – National Agrarian Registry
RBMA	Reserva de la Biósfera Montes Azules – Montes Azules Biosphere Reserve
REDD+	Reducing Emissions from Deforestation and Forest Degradation and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries
SALUD	Secretaría de Salud – Ministry of Health
SAP	Structural Adjustment Programme
SEDESOL	Secretaría de Desarrollo Social – Ministry of Social Development
SEDUE	Secretaría de Desarrollo Urbano y Ecología – Ministry of Urban Development and Ecology
SEMARNAP	Secretaría de Medio Ambiente, Recursos Naturales y Pesca – Ministry of the Environment, Natural Resources and Fisheries
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales – Ministry of the Environment and Natural Resources

SEP	Secretaría de Educación Pública – Ministry of Public Education
SES	Socio-Ecological System
SHCP	Secretaría de Hacienda y Crédito Público – Ministry of Finance
TNC	The Nature Conservancy
TEEB	Economics of Ecosystems and Biodiversity
UCB	University of California at Berkeley
UEFS	Unión de <i>Ejid</i> os Fronteriza del Sur – <i>Ejido</i> Union Fronteriza Sur
UEJS	Unión de <i>Ejid</i> os Julio Sabines – <i>Ejido</i> Union Julio Sabines
UIA	Universidad Iberoamericana – Iberoamerican University
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WB	The World Bank
WCED	World Commission on Environment and Development
WWF	World Wildlife Fund for Nature

1. Introduction: Payments, Ecosystems and Development

A remarkable development has taken place in the forests of the Global South over the last two decades. In an era of climate change, rapid rates of deforestation and forest degradation in the developing world – home to thousands of ‘poor’ agrarian and indigenous communities – had increasingly become an issue of global concern. The ‘sustainable development’ concept, carried over from the Brundtland Report (WCED, 1987) and the Rio Earth Summit 1992, brought the view that environmental and development ‘problems’ go inextricably hand in hand such that effective ‘solutions’ require addressing both issues simultaneously. This belief has spread widely since then, bringing the worlds of conservation and development increasingly together and motivating the experimentation with diverse environmental ‘carrots and sticks’ by governments, Non-Governmental Organisations (NGOs) and the private sector. A perplexing experiment emerged in this context, first in Latin America and then elsewhere across the Global South. One that was so seemingly simple and obvious that it caught everyone’s attention. This was not about establishing national parks, biosphere reserves or other forms of ‘command-and-control’ environmental policy and regulation that formed the backbone of the conservationist movement in the 20th century and that still dominate environmental practice to date. Nor was it about displacing labour and activities away from forests by financing and supporting agricultural intensification, ecotourism or other forms of ‘conservation by distraction’. Finally, it was not about forestry, agroforestry, agroecology or other forms of ‘sustainable’ use and management of resources. Rather, the experiment was about giving payments to forest-dwelling families and communities for, quite literally, doing nothing. Payments conditional on doing nothing to their forests. This experiment was called Payments for Environmental Services (PES) and time would show that it was neither simple nor obvious.

Since the late 1990s, countries in the Global South, firstly in Latin America and then elsewhere, began experimenting with PES¹. These early policy experiments, artefacts of international aid, were firmly rooted in ‘neoliberal’ ideology. As suggested by their name, PES were originally imagined as markets where ‘buyers’ and ‘sellers’ could exchange payments for the provision of ‘environmental services’, such as carbon sequestration, watershed protection, biodiversity protection, and landscape beauty. Constituting an excellent context to test ‘neoliberal’ environmental policies, as part of the broader family of ‘Market-Based Instruments’ (MBIs) for conservation, PES attracted significant academic discussion and have since then been ‘contested along disciplinary and ideological lines’ (Muradian et al., 2013). Market enthusiasts, mostly mainstream and environmental economists, hailed PES as offering much potential for ‘win-win’ outcomes, i.e. simultaneous improvements for nature and people. In turn, critics from the left decried this development as but another instrument from the ‘neoliberal bag of tricks’ (Ferguson, 2009; Van Hecken et al., 2018) representing ‘green grabbing’ (Fairhead et al., 2012), ‘commodity fetishism’ (Kosoy and Corbera, 2010), and our society finally ‘selling out on nature’ (McCauley, 2006). Yet, for good or bad, the practice of PES often resisted ‘neoliberal’ intentions. Mushrooming national and subnational initiatives did emerge and assemble around a language of environmental markets, and the need for valuation, commoditisation and compartmentalisation of different types of ‘environmental services’. However, they functioned at best as ‘market-like’ hybrids, rarely commodifying and valuing ‘environmental services’, and often involving an active role

¹ As noted by McElwee et al. (2014: 423), though PES have a ‘long history’ in developed countries, including the Conservation Reserve programme in the United States, the Common Agricultural Policy in the European Union, or other programmes in Australia and New Zealand, “PES approaches have only more recently expanded into poorer developing countries of the global South”. See also Wunder et al. (2008) for a comparative analysis.

of governments who frequently incorporated PES within broader rural development strategies (McElwee et al., 2014).

PES are no longer an experiment. To date, millions of hectares of forests are enrolled in national, subnational and local initiatives in Latin America (Balvanera et al., 2012) and beyond (Ezzine-de-Blas et al., 2016). An early review by Landell-Mills and Porras (2002) listed almost 300 PES initiatives and ‘the number has grown since’ (Pattanayak et al., 2010: 255). National government-led programmes in Costa Rica (Pagiola, 2008), Mexico (Muñoz-Piña et al., 2008), Ecuador (Wunder et al., 2008) and China (Bennett, 2008) have expanded, consolidated and now represent a crucial component of national forest policy agendas. Various types of forest-based² PES exist, some are ‘activity enhancing’, including active conservation activities such as reforestation or agroforestry, while others are ‘activity reducing’, involving voluntary forest set-asides (Engel et al., 2008; Wunder, 2007). Yet the most common approach has been ‘activity reducing’, government financed PES providing payments to families and communities for conserving or ‘doing nothing’ to standing forests (Alix-García et al., 2008). To date, these schemes disburse significant cash or in-kind transfers to millions of ‘poor’ peasants who hold customary and legal land tenure in complex individual and collective arrangements. Not only this, but in a world where forests have become increasingly pivotal in global climate politics (Hecht, 2014a), forest-based PES have come to play an important role in international strategies to curb climate change. This is because forests are considered crucial deposits of carbon and land use change is a primary contributor to carbon emissions (Neeff and Ascui, 2009). REDD+³, portrayed “as the world’s largest PES experiment” (Corbera, 2012: 612), took a prime position in global forest politics on 12 December 2015, when 196 parties signed

² Though not all PES are forest-based, at a global level “a considerable share of all PES schemes are in one way or another related to forests” (Prokofieva, 2016: 131; see also, Ezzine-de-Blas et al., 2016).

³ REDD+ stands for reducing emissions from deforestation and degradation, conserving and enhancing forest carbon stocks, and sustainably managing forests.

the Paris Agreement at the 21st Conference of the Parties (COP 21) within the United Nations Framework Convention on Climate Change (UNFCCC):

Parties are encouraged to take action to implement and support, including through results-based payments...policy approaches and positive incentives for activities relating to *reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries*. (United Nations, 2016: 6 *my emphasis*)

As the PES agenda has gone underway, some academic debates have closed while new have emerged. PES have continued to enjoy extensive coverage nonetheless. The concept of PES, their suitability to achieve certain goals, their socioenvironmental effectiveness, and many other aspects have been examined and scrutinised from multiple disciplines. PES, and more generally MBIs, have created a policy agenda hybridising opposed paradigms, such as a neoliberal agenda framed around the need for market-based environmental institutions, versus a Keynesian vision placing emphasis on the active role of governments to face the ecological crisis. The debates around PES reflect these tensions. Issues around the PES concept, their objectives, design and implementation are not only interesting on a technical level. They are especially interesting because they reveal fundamental political, ideological and normative assumptions. The issue at stake here is whether policies crafted by international actors to address the gravity of deforestation and forest degradation in an era of climate change can perform their task.

However, for all this discussion on PES, their meaning, achievements and shortcomings, one perspective remains less examined: the perspective of local stakeholders. This includes participating families and communities who receive payments to conserve their forests, as well as local PES intermediaries and people from governments, NGOs, and the private sector who implement PES on the ground. Those who bear with an external policy agenda crafted by conservation and development ‘experts’ far away from their local

realities. Those who engage with PES but keep attention to what matters to them, their long-term livelihood goals. Research has suggested that it matters how PES fit within the broader institutional, socioeconomic, political, biophysical and policy context in which they operate. Studies have also shed light on how issues of policy design shape individual and collective incentives and have various socioenvironmental consequences. Yet, how do these issues look like when examined from a long-term and multi-level perspective that brings to the fore the voice of local stakeholders? What clues can local perspectives offer for understanding the social and environmental effects of PES? How do PES effects emerge at various scales and how they evolve in time?

This thesis reflects on these questions with a case study of six forest-dwelling communities in the municipality of Marqués de Comillas (MdC) in the Lacandona Rainforest, Chiapas, Mexico (Chapter 2). Using a multi-level, dynamic and multidisciplinary livelihood approach that combines socioeconomic and geospatial data (Chapter 3), this thesis examines the role of PES within the broader livelihood strategies of participating families and communities on three interrelated and consecutive themes: people's strategies about land use (Chapter 4); people's ways of distributing money from PES (Chapter 5); people's ways of combining policies (Chapter 6). The implications of such findings for how to better understand the socioenvironmental effects of PES and how to conceptualise policy interactions are subsequently discussed (Chapter 7).

Overall, the contribution of this thesis to the PES literature is threefold: methodological, empirical and conceptual. Methodologically, it presents a novel approach to examine the socioenvironmental effects of PES, one that combines geospatial and socioeconomic data, and that gives voice to the agency of local stakeholders while not losing track of the dynamic and multi-level context where PES operate as well as changing features of policy design and implementation (Chapter 3).

Empirically, it provides original material on the topics of multiple land uses, community payment distribution mechanisms, and policy interactions. In Chapter 4, I show that participants only enrol to PES a fraction of the land that they manage. While they mostly ‘conserve’ enrolled forests, participants often deforest non-enrolled lands. I show that participants make enrolment and non-enrolment decisions simultaneously and that these result from individual aspirations, as well as geographically and historically determined opportunity costs. In Chapter 5, I show that land institutions (structure) tend to shape how communities distribute PES benefits and tend to move distributions towards cash. Yet in some cases, the structure creates some room for manoeuvre for key actors to use the money effectively for collective investments. In this way, the chapter emphasises the importance of land institutions and the tendency towards distributing money in cash even when lands are held ‘communally’. Overall, I show how these processes tend to perpetuate and even exacerbate inequality. In Chapter 6, I show that families tend to use money from PES and other policies for different purposes and I highlight how features of payment design influence their spending behaviour. At the same time, I show how, despite some efforts made by families and communities, the lack of coordination between the government agencies that implement different policies misses opportunities to build more meaningful links and synergies at the family, community and regional levels.

Conceptually, it builds a theoretical lens and research agenda for how to better understand the effects of PES and their role in a broader policy landscape. Taking stock from the evidence presented in earlier chapters, Chapter 7 shows that PES outcomes are manifold, multi-level and dynamic, and that they emerge as the result of the interactions between historically shaped institutions, policy design and decision-making processes at the local level. I show how unless we explore the interactions between these three dimensions, ‘context’, ‘design’ and ‘decision-making’, we will not understand what is going on.

Finally, I show that there are real implications in terms of conceptualising rural development policy as overall, integrated environmental and social policy, instead of piecemeal, isolated, self-contained policies with narrow objectives. For this, I introduce the concept of the ‘policy matrix’.

This chapter proceeds as follows. Section 1.1 traces the global origins of PES. Section 1.2 reviews the literature and highlights the gap where this thesis aims to contribute. Section 1.3 concludes this chapter by providing a sense of the logic of the argument presented throughout this thesis.

1.1. The global origins of PES

The World Conservation Strategy (IUCN et al., 1980) marked a crucial turning point in the fields of international development and environmental conservation. Articulating most clearly the idea of conservation and development not only as ‘not necessarily exclusive’ but rather as ‘mutually dependent’ goals (Robinson, 1993), it came to represent arguably the first document bridging the conservation-development divide (Roe, 2008). The view of conservation and development goals as dependent on each other differed radically from earlier views in which human activity and environmental conservation were perceived as deeply antagonistic and characterised by inherent trade-offs (Barrett et al., 2013; Callicott, 1991). Indeed, the ‘wilderness’ conservation approach that ‘formed the backbone’ of the conservation movement in the 20th century was based on this view and was mostly about ‘command-and-control’ instruments, mainly national parks and biosphere reserves, to protect areas and biodiversity from human interference (Swallow et al., 2009). By the time the World Conservation Strategy (IUCN et al., 1980) was published, however, widespread recognition that command-and-control approaches to conservation were not necessarily environmentally effective and that they often alienated local people, led to a shift towards efforts to link protected areas with local social and

economic development (CIFOR, 1999). Although national parks and other command-and-control instruments have continued as the main approach to conservation (Chape et al., 2003; Wunder, 2013), the 1980s marked the beginning of a general shift towards ‘softer’ environmental regulation (Swallow et al., 2009).

Integrated Conservation and Development Projects (ICDPs) came to the foreground in the 1980s and 1990s, becoming a dominant framework in large-scale conservation efforts across the Global South (CIFOR, 1999). ICDPs encompassed “a wide variety of project initiatives, including activities on the boundaries of national parks, or within biosphere reserves and multiple-use areas, as well as regional land-use plans with protected area components or large-scale development projects with links to nearby protected areas” (Brandon and Wells, 1992: 558). The appeal in ICDP lay in that they offered the potential for achieving both conservation and development objectives at the same time (Ferraro and Kiss, 2002), thus offering ‘something for everyone’ (Christensen, 2004: 7). As argued by Barrett et al. (2013: 62), the inherent assumption was that “poverty and environmental degradation have common drivers that, if effectively addressed, could yield ‘win–win’ results on both fronts simultaneously.” Yet, as the ICDP agenda unfolded, it proved to be less successful in practice than otherwise expected on both conservation and development fronts (Sayer, 1995). Despite large amounts of resources spent by international conservation organisations, international development agencies, and many other organisations, establishing ICDPs that actually worked proved to be “more difficult than popularizing the concept or raising the funds” (CIFOR, 1999: 24).

Beyond misconceptions on the relations between poverty and environmental degradation (Christensen, 2004; Ferraro et al., 1997), as well as how communities manage and conserve resources (Agrawal and Gibson, 1999), a major limitation brought forward by critics of ICDPs was their inability to provide incentives for conservation. As noted by

Ferraro (2001: 992-93), “the links that development interventions create between individual well-being and habitat conservation are often vague and indirect, or simply non-existent”. Thus, a call was made from the early 2000s for more direct conservation approaches based on a ‘willing buyer-willing seller model’ through which conservation outcomes could be exchanged for payments in cash or kind (Ferraro and Kiss, 2002). As the limitations of the command-and-control and ICDP approaches became increasingly apparent (Swallow et al., 2009), the stage was set for “a third wave of more direct, targeted incentives...to make further progress on the conservation and development front” (Barrett et al., 2013: 61).

The call for more direct approaches to conservation in the 2000s converged with the incipient creation of markets for environmental goods and services under the ‘ecosystem services’ or ‘environmental services’ framework⁴ (Gómez-Baggethun et al., 2010). From the 1970s, ecosystems and natural functions became increasingly reconceptualised in utilitarian terms as ‘stocks of capital’ that provide ‘environmental services’ which are essential to human survival and welfare (Gómez-Baggethun and Ruiz-Pérez, 2011; Kemkes et al., 2010; Norgaard, 2010). Environmental services have been defined as “flows of materials, energy and information from natural capital stocks which combine with manufactured and human capital services to produce human welfare” (Costanza et al., 1997: 254). Under this framework, several types of environmental services have been identified and classified according to their function and characteristics, including:

⁴‘Environmental services’ and ‘ecosystem services’ are terms that have often been used inconsistently and interchangeably in the literature (Derissen and Latacz-Lohmann, 2013; Wunder 2013). Diverse definitions have been brought forward in the literature. For example, as pointed out by Derissen and Latacz-Lohmann (2013), for the FAO ‘environmental services’ are seen as a subset of ecosystem services; in contrast, for Muradian et al. (2010) ‘ecosystem services’ are considered a subset of ‘environmental services.’ Throughout this thesis, the term ‘environmental’ is preferred over ‘ecosystem’, especially when dealing with payments for services, to represent both services produced intentionally or unintentionally by “man-made conservation activities” (Derissen and Latacz-Lohmann, 2013: 15).

production of goods, life support processes, life fulfilling processes and conservation of future options (Daily et al., 2000).

The environmental service concept developed originally as a ‘metaphor’ in order to build support for conservation (Norgaard, 2010). As pointed out by Gómez-Baggethun et al. (2010: 1213), “in the 1970s and 1980s, a growing number of authors started to frame ecological concerns in economic terms in order to stress societal dependence on natural ecosystems and raise public interest on biodiversity conservation.” However, in a second stage from the 1990s onwards, the environmental service concept evolved into a pragmatic economic framework for assessing ecosystem change, particularly in the Global South (Gómez-Baggethun et al., 2010; Norgaard, 2010; Peterson et al., 2010). Motivations behind this shift were the perceived failure of previous strategies for reducing ecosystem degradation, as well as the need to build support among politicians and voters by communicating in a language that reflected the dominant political and economic framework (Gómez-Baggethun and Ruiz-Pérez, 2011; Ropke, 2004). Costanza et al.’s (1997) influential work, where the authors provided economic estimations of the value of environmental services worldwide, was key in mainstreaming the concept (Gómez-Baggethun et al., 2010).

The Millennium Ecosystem Assessment (MA, 2005) and The Economics of Ecosystems and Biodiversity (Sukhdev, 2008) gave further impetus to the environmental service framework. These initiatives set the foundations for a future market-based policy agenda by theorising on the links between natural ecosystems and human welfare, and by urging researchers to develop stronger theory and empirical documentation on the economic value of environmental services (Chan et al., 2007; Norgaard, 2010; Peterson et al., 2010). Once established and mainstreamed, the environmental services framework moved into a third stage since the late 1990s. In this stage, there was an increasing interest, particularly

across the Global South, for the development of payment schemes and markets to exchange environmental services (Gómez-Baggethun et al., 2010; Sattler and Matzdorf, 2012). This brought the worlds of ecology and economics, as well as conservation and economic development, increasingly together (Braat and De Groot, 2012). In this way, “over a period of about 15 years, an eye-opening metaphor intended to awaken society to think more deeply about the importance of nature and its destruction through excessive energy and material consumption transformed into a dominant model for environmental policy and management in developing countries” (Norgaard, 2010: 1219).

Rooted in the environmental services framework, Payments for Environmental Services (PES) mushroomed in forest settings since the late 1990s in the Global South as calls were made in the policy-making and academic communities for ‘more direct conservation approaches’ (Wunder, 2005: 1). Much of the early excitement on PES was based on the notion that direct payments for conservation were a more cost-effective and efficient conservation alternative than ICDPs (Ferraro and Kiss, 2002; Ferraro and Simpson, 2002). Not only this, but because many environmental service providers in the Global South are ‘poor’ forest dwellers, PES also received much attention for their potential as a tool for poverty alleviation (Bulte et al., 2008; Engel et al., 2008; Wunder, 2008). As pointed out by Pattanayak et al. (2010: 255), “because developing countries are home to much of the world’s poor, the allure of a potential win-win approach—reducing poverty and ecosystem degradation—makes PES irresistible to academics, policy makers, and program implementers alike.”

Latin America was an early adopter of forest-based PES at a national, subnational and local scale since the late 1990s. Over the years, PES have mushroomed and expanded in the region (Balvanera et al., 2012). Latin American PES have been implemented and funded by different combinations of governments, private actors and Non-Governmental

Organisations (NGO), though national government-led PES have been the largest in number and scope. Starting in 1997, Costa Rica's national Pago por Servicios Ambientales (PSA) to counter deforestation pioneered the use of PES in the Global South (Pagiola, 2008). Mexico followed, introducing its national hydrological PES programme (PSA-H) in 2003 (Muñoz-Piña et al., 2008), and subsequently its carbon, biodiversity and agro-forestry services PES programme (PSA-CABSA) in 2004 (Corbera et al., 2009). These programmes complemented earlier local level initiatives in Mexico, including some carbon forestry projects (Corbera, 2005; Corbera et al., 2007a) and a watershed scheme (Manson, 2004). Since then, other PES have emerged in Ecuador, Colombia, Bolivia, Brazil, Panama, among others (Balvanera et al., 2012; FONAFIFO et al., 2012; Wunder et al., 2008).

PES have also expanded to other regions across the Global South. China was an early adopter with its Sloping Land Conversion Programme developed in 1999 (Bennett, 2008). Other PES have been developed in the Asian continent, including Vietnam (McElwee et al., 2014; Pham et al., 2014), Cambodia (Milne and Adams, 2012) and Indonesia (Pirard, 2012). In the African continent, PES initiatives have been implemented in South Africa (Turpie et al., 2008), Rwanda (Gross-Camp et al., 2012, Martin et al., 2014), Uganda (Jayachandran et al., 2016), among others (Ferraro, 2009).

To date millions of hectares of forests are enrolled in PES across the Global South⁵. Global and regional reviews show that Latin America continues to dominate the PES scene, followed by Asia, and lastly Africa lagging well behind (Balvanera et al., 2012; Ezzine-de-Blas et al., 2016). These reviews further show that most PES in Latin America in Asia are publicly funded, while African PES are predominantly privately funded. As

⁵ A review by McElwee et al. (2014) provided the following amounts on the largest PES schemes worldwide: China 12 million hectares (ha); Vietnam 4 million ha; Mexico 2.5 million ha, Ecuador 868,000 ha; and Costa Rica 800,000 ha.

noted by Wunder (2013), these trends seem to reflect the existence of more adequate economic, institutional and cultural pre-conditions for PES to emerge and function in Latin America and some countries in Asia such as China and Vietnam. Such pre-conditions noted by Wunder (2013) include: the ability for PES to compensate other land economic alternatives, e.g. opportunity costs, and as such generate demand for these policies; the existence of trust between actors, institutions capable of overcoming transaction costs, and clearer land tenure clarity and security; and a ‘right culture of give and take’ required to sustain payment transactions.

Thus, over the last two decades, PES quickly expanded, consolidated and have come to represent a crucial component in the forest policy agendas of many countries, first in Latin America and then elsewhere. Yet, not only policy makers seeking for alternatives have shown continued interest in PES. As the PES agenda went underway, these policies also caught the attention of multiple, and oftentimes conflicting, academic communities and schools of thought. This has triggered significant scholarly debates and discussion on multiple aspects of the theory and practice of PES. The following section examines the evolution of such debates.

1.2. There and back again: shifting debates on PES

From early on, the rise of the PES agenda attracted significant academic attention. Based on a Google Scholar search conducted in 27 February 2017, Börner et al. (2017) note that an average of 1715 articles were published per year from 2010-15 containing the terms ‘Payments for Environmental Services’ or ‘Payments for Ecosystem Services’ or ‘Payments for Hydrological Services’. Part of the explanation behind so much discussion on PES may be attributed to the explosive and continued implementation of these programmes. Indeed, a growing body of literature has focused on examining their ‘real world’ practice and operation, their achievements and shortcomings. Yet, significant

academic interest on the topic seems to have been fuelled by how PES stumbled on the playground of several ‘epistemic communities’ endorsing different views around broader questions on development and the environment, some in direct contradiction with each other. Intense debates around the ‘neoliberal’ nature of PES, their prospects for achieving certain goals, and many other aspects of their theory and practice, reflect these diverse positions.

This section examines scholarly debates over the concept, purpose and effects of PES, a set of interrelated themes that encompass much of the existing literature. I show how some debates have closed while new have emerged as the PES agenda has unfolded. Yet, I argue that despite significant scholarly efforts to understand PES and their socioenvironmental effects, as well as a great of academic reflexivity, two issues remain less studied and underemphasised. Firstly, the perspective of local stakeholders. Further, the long-term and multi-level effects of PES. I argue that this has resulted in a limited understanding of how PES effects emerge at various temporal and spatial scales, and the local mechanisms that explain these manifold and evolving outcomes. It is here where this thesis aims to contribute.

1.2.1. PES in times of neoliberalism

Since their early roots, PES have been inseparable from the episteme and trajectory of the so-called ‘neoliberalisation⁶ of nature’ or ‘neoliberal natures’. Broadly, this can be understood as a process starting from the 1980s that has involved the increasing ‘encounter between neoliberalism and nature’, or the use of neoclassical economic theory and practice on the non-human world (Castree, 2003, 2006, 2008a, 2008b; Heynen and

⁶ I recognise that the term ‘neoliberalism’ has been subject to much debate (e.g. Barnett, 2005). Yet, for the purpose of this thesis, I understand neoliberalism as “generally associated with free trade and reduced government and with a belief in market- rather than state-led solutions to social and environmental problems” (Liverman and Vilas, 2006: 328).

Robbins, 2005; Liverman, 2004; McCarthy and Prudham, 2004). Some examples of such ‘neoliberal natures’ are the following:

Neoliberalism has been linked to the privatization and commodification of unowned, state-owned, or common property resources such as forests, water, and biodiversity; payments for environmental services; deregulation and cuts in public expenditure for environmental management; the opening up of trade and investment; and transfer of environmental management to local or nongovernmental institutions.⁷ (Liverman and Vilas, 2006: 328)

PES attracted significant scholarly attention from early on as the prodigal experiment in the broader family of ‘Market-Based Instruments’ (MBI) for environmental policy, also including cap-and-trade permits, certification schemes and biodiversity offsets, among others (McElwee et al., 2014; Muradian et al., 2013). Much of the literature has revolved around debates between the so-called ‘environmental economics’ and ‘ecological economics’ perspectives to PES (Tacconi, 2012). Yet, a third ‘critical political ecology/economy’ perspective, which has brought forward a largely sceptical view of PES (Van Hecken et al., 2015a; 2015b), has also contributed to the literature. Though risking simplification, I argue below that these labels, i.e. ‘ecological economics’, ‘environmental economics’ and ‘critical political ecology/economy’ perspectives, are useful to emphasise how PES have been used by scholars to reflect on fundamental questions between different schools of thought. Questions around the concept, purpose and other aspects of PES have attracted significant attention not only because they are interesting at the technical level, but most importantly because these issues reflect a series of fundamental normative, political and ideological assumptions and worldviews. As

⁷ Evidently, this is only part of the much broader surging of ‘neoliberalism’ in many regions of the world since the 1980s, firstly in the United States and the United Kingdom under the governments of Reagan and Thatcher and subsequently across the Global South in the form of Structural Adjustment Programmes (SAP) and beyond. The roots of neoliberalism are complex, but they have been traced to reactions against post-war Keynesianism as capitalist economies stagnated in the 1970s and the work of neoclassical economists such as Milton Friedman and Von Hayek (McCarthy and Prudham, 2004).

noted by Wunder (2015: 240), “the way we define tools such as PES has important implications for how we eventually design and implement them”.

In a seminal contribution, Wunder (2005: 3) defined PES as: 1. a voluntary transaction where; 2) a well-defined ES⁸ (or a land-use likely to secure that service); 3) is being ‘bought’ by a (minimum one) ES buyer; 4) from a (minimum one) ES provider; 5) if and only if the ES provider secures ES provision (conditionality). Such a view, which became dominant in the early stages of PES and that arguably still dominates to date, was given further theoretical and empirical refinement in special issues in the journal *Ecological Economics* (Engel et al., 2008; Wunder et al., 2008).

In a nutshell, this view conceived PES as market mechanisms designed to solve environmental ‘market failures’. Drawing heavily from Coase (1960) and Hardin (1968), this view understood environmental ‘problems’, such as forest loss and degradation, as a consequence of the failure to incorporate the environment into the market system. The assumption here is that those at the resource base have no mechanisms to privately capture the positive ‘environmental externalities’ that their resource management practices provide. This ‘market failure’ unequivocally leads, as in textbook neoclassical economics, to the under-provision of public environmental goods. PES attempt to put into practice the ‘Coase theorem’ (Engel et al., 2008) which states that if transaction costs are low and property rights are clearly defined, an efficient provision of environmental services can be achieved through private negotiation. Thus, PES serve as a mechanism to correct market failures by creating a market where service ‘buyers’ and ‘sellers’ interact with one another through conditional payments at the ‘right price’ (Muradian et al., 2010).

⁸ Environmental services (ES).

Unsurprisingly, for this perspective, understanding PES and ensuring that they worked as intended required placing emphasis to their Coasean features, mainly creating well-defined goods, defining property rights, reducing transaction costs, and enhancing negotiation processes. In other words, making Coasean PES ‘work’ required ensuring that they effectively functioned like efficient markets. Evidently, early literature from this perspective reflected these concerns. These types of considerations involved: designing contracts to elucidate opportunity costs and thus reduce ‘informational rents’ (Ajayi et al., 2011; Ferraro, 2008; Latacz-Lohmann and Van Der Hamsvoort, 1997; Schomers and Matzdorf, 2013); enhancing efficiency through spatial targeting (Alix-García et al., 2008; Wünscher et al., 2008); ensuring that adequate property rights were at place (Engel and Palmer, 2008; Landell-Mills and Porras, 2002); and creating well-defined services that could be subject to trading (Engel et al., 2008; Wunder, 2005).

The alleged ‘neoliberal’ nature of PES attracted a wealth of criticism from a largely ‘critical political ecology/economy’ perspective. Rooted in neo-Marxist, political ecology and critical geography frameworks, authors under this perspective have largely rejected the PES agenda, and more generally the ‘neoliberalisation of nature’, as an unsuitable agenda for environmental policy. From an ethical perspective, McCauley (2006) decried the development of environmental markets as representing our society ‘selling out on nature’ and suggested instead that “we will make more progress in the long run by appealing to people's hearts rather than to their wallets” (McCauley, 2006: 28). Others linked PES to the expansion of capitalism to new domains and they argued that this development would unavoidably imply different transacting parties operating under unequal terms of exchange (McAfee, 1999; Büscher, 2012). Similarly, voices critical of environmental markets have used Harvey’s (2003) concept of ‘accumulation by dispossession’ and Martínez-Alier’s (2002) notion that ‘the poor sell cheap’ to emphasise

how market-based policies might entail virtual and actual ‘green grabs’ (Fairhead et al., 2012) and involve ‘conservation rents for renouncing development’ (Karsenty, 2007). Others, drawing from the work of Polanyi (1944), warned of the counterproductive ethical and practical consequences of commodifying nature. Kosoy and Corbera (2010) argued that PES represented both a symptom and consequence of ‘commodity fetishism’, which disregards ecosystem complexity, reduces ecosystem values to single exchange values, and creates power asymmetries across those involved in market development. Similarly, Gómez-Baggethun and Ruiz-Pérez (2011) warned about the counterproductive consequences of commodifying nature for biodiversity conservation and equity in access to benefits from environmental services.

Yet, much to the dismay, or relief, of critical and supporting voices of PES’ ‘neoliberal’ nature, an increasing body of empirical literature began to show that both views had been largely exaggerated and had rested more on ideological assumptions and beliefs than on an a careful examination of reality. Though with varying degrees, ‘real world’ PES did not seem to encompass a great deal of the elements associated with neoliberal policy, such as commodification, privatisation and the retreat of the state (McElwee et al., 2014). Out of a combination of practical and political considerations and contestations, many alleged ‘neoliberal’ aspects of PES seemed to give way, or were never actually considered, during the design and implementation processes by policy makers. This was the case of national PES initiatives in the Global South, mainly in Latin America and including the Mexican case. Paying special emphasis to the Mexican PES because this is the case study examined in this thesis, I proceed to highlight some important aspects of how the ‘neoliberalisation’ of PES was ‘contested’.

PES in the real world did not commonly involve thorough processes to value nature or to compartmentalise environmental services. Rather than valuation, policy makers often

used estimations of opportunity costs or arbitrary methods to determine payments (Balvanera et al., 2012; McElwee et al., 2014). For instance, payment levels in national Mexican PES responded more to opportunity cost assessments and budget considerations than to prices signalling the relative demand and supply for environmental services (Muñoz-Piña et al., 2008; Shapiro-Garza, 2013a). Further, instead of measuring and compartmentalising environmental services, policy makers often used resource management practices as proxies for service provision. In Mexico, the conservation of standing forests has been used as a proxy for the provision of ‘hydrological’, ‘biodiversity’ and ‘carbon sequestration’ services almost interchangeably, an issue that I will foreground in Chapter 2. Thus, apart from some carbon projects (e.g. Corbera, 2005; Osborne, 2011), Mexican PES did not involve real ‘commodification’ processes. Similar trends have taken place elsewhere (McElwee et al., 2014).

Also, rather than involving voluntary transactions between individuals, PES often involved interactions between communities and governments. On the side of ‘buyers’, national level PES initiatives such as those in Costa Rica, Mexico and China, involved an active role by governments as the single or monopsonistic ‘buyers’ of environmental services (McElwee et al., 2014; Shapiro-Garza, 2013b). On the side of ‘sellers’, where land institutions involved collective property and tenure regimes, communities acted on behalf of individual landowners. This includes the case of PES operating in Mexican *núcleos agrarios*, i.e. *ejidos*⁹ or agrarian communities, where “collective decisions over PES prevail over household choices, and may mask, however, some potential individual opposition or lack of interest” (Kosoy et al., 2008: 2081). Due to levels of aggregation

⁹ See Appendix A and Section 3.3.1 for detailed descriptions of land institutions in Mexico and MdC.

among buyers and sellers, the alleged voluntary nature of PES did not necessarily hold everywhere (Wunder, 2015)

Finally, only seldom were policy implementers in the Global South guided exclusively by environmental efficiency concerns, as suggested by the Coasean PES. Instead, policy makers in government-led PES often linked these policies with other ‘social’ considerations, mainly anti-poverty goals or regional development (Wunder et al., 2008). In the Mexican case, policy makers linked PES with an anti-poverty agenda, while negotiation processes with peasant organisations brought forward PES as a way to ‘revalue the countryside’ (Shapiro-Garza, 2013a). These processes seemed to be associated with the fact that governments maintained a tight control over PES, both in terms of their development and funding, which enabled them to link these policies with broader rural development agendas (McAfee and Shapiro, 2010).

Thus, when confronted with the real world of politics and implementation, not much of the alleged ‘neoliberal’ theoretical PES seemed to remain in practice. While PES had been envisaged as involving commodification, privatisation and state retreat, real policies often involved an active role of the state, little commodification and different types of community involvement. Thus, “the “contested neoliberalisation” that has accompanied some of these major PES policies shows that PES projects are not one-size-fits-all, and the promised simplicity and efficiency of market-led conservation has been overstated” (McElwee et al., 2014: 436). The divergence between the practice and theory of PES brought forward the need for alternative conceptualisations and frameworks to better capture and understand these policies. The ‘ecological economics’ perspective to PES helped to fill this gap and their contribution is the topic of the following section.

1.2.2. The ‘ecological economics’ critique

From early on, the so-called ‘ecological economics’ perspective to PES advanced an alternative conceptualisation to the Coasean view of PES. Rooted in the field of institutional economics, old and new, and its interface with ecological economics, this perspective argued that the ‘narrow’ Coasean framework failed to capture the reality of many PES and that it was poorly suited to empirically examine or theorise over some key aspects of their theory and practice. In a series of special issues in the journal *Ecological Economics*, a ‘broader’ agenda was brought forward to better capture the diversity of context and institutions where PES operate and the multiple social and environmental values and goals they achieve (Farley and Costanza, 2010; Muradian et al., 2010; Tacconi, 2012). Overall, this perspective presented a more critical stance to PES but otherwise not fully antagonistic when compared with the sceptical views endorsed by the ‘critical political ecology/economy’ described above (Wunder, 2013).

Multiple alternative definitions of PES have been brought forward, each emphasising different aspects. These different definitions are summarised in reviews by Derissen and Latacz-Lohmann (2013), Sattler and Matzdorf (2012), and Wunder (2015). Yet, arguably the most influential has been Muradian et al.’s (2010: 1205), who defined PES as: “a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources”. What ecological economists have in common is that they have proposed an ‘augmented’ research agenda for PES aiming to re-embed the ‘socially empty’ Coasean view, to pay attention to their social production, and to transcend the idea of ‘getting the prices right’ towards a broader concern for ‘getting the institutions right’ (Van Hecken et al., 2015b). These ‘augmented’ conceptions of PES stressed the role played by multiple actors and power relations involved in PES, the intricate institutional

arrangements in which they take place, the complexity of the ecosystems which they are intended to sustain, and the multiple and incommensurate values embedded in non-market institutions in which PES operate. Under this perspective, environmental ‘problems’ were not understood as the consequence of the failure to establish working markets, but rather as the result of intricate social, political, institutional, environmental and cultural processes operating at different scales in space and time.

Though the literature from this perspective is extensive, some of the main conceptual themes brought forward by ecological economists are the following. Firstly, institutional analyses examining the governance frameworks in which PES operate (Corbera et al., 2009; Muradian and Rival, 2012; Muradian et al., 2010; Vatn, 2010). These studies have shed light on how discourses and practices around PES operate at various interconnected governance levels. From global actors and organisations who frame, legitimise and provide financial and technical support, to national or regional governmental actors and NGOs involved in negotiations over design and funding, and finally to local communities and organisations involved in their operation on the ground. Recognising that PES often operate in community contexts involving cooperation regarding issues such as participation decisions, payment distribution and monitoring, scholars have turned their gaze to the theory and practice of the collective action and Common-Pool Resources (CPR) literature (e.g. Ostrom, 1990, 2010, 2011, 2012; Ostrom and Basurto, 2011). Further, recognising that PES may operate and evolve alongside other institutional frameworks at various governance levels, and that such interactions are bound to have socioenvironmental effects, scholars have emphasised the need to engage with the literature on institutional ‘interplay’ (Berkes, 2002; Young, 2002a, 2002b).

Another theme has been around reflections over the link between equity and efficiency (Corbera and Pascual, 2012; Pascual et al., 2010, 2014). These authors have emphasised

that different actors associated with PES at various levels, from those at the local resource base to high level officials involved in policy design, may have different and potentially conflicting notions of fairness, equity and justice. Also, these authors have suggested the possibility of ‘elite capture’ in PES schemes, in the sense that powerful local elites may receive a disproportionate amount of the payments and other benefits associated with PES. As such, these authors have brought forward the view that issues to do with fairness, equity and legitimacy are not only important intrinsically, but that they also have instrumental implications for the environmental performance of PES. This type of work reflects the view that PES operate in complex Socio-Ecological Systems (SES) at various scales in space and time, such that the environmental and human worlds are inherently and unavoidably intertwined.

A further theme has been to explore the roles played by different political actors and power relations in shaping PES design and implementation at various levels (McAfee and Shapiro, 2010; Milne and Adams, 2012; Rodríguez de Francisco et al., 2013; Shapiro-Garza, 2013a, 2013b; Van Hecken et al., 2015a, 2015b). Arguably, some of these authors oscillate between the ‘ecological economics’ and the ‘critical political ecology/economy’ perspective to PES. What these authors have in common is that they have brought forward the need to ‘re-politicise’ PES by explicitly examining how the workings of politics and power influence multiple spheres of PES. This includes examining how various stakeholders interact with one another, how programme design processes are negotiated at different levels, and how local populations make decisions regarding aspects such as participation and payment distribution. Based on the view that ‘PES leaves much power with the intermediary’ in the Global South (Vatn, 2010: 11250), much attention has been paid to the multiple roles played by intermediaries in these contexts (Huber-Stearns et al., 2013; Pascual et al., 2010; Pham et al., 2010; Swallow et al., 2009).

A fourth and final theme has involved discussions over the conceptual flaws inherent in the Coasean view of PES (Farley, 2012). These include the incorrect assumption of rivalry and excludability as dynamic policy variables instead of biophysical characteristics which are not dynamic at all (Farley and Costanza, 2010), the inherent problems in measuring natural capital and assigning monetary value to environmental services (Rival and Muradian, 2013), and the scientifically weak links between land use and environmental service provision (Bateman et al., 2011; Pascual et al., 2010).

As the PES agenda advanced, a productive dialog took place between environmental and ecological economists. This ultimately served to produce some degree of convergence regarding important aspects of PES conceptualisation and implementation. Overall, environmental economists came to recognise that many of the aspects in the original Coasean view of PES were based more on ideology than reality. Thus, they showed some disposition to engage with the lessons offered by ecological economists. As noted by Wunder (2013: 235), “the ecological economics perspective has provided important inputs into the PES debate, including in its insistence on the importance of equity and the diversity of institutional contexts. Yet, arguably these lessons have widely been taken on board already by the environmental economists”.

A couple of points of convergence between these schools were reflected in a new definition of PES brought by Wunder (2015). This new definition, which he termed ‘modified narrow’ in reference to the original ‘narrow’ definition in Wunder (2005), understood PES as: (1) voluntary transactions, (2) between service users, (3) and service providers, (4) that are conditional on agreed rules of natural resource management, (5) for generating offsite services (Wunder, 2015: 241). Clearly, this definition, which seemingly closed earlier ‘taxonomic quarrels’ between both schools, departed in

significant ways from the Coasean PES conceptualisation in Wunder (2005). I highlight the main points below.

Importantly, most of the market features of the Coasean PES were removed or toned down in the new ‘modified narrow’ definition. The language of ‘buyers’, ‘sellers’ and ‘well-defined’ services gave way to that of ‘users’, ‘providers’ and ‘agreed rules on natural resource management’. This reflected the fact that PES failed to produce real markets where agents could exchange environmental services and instead recognised that PES often relied on governments acting on behalf of ‘users’, and landowners engaging in resource management as proxies for service ‘provision’. Wunder (2015) notes that he also modified the ‘buyer’ and ‘seller’ terms because they gave readers, including Muradian et al. (2010) and Gómez-Baggethun et al. (2010), an inadequate association with markets.

Though other non-market features of Wunder (2005) were kept in the new definition, Wunder (2015) offered some further clarifications. ‘Voluntariness’ was maintained as inherent for PES, though Wunder (2015) recognised that individual voluntariness may be restricted when collective decision-making on both the user and provider sides involves some degree of aggregation. This would include, for instance, governments acting on behalf of users, and communities engaging collectively in PES, both situations common in the case of Mexico. In turn, as part of the analysis in this new definition, Wunder (2015: 241) outlined ‘conditionality’ as the most important feature and what “makes PES the frontrunner of a new paradigm of contractual conservation”. Arguably, the primacy given to conditionality would be subject to debate by the ‘ecological economics’ perspective to PES, especially because this feature does not appear in Muradian et al. (2010) definition. I will say more about persistent disagreements below.

Definitions aside, however, other issues have remained contested between these two schools as the PES agenda has advanced. A first point of persistent disagreement has been

over the purpose and prospects of PES.¹⁰ Environmental economists have consistently portrayed PES as a tool primarily designed to achieve environmental goals. Other objectives, such as concerns for poverty, human rights or indigenous rights, have been considered as beneficial ‘side-objectives’ but never explicit goals (Pagiola et al., 2005; Wunder, 2005, 2008, 2013). This early view has not given way as the PES agenda has advanced. It has been justified by the historical failures of policies perceived as too ambitious in their goals such as ICDPs, the risk that overloading the PES agenda will lose efficiency and thus produce ‘old ICDPs wine in new PES bottles’, as well as concerns over running out of financing options if environmental goals are not achieved (Wunder, 2005, 2008). Though environmental economists have taken a more critical view of ‘side objectives’, recognising that PES may work more as a ‘win-settle’, i.e. achieving environmental goals while not making people worse off (Barrett et al., 2011; Wunder, 2013), they still endorse a highly optimistic view of PES based on a deeply rooted assumption that since enrolment to PES is voluntary, and because PES involve payments, participants are necessarily better-off because “otherwise they would not join” (Wunder, 2013: 231).

Evidently, such a view separating environmental and social goals goes against the notion held by ecological economists that the social and environmental worlds are interdependent and, as such, cannot be understood independently from one another. Further, the primacy of environmental versus other goals goes against the

¹⁰ In here, it is warranted to clarify that the issues of concept and purpose of PES are intimately linked but are not the same. According to Oxford Dictionary, ‘concept’ can be defined as “an idea or mental picture of a group or class of objects formed by combining all their aspects” (Thompson et al., 1995: 275). In turn, ‘purpose’ can be defined as “an object to be attained; a thing intended” (Thompson et al., 1995: 1113). Thus, while the former is about the aspects which might determine of something is PES or not, the latter refers to the reason why PES exist in the first place. Yet, concept and purpose are closely linked because policy features function as the ‘means’ to achieve the ‘ends’ that justify the existence of policy. These issues require further examination. In any case, it is not coincidental that much contestation has taken place regarding the purpose of PES between the very same authors who have quarrelled about their concept.

multidimensional worldview among ecological economists where multiple social and environmental values co-evolve, such that any decision requires situating trade-off thinking at the heart of any analysis. Thus, while ecological economists recognise that ‘win-win’ solutions are possible under some contexts, they adopt a more sceptical view of PES, or other simple policy tools such as ICDPs, to solve complex policy problems (Muradian et al., 2013).

A second point of disagreement relates to the types of issues emphasised or deemed as important, as well as the analytical frameworks used to study them. Consistently, environmental economists have focused on understanding how aspects of design and implementation shape PES performance. This includes a body of studies of a ‘technical-managerial’ nature studying questions on ‘efficiency-enhancing’ design and ‘getting the price right’ (Van Hecken et al., 2015b). Much of this technical-managerial work is summarised by Engel (2015) who claims that the ‘devil is in the detail’ on several features of PES design and implementation. For this, scholars have relied mostly on frameworks rooted in behavioural economics, transaction costs economics and environmental economics.

In turn, ecological economists have paid more attention to how PES outcomes are influenced by the socioeconomic, political, policy and biophysical context where they operate. Rather than ‘getting the price right’, much of the literature has focused on ‘getting the institutions right’ and the “design of institutional arrangements that lead to optimal ES provision and enhanced social equity through hybrid governance models” (Van Hecken et al., 2015b: 14). As such, scholars have used hybrid analytical frameworks at the interface between ecological economics and institutional economics, including notions from the collective action and CPR literature.

Overall, judging by how the ‘environmental economics’ and ‘ecological economics’ schools understand the world, it is possible that the aforementioned debates and areas of disagreement may not necessarily close. After all, questions around how to interpret outcomes, how to deal with trade-offs, as well as what issues to forefront or emphasise, all involve different normative dimensions. At the core, these positions involve different epistemological and ontological assumptions that may be hard to reconcile (e.g. Gendron, 2014). Indeed, the fact that ‘critical political ecologists/economists’ have staunchly maintained a critical stance towards PES on the basis of their inherent ‘neoliberal’ nature and roots, reflects these types of irreconcilable positions. For instance, Fletcher and Büscher (2017: 225 *original emphasis*) argue that the “key question is not just whether PES is or is not *innately* neoliberal in its actual implementation, but rather how it functions within a broader neoliberal political economy and regime of environmental governance.” In turn, a counter critique emerged by Van Hecken et al. (2018) who argued that this type of structural political ecology approach keeps the ‘neoliberal’ monster alive while at the same time neglects human agency and the actual experience of PES on the ground. In Chapter 7, I will highlight how my evidence contributes to these debates.

To conclude the past two sections, I have shown here how PES have attracted significant debates between three ideal-type schools: ‘environmental economics’, ‘ecological economics’ and ‘critical political ecology/economy’. As the PES agenda advanced, productive discussions have taken place between the first two schools while the latter have remained entrenched on a more critical stance largely dismissing PES. In this dialogue, debates around the concept and market nature of PES seemed to have narrowed but there are still disagreements on their purpose, prospects as well as on the types of questions emphasised and the frameworks to study them. Yet, for all these discussions

and debates on the concept and purpose of PES, what does the literature tell us about their socioenvironmental effects? This is the topic of the following section.

1.2.3. Silver bullet or fools' gold?

From the beginning, the course of PES has been shaped by the discourse and practice of 'sustainable development'. The vision carried over from the Brundtland Report to the Rio Earth Summit in 1992 and beyond, was that environmental and development 'problems' are inexorably linked (Wunder, 2013). In the Global South, the link between the environment and the economy inherent in the concept of 'sustainable development' hybridised the agenda of 'environmentalists' searching for alternatives to face the ecological crisis, with 'developmentalists' concerned with poverty and other social problems. In other words, the presumed unavoidable association between poverty and environmental degradation served to bridge the worlds of conservation and development increasingly together. This paved the way for the rise in the framing of, and continued quest for, policies pursuing 'win-win' solutions, i.e. aimed to solve environmental and development problems simultaneously.

From early on, high expectations were placed on PES as the new 'silver bullet' to tackle environmental challenges where others had failed. As noted by Wunder (2005: 5), PES represented "the most promising innovation in conservation since Rio 1992". A series of contributions by Ferraro and Kiss (2002), and Ferraro and Simpson (2002) suggested that paying for ecosystem protection directly was more cost-effective and efficient than indirect conservation approaches as ICDPs. This call attracted significant attention from global actors in search for environmental policy alternatives, including multilateral organisations such as the World Bank and the GEF, as well as international environmental NGOs (ENGOS) such as IUCN and WWF (Van Hecken et al., 2015b). Yet, when operating in the context of the Global South and home of many forest-dwelling rural poor,

PES became unavoidably intertwined with a development agenda focused on poverty alleviation. The presumed potential for PES to contribute to poverty alleviation when disbursing payments to ‘poor’ landowners (Pagiola et al., 2005) seemed to fare well with international aid agencies, private donors and governments in the Global South looking for a double environmental and social dividend (Bulte et al., 2008). Thus, the potential for PES to achieve ‘win-win’ solutions helps explain why these policies became so popular among policy makers and conservation practitioners and so quickly adopted across the Global South (Muradian et al., 2013; Pattanayak et al., 2010). Indeed, Wunder (2008: 279) goes as far as to say that “some donors are only interested in PES for their hoped-for pro-poor effects, rather than their environmental impacts”.

Arguably, scholars from the ‘environmental economics’ and ‘ecological economics’ perspectives have both remained cautious of an ‘uncritical commitment’ by policy makers and practitioners to PES as win-win panaceas (Muradian et al., 2013; Wunder, 2013). In any case, as PES experiments quickly spread across the Global South, scholars recognised an important need for understanding their effects, social and environmental. A call for PES evaluation was made in the academic community to compensate for the fact that policy makers proved not to be much interested in conducting serious evaluations and as such empirical evaluations were more the ‘exception rather than the norm’ (Ferraro and Pattanayak, 2006; Pfaff et al., 2008; Wunder, 2007).

The academic community responded vigorously and there is now a substantial body of empirical literature examining the socioenvironmental effects of PES. Environmental economists have paid more attention to environmental effects, which seems to reflect their interest in understanding what they have consistently perceived to be the primary purpose of PES: ‘achieving environmental outcomes’ (Wunder, 2013: 231). Alternatively, ecological economists have focused more on the ‘social’ side of PES,

reflecting their variegated interests in “justice, recognition, redistribution, power, democracy, citizenship, the state, and many other political categories” (Muradian and Rival, 2012: 99). Below, I review the literature with emphasis on studies conducted in Mexico, the case study in this thesis.

Overall, PES have proven to be neither silver bullet nor fools’ gold. Early reviews revealed mixed findings on both environmental and social aspects (Pattanayak et al., 2010). A recent and comprehensive review by Börner et al. (2017) including case studies, national level analysis, previous reviews and global studies confirmed much heterogeneity in outcomes.

Environmental economists who have increasingly used ‘impact evaluation’ frameworks have conducted much of the literature on environmental effectiveness. This has involved the development of theories and methods, such as experimental and quasi-experimental designs, to construct a ‘counterfactual’ and thus assess the extent to which PES result “in a change in land use compared to what would have happened without the program” (Wunder et al., 2008: 843). Under this view, studies have paid attention to questions of ‘additionality,’ ‘leakage’ or ‘spillovers,’ and ‘permanence’ of PES¹¹. Overall, studies have produced mixed results in all of these categories.

Firstly, PES studies reveal low levels of additionality at the national level, including the cases of Costa Rica (Arriagada et al., 2009; Sánchez-Azofeifa et al., 2007) and Mexico (Alix-García et al., 2012). Yet, subnational or local level studies have revealed high additionality. For instance, a study by Costedoat et al. (2015) evaluating additionality in

¹¹ ‘Additionality’ refers to whether PES induce behavioural changes or whether they are simply “paying for land practices that they would have conducted anyway” (Engel et al., 2008: 668). ‘Leakage’ (also called slippage) or ‘spillovers’ refer to whether PES “indirectly impact land use, by either encouraging additional conservation (spillovers) or leading to deforestation (leakage) in areas not under contract” (Pattanayak et al., 2010: 258). ‘Permanence’ refers to the ability of PES to achieve improvements in environmental service provision beyond the duration of contracts.

Marqués de Comillas and Benemérito de las Américas, including the six communities in this thesis' study area, found that PES reduced 12 to 14.7% of forest cover loss from 2007-2013. Overall, the study showed that PES have been effective at reducing forest cover loss in a context where rates have been historically high (see Chapter 2). Similarly, Börner et al. (2017) point out to other local level studies on additionality showing positive results in Mexico (Honey-Rosés et al., 2011), Costa Rica (Arriagada et al., 2012), and Uganda (Jayachandran et al., 2016).

Similar results have been found regarding leakage and permanence, the latter issue being only studied recently arguably because PES are just beginning to reach a certain level of maturity. Studying an early cohort of PSA-H in Mexico, Alix-García et al. (2012) found evidence of leakage at the *ejido* level, overall reducing effectiveness by 4%. Similarly, in a study in the Mexican state of Yucatán, Le Velly et al. (2017) found evidence that PES displaced deforestation to other non-enrolled parts of the *ejido*. This study also found that the additional environmental effects of PES ceased once contracts ended, thus suggesting outcomes were not permanent. In turn, a study in Colombia by Pagiola et al. (2016) found that positive outcomes were maintained after the end of the PES contracts. Thus, more research is required on leakage and permanence. Chapter 4 provides a conceptual and methodological contribution to the issue of leakage.

Using similar impact evaluation analyses, a few studies have examined the contribution of PES to poverty alleviation, mainly understood in terms of income. Overall, these studies have also produced mixed effects. National level studies in Mexico have showed small effects of PES to household income (Alix-García et al., 2015; Sims and Alix-García, 2017). Similar results have been found in subnational studies in Costa Rica (Arriagada et al., 2015). Yet, other studies in Mozambique (Hedge and Bull, 2011) and

China (Uchida et al., 2007) have showed significant effects of PES on short and long-term socioeconomic indicators.

Most of the literature examining PES' effects on people has been qualitative, arguably reflecting the types of methods and frameworks of preference among ecological economists. These studies have transcended a narrow view of social effects as solely relating to income, and in turn adopted a more holistic understanding of how PES shape individual and community life and their potential for unintended social outcomes. Key themes explored from this view have been around participation and distribution, both of which have produced mixed outcomes. Studies have shown how participation in PES may not always be voluntary, for instance when decisions to participate are made collectively as in Mexico (Kosoy et al., 2008) and Cambodia (Milne and Adams, 2012), or when governments apparently force families and communities to participate as in China's Sloping Land Conversion Programme (Bennett, 2008) or Vietnam (Pham et al., 2014). Other studies have shown how PES reproduce or exacerbate land, resource or informational inequalities in Mexico (Corbera et al., 2007a; García-Amado et al., 2011) and Ecuador (Rodríguez de Francisco et al., 2013). While recognising these types of drawbacks, some studies have shown how PES have led to other types of positive and unintended social effects. Studies in Chiapas have shown how PES have contributed to improving land security (Osborne, 2011) or how participation in PES may be used "to overcome social inequalities or as a way of the strengthening of an individual's social relations" (Hendrickson and Corbera, 2015: 70). Studies have shown how PES are reshaped by rural actors to reflect their social, cultural or economic priorities in Mexico (Shapiro-Garza, 2013a, 2013b) and Vietnam (McElwee et al., 2014).

More importantly, studies have begun to shed light on the potential determinants, or causal mechanisms, which may help to explain PES effects. Systematising much of the

existing empirical literature but also drawing on theoretical predictions, Börner et al. (2017) brought forward a theory of change linking socioenvironmental outcomes to issues of policy design and the context where they operate. Some of the contextual factors identified by Börner et al. (2017) as important for shaping PES outcomes are the following: levels of pre-programme compliance and opportunity costs, property rights, mobility of production factors, as well as local pre-existing inequalities and conflicts. In terms of design, Engel (2015) provided a review of the main features of PES design and how they might influence outcomes.

Yet, despite many advances in empirical literature, there is still a need for further research to uncover the causal mechanisms behind local heterogeneous effects, how PES effects change and appear at different levels, and thus help to validate or disprove predictions that until now have been theoretical (Ferraro and Hanauer, 2014). I will foreground these issues in the following section.

1.2.4. Re-engaging with the local: perspectives, space and time

In the previous sections, I traced the evolution of the academic literature and main debates around PES. I argued that the extensive interest in PES, both implementation and scholarly wise, reflects how PES produced a policy agenda hybridising multiple paradigms, thus creating a vortex where environmentalists, developmentalists, neoliberals, and all their respective critics, seemed to converge. As the PES agenda evolved, debates on their alleged ‘neoliberal’ nature and concept seemed to narrow down, while discussions on their ‘win-win’ prospects, purpose and effectiveness remain contested. I argue here that despite much theoretical and empirical advances for understanding PES and their effects, two interrelated issues remain underemphasised in the PES literature: the perspective of local stakeholders, and the long-term and multi-level effects of PES. Overall, I argue that this has resulted in a limited understanding of how

PES effects emerge at various temporal and spatial scales, and the local mechanisms that explain manifold and evolving outcomes.

For much discussion on whether PES are, or should be, ‘neoliberal’ or ‘win-win’ solutions, less emphasis has been placed on the perspective of local stakeholders. We already know a great deal about the perspectives of PES ‘designers’ and ‘experts’, those who have voice in different aspects of real-world PES design and implementation, as well as authoritative say on the ‘theory’ of PES. ‘Designers’ influencing the shifting discourse and practice of PES have included government institutions, academics, peasant movements and international donors, such as the World Bank. At a global level, ‘experts’ in academia and research centres have influenced how we have come to understand the concept of PES and how we evaluate and interpret their effects. The theory and practice of PES have evolved as policy makers and academic communities have communicated with one another through academic and policy documents, among other channels. In Chapter 2, I will examine how these processes unfolded in the Mexican PES.

Yet, we know much less about how these issues look like from the perspective of local stakeholders. The perspective of those who bear with a changing policy agenda crafted far away in universities, government offices or the headquarters of multinational organisations. Those at the resource base for whom whether PES are ‘neoliberal’ or ‘win-win’ may mean little but otherwise seemingly trivial aspects of design and implementation may matter a lot. These local stakeholders include families and communities who choose to participate in PES and receive payments for setting aside their forests for conservation, for whom social and environmental trade-offs are important not because they are interesting academic questions but because their livelihoods are at stake. Other stakeholders include local government officials, those who are in charge of implementing policies crafted at higher government levels and who must confront the

reality of monitoring and sanctioning on the ground. And finally, these local actors include PES intermediaries and technical advisors, often ENGOs, who engage with PES to pursue their own goals but at the same time must reconcile the different agendas of various environmental services ‘buyers’ and ‘sellers’.

To be fair, these issues have been increasingly noted in the PES literature as the current research of this thesis went underway. The need to bring to the fore the voice of local perspectives has been emphasised most forcefully by Van Hecken and co-authors (Van Hecken et al., 2015a, 2015b, 2018) who called for a ‘a power-sensitive and socially-informed’ analysis of PES. In their more recent contribution, framed as a critique to Fletcher and Büscher’s (2017) view of PES as a ‘neoliberal conceit’, Van Hecken et al. (2018: 315) brought forward the need “for a situated actor-oriented approach to PES research, allowing PES praxis to inform knowledge generation and critically giving voice and power to all actors making sense of PES”. Increasingly, empirical studies have given voice to local stakeholders in Mexico, most notably by Corbera and co-authors (e.g. Corbera, 2005; Corbera and Brown, 2008; Corbera et al., 2007a, 2009), and elsewhere (McElwee et al., 2014; Milne and Adams, 2012; Pham et al., 2014; Rodríguez de Francisco et al., 2013). Some of these studies have involved extensive fieldwork periods and anthropological approaches and methods, such as ethnography and participatory observation. Yet, this type of empirical literature is still limited and local perspectives have yet to make their way into the theory and practice of PES. The view here is that long-term empirical studies can help to better capture the complex and changing dynamics of PES as they are experienced on the ground. Below, I will say more about the need to incorporate multiple spatial and temporal scales into PES analyses.

Further, despite some advances in our understanding of how contextual factors and PES design factors influence socioenvironmental effects, not enough reflection has been paid

as to how context and design change over time and how they influence evolving PES effects at various spatial scales. In other words, there has been insufficient theoretical and empirical examination on the temporal and spatial dynamics of context and design, and how they shape the social and environmental effects of PES. The need to examine the issues of temporal and spatial scale in the evaluation of conservation programmes has also been increasingly emphasised in recent literature (Baylis et al., 2016; Van Hecken et al., 2015a, 2015b) but empirical studies of this kind have been lacking.

On the issue of spatial scale, PES studies at the local level have mostly used individual families or individual communities as the ‘unit of analysis’. The literature has advanced much on our understanding of how some aspects of PES implementation involve individual and collective processes simultaneously. For instance, the common property nature of forests in Mexico has been recognised as a ‘unique’ and ‘interesting’ setting for the implementation and analysis of PES and a feature that differentiates it from other large-scale national initiatives, such as Costa Rica and China (Alix-García et al., 2005; Kosoy et al., 2008; Muñoz-Piña et al., 2008). Studies in Mexico, and elsewhere where PES involve some degree of collective action, have shown how individual family and community aspects related to PES have implications for decision-making processes such as participation, payment distribution, as well as collective activities such as monitoring and enforcement (Corbera et al., 2007a, 2007b; Tacconi et al., 2013; Mahanty et al., 2013).

Yet, the literature has largely neglected the ‘inter-community’ or regional dimension of PES and how dynamics at this level might shape performance. Communities who participate in PES are bound to interact with other communities, which in turn may or may not participate in PES, and such interactions can have important implications for PES performance. After all, rural livelihoods are not confined to the family or community

levels, but are also influenced by the broader regional context where they are situated. Much in the same way in which interactions between families within individual communities involve synergies and tensions for people and the environment, interactions may take place at a higher level between communities within regions. For instance, environmental monitoring and patrolling may involve some degree of coordination between communities. Such interactions can increase environmental protection effectiveness and efficiency if they are based on trust and mutual understanding. Yet, PES may also lead to conflicts and tensions between communities engaging with PES and non-participating neighbours. Similarly, the distribution and spending of PES money may respond to inter-community dynamics and considerations, and thus have regional effects. For instance, multiple communities may engage in shared services or activities, such as roads, schools and health clinics, and they might choose to spend PES money for these purposes. All of this suggests that PES may have regional spillovers, positive and negative, shaping their performance. Though the potential for PES to have regional effects has long been theorised in the literature (Engel et al., 2008; Wunder, 2005), there is a need to empirically examine regional PES effects.

The issue of PES temporal dynamics has been less studied, arguably because studying change requires long-term empirical examination. As noted by Corbera et al. (2009: 758), “one needs to take a long-term research perspective, and focus on shifting policy dynamics and incentives in the communities, areas or regions benefitting from PES”. Thus, while important empirical and theoretical advancements have been made on how contextual and design factors shape PES outcomes, these issues have been mostly looked at from a static perspective. For instance, Börner et al. (2017) theorise about how PES outcomes emerge from their interplay with ‘pre-existing’ contextual factors, such as levels of pre-programme compliance and opportunity costs, property rights or production

factors. Similarly, Engel (2015) discuss how ‘the devil is in the detail’ regarding aspects of PES design at any moment in time. Yet, both the context where PES operate and their design features are bound to evolve and change with their ongoing implementation. All of these changing aspects are likely to have important implications for the short and long-term effects of PES.

For instance, in Chapter 2, I will show how the design of Mexican PES evolved after different iterations, reflecting a series of political and pragmatic processes. Drawing on lessons from the literature on managing the commons, Muradian and Rival (2012: 98) suggest that changes in PES design and rules may have a series of effects depending on: “1) how a particular institutional arrangement fits the local ecological conditions; (2) how rules are developed and adapted across time; and (3) how social actors perceive these arrangements in terms of legitimacy and equity”. There may be processes of path-dependency regarding design features, in the sense that changes at one moment in time may have implications for subsequent periods. Indeed, some of these changing aspects have been highlighted in the debate as to whether participation in PES may ‘crowd-in’ or ‘crowd-out’ intrinsic environmental motivations (Rode et al., 2015) and on questions around permanence (Le Velly et al., 2017; Pagiola et al., 2016). Thus, as PES evolve and acquire temporal maturity, with participants renewing their contracts and participating in different programme iterations, there is a need for adopting a dynamic lens to capture these changing aspects and how they influence effects.

These two issues, i.e. the limited attention to local perspectives and the static and spatially narrow nature of PES analyses, result in a limited understanding of how PES effects, social and environmental, emerge and evolve at various spatial and temporal scales in space and time. On the one hand, by disregarding local perspectives, research overlooks the dynamism of the practice of PES and how, intentionally or not, these policies touch

upon multiple aspects of family and community life for those at the resource base. This misses out on how local actors, including participating families and communities, local government officials and intermediaries give meaning to PES, how they shape these policies through day-to-day practice, and how they respond to and resist shifting aspects of design and implementation crafted far away from their reality. In the end, by paying little attention to local perspectives, research has missed a potential source of valuable clues for the theory and practice of PES.

On the other hand, static and spatially narrow analyses fail to account for the dynamism of the local context where PES operate, and how aspects of design and implementation evolve. Overall, this has resulted in analyses of a spatial and temporal self-contained nature whereby aspects in the ‘realm’ of PES, such as land use, are examined as though they were fixed and independent from the broader livelihoods of participating families and communities. Below, I emphasise three issues that have been overlooked or under examined in the literature: the role of PES in the broader land use strategies of participating families and communities; PES money as one component in the larger income portfolio of participants; PES as part of a broader ‘policy mix’. These topics will be examined in Chapters 4 to 6, and here I highlight how studying these questions from a dynamic and spatially broader perspective may provide a better understanding of the social and environmental effects of PES.

Firstly, apart from forest lands enrolled in PES, participating families and communities may simultaneously manage multiple other land uses, including lands for agricultural and ranching activities, fallow lands under rotating or shifting cultivation, and voluntary forest reserves left aside for forest products or other uses. If PES enrolled forests are just one among multiple other land uses managed by participating families and communities, then the performance of PES in the short and long-term is bound to depend on the dynamic

interplay between different land uses. Studying such interactions may help shed light on how PES fit in the wider and longer-term land use trajectories of participants, including evolving needs for agricultural production as well as timber and other forest resources, and how competing land uses coevolve with PES, for instance, government policies providing subsidies for agriculture or regional speculative land markets shifting land prices. Thus, examining broader land uses may overall enable a better understanding as to how PES enrolment and non-enrolment decisions are balanced at the family, community and regional levels. Some of these issues have been partly examined in the literature on leakage and spillovers (e.g. Alix-García et al., 2012; Le Velly et al., 2017; Pattanayak et al., 2010; Sims and Alix-García, 2017) but there has been insufficient reflection on the dynamic interactions between PES and other land uses. I will examine these issues in Chapter 4.

Further, besides cash or in-kind benefits from PES, participating families and communities may simultaneously manage income from multiple other sources, including agricultural production or commercial fishing and hunting, employment, remittances, loans, income from illegal activities, or multiple forms of government subsidies and cash transfers. If PES income is just one within a broader income portfolio, then financial decisions are bound to depend on how multiple forms of income, PES and non-PES, interact with one another. Examining income interactions may shed light on how participants define their short and long-term financial strategies, and how these decisions have various implications over aspects of family, community and regional life much beyond five-year long PES contracts. Thus, examining income portfolios may enable a better understanding as to how participants use income to balance farm and off-farm livelihoods. Some of these questions have been indirectly examined in the literature on the ‘social’ implications of PES regarding spending (Mahanty et al., 2013; Tacconi et al.,

2013) and distribution (Pham et al., 2014), as well as on the ‘environmental’ implications of social policies that provide additional income (Alix-García et al., 2013). Yet, there is a need to directly examine how multiple sources of income, PES and non-PES alike, combine to produce socioenvironmental effects. I will examine such questions in Chapters 5 and 6.

Finally, PES are likely to coexist and coevolve alongside a broader set of social and environmental policies operating at the family, community, regional levels and beyond. This ‘policy mix’ may include environmental ‘carrots and sticks’, such as direct command-and-control mechanisms or indirect ICDP-like instruments, agricultural and ranching subsidies, as well as social protection policies providing diverse forms of conditional and unconditional cash and in-kind benefits among the ‘poor’. If PES are just one within a broader set of policies, then multiple aspects of PES performance are bound to be shaped by their dynamic interactions in the ‘policy mix’. Studying the multiple and evolving roles of PES in the ‘policy mix’ may shed light on how PES-related decisions, such as those pertaining to land use and payment spending and distribution, are shaped by PES’ interplay with other policies, and how certain policy combinations may inadvertently create synergies or tensions with PES, for instance when PES coexist with other policies directly or indirectly promoting forest conversion and degradation. Thus, examining policy mixes may provide a better understanding on the role of PES within broader rural development strategies. The need for understanding PES in the ‘policy mix’ has been stated over and over again (Baylis et al., 2016; Börner et al., 2017; Engel et al., 2008; Muradian et al., 2013; Rodríguez et al., 2011) and, drawing on insights from the literature on institutional ‘interplay’ (e.g. Berkes, 2002; Young, 2002a, 2002b), some of empirical studies have studied PES’ interplay with other environmental policies and regulation (Barton et al., 2013; Begossi et al., 2011; Ring and Schröter-Schlaack, 2011; Robalino et

al., 2015; Sverdrup-Thygeson et al., 2014). Yet, the potential interactions of PES with socioeconomic policies have only been theorised (Persson and Alpízar, 2013; Rodríguez et al., 2011; Wong, 2014). Clearly, there is a need for further examination on how PES interact with socioenvironmental ‘policy mixes’ at multiple temporal and spatial scales. I will examine these issues in Chapter 6 and will elaborate on such findings in Chapter 7.

To conclude, I have argued here that PES research has overlooked the perspectives of local stakeholders and that there has been insufficient reflection on the longer-term and spatially broader dynamics and effects of PES. Ultimately, this has resulted on a limited understanding of the evolving and multi-level social and environmental effects of PES and the mechanisms that explain them. This thesis aims to fill this gap in the literature by exploring the role of PES in the broader livelihood strategies of participating families and communities in the Mexican Lacandona Rainforest. For this, I use a multidimensional multi-level and dynamic analytical framework that brings to the fore the voices and perspectives of local stakeholders at the family, community and regional levels, and that also pays attention to the dynamic interplay between aspects of policy design and implementation, as well as the socioeconomic, political, biophysical and policy context where PES operate. I will outline such a framework in Chapter 3.

1.3. Understanding PES: context and design

This thesis outlines the multiple questions and avenues of academic enquiry that are opened by shifting the focus towards the perspective of local stakeholders, by giving voice to the agency of participants while not losing track of the dynamism of the broader context where PES operate as well as changing features of their design and implementation. As I will elaborate in Chapter 3, this lens offers a source of clues for understanding the dynamic and multi-level socioenvironmental effects of PES. Seen from this lens, it becomes evident that “almost never are PES the only game in town” (Wunder,

2013: 235). On the contrary, what this lens makes clear is that PES are just one component in the broader livelihoods of participating families and communities: forest conservation with incentives is just one among many other land uses; PES money is but one component in a broader income portfolio; PES coexist and coevolve with a larger family or environmental ‘carrots and sticks’ and development policies disbursed among the ‘poor’. If PES are only one component of participants’ livelihood strategies, I will show, their social and environmental effects are then likely to be influenced by their dynamic and spatial interactions with the non-PES ‘realm’, this being other land uses, forms of income or ‘policy mixes’. Overall, I show that bringing to the fore the voice of local PES stakeholders, while also keeping track of aspects of context and design, can help provide a better understanding of the dynamic and multi-level social and environmental effects of PES and their mechanisms.

This is the logic of the argument presented throughout this thesis. Using the lens described above, the chapters examine the strategies of participating families and communities regarding three sequential and interrelated dimensions of PES: multiple land uses (Chapter 4), community payment distribution (Chapter 5), and ways of combining policies (Chapter 6). I have chosen these themes because the literature suggests that land use, payment distribution and spending have real and enduring implications for PES performance and on the lives of participating families and communities. Further, studying these sequential themes among the same families and communities allows telling a deeper and more comprehensive story of PES in the study area: people first choose how to participate (Chapter 4), then they decide how to distribute PES money (Chapter 5), and finally they decide how to spend the money (Chapter 6). On the theme of multiple land uses, I show how simultaneously examining how participants navigate choices between PES subsidised forest conservation and other land uses, such as agriculture and ranching,

enables a better understanding of how to evaluate and interpret environmental performance. On the theme of community payment distribution, I show how distributional outcomes emerge and evolve as communities re-examine their local notions of land property. I show how communities devise distribution mechanisms simultaneously drawing upon aspects rooted in historical land institutions as well as factors emerging from ongoing participation in PES. Overall, I show how PES revenues are likely to reproduce or exacerbate pre-existing land and power inequalities. On the theme of policy interactions, arguably the least examined in the literature of those covered in this thesis, I show how synergies and contradictions emerge inadvertently at the family, community and regional levels between PES and a Conditional Cash Transfer (CCT) programme disbursing cash to ‘poor’ families conditional on them attending schools and medical check-ups. Overall, I show how seemingly trivial aspects of payment design actually matter a lot for participants and shape their spending practices, and how studying policy interactions offers an uncharted terrain for further reflection on the role of PES within a broader ‘policy mix’. I foreground this important topic in the concluding chapter of this thesis.

I study these questions among a region of six *ejidos* in the municipality of Marqués de Comillas (MdC) in the Lacandona Rainforest, in the southern state of Chiapas, Mexico. In Chapter 2, I trace the origins of PES in Mexico, their rationale and evolution. I highlight the collective ownership of Mexican forests and how this has had important implications for PES design and implementation. Subsequently, I examine the political economy of MdC and the Lacandona Rainforest leading to the time when PES came into place in the 2000s. Overall, this historical chapter aims to contextualise the study area and to set the scene for the subsequent empirical chapters. As such, this chapter provides a historical account of the colonisation process as it took place in MdC since the 1970s and the

evolving social and environmental dynamics in the Lacandona leading to the 2000s. I foreground how colonisation in MdC responded to a broader national government strategy aimed to bring tropical lands into production and solve agrarian conflicts, but I also emphasise how specific frontier dynamics in MdC were shaped by geopolitical considerations mostly to do with international and national armed conflicts as well as government interests in exploiting natural resources in the Lacandona. I also foreground how colonisation in MdC has been associated with extensive processes of deforestation and degradation, and how people in MdC have experienced contradictory development and conservation government agendas since the 1980s. The Mexican federal and state governments have, on the one hand, directly or indirectly promoted the expansion of the agricultural frontier, while at the same time devised and experimented with various environmental ‘carrots and sticks’ to protect the forests of the Lacandona.

Overall, this thesis shows that the effects of PES are socioenvironmental, dynamic and multi-level, and that they emerge at the interface between three sets of factors. ‘Contextual’ factors to do with the historical institutions, biophysical, political and policy settings where PES operate. ‘Policy design’ factors to do with payment features, programme rules, and both formal and informal aspects of their implementation on the ground. Finally, a third dimension that I term ‘decision-making’ and bring forward in Chapter 7, to do with how local stakeholders make decisions based on their cultural norms, values and aspirations. I show how unless these three dimensions are examined with a multidimensional, dynamic and multi-level perspective, the social and environmental effects of PES will not be sufficiently understood. The fact that PES effects emerge at various temporal and spatial scales helps to transcend the view of PES as a piecemeal, isolated, self-contained policy with narrow objectives. Rather, the thesis builds a picture of PES as being inserted within a broader government-led rural

development agenda, with all its tensions, contradictions and unexpected synergies. Thus, I argue that there are real implications in terms of conceptualising rural development policy as integrated, overall environmental and social policy. I call this the ‘policy matrix’ and develop this concept in the concluding chapter.

2. The Case Study in Historical Perspective

This chapter aims to contextualise the reader with the historical development of the Mexican PES and the region in Chiapas where the work of this thesis was carried out. This contextualisation is important because processes to do with PES design, as well as the historical context of Mexico in general, and the study area in particular, will play a crucial role in shaping people's land use decisions (Chapter 4), community distribution of PES money (Chapter 5), and people's ways of combining policies (Chapter 6). The first section examines the rise of PES in Mexico, their rationale and objectives, as well as the processes that led to the current features of their design and implementation. With this broader introduction about Mexico in place, Section 2.2 explores the dynamic political economy of Marqués de Comillas (MdC) and the Lacandona Rainforest up to the time when PES came into place in the 2000s. Section 2.3 concludes the chapter by presenting some final remarks.

Throughout this chapter, I emphasise the historical and persistent contradictory nature of Mexican government policies regarding its forests. The contradiction lying in that, while the government has eagerly engaged with various environmental 'carrots and sticks' to protect its forests from rapid deforestation and degradation, at the same time national policies have continued to encourage the opening of forests for agricultural development. These tensions and contradictions between environmental and development policy agendas have important implications for PES that I will examine in the study area in relation to land use in Chapter 4, community payment distribution in Chapter 5, and policy interactions in Chapter 6. I will carry over these lessons to Chapter 7, when I bring forward the need to examine 'decision-making' as another analytical category to complement 'context' and 'design', as well as the concept of the 'policy matrix'.

2.1. Mexico's PES experiment: from environmental market to rural subsidy

PES in Mexico have become a key pillar of the country's strategy to protect its forests from rapid loss and degradation. National Mexican PES figure among the largest national initiatives in the Global South, jointly with Costa Rica's Pagos por Servicios Ambientales (PSA), China's Sloping Land Conversion Program, and Ecuador's Sociobosque. From 2003-2011, more than 3.4 million hectares of forested lands were enrolled to various programmes (Alix-García et al., 2015; CONAFOR, 2012; FAO, 2010; Sims and Alix-García, 2017). This represents 1.7% of the total national territory and 5.1% of the total forest surface in Mexico¹². During this period, approximately \$6 billion¹³ Mexican Pesos (Mxn) or US\$490 million were disbursed in 5967 contracts among communities and individual smallholders. Most of this has been funded by the federal government, except for a World Bank (WB) loan for the pilot programme in 2001, as well as a US\$45 million loan from the World Bank and a US\$15 million loan from the Global Environmental Facility (GEF) in 2006 (Shapiro-Garza, 2013b).

While framed originally around an 'environmental service' market logic, Mexican PES have functioned more as a government-led effort for the protection of standing forests collectively owned by 'poor' communities. In their current shape, PES involve voluntary, five-year long renewable contracts, annual cash payments per hectare disbursed conditional on maintaining forest cover as a proxy for environmental service provision. Mexican PES also involve extensive participation by 'poor' communities, an active government involved in financing and managing the programmes, and an important role played by local intermediaries as liaisons between participants and the government. This

¹² This considers total national and forest surfaces, respectively, of 196.4 and 66 million hectares on 2015 (FAO, 2015).

¹³ Throughout this thesis, one billion refers to one thousand millions.

section examines the Mexican context where PES emerged, their original logic, contradictions and processes explaining their current form.

2.1.1. The forests of Mexico and their discontents

Mexico lost much of its forests over the last 50 years. Historical deforestation estimates vary significantly, ranging from 365,000 to 1,500,000 hectares (ha) of forest loss per year (Velázquez et al., 2002). Yet, even conservative estimates situate Mexico as one of the top deforesters in the world during the 1980s and 1990s (Alix-García et al., 2004). From 1976-2000, Velázquez et al. (2002) estimated an annual deforestation of 545,000 hectares: 86,718 of temperate forests, 263,570 of tropical forests and 194,592 of scrub forests. Deforestation rates seemed to have dropped in Mexico since the 1990s, but they remain high nonetheless. According to FAO (2010), Mexico lost a total of 5.49 million hectares from 1990-2010: 354,000 annually from 1990-2000; 235,000 annually from 2000-2005; and 155,000 annually from 2005-2010. To date, 34% of the national territory or 66 million hectares consists of forests and rainforests (FAO, 2015).

As in other tropical countries, studies in Mexico have shown that deforestation has been highest in the tropical areas, which are located mostly in the southeast of the country (World Bank, 1995). In the second half of the 20th century, Mexico occupied the third place in the world on tropical deforestation (Ortiz-Espejel and Toledo, 1998). The states of Chiapas and Yucatán registered the highest rates of forest conversion from 1993-2007, with Chiapas alone contributing to 12% of national deforestation during the period (De Jong et al., 2010; Díaz-Gallegos et al., 2010 cited in Soto-Pinto et al. 2012). These processes have been prevalent in the study area and region where the work of this thesis was carried out. The Lacandona Rainforest lost about a third of its forest from the mid-1970s to the mid-1990s (De Jong et al., 2000). In Marqués de Comillas (MdC), the annual deforestation rate for the periods 1986-1997 and 1997-2005 has been estimated at 2.3%

and 4.8% respectively, leading to a loss of 48% of total forest cover and representing one of the highest rates in Mexico (Castillo Santiago, 2009).

The issue of forests and their loss in Mexico, as in many other countries across Latin America, is entirely linked to government agricultural frontier policies (Kaimowitz, 1996). Over the 20th century, Mexico embarked on a national wide agrarian reform and colonisation process. Yet, the ‘incomplete’ character of Mexican agrarian reform (Esteva, 1983), especially in the southern states, was more about opening ‘idle’ forest lands for peasant colonisation than about expropriating and redistributing lands already into production. Colonisation without redistribution served the dual aim of solving agrarian issues without affecting landed elites, a processes that explains the colonisation of the Lacandona Rainforest that I examine in Section 2.2. Extensive peasant colonisation processes in the southern tropic states of Mexico, what Revel-Mouroz (1980) termed the ‘conquest of the Mexican tropics’, were part of a broader and longer-term ‘developmentalist’ agenda. This agenda was about bringing idle lands into production to supply increasing urban markets demanding agricultural products, as well as about developing Green Revolution food and technology systems (Leyva Solano and Ascencio Franco, 1996; O’Brien, 1995). Over the course of agrarian reform and colonisation from the 1930s and ending in the 1990s, around half of the total national territory was distributed to *ejidos* and agrarian communities¹⁴. Figures differ but somewhere from 70% to 80% of forests are currently held in common property among *ejidos* and agrarian communities (Bray and Merino-Pérez, 2004; Corbera et al., 2011). This makes Mexico the country with the second highest proportion of forests held in communal property, only behind Papua New Guinea (White and Martin, 2002).

¹⁴ The complexity of the *ejido* and Mexican land institutions warrant a special section, which I present in Appendix A.

Throughout the agrarian reform process in Mexico until its end in 1992 and beyond, government policies have maintained an enduring agrarian bias directly or indirectly promoting deforestation for agricultural production (Carabias et al., 2008). As elsewhere in Latin America, the immediate cause of tropical deforestation across Mexico has been associated with the expansion of agriculture and pastures (e.g. Angelsen and Kaimowitz, 1999; Kaimowitz and Angelsen, 2008; Rudel et. al., 2000; White et al., 2001). Despite variations across time and space, there is consensus that smallholder cattle ranching in extensive production systems has been a major cause of deforestation in Latin America since the 1960s and Mexico is no exception: “the most important change in land use in tropical Latin America over the last thirty years has been the widespread conversion of forest to pasture. Between 1981 and 1990, the region lost 75 million hectares of forest, the majority of which became grass lands” (Kaimowitz, 1996: 1). This contrasts with deforestation processes elsewhere, such as those caused by logging in Southeast Asia or for fuelwood across the African continent (Angelsen and Kaimowitz, 1999).

The extensive historical loss of Mexican forests did not go unnoticed at the national or international levels. From the 1970s onwards, the country witnessed the creation, strengthening and articulation of environmental institutions and policies. Many of these have been about policies and regulation to protect forests. The Mexican environmentalist movement has been traced to the early 20th century, marked by the figure of Miguel Ángel de Quevedo who declared the first national park in 1917 and who managed to place 30% of the national territory worth of forests under different legal figures (De la Maza and De la Maza, 2005). Yet, this early environmentalism was subdued by agrarian reform and colonisation concerns. The modern environmentalist movement in Mexico finds its roots in the 1970s as various processes, national and international, developed simultaneously (Carabias et al., 2008). Firstly, the consolidation of academic knowledge in the field of

ecology, including the work of Alfredo Barrera, José Sarukhán, Arturo Gómez-Pompa and Gonzalo Halffter, who helped position forest protection as an issue of crucial concern because forests hold a great deal of the country's enormous biodiversity. Mexico is the fourth most biologically diverse country in the world (Mittermeier and Mittermeier, 1992), occupying the second place in reptilian diversity, and is among the top five in amphibians, mammals and vascular plants (CONABIO, 2008). Secondly, Mexico's participation in international environmental summits and programmes, including the 1972 United Nations Conference in Stockholm focused on concerns over pollution and the Man and Biosphere programme in the late 1970s. This latter programme led to the creation of the first biosphere reserve in the country, the Montes Azules Biosphere Reserve (RBMA) in the Lacandona and that borders the *ejidos* in the study area of this thesis. Finally, the creation, adaptation and entrance of national and international organisations articulating environmental concerns in the 1980s, including: the first national ecologist organisations, among which figure the Grupo de los Cien in 1985; the first political parties with environmental agendas; and the entrance of international conservation organisations to Mexico, mainly The Nature Conservancy (TNC), Conservation International (CI) and the World Wildlife Fund (WWF).

Yet, there is little doubt that Mexico's participation in The Rio Earth Summit in 1992 was a catalyser for the articulation and consolidation of environmental policy and institutions, frequently framed around a 'sustainable development' narrative, and that led to PES and beyond. As noted by Carabias and Provencio (1994: 19 *my translation*), the consequences of Mexico's participation and preparation for the 1992 summit included "institutional change, larger efforts to translate ecological legislation into regulations and standards, and the adoption of special programmes". In the short-term, these changes included the integration of environmental themes in the newly created Ministry of Social Development

(SEDESOL) in 1992, from which the National Ecology Institute (INE) and the Federal Prosecutor for the Protection of the Environment (PROFEPA) emerged. In 1994, the Ministry of the Environment and Fisheries (SEMARNAP) consolidated the environmental and the renewable natural resource management sectors (Carabias et al., 2008). Over the years, two important commissions emerged from SEMARNAP: the National Commission for Natural Protected Areas (CONANP) in 2000 and the National Forestry Commission (CONAFOR) in 2001. Since their creation, CONANP and CONAFOR have played a prominent role in the creation and management of environmental ‘carrots and sticks’ in Mexico, including protected areas, community sustainable forestry, different types of Integrated Conservation and Development Projects (ICDPs), and Payments for Environmental Services (PES).

By the time the first national PES came into place in 2003 in Mexico, the environmental agenda had already made its way into the forest landscape. By the mid-2000s, 22.7 million hectares of forests were under 161 federal protected areas managed by CONANP, representing 11.4% and 35.5% of the national and forest surface, respectively (Kaimowitz, 2008). By this time, Mexico contained a large, diverse and mature community forestry sector composed by thousands of community enterprises commercially producing timber (Bray et al., 2005). In this context, PES emerged as a ‘complement’ to pre-existing policies aiming to fight forest loss and degradation:

Before introducing the concept of payment for environmental services (PES), the Mexican government's strategy to reduce deforestation relied on three types of instruments: (1) direct regulations of activities that change land use or degrade natural areas, (2) subsidies to sustainable forestry activities, and (3) police action to stop timber theft. (Muñoz-Piña et al., 2008: 726)

The following section deals with how PES developed in Mexico.

2.1.2. Mexico's PES experiment turned reality

In 2001, a pilot phase for the development of a national PES programme was commissioned by the Ministry of the Environment (SEMARNAT)¹⁵ to a group of economists at the Department of Policy and Environmental Economics (PEA) at INE. This initial proposal emanated from Mexico's Strategic Forestry Programme 2025, a collaboration between SEMARNAT, the Inter-American Development Bank (IADB) and the Finnish Government (CONAFOR, 2002). The PES design team included economists from INE, the Mexican universities Universidad Iberoamericana (UIA) and Centro de Estudio y Docencia Económica (CIDE), the University of California at Berkeley (UCB), as well as advice and financial support from the World Bank (Alix-García et al., 2005; Muñoz-Piña et al., 2008). The Pilot PES was predated and inspired by early initiatives in Mexico, including some carbon forestry projects and a watershed scheme in Coatepec (e.g. Corbera, 2005; Manson, 2004), as well as PES initiatives in other countries, such as the national PSA in Costa Rica.

In this first pilot stage, PES designers brought forward a vision of PES that McAfee and Shapiro (2010) have characterised as 'pro-market' and 'pro-poor'. I further add a 'pro-forest' orientation to this early conception. However, as the PES agenda has unfolded in Mexico, this vision was confronted by the reality of politics and implementation at different stages. Drawing on multiple studies examining the evolution of the design and implementation of PES in Mexico, some of which have involved fieldwork or direct involvement in PES design, this section highlights the key processes through which PES evolved to take their current form which, I argue, is best characterised as 'pro-forest', 'pro-poor' and 'market-framed' (see Table 1).

¹⁵ In 2000, the jurisdiction of fisheries was removed from SEMARNAP thus becoming SEMARNAT.

Table 1: Evolution of design and implementation of Mexican PES

Basic information	Programme	Pilot PES	National PSA-H	National PSA-CABSA	National ProÁrbol	National ProÁrbol and PRONAFOR	Lacandona PESL
	Years	2001-2002	2003-2005	2004-2005	2006-2009	2010-2012 2013-2018	2010-2015
	Main actors	INE	CONAFOR	CONAFOR	CONAFOR, SEMARNAT	CONAFOR	CONAFOR
	Other actors	CIDE, UIA, UCB, WB		MECNAM	WB, GEF		
‘Pro-forest’ aspects	Eligibility	Forest density (proxy for ES)	Forest cover	Forest cover	Forest cover	Forest cover	Forest cover
	Conditions (enrolled)	No touch	No touch			No touch	No touch
	Conditions (non-enrolled)		No touch (ambiguous)	No touch (ambiguous)	No touch (ambiguous)	No touch (ambiguous)	Explicit no touch (not enforced)
	Other			Management plans, technical advisor	Management plans, technical advisor	Management plans, technical advisor	Management plans, technical advisor
‘Pro-market’ aspects	ES paid for	Hydrological	Hydrological	Biodiversity, carbon, agroforestry	Hydrological, biodiversity, carbon, agroforestry	Hydrological, biodiversity	Bundle
	Main funding	Federal	Federal	Federal	Federal	Federal	Chiapas government
	Other funding	WB			WB, GEF, matching funds	Matching funds	Matching funds
	Contract	Five-year kick-start	Five-year kick-start	Five-year kick-start	Five-year renewable	Five-year renewable	Five-year renewable
	Payment characteristics	Annual (conditional)	Annual (conditional)	Annual (conditional)	Annual (conditional)	Annual (conditional)	Annual (conditional)
		Auctions	Opportunity cost calculations, arbitrary	Carbon price, arbitrary	Arbitrary	Arbitrary	Arbitrary
		Pay individuals	Pay <i>ejido</i>	Pay <i>ejido</i>	Pay <i>ejido</i>	Pay <i>ejido</i>	Pay <i>ejido</i>
		Differential payments (forest density)	Differential payments (forest types)	Rules depending on ES	Rules depending on ES	Differential payments (forest types)	Differential payments (forest types)
	Sanction (non-compliance)	N.A.	Reduce payment	Reduce payment	Return payments	Return payments	Return payments
	Spending	No conditions	No conditions	No conditions	No conditions	Reinvest 30-50% (2015)	Reinvest 50% (2015)
‘Pro-poor’ aspects	Targeting and prioritisation	Marginalisation		Marginalisation, <i>ejidos</i> , indigenous	Marginalisation, <i>ejidos</i> , indigenous	Marginalisation, <i>ejidos</i> , indigenous	<i>Ejidos</i>
	Property limit	Max. 2000 ha	Max. 4000 ha		Hydrological max. 3000 ha, biodiversity max. 2000 ha	Hydrological max. 6000 ha, biodiversity max. 2000 ha	Max. 3000 ha

Source: Own elaboration with data from CONAFOR online databases

(<http://www.conafor.gob.mx>), Alix-García et al. (2005), Corbera et al. (2009), McAfee and Shapiro (2010), Muñoz-Piña et al. (2008), Shapiro-Garza (2013a, 2013b), and fieldwork

From early on, PES designers in the pilot stage focused on forest protection as a proxy for the provision of ‘hydrological services’. McAfee and Shapiro (2010) and Shapiro-Garza (2013a, 2013b) note a series of political and pragmatic reasons for this link between forests and hydrological services. These include a policy priority by SEMARNAT to protect both forests and water, the feasibility for developing markets for water services, as well as the relative easiness and non-costly monitoring and enforcement of forest loss. Alix-García et al. (2005) further add that funding would be easy to implement by attaching funding to water bills: “the team responsible for the program design proposed designating 2.5% of the annual water fees, which for 2002 were around 200 million pesos (\$20 Million), to finance projects in priority watersheds” (Alix-García et al., 2005: 21).

Finally, the design team envisaged eligibility based on forest density levels and voluntary five-year contracts involving annual payments disbursed conditional on maintaining high levels (Alix-García et al., 2005). In other words, the design team already embraced a ‘no touch’ or payments for doing nothing to enrolled forests (McAfee and Shapiro, 2010).

In this stage, the design team imagined PES as eventually transitioning into a real market for environmental services, possibly reflecting their training in economics and the international context where PES emerged. As noted by Shapiro-Garza (2013a: 138), this first iteration of PES “was strongly influenced by the discourse of international conservation NGOs and multilateral lending institutions that promoted market-based environmental policies as more efficient and effective than previous command and control regulatory approaches”. For the design team, government involvement in PES was temporary and only to ‘kick-start’ funding while participants sought markets for their services. This would avoid PES becoming another perpetual rural subsidy (McAfee and Shapiro, 2010; Shapiro-Garza, 2013b). The design team established forest density as a proxy for hydrological services because this would allegedly create a conditional link between forest conservation and hydrological services provision. Further aspects of design responded to interests for efficiency and to establish direct links between environmental service ‘buyers’ and ‘sellers’. These concerns are reflected on ideas about payment levels and distribution. For instance, a system of auctions was originally conceived to elucidate opportunity costs, thus enabling the establishment of differential payments based on these costs (Muñoz-Piña et al., 2008). Additionally, the design team recommended that it would be more efficient to give payments to individual landowners rather than to *núcleos agrarios* (Shapiro-Garza, 2013b).

Finally, while seemingly antithetical to a pro-market view of PES, the design team included a series of pro-poor provisions. Challenging recommendations from the World

Bank, designers considered targeting communities classified as ‘marginalised’ or ‘highly marginalised’ and setting an upper limit of 2000 hectares per participant to benefit smallholders (Shapiro-Garza, 2013b). Alix-García et al. (2005) argues that this poverty-environment link reflected sympathy of PEA director for anti-poverty policy and the possibility of accessing a broader set of funding bodies. Further, Shapiro-Garza (2013b) notes that policy makers believed that PES would have to achieve some degree of poverty alleviation out of the perception that forest degradation was linked to subsistence production among the poor.

Yet, this pro-forest, pro-market and pro-poor vision of PES was confronted in the process leading to the 2003 national hydrological PES (PSA-H). In 2002, the design and operation of PES were handed over from INE to CONAFOR after an early proposal was rejected by SEMARNAT (Alix-García et al., 2005). SEMARNAT Secretary Lichtinger gave the project to CONAFOR Director Alberto Cárdenas who “saw the program as the fulfilment of CONAFOR’s objective of including environmental services in its operations, very much in line with the involvement that the Commission already had in several local environmental services initiatives” (Alix-García et al., 2005: 20). As CONAFOR took control, the resulting outcome in the national PSA-H departed from the PES pilot in important ways.

Firstly, the focus on forests as a proxy for environmental services was maintained, but the Ministry of Finance (SHCP) removed the condition of an earmarked percentage and only approved a fixed amount of Mxn\$200 million, seemingly because “Mexican fiscal policy has always opposed earmarking taxes because it aims to separate budget priorities from funding sources” (Muñoz-Piña et al., 2008: 727). This effectively removed the link between ‘buyers’ and ‘sellers’ of hydrological services, while also reducing future funding significantly. Alix-García et al. (2005) note that if funding had been earmarked,

the budget would already have tripled by 2005 due to increases in water user fees. Further, given the pro-forest nature of PES, CONAFOR faced the inescapable reality that most of the schemes in a national PES would take place among collective forms of forest ownership. This is because, as I mentioned in Section 2.1.1, from 70% to 80% of total forests are collectively owned by *núcleos agrarios* (Bray and Merino-Pérez, 2004; Corbera et al., 2011). This realisation forced CONAFOR to reconsider distributing payments to individual landowners. Against recommendations by the pilot PES designers, CONAFOR chose to establish contracts with, and distribute payments to, *núcleos agrarios* allegedly because it was more legally valid (Shapiro-Garza, 2013b). This choice would have profound implications for the operation of PES among the *ejidos* in the study area of this thesis and elsewhere in Mexico. Targeting based on marginalisation levels was not accepted by CONAFOR and only a limit of 4000 hectares per participant was adopted (Shapiro-Garza, 2013b). The terms of reference in PSAH in 2003 (CONAFOR, 2003: 28) stipulate that this limit per participant includes the cumulative surfaces from previous applications as well. Yet, a study of PSA-H in 2003-2005 found that 78% participants were classified as ‘high’ or ‘very high’ in levels of marginalisation (Muñoz-Piña et al., 2006). This seems to reflect a national poverty-environment nexus, in other words, a link between forest-dwelling communities and high poverty levels.

Other pro-market components in the pilot PES fell apart due to a combination of politics and pragmatism. Though perhaps unintentionally, the permanent role of the government as a monopsonistic buyer of ‘environmental services’ was established on the precise moment when designers chose to focus on water because the federal government has historically maintained a tight control over water property rights (Shapiro-Garza, 2013b). The system of auctions to elucidate opportunity costs was also removed because differential payments could be considered unfair, confuse participants, possibly be

associated with high administrative costs and because CONAFOR did not want to appear to be buying land (Muñoz-Piña et al., 2008). Instead, as noted by McAfee and Shapiro (2010: 589), CONAFOR chose a more ‘egalitarian’ formula of “a fixed amount per hectare with a cap on land area per participant.” To define payment levels, the team calculated opportunity costs of average maize production (Jaramillo, 2002 cited in Muñoz-Piña et al. 2008). However, in the end payment rates were set arbitrarily depending on the size of the budget and political negotiations (Muñoz-Piña et al., 2008; Shapiro-Garza, 2013a) with two-tiered differential payment between cloud and other types of forests. Cloud forest payments were set higher to reflect their presumed higher provision of hydrological services, this despite inconsistent and even contradictory scientific evidence (Shapiro-Garza, 2013b).

Alix-García (2005: 26) argue that “to avoid slippage, in most cases the contract specified that removal of trees from the community’s entire forested area (even outside of the area for which payments were being made) constituted a contract violation and subsequent non-payments.” Yet, the terms of reference in the 2003 PSA-H (CONAFOR, 2003) as well as further iterations have been rather ambiguous on the commitment of participants regarding non-enrolled forests. It was only in the terms of reference of the 2011 local PES programme in the Lacandona¹⁶ when participants were required to explicitly state a commitment to “not deforest any property with forest” (CONAFOR, 2011: 6 *my translation*). In any case, as I will show in Chapter 4, this condition has never been enforced by CONAFOR and this has had important environmental implications in the study area of this thesis.

¹⁶ I will describe this programme subsequently in this section.

A second national PES, called PSA-CABSA, emerged in 2004 from a serendipitous situation where PES designers were forced to negotiate with peasant and forest-based organisations (Shapiro-Garza, 2013a).¹⁷ Following massive peasant protests in early 2003, President Fox (2000-2006) agreed to negotiate rural policies with a coalition of twelve peasant and indigenous organisations called Movimiento ¡El Campo No Aguanta Más! (MECNAM)¹⁸, which literally translates as ‘The Countryside Cannot Stand Anymore!’ (Shapiro-Garza, 2013a). A product of the negotiations was the National Agreement for the Countryside (Acuerdo Nacional para el Campo) whereby peasant organisations were given right to review all government programmes in the rural sector. In an ironic turn of events, the cornerstone of MECNAM’s environmental agenda revolved around the expansion and modification of PSA-H (Shapiro-Garza, 2013a). As documented by McAfee and Shapiro (2010) and Shapiro-Garza (2013a, 2013b), the vision brought forward by MECNAM significantly differed from PSA-H and the pilot PES and their negotiations had implications for the design and implementation of PSA-CABSA and subsequent PES schemes in Mexico.

MECNAM’ vision of PES was about ‘revaluing the countryside’ (Shapiro-Garza, 2013a), mainly articulated around the recognition of the active role of peasants in environmental stewardship and the economic support required to allow stewards to remain in their lands. MECNAM negotiated and managed to include actively managed forests as eligible for participation (Shapiro-Garza, 2013a). In contrast to the ‘no touch’ policy in earlier PES views, MECNAM endorsed a forest ‘management’ perspective including the need to

¹⁷ SHCP labelled PES as a rural subsidy instead of a payment for a service. This situation, which appeared seemingly out of bureaucracy (Alix-García et al., 2005), had the implication that PES’ rules of operation must be debated in a public forum because of Mexican legislation. This event coincided with a series of negotiations being held during 2003 between President Fox (2000-2006) and peasant organisations around the phasing out of trade liberalisation of maize and other staple products ten years after NAFTA (McAfee and Shapiro, 2010).

¹⁸ See Sámano Rentería (2004) for a review of MECNAM.

develop forest management plans, receive technical assistance and open agroforestry systems as eligible areas. The notion behind this was that conservation set-asides, or ‘passive’ conservation, failed to value the active role of peasants “as knowledgeable and necessary stewards protecting their forest from pests, disease, fire, illegal logging and poaching while at the same time relying on these natural systems for their physical sustenance and cultural reproduction” (Shapiro-Garza, 2013a: 145). Representing a peasant coalition, MECNAM also endorsed a pro-poor agenda. It lobbied successfully to prioritise marginalised and indigenous communities in the point-based system to rank applications and for *ejidos* to receive 90% of resources (Alix-García et al., 2005; CONAFOR, 2004; McAfee and Shapiro, 2010). In the end, PSA-CABSA included components for carbon capture, biodiversity and agroforestry. Its carbon component targeted areas that could demonstrate high potential for carbon capture (CONAFOR, 2004). Biodiversity PES (PSA-B), in turn, targeted areas characterised for their biological diversity. An annual budget of Mxn\$100 million was distributed to PSA-CABSA from the federal budget, which was annually negotiated in Congress (CONAFOR, 2004; Corbera et al., 2009). While there is little doubt that the involvement of MECNAM in the negotiation process of PSA-CABSA had implications for its design, most of these aspects were eventually dropped after further iterations.

In 2006, PSA-H and PSA-CABSA were integrated under the broader forestry framework known as ProÁrbol (Corbera et al., 2009), allegedly to streamline administration (Shapiro-Garza, 2013a). Funding in 2006 included matching loans from the World Bank the GEF, respectively at US\$45 and US\$15 million, aimed to restructure and expand PES programmes, and to increase their market-based aspects (Shapiro-Garza, 2013b). These grants were matched by CONAFOR and an additional US\$80 million were injected from PSA-H and PSA-CABSA funds (Corbera et al., 2009: 751). After a series of iterations

over the years, ProÁrbol maintained a pro-forest focus and increased its pro-poor agenda. Yet, despite attempts by the World Bank, pro-market aspects experienced further erosion. Though ProÁrbol originally included hydrological, biodiversity, carbon and agroforestry, the latter two proved to be largely unsuccessful and were eventually discontinued. Carbon sequestration schemes were discontinued in 2010 after implementation failure, seemingly due to a lack of understanding within CONAFOR “on the workings of the international carbon markets and the technicalities of measuring and monitoring forest-sequestered carbon” (Shapiro-Garza, 2013b: 11). Shapiro-Garza (2013b) notes that between 2005 and 2008, only 71 projects were funded for a design phase and none of them managed to sell carbon in open markets. Similarly, agroforestry schemes were discontinued in 2010 after a series of iterations. In turn, provisions inherited from PSA-CABSA around requirements for developing forest management plans and receiving technical assistance have been kept. As I will show in Chapter 5, the inclusion of technical assistance set the stage for intermediaries to play an important role in the operation of PES in the study area.

Thus, only hydrological and biodiversity services have been paid for consistently in national PES schemes in Mexico. This tendency was carried over to the National Forestry Programme (PRONAFOR) starting in 2013 under President Peña Nieto (2012-2018).¹⁹ Throughout the years, hydrological and biodiversity PES have both involved flat payments per hectare on a ‘no touch’ forest approach as in the early PES pilot and PSA-H. Biodiversity PES were funded mostly by the loan from GEF (Shapiro-Garza, 2013b). As in the case of hydrological services, payment levels in biodiversity have been set rather

¹⁹ PRONAFOR formed part of President Peña Nieto’s broader National Development Plan (Plan Nacional de Desarrollo) from 2013-2018, specifically Objective 4.4 which aims to “promote and guide an inclusive and facilitating green growth that preserves our natural heritage while generating wealth, competitiveness and employment” (CONAFOR, 2014a: 13 *my translation*). During 2013 and 2014, around Mxn\$7 billion were destined annually to PRONAFOR.

arbitrarily due to a lack of commensurability and absence of a true market (Shapiro-Garza, 2013b). Hydrological PES continue to pay differential amounts depending on forest type, despite recommendations from the World Bank for switching from flat rates to differentiated payments based on risk of deforestation and opportunity costs (McAfee and Shapiro, 2010).

As the implementation of ProÁrbol went underway, the remaining pro-market aspects were also dropped. In 2008, CONAFOR decided that participants from the original PSA-H contracts could reapply on further PES contracts (McAfee and Shapiro, 2010). This was because, except for a few cases, markets largely failed to materialise (Shapiro-Garza, 2013b). As such, the federal government continued to play an active role in financing and operating PES, thus moving farther away from the temporary and market-driven emphasis of government funding and rather falling in line with the perennial, long-term nature of rural subsidies (McAfee and Shapiro, 2010). As an alternative to government funding, as well as to expand PES uptake and increase contract length, ProÁrbol included the Matching Funds Scheme (Esquema de Fondos Concurrentes). In this scheme, local government and private parties can develop and fund five to fifteen-year long PES mechanisms and CONAFOR matches their investments (CONAFOR, 2013). Yet, by 2008 only seven projects had been achieved, totalling 26,328 hectares (CONAFOR, 2009), and the number only increased to 16 by 2009 (SEMARNAT, 2010). Finally, seemingly to reduce the subsidy nature of PES, CONAFOR introduced a ‘reinvestment’ policy in 2015 requiring participants in national PES to invest 30-50% of the payments (CONAFOR, 2014b). In an interview held in Tuxtla Gutiérrez in 2016, CONAFOR’s regional manager in Chiapas expressed to me that this change from ‘passive’ to ‘active’ conservation responded to CONAFOR’s interest to ‘see’ where all the money was going. In Chapter 6, I highlight how this rule has been highly contested among participants in

MdC. Eventually, however, the reinvestment policy would prove to be short-lived and ultimately removed by 2018.

Finally, different iterations have made national PES increasingly pro-poor. From early on, PES became one of the top policy priorities under President Calderón (2006-2012) who saw PES as irremediably linked with a poverty alleviation agenda and decided to increase funding significantly (Shapiro-Garza, 2013b). Despite recommendations from the World Bank to ‘reassert market efficiency, conservation-first priorities’ (McAfee and Shapiro, 2010: 593), various pro-poor aspects have been carried over or further incorporated into PES design. For instance, the point-based system to rank applications awards higher points for areas with high degrees of marginalisation, *ejido* applications *vis-à-vis* individual applications, and municipalities with a majority of indigenous population. Studies of ProÁrbol have reflected this increasing pro-poor agenda. A study of PSA-H in 2003-2005 found 78% participants in high or very high marginalisation (Muñoz-Piña et al., 2006). These numbers increased to 82.8% and 91.4%, respectively, in 2006 and 2007 (Muñoz-Piña et al., 2008) since PSA-H merged into ProÁrbol.

More recently, local PES initiatives framed under REDD+ have replicated lessons from national schemes. This includes the Special Programme for Conservation, Restoration and Sustainable Use in the Lacandona Rainforest (PESL) first established in 2010 in the Lacandona Rainforest and more specifically MdC where this thesis fieldwork was carried out. PESL forms part of the National Strategy for REDD+ (ENAREDD+) through which CONAFOR promotes the development of Early Actions for REDD+ (ATREDD+) (CONAFOR, 2013). ATREDD+ are a set of regional and local level efforts focused on countering forest and forest carbon loss through the establishment of diverse public policies (CONAFOR, 2013). The motivation behind the development of PESL has been the rapid process of land use change in the Lacandona Rainforest, Chiapas, considered as

one of the most important regions in Mexico in terms of environmental service provision (CONAFOR, 2010). Only municipalities of the Lacandona Rainforest are eligible for participation, including the municipality of Marqués de Comillas where this thesis' work was conducted. While in 2010, eligible zones under PESL included the municipalities of Benemérito de las Américas, Marqués de Comillas, Maravilla Tenejapa and some communities in Ocosingo, by 2012 eligible zones were extended to El Chilón, La Trinitaria, Las Margaritas and Palenque (CONAFOR, 2010, 2012).

PESL is an integral regional programme that includes multiple types of support, including agroecology, forest regeneration, restoration of riverbanks and streams, payments for environmental services, forest studies and community forestry (CONAFOR, 2013). The PES component in the PESL operates practically the same as hydrological and biodiversity PES with the difference that rather than paying for the provision of a specific environmental service, payments are intended to preserve a 'bundle' of environmental services provided by forests (CONAFOR, 2010). As I will show over the following chapters, *ejidos* and individual landowners in the study area have participated in various iterations of national and local hydrological, biodiversity and 'bundle' PES almost interchangeably. Thus, the development of REDD+ in the Lacandona Rainforest has been closely intertwined and has built upon lessons from PES as in other parts of Mexico (Shapiro-Garza, 2013b).

Thus, the original pro-forest, pro-market and pro-poor vision of PES among the first pilot designers was 'hybridised' through federal politics, contestation by rural social movements, the institutional context of environmental services and aspects of their implementation (Shapiro-Garza, 2013b). After various iterations, from PSA-H and PSA-CABSA to ProÁrbol, PRONAFOR and finally PESL, PES in Mexico evolved into their current shape: annual payments targeting 'poor' communities conditional on doing

nothing to standing forests, under five-year renewable contracts funded and operated by the federal and state governments who seek rural development goals. After various iterations, the original pro-forest and pro-poor aspects in the pilot phase have remained strong and even strengthened. In turn, the pro-market aspects have faded over time and all that remains are narratives, mostly endorsed by the World Bank, around the idea of establishing markets for environmental services. Market aspects of PES design may have failed to materialise in Mexico. Nonetheless, market narratives continue to frame the notion of PES and justify their existence. As such, it might be best to describe Mexican PES in their current shape not as a ‘pro-market’ environmental policy, but rather as a ‘market-framed’ rural development policy paying ‘poor’ forest-dwelling families and communities for doing nothing to their forests.

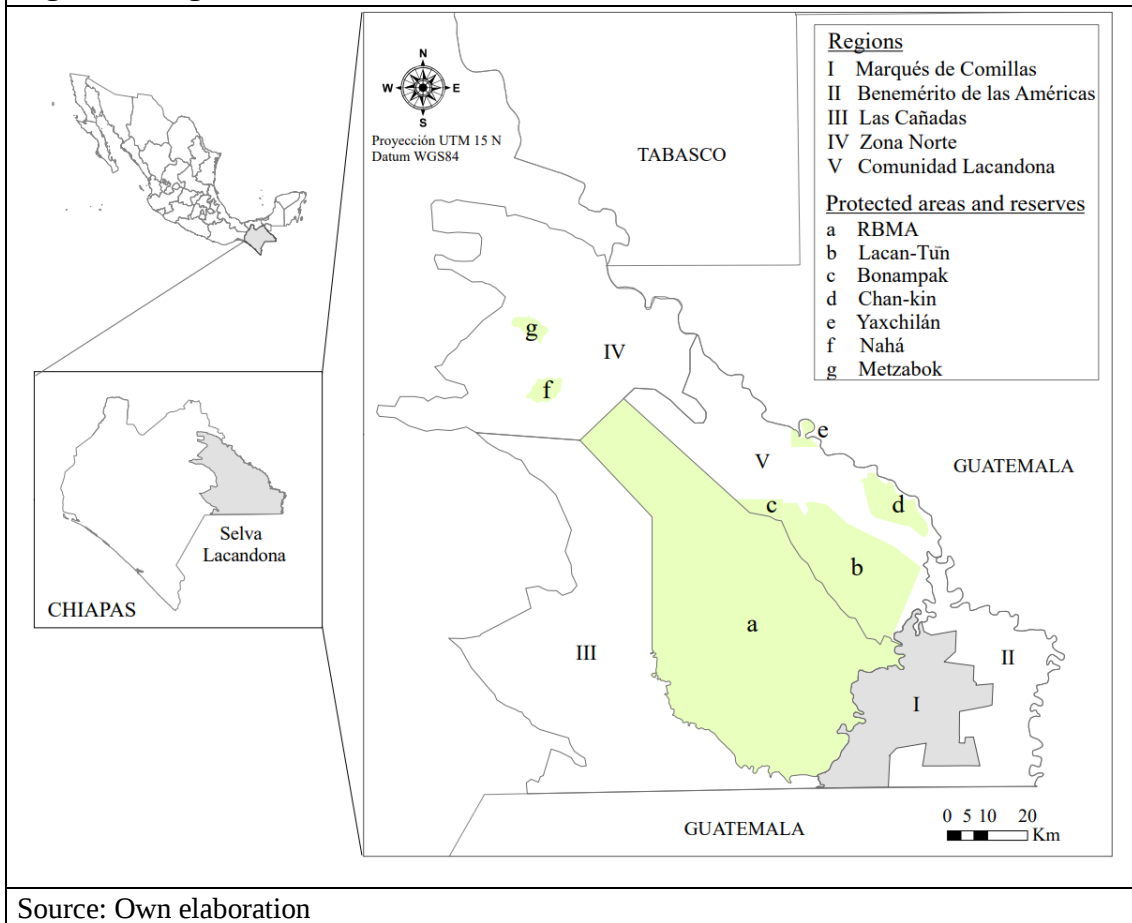
2.2. The political economy of Marqués de Comillas and the Lacandona Rainforest

The Lacandona is not a univocal reality, but a mosaic of multiple Lacandonas conceived and concretised from various interests. The *ejidatarios* obviously were not the only ones wanting to convert the forest into a space of economic exploitation or social influence, based on a specific strategy. Many other groups did this, including timber companies, missionary churches, leftist movements, conservation institutions, international financial institutions (World Bank, International Development Bank, International Bank of Financial Resources), government agencies (Agrarian Reform, Public Education, Agriculture and Hydraulic Resources, Petróleos Mexicanos, the Federal Commission of Electricity, Social Development, Urban Development and Ecology, Health, National Defence). The Zapatista rebels and the drug trafficking mafias recently entered this list, both with peculiar and clandestine plans for the Lacandona. (De Vos, 2002: 44 *my translation*)

In its current form, the municipality of MdC is one of the sub-regions of the Lacandona Rainforest in the northeast of the state of Chiapas, along with Las Cañadas, Zona Norte, Comunidad Lacandona, Montes Azules Biosphere Reserve (RBMA) and the municipality Benemérito de las Américas (Figure 1). More specifically, MdC is bounded on the northeast by Benemérito de las Américas, on the south by Guatemala and on the west by the RBMA. Colonised only from the 1970s onwards by peasants from various states from Mexico, the vastly unpopulated tropical forest area of 94,266 hectares (INEGI, 2014) that is now MdC, has a population of around 10,000 people distributed among 25 *ejidos*²⁰.

²⁰ I present an extensive account of the *ejido* institution in Mexico in Appendix A.

Figure 1: Regions of the Lacandona Rainforest



In its recent but extremely complex history, MdC has undergone a range of shifting processes, with important transformations on its forests and local populations. This section deals with these transformations leading to the time when PES came into place in the 2000s. The history of MdC forms part of much broader historical processes in the Lacandona Rainforest and beyond. Thus, I begin this section long before the 1970s when MdC was first colonised. The analysis in here starts in the early 19th century, with each consecutive section working its way through various processes and stages until the 2000s. For the analysis, I take as a starting point literature emphasising how ‘development’ policy and discourse reflect different ways of ‘seeing’ (Scott, 1998) as well as how their ‘effects’ often surpass official intentions and are rooted in political and power relations (Escobar, 1995; Ferguson, 1994).

I highlight three main themes as pertaining to the history of the forests and people in MdC and the Lacandona Rainforest. Firstly, the complex colonisation processes of the Lacandona and how they were shaped by a much broader national land reform process in Mexico during the 20th century. Further, the prominent role of the state in promoting peasant colonisation in the Lacandona and its failed attempts to exploit the natural resources in the region. Finally, the rising contradictions of government policy and regulation seeking, on the one hand, to ‘develop’ the region by inducing agricultural expansion, while, on the other hand, aiming to ‘conserve’ the region’s forests.

Overall, these historical processes will play important roles when I examine how families and communities in MdC began to engage with PES in the mid-2000s. The history of colonisation and government policy in MdC would shape in important ways how people made PES-related land use decisions (Chapter 4), how communities distributed money from PES (Chapter 5), and how people combined different policies (Chapter 6). Thus, this section will serve to introduce the reader to the study area and to provide relevant information for the subsequent chapters.

2.2.1. 1820s-1940s: Early stages: ‘Desert of Solitude’ to ‘green gold’ reserve

The modern history of the Lacandona Rainforest, or Selva Lacandona in Spanish, began in the early 1820s when the provincial state of Las Chiapas became independent from Spain and the Lacandona Rainforest was ‘discovered’ for the first time as a forest reserve (De Vos, 1988a, 1988b)²¹. Lacandón was the name given by the Spaniards to Lacam-Tun, literally meaning ‘big stone’ in Mayan, the original settlement place of indigenous populations in the Miramar Lagoon (De Vos, 1980, 1988a, 2002). Following the Spanish conquest in the year 1525 and subsequent attempts for evangelisation and ‘settlements’

²¹ In 1822, Cayetano Ramón Robles, a government official from Chiapas requested government authorisation and means to explore the river Jataté until the Usumacinta for the establishment of mahogany and cedar extraction sites (De Vos, 1988a, 1988b).

(*reducciones*) by Spaniards, these ‘original’ Lacandones dispersed and eventually disappeared towards the end of the 17th century (De Vos, 1980). The Lacandones who currently form part of the Comunidad Lacandona in the 21st century descend from more recent migrants from the Yucatán peninsula, known locally as *caribes*, who migrated by the late 18th century. During the Colonial period from the 16th to the early 19th century, the region remained largely unpopulated, thus historically referred to as ‘The Desert of Solitude’ (El Desierto de la Soledad) or ‘The Desert of Ocosingo’ (De Vos, 1980, 2002).

From the 1870s to 1949, the Lacandona Rainforest became a lucrative site for the extraction of precious timber, or ‘green gold’ (*oro verde*) (De Vos, 1988a)²². The ‘vacant’ lands in the Lacandona Rainforest were acquired onwards by a handful of timber companies (*madereras*) from Tabasco with international capital who began extracting mahogany (*caoba*) and cedar (*cedro*) for markets in London, Liverpool and New York at gold prices under the name ‘timber from Tabasco’ (De Vos, 1988b). Lands were ‘auctioned’ under agrarian laws in 1889, 1890 and 1893 to Spanish, Belgian, English and North American organisations focused entirely on international markets (Arizpe et al., 1993). Land was acquired through ‘surveying’ (*deslinde*), a process during Porfirio Díaz’s dictatorship (1876-1911) which sought to open the leasing of ‘idle’ (*ociosas*) lands for private companies and individuals (De Vos, 1988a). In the surveying process, “the Mexican government granted land survey companies a third of the supposedly unoccupied lands they surveyed, and in this way vast areas of uncultivated and sparsely populated Indian lands passed into the survey companies’ hands” (Klooster, 2003: 98; see also, González Pacheco, 1981; Guerrero, 1988). In this process, at the turn of the 20th century, except for rivers and lakes which were still owned by the state, the entire territory

²² De Vos (1988b) mentions that this process began after a successful experiment by Felipe Marín, a businessman from Balancán, in 1859. He cut 72 mahogany trees in the Usumacinta river and later collected 70 in Tenosique proving the viability of the rivers for the extraction of timber.

of what is now the Lacandona Rainforest had been acquired by a handful of private properties and individuals: three industrialists from Mexico City (Dorantes, Martínez de Castro and Doremberg) possessed half of the territory and the rest was owned by five timber enterprises from Tabasco (Bulnes, Romano, Sudoriental, Valenzuela and Agua Azul) and a Spanish noble, the Marqués of Comillas (De Vos, 1988a).²³ Claudio López Bru otherwise known as El Marqués of Comillas a shipping magnate and landowner from Comillas in Spain, acquired a large extension of land on what is currently known as MdC and Benemérito de las Américas (De Vos, 2002). Through a Mexican liaison, López Bru acquired land through surveying in 1887 in the state of Guerrero. Yet, after complications with the paperwork, the federal government proposed a land switch in Chiapas, which was resolved in 1905.

During this time, the surrounding areas of the Lacandona Rainforest experienced a starkly different process of land accumulation. Since the early days of independence in the 1820s, liberal and conservative governments both had the goal of removing restrictions on private appropriation of land. This included ‘vacant lands’ (*terrenos baldíos*), which were lands held in trust by the Spanish crown as buffer areas for indigenous communities (Arizpe et al., 1993; Harvey, 1998a). The liberal reform period in 1857 gave further impetus to this process, leading to extensive dispossession of church and indigenous properties, as well as private appropriation of vacant lands. The Lerdo Law removed church property and dissolved communal property, favouring the expansion of large plantations and estates producing sugar, cocoa, cattle and timber. In this process, the areas around the Lacandona Rainforest formed an ‘estate border’ (*franja finquera*) composed

²³ The establishment of timber companies led to a conflict with Guatemala over national boundaries in 1892, with an agreement ultimately reached in 1895 (De Vos, 1988b; Zebadúa, 2010).

by *fincas* and *haciendas*²⁴ concentrated in the hands of a few capitalists from Comitán and San Cristobal de las Casas (Leyva Solano and Ascencio Franco, 1996). This *franja finquera* was populated mostly by indigenous communities who had lost their land in the reform process. Leyva Solano and Ascencio Franco (1996: 78 *my translation*) note that the *fincas* became “the economic and domination system upon which regional life was constituted”. Living conditions in *fincas* and *haciendas* were characterised by servitude and debt, since dispossessed Indians had no resources to cover costs of living or transportation and could only pay their debts with labour and work remunerated in tokens exchanged at ‘company stores’ (*tiendas de raya*). This forced a recurrent retake of loans and debt accumulation among peasant who became ‘indebted workers’ (*peones acasillados*) and which represented 50% of the rural workforce by 1910 in Chiapas (Harvey, 1998a).

Thus, towards the turn of the 20th century, the *franja finquera* outside the Lacandona Rainforest co-existed with a handful of timber companies operating a series of timber production sites (*monterías*) inside. Yet, from the 1920s, after the Mexican revolution (1910-1920) and a fall in commerce after the Second World War (WWII), the timber companies began a steady decline in production ending in 1949 when the federal government prohibited the export of unprocessed timber (De Vos, 1988a). From the 1930s onwards, the following decades would see important shifts opening spaces for new actors and logics in the region, including peasants, state companies, private businesses, NGOs and the church (Leyva Solano and Ascencio Franco, 1996).

²⁴ These refer to large plantations and ranching private estates. See Leyva Solano and Ascencio Franco (1996) for further detail.

2.2.2. 1930s-1980s: The ‘last refuge’ for colonisation

The 1930s marked the beginning of a new stage in the Lacandona Rainforest, with a series of important implications persisting to date. From the 1930s to the 1980s, more than 150,000 settlers from Chiapas and other states across Mexico colonised the region (De Vos, 2002: 37). The colonisation process has been characterised as having two stages (De Vos, 1988a; Leyva Solano and Ascencio Franco, 1996). First, an ‘induced’ or disorganised stage from the 1930s emerging from agrarian reform and leading to colonisation in the Zona Norte and Las Cañadas. Further, a more ‘directed’ stage from the 1970s directly supported by the federal and Chiapas government leading to colonisation in the south and east, including MdC.

Early colonisers have been traced to the 1930s mostly in the north of the Lacandona Rainforest. This involved a combination of ‘floating populations’ labouring in extractive industries, such as ranching, timber companies, rubber, sugar cane, sugar and coffee plantations, as well as early permanent establishments among peasant communities (Leyva Solano and Ascencio Franco, 1996). Yet, the bulk of colonisation in the ‘induced’ stage took place from the 1950. This involved going deep into the forest in contrast to settlements in the 1930s and 1940s located mostly along the outskirts. At this stage, peasants colonised areas owned by timber companies, whether they had been expropriated or not, leading to a series of land conflicts (De Vos, 1988b, 2002).

Colonisation from the 1950s onwards was facilitated by a series of expropriation decrees involving the creation of *ejidos* over the timber companies created during the Porfiriato. Early settlements in the 1930s took place in the context of agrarian reform pushed by President Lázaro Cárdenas (1934-1940) at a nation-wide level²⁵. The main thrust came

²⁵ Esteva (1983) notes that during Cárdenas presidency more than 20 million hectares were redistributed to peasants nationwide, representing a surface almost twice as large than in the previous 20 years.

under President Miguel Alemán (1946-1952) who expanded the ‘march to the south’ (*marcha al sur*) strategy of President Ávila Camacho (1939-1945). This strategy was marked in a longer process that has been termed the ‘conquest of the Mexican tropics’ going as back as the Porfiriato and seeking to integrate the vast unpopulated forests of the southeast to the economy (Revel-Mouroz, 1980). This strategy involved bringing ‘idle’ lands to production by offering the colonisation of the tropics (González Ponciano, 1995), a wider process in other countries across Latin America as I mentioned in Section 2.1.1. More generally, from the 1940-70s the reform took place in the context of Import Substitution Industrialisation (ISI) in the country which favoured the accumulation of capital, a reduced rhythm of agrarian reform and in a context where the ‘best’ lands remained in the hands of private companies and individuals favoured by public credit and fiscal support (Zebadúa, 2010).

Importantly, the colonisation took place in the context of a ‘late’ and ‘incomplete’ agrarian reform (Esteva, 1983), which was less about expropriating private *fincas* and *haciendas* than about opening national lands, including forests, to peasant colonisation (De Vos, 2002). In other words, the agrarian reform did not much alter the *franja finquera* outside the Lacandona Rainforest as much as it opened the lands inside for colonisation. Authors have emphasised that this incomplete agrarian reform has led to the colonisation of inferior lands in terms of access, productivity and quality (e.g. Zebadúa, 2010). For the state, opening the forest for colonisation allowed to ‘kill two birds with one stone’: solving peasant demands for land but without affecting landed elites. As such, the Lacandona Rainforest represented the ‘last refuge’ or ‘safety valve’ for land pressures in Chiapas since unoccupied lands in the region allowed government to avoid affecting private landowners (Arizpe et al., 1993; Harvey, 1998a; Robles Gil, 1991 cited in Arizpe et al. 1993). Several authors have emphasised that this process in Chiapas has been a

consequence of the historical concentration of power and autonomy among local elites, in turn a consequence of the geographical separation and weakness of the colonial and independent states (Harvey, 1998a; Zebadúa, 2010).

In the Lacandona, a series of expropriations in 1957, 1961 and 1967 under Presidents Ruiz Cortines (1952-1958), López Mateos (1958-1964) and Díaz Ordaz (1964-1970) declared lands in the Lacandona Rainforest as apt for agricultural colonisation. These initiatives were supported by the Department of Agrarian Issues and Colonisation (DAAC) who, “since the 1950s was preparing a new demarcation in the forest, with the objective of nullifying the property titles issued during the Porfiriato, convert the forest again into national lands and open it to colonisation” (De Vos, 1988b: 25 *my translation*).

The first settlers from the 1950s were indigenous Tzeltal and Chol *peones acasillados* from *fincas* and *haciendas* near Ocosingo, Yajalón, Chilón, and Bachajón who had lost land due to encroachments (Harvey, 1998a). The increased shift to cattle production in these estates had reduced demand for labour and shifted the labour dynamic of *peones acasillados* to one of cowboys and wage labourers, thus leading to the ‘expulsion’ of peasant populations (Leyva Solano and Ascencio Franco, 1996). The increased shift to cattle has been associated with increasing urban markets demanding agricultural products and the Green Revolution in the 1960s changing food and technology systems (Leyva Solano and Ascencio Franco, 1996; O’Brien, 1995). Federal agencies such as National Indigenist Institute (INI) and DAAC encouraged these Tzeltal and Chol groups to migrate rather than confront landed elites in Los Altos (Harvey, 1998a). New waves of indigenous Tzotziles colonised the Lacandona Rainforest from the 1970s when communities expelled members who resisted indigenous ‘bossism’ (*caciquismo*) (Harvey, 1998a). Yet, beyond these ‘structural’ explanations, authors who have conducted fieldwork among these newly formed communities have highlighted a series of ‘agential’ factors to account for

colonisation processes. These include aspects of life and dynamics in previous communities, such as violence and lack of opportunities among young people; personal skills and traits, such as a sense of adventurism and leadership; and moving as an act of freedom and emancipation (Arizpe et al., 1993; Leyva Solano and Ascencio Franco, 1996; Ortiz-Espejel and Toledo, 1998).

In turn, a more ‘directed’ stage began by the 1970s particularly in what would then become MdC and Benemérito de las Américas. In the 1970s and 1980s, the still unoccupied lands also served as a ‘last refuge’ for solving peasant demands in Chiapas, as well as other states in Mexico. Yet, colonisation in MdC had a specific character and logic. In 1934, agrarian reform policies of President Cárdenas (1934-1940) affected MdC by nullifying Claudio De Bru’s title from 1905 and instead declaring national lands.²⁶ In 1955, the region was declared national lands but it remained unpopulated out of a lack of access. Finally, in 1967, the state declared a surface of 401,959 hectares, part of which is now MdC²⁷, as national property subject to peasant colonisation (De Vos, 2002). MdC was first colonised during the period of President Echeverría (1970-1976) under what has been termed as the rebirth of ‘agrarian populism’ in the 1970s whereby the ‘march to the south’ philosophy of previous decades was given impetus (Harvey, 1998a). Echeverría led an extensive colonisation project in the Mexican tropics, particularly Veracruz, Tabasco and Chiapas, together with processes and attempts for the promotion of forestry and cattle ranching (Castro et al., 2015). During this time, the state actively pursued colonisation in MdC among peasants from different parts of the country, even using the national radio to communicate the availability of lands (Castro et al., 2015).

²⁶ Claudio de Bru’s daughter unsuccessfully sued the government demanding restitutions (De Vos, 2002).

²⁷ Also including properties previously owned by Romano and Martínez de Castro (De Vos, 2002).

Several authors have emphasised the consolidation of national sovereignty in the frontier with Guatemala through the creation of a ‘human national frontier’ as the main motivation driving a ‘directed’ colonisation agenda in MdC from the 1970s (Arizpe et al., 1993; De Vos, 2002; González Ponciano, 1995). Since the Spanish conquest, the jurisdiction of Chiapas and the border between Mexico and Guatemala had been an issue of contestation (Zebadúa, 2010). In the late 19th century, the region of MdC was precisely the most disputed territory during the Boundary Treaty (Tratado de Límites) from 1882 through 1895 at the beginning of the ‘green gold’ era of the Lacandona Rainforest (González Ponciano, 1995). De Vos (2002) also notes that from the 1950s onwards, state interests over petrol exploration and plans for hydroelectric dams in the bordering regions caused a series of geopolitical manoeuvres between both countries. For instance, he notes that the Guatemalan government coordinated the colonisation of areas between the rivers Pasión and Usumacinta from the 1960s to avoid the possibility that the Mexican government would build dams in Mexican territory and potentially flood 195,000 hectares located mostly in Guatemala (De Vos, 2002: 52). Yet, national sovereignty considerations would acquire further impetus at the turn of the 1980s when the civil war erupted in Guatemala and 30,000 refugees, 15,000 of them in MdC, suddenly arrived in the Lacandona Rainforest (De Vos, 2002; Harvey, 1998a).

Finally, different aspects taking place during the ‘induced’ colonisation seem to have caused the Mexican state to reconsider its colonisation strategy. De Vos (1988b) argues that this ‘directed’ approach to colonisation was driven by ecological concerns due to the destruction of the forest by peasants and timber companies after the more ‘induced’ processes in the north and west. By the 1970s, the population of ‘induced’ colonisation in the north and west was around 100,000 (Harvey, 1998a). These processes have been understood as “anarchical, conflictive and predatory” (Arizpe et al., 1993: 88 *my*

translation). The ecological damage has been associated by sudden arrival of thousands of migrants who ‘spontaneously’ settled the forest to work agricultural and ranching activities in lands of very low efficiency and with a complete lack of technical assistance and communication (Ortiz-Espejel and Toledo, 1998).

The settlement process in MdC and Benemérito de las Américas from the 1970s to the 1980s took place in three different waves (De Vos, 2002) (Table 2). The first population centres in MdC were registered officially in 1964. This included the *ejidos* Licenciado Adolfo López Mateos, Reforma Agraria, Zamora and Quiringüicharo which were granted to people from Mexico City and Michoacán; however, none of these groups actually set foot and the first actual settlements took place from 1972 onwards (De Vos, 2002: 168). From 1972, the first groups of colonisers formed *ejidos* along the riverbank of the Lacantún River, including four of the *ejidos* in study area: Playón de la Gloria in 1974, Galacia in 1975, Boca de Chajul in 1976, and Adolfo López Mateos in 1979. The second wave took place in the 1980s towards the border with Guatemala, driven by the news that a highway would be built alongside the border to provide easier access for oil exploration for the national petroleum company (PEMEX) between the cities of Palenque and Comitán. This includes *ejido* El Pirú in 1980 which is examined in this thesis as well as some groups of Choles and Tzeltales from Simojovel and Huitiupán resettled from Las Cañadas after the creation of the RBMA²⁸, as well as the resettlement of Zoques after the eruption of the Chichonal volcano in 1982 (Harvey, 1998b). A third and final stage took place at the time of the civil war in Guatemala from 1981-1982 onwards when thousands of refugees arrived in the area and it became known that there would be further road constructions in the region, both to help PEMEX activities and to establish infrastructure to mobilise military troops. These colonisers claimed the ‘last piece of the pie’, in other

²⁸ Montes Azules Biosphere Reserve. See Section 2.2.3.

words what others had not claimed previously before because it was far away from rivers and potential roads (De Vos, 2002: 169). This included Flor del Marqués settled in 1984, the last of the six *ejidos* examined in this thesis.

In this process, the tropical forest region that is now MdC and Benemérito de las Américas, of around 200,000 hectares and largely unpopulated by 1960, would be colonised by almost 15000 people from very different backgrounds by the 1990s:

Never before has there been a conglomerate of people so strikingly different regarding geographical origin and ethnic background. Mestizo and indigenous peoples from Distrito Federal, Puebla, Oaxaca, Guerrero, Tabasco, Michoacán, Veracruz and, obviously, Chiapas had to learn how to live with each other, and sort differences and barriers imposed by language, tradition and religion. (De Vos, 2002: 170 *my translation*)

Apart from landless mestizo and indigenous peasants from several states seeking land, this new population included all sorts of people, from cattle ranchers, diverse ‘multi-tradepersons’²⁹ and even fugitives (González Ponciano, 1995). Yet, despite this heterogeneity, a common characteristic of MdC *vis-à-vis* other regions was that the entire land surface was under *ejido* governance by the 1980s (De Vos, 2002).

Several authors, some of which conducted fieldwork in MdC, have provided accounts of what life was like for colonisers in these early stages (Arizpe et al., 1993; De Vos, 1988b, 2002; González Ponciano, 1995). The first settlers came by foot from the lakes of Montebello and *ejido* Lacanjá close to the ruins of Bonampak. Others came by planes that landed in the riverside or air strips of old *monterías*. These peasants had been informed by agrarian officials about the availability of land in MdC. Yet, most of the early settlers

²⁹ González Ponciano (1995) mentions the following ‘multi-tradepersons’: cowboys, mechanics, bricklayers, fishermen, boat manufacturers, people who worked in *monterías*, blacksmiths, electricians, labourers, heavy machinery operators and university professionals.

left after some time due to rough conditions. Many had come from temperate climates and they had to learn how to live for the first time in a tropical setting. In De Vos (1988b), one of the first settlers from Boca de Chajul described by 1984 that they had to resettle a few times because homes were constantly flooded and ruined during the rains. Floods and pests also constantly destroyed crops. Most people got sick in the tropical weather and they recall multiple incidents with wild animals. It took years for the first doctor and priest to arrive. De Vos (2002) emphasises that despite colonisation being ‘directed’, settlers were ‘abandoned’ by the state. They had minimum state services such as education and health and the peasants suffered constant extortions and harassment by state agents. Further, they suffered legal abandonment in acquiring land documentation. This, together with the lack of roads and communication, meant that settlers took many years to acquire official land documentation. New colonisers began to open airstrips so that they could bring their families, bring food and seeds and bring government officials to set boundaries. De Vos (1988b) contains passages by writer Carlos Abascal who visited the region in 1986:

Little by little, people experienced the uncertainty that the first days provoke for those newly arrived...The first to arrive got the riverbank lands where they would construct the first houses of the new *ejido* and there were those who had to move two or three kilometres inland after the first rains flooded the *solares* and *milpas*. Those arriving later had to go inland.³⁰ (Carlos Abascal cited in De Vos, 1988b: 303).

The empirical chapters in this thesis will provide further accounts on these early colonisation processes among people in the study area. In Chapters 4 to 6, I will show how the early settlement processes, in terms of land selection and the development of the

³⁰ *Solar* refers to individual house plots in the *ejidos*. The *milpa* is a rotating crop system that commonly involves the simultaneous cultivation of maize, beans, pumpkin and other crops.

communities, have played important roles in shaping how people make PES-related decisions regarding land use, as well as payment distribution and spending.

Table 2: The settlement process in Marqués de Comillas		
Settlement wave	<i>Ejido</i>¹	Year
First wave	Zamora Pico de Oro	1973
	Playón de la Gloria	1974
	Galacia	1975
	Boca de Chajul	1976
	Quiringüicharo	1977
	Adolfo López Mateos	1979
	Reforma Agraria	1980
Second wave	El Pirú	1980
	Santa Rita la Frontera	1985
	Barrio San José	1986
Third wave	América Libre	1980
	San Isidro	1980
	Dr. Belisario Domínguez	1982
	Emiliano Zapata	1982
	José López Portillo	1982
	La Victoria	1984
	Nuevo Paraíso	1984
	Flor del Marqués	1984
	La Corona	1985
Source: Own elaboration with data from De Vos (2002), and fieldwork		
Note: 1) Case studies in grey		

Over the following decades, peasant organisations in MdC would undergo different processes than those in regions colonised during the ‘induced’ stage. I will not go in depth into these issues, as they are much beyond the purposes of this chapter. Yet, a few comparative observations are worth mentioning here, as they will have implications over the 1980s and 1990s. In MdC, peasant organisations were formed under the traditional ‘corporatist’ system, the National Peasant Confederation (CNC) and Revolutionary Institutional Party (PRI) (Harvey, 1998a). This includes the Unión de *Ejid*os Julio Sábines (UEJS) formed in 1981 and the Unión de *Ejid*os Fronteriza del Sur (UEFS) formed in

1986³¹ which became influential in the 1980s as liaisons between the communities and the state (De Vos, 2002). Yet, Harvey (2005) notes that these organisations lost influence from the 1990s due to transformations in the agricultural sector and corrupt management. Further, the presence of protestant churches was influential from early on in MdC, more so than the catholic church out of distance and a lack of communication from the San Cristóbal de las Casas diocese. In turn, among settlers in the Zona Norte and Las Cañadas, peasant organisations were constituted independently to the corporatist state (Harvey, 1998a). Though protestant missionaries from North America were invited from the early 1940s to assist in ‘acculturation’ of the indigenous populations (Dichtl, 1987 cited in Harvey 1994), catholic missionaries from 1960s became strongly influential in cultural and social life. The catholic church sought to revive communal practices, adopted discourses and narratives framed around ‘liberation theology’ and biblical Exodus, and had a highly influential role in the historical process leading to the Zapatista rising and its aftermath (e.g. De Vos, 2002; Harvey, 1998a; Leyva Solano and Ascencio Franco, 1996; Montemayor, 2009).

2.2.3. 1970s-1980s: Emerging contradictions: development and conservation

At the turn of the 1970s, the state had successfully managed to ‘induce’, and was beginning to ‘direct’, thousands of peasants to colonise the Lacandona Rainforest. As shown in the previous section, this process had been historically flawed and limited in many ways, yet it followed a certain logic and consistency to do with opening the region for colonisation and expanding the agricultural frontier. From the 1970s onwards, however, the region and its inhabitants would experience a contradictory and erratic state

³¹ President Echeverría created the figure of Unión de *Ejid*os to incorporate *ejidos* into rural development projects to increase government support such as subsidised inputs and preferential credit with the objective of increasing food staples (Harvey, 1998a). The new government of López Portillo created a third level of organisation bringing two or more Unión de *Ejid*os in the form of Collective Interest Rural Association (ARIC) (Harvey, 1998a).

as new and old interests shaped state regulation and policy over the following decades. In contrast with state actions in previous decades, this period was marked by the first glimpse of a state concerned with the destruction of the forests, with simultaneous interests in using state enterprises to exploit the region's timber, petrol and hydroelectric resources, as well as a state driven by national security concerns in the border with Guatemala. As these emerging contradictions unfolded, a series of enduring conflicts emerged, some of them existing to this date. This section deals with these processes, firstly in the Zona Lacandona and RBMA, and subsequently in MdC.

2.2.3.1. The Zona Lacandona and RBMA

From the second half of the 20th century, national and international actors began to call attention to the ecological richness of the Lacandona Rainforest as well as the rapid rate at which the forest was being depleted. Ortiz-Espejel and Toledo (1998) note that the Lacandona Rainforest had caught the attention among eminent Mexican biologists at least since the 1960s due to its enormous biological richness. These authors note that the region received increased interest in the international scientific community as more complete and detailed inventories of its biological characteristics were undertaken, with its biological importance being confirmed by the publication in 1989 of a new species *Lacandonia Schimatica* (Martínez and Ramos, 1989). A wealth of studies has emphasised the ecological value of the Lacandona Rainforest as a place with extremely high 'biodiversity' in terms of plants, mammals, birds, butterflies, amphibians, reptiles, fish, as well as multiple other 'environmental services' (Carabias et al., 2015).

At the same time, a region that had been originally perceived as containing 'boundless resources' (Ortiz-Espejel and Toledo, 1998) was being depleted at an alarming rate. From 1964-74, deforestation took place at a 'record time' in the north and subsequently in the west and southwest as Aserraderos de Bonampak, the last legacy of the legacy of timber

companies from the ‘green gold’ age, introduced modern machinery in the north, not only destroying forests in this process but also opening inaccessible paths for new waves of colonisers and ranchers (De Vos, 1988a, 2002). Studies confirmed the high rates of forest destruction taking place from the 1950s (SEDUE, 1987). For instance, De Vos (1988b: 24 *my translation*) argued that “over the last thirty-five years, the forest suffered such a huge and accelerated devastation, that it can be stated that, by the 2000s, there will be no tropical forest in Chiapas if the current rate of forest clearing continues.” In the context of a rising discourse on the global consequences of deforestation in the tropics, the local dynamics of deforestation in the Lacandona received increasing attention among the international community. From being perceived as ‘no one’s land’ in the 1960s, the Lacandona Rainforest increasingly became ‘everyone’s land’ (Arizpe et al., 1993).

In 1972, President Echeverría (1970-1976) signed a presidential resolution creating the Lacandona Zone. The decree stipulated that 614,321 hectares belonged to 66 families of Lacandones, including: 160,211 hectares expropriated and declared as national lands in 1967; 423,745 hectares of previous ‘private holdings’ whose owners had not been able to their property, including mostly companies and private titles awarded during the Porfiriato and which the Agrarian Reform Law in 1971 would declare void; and 30,365 hectares reserved for archaeological zones Yaxchilán and Bonampak and national parks intended to be formed around a series of lagoons³² (De Vos, 2002). Further, in 1978, President López Portillo (1976-1982) signed the decree of the Montes Azules Biosphere

³² El Cedro, Lacanjá, Miramar, El Ocotal, Santa Clara, Petjá, Itzanocú, La Maroma, Metzabok.

Reserve (RBMA)³³. The RBMA represented the first biosphere reserve enacted in Mexico and included 331,200 hectares partly overlapping with the Zona Lacandona.³⁴

Several authors have emphasised the instrumental role of the Mexican and international scientific and environmentalist communities in shaping the creation of the Zona Lacandona in 1972 and the 1978 RBMA, and more generally regarding environmental regulation and policy since the 1970s as mechanisms to stop colonisation and counter forest destruction (Arizpe et al., 1993; De Vos, 2002; Harvey, 2005). For instance, De Vos (2002) highlights the influential role played by Gertrudis Duby, a Swiss national and wife of distinguished archaeologist Frans Blom, in the gestation of the 1972 resolution. The author notes that Duby had resided and studied the Lacandones since 1943 and had dedicated decades to persuade government institutions of the need to grant Lacandones with official titles to solve the potential invasion by timber companies and colonisers. As a friend Manuel Velasco Suárez, who became governor of Chiapas, Duby was able to communicate this concern to Luis Echeverría who became president in 1970. According to De Vos (2002), Duby received Velasco and Echeverría at her house Na Bolom in San Cristóbal de Las Casas in 1971, and two months later, the 26th of November 1971, Luis Echeverría signed a presidential resolution creating the Zona Lacandona. Similarly, Arizpe et al. (1993: 107) note that Gertrudis Duby and Manuel Álvarez del Toro led a movement from the 1960s to protect the forest, its biodiversity, history and meaning. De la Maza (2015) provides an account of the process leading to the RBMA, highlighting the influential involvement of Gonzalo Halffter in the Man and Biosphere project of The United Nations Educational, Scientific and Cultural Organization (UNESCO), as well as

³³ The original name was Montes Azules Integral Biosphere Reserve but the Integral term was removed in 1996 thus becoming RBMA, as it is known to date. To avoid confusion, I will use the name RBMA throughout this thesis.

³⁴ Yet, over the following decades, protected areas would be commonly referred to as ‘paper natural areas’, meaning that, beyond their creation, no actions would take place to actively enforce and operate them (De la Maza, 2015).

Miguel Álvarez del Toro and Pedro Reyes as influential voices in the establishment of a zone for conservation. Indeed, the official Management Programme of the RBMA stipulates that this reserve emerged “as an answer for social demand to conserve the natural resources in the country, especially for the protection and conservation of the Mexican tropics and as a Mexican answer to UNESCO’s ‘Man and Biosphere’ programme (INE, 2000: 13 *my translation*).

The official motivation behind the 1972 resolution was that Lacandones had managed their lands since ‘immemorial times’ and had suffered from the invasion of indigenous migrants and timber companies (Leyva Solano and Ascencio Franco, 1996). De Vos (2002) provides a critical review of the 1972 resolution. The author highlighted a series of historical flaws, not least that these Lacandones who received the most extensive land amount in the history of agrarian reform in Mexico were not the ‘original’ dwellers before the Spanish conquest but rather more recent migrants from the Yucatán Peninsula. Yet, De Vos (2002) argues that beyond this ‘official’ discourse lay hidden a state interest to exploit the forest resources that had not been reached by the private companies from Tabasco towards the turn of the 19th century. This interest became clear in 1974 when the government forestry company COFOLASA was created with the support of the development bank NAFINSA and which led to the expropriation of Aserraderos de Bonampak (Arizpe et al., 1993; De Vos, 1988a, 1988b, 2002). In 1974, the Lacandon Community conceded COFOLASA a ten-year contract for the exploitation of 35,000 square metres, or 10,000 trees per year (de Vos, 2002: 113). Arizpe et al. (1993) note that the operation of COFOLASA was not very successful due to high costs and agrarian conflict. COFOLASA declared bankruptcy in 1980 and was then acquired by the state of Chiapas until it closed following a forestry ban in 1989.

The enactment of the Zona Lacandona and RBMA had profound effects for the political configuration of the Lacandona Rainforest in the following decades and became a source of land conflicts leading to the Zapatista rising in 1994 and beyond. The 1972 resolution declared 38 colonies and around 2,400 families mostly of Tzeltales and Choles, as ‘invaders’ (De Vos, 2002; Leyva Solano and Ascencio Franco, 1996). President Díaz Ordaz (1964-70) had declared land possession for indigenous groups but the new decree in 1972 cancelled this in support of Lacandones (Montemayor, 2009). After negotiations with then governor Velasco Suárez, these ‘invader’ communities received a resettlement offer under the condition that they be incorporated as ‘commoners’ (*comuneros*) in the Zona Lacandona whose presidency would be held by Lacandones. The 17 communities who already had a presidential resolution chose not to be resettled and defended their rights, while the remaining 21 communities agreed to be resettled by 1976 in two population centres. Indigenous Choles settled in Frontera Echeverría (now Frontera Corozal) and indigenous Tzeltales settled in Doctor Velasco Suárez (now Nueva Palestina). The remaining 17 communities who chose to stay and fight against the setting of ‘the boundary’ (*la brecha*) would become involved in long disputes with the state. The RBMA created additional disputes as it affected not only the 17 communities declared as ‘invaders’ by the 1972 resolution but also an additional 9 communities (De Vos, 2002). In 1989, the 26 communities affected by Zona Lacandona and RBMA demarcations finally managed to receive a land resolution in 1989 by President Salinas (1988-1994) with a total extension of 52,439 hectares.

The 1970s and 1980s in the Lacandona Rainforest have been characterised as repressive and conflictive, issues caused by the superposition of contradictory land decrees, continued state support for large plantation and ranching landowners allowing or consolidating private guards (*guardias blancas*), institutional co-optation through

corporatist dynamics, as well as efforts to delegitimise settlements as ‘invaders’ (Montemayor, 2009). These conflicts have been highlighted as eventually forming the backbone of the Zapatista rising in 1994:

The ‘expulsion’ or ‘resettling’ of families who had been already expelled before years back due to dams or hunger was the beginning of a complex political process which transformed life in the Lacandona Rainforest at the expense of community dispossession, exploitation and confrontation that would eventually become the fundamental base for the EZLN. (Montemayor, 2009: 114 *my translation*)

In the 1990s, additional protected areas and communal reserves were established from 1992-1996 and covering 123,660 hectares: the Lacan-Tun Biosphere Reserve (61,873 hectares); three Flora and Fauna Protection Areas, Chankín (12,184 hectares), Metzabok (3,368 hectares) and Nahá (3,847 hectares); the Sierra Cojolita Communal Reserve (35,410 hectares); and the Natural Monuments Bonampak (4,357 hectares) and Yaxchilán (2,621 hectares). Over the 1990s, the Lacandona community “has been a meaningful actor in the consolidation of environmental conservation policy” hosting a series of protected areas and communal reserves and accessing funds earmarked for conservation from the 2000s onwards (Calleros-Rodríguez, 2014: 141). At the turn of the 21st century and beyond, diverse authors have emphasised the continuation of old, and the emergence of new, land conflicts between the state, conservation organisations, as well as the Lacandona community, ‘invaders’ and resettled Choles and Tzeltals (e.g. Calleros-Rodríguez, 2014; O’Brien, 1998; Rocheleau, 2015).

2.2.3.2. Meanwhile in MdC: the rise and fall of colonisation

At the same time when the state was establishing protected areas and environmental protection measures elsewhere in the Lacandona Rainforest, state-led colonisation acquired further impetus in MdC and Benemérito de las Américas. As a frontier region, the state of Chiapas in general, and the region of MdC in particular, acquired special

attention in the first years of the 1980s in the interest of national security following the civil war in Guatemala (De Vos, 2002; Harvey, 1998a). This international event was used as a point of entry for a broader military and political strategy involving militarisation, directed colonisation, and the opening of roads for PEMEX explorations (Harvey, 1998a). In MdC, ecological considerations were not a priority at all during the early 1980s and would only be seen in 1986 once Guatemalan refugees were resettled and the colonisation project concluded.

As noted earlier, when the civil war broke in Guatemala 1982, around 14,000 refugees suddenly appeared in MdC (De Vos, 2002). At the time, the local population in MdC was below 10,000 people. These refugees were escaping the Guatemalan army (*kaibiles*) who were conducting indiscriminate genocide actions against potential guerrillas as part of their ‘land sweep’ (*tierra arrasada*) strategy (Arizpe et al., 1993). They were part of a broader group of 20,000 to 30,000 refugees who occupied the south of the Lacandona in 1981 and 1982 in MdC and Las Margaritas who escaped colonies in Ixcán and Petén founded a decade before by North American missionaries (De Vos, 2002: 37-38). Refugees in MdC occupied a camp called Puerto Rico in the riverbank of Lacantún, close to Boca de Chajul. Studies involving fieldwork with people living in MdC at the time have documented a series of political, economic and cultural interactions emerging between local communities and these refugees (Carabias et al., 2012; Castro et al., 2015; González Ponciano, 1995). For instance, with support by the Mexican Refugee Support Commission (COMAR), the local population lent lands to refugees in exchange for ‘cheap labour’ to convert forests.

The spontaneous emergence of refugees from Guatemala was considered as a national security threat (González Ponciano, 1995). At the time, “agrarian need, economic interests, geopolitical motivations, all of this converges in making the MdC zone as one

of the most neuralgic regions of Mexico” (De Vos, 1988b: 301 *my translation*). Arizpe et al. (1993) argued that this situation led to a series of high-level discussions within the Mexican state over how to deal with the conflict: whether to militarise the border regions or to create a ‘national human frontier’. As noted by González Ponciano (1995: 444 *my translation*), “when the war in Central America began to have effects in Mexico, the state declared that it opted for development and not the militarisation of the border regions.” Choosing to ‘develop’ the region, the state ‘directed’ colonisation in the yet unpopulated south and east parts of MdC. This involved the construction of the frontier road (*carretera fronteriza*) which would pass through MdC, border Guatemala and link Palenque and Comitán (González Ponciano, 1995; Harvey, 1998a). The road formed part of the broader Plan Chiapas and Plan del Sureste signed in 1983 which, under the banner of increasing social and economic development, included an extensive agenda for regional development along three dimensions: improving road access, reducing environmental destruction and solving land disputes (Harvey, 1998a: 151). Yet, this strategy seems to have been more effective at promoting colonisation than in doing so in an ‘orderly’ manner:

Although the colonisation was presented as obeying a rational plan to protect the proper use of natural resources, in effect the main objective (and result) was simply to help establish the state’s presence in the area. Colonization was not orderly, nor did it lead to ‘rational’ farming practices. The flow of migrants doubled the population from thirteen *ejidos* with 10,000 inhabitants in 1984 to twenty-nine *ejidos* with 22,000 inhabitants in 1986. The lack of technical assistance, credit and infrastructure led colonists, ranchers, and loggers to deplete the forest’s valuable mahogany trees. (Harvey, 1998a: 152)

Nonetheless, the road construction was discontinued in 1985 when most of the refugees were forcibly relocated to camps in Campeche and Quintana Roo as they were perceived as a threat for national sovereignty (González Ponciano, 1995). De Vos (2002) claims

that around half of refugees chose to stay in the Mexican *ejidos* despite losing refugee status. It was only later in the 1990s in the aftermath of the Zapatista rising that the state continued and finally finished the construction of the road in the year 2000 as part of a broader militarisation and counterinsurgency strategy (Harvey, 2005).

While the ‘directed’ colonisation project gained momentum in MdC, the state conducted explorations for petrol and opened roads for PEMEX. In MdC, explorations took place from 1976-1981, road constructions in the early 1980s, and finally drilling from 1984 through 1992 (De Vos, 2002)³⁵. In 1984, PEMEX built the *carretera fronteriza* that passes through the centre MdC, instead of going along the Lacantún River, which facilitated access to these areas for colonisers (González Ponciano, 1995). In the case of hydroelectric plans, the state was less successful. De Vos (2002) presents a wealth of information on plans by the Federal Commission of Electricity (CFE) to develop a network of dams to produce hydroelectric energy from rivers, which never took place.

Yet, colonisation in MdC was officially suspended in 1986 (González Ponciano, 1995). More evidence is needed on this, but it seems that this action was made possible once national security was no longer perceived to be at risk, both because refugees had been resettled to other regions of the country and because the state had managed to create a ‘human national frontier’ in MdC. As those communities affected by the Zona Lacandona and RBMA decrees a decade earlier, communities in MdC would experience from the 1980s a series of state regulations and policies framed around a need to protect the forests which they had been previously encouraged to colonise. In contrast to the decrees in 1972 and 1978, however, these did not involve the creation of protected areas, but a mix of

³⁵ De Vos (2002) notes that PEMEX left the region suddenly in 1992 without providing explanations and left 11 wells in MdC and 8 in Las Cañadas.

negotiated and non-negotiated regulation and incentives to limit the expansion of the agricultural frontier. I will focus on these issues in the following section.

2.2.4. 1980s-2000s: Enduring contradictions in MdC

The government worries about the forest because we are close to its destruction...now it worries, because the government is involved with scientists around the world, it has international relationships. Why did they give us land when we requested it? Why did they deceive us? Why did they give land which cannot be worked to an *ejido*? The law of agrarian reform says that we should work our land and now they forbid us, we are subordinates, we live in a type of slavery. (Elías Valles Orozco from *ejido* Nuevo Chihuahua cited in Arizpe et al. 1993: 153-154 *my translation*)

In their study on social perceptions about deforestation, conducted among people in MdC and other regions of the Lacandona Rainforest, Arizpe et al. (1993) emphasise the sense of perplexity among these recent migrants as to how their local practices around agriculture and ranching, had suddenly become part of the global ‘problems’ of land use change and deforestation. From being the perceived as the ‘tail of the world’, as put by another migrant in MdC interviewed in this study, forests became the ‘eye of the hurricane’ referring to the current and increasing national and international concern about the conservation of the forests. This sense of perplexity was not unwarranted at the time, nor would it be in the upcoming years. After all, the colonisation of MdC, as the last sub-region of the Lacandona Rainforest to be settled, had been actively ‘directed’ by the state in the 1970s and 1980s.

From the mid-1980s onwards, communities in MdC were witnesses of a rising discourse, and associated regulation and policy, around forest conservation in stark contradiction with the colonisation project (Arizpe et al., 1993; Harvey, 1998b). As I noted previously in Section 2.1.1., this is precisely the period when environmental state institutions and

regulation emerged, consolidated and were strengthened in Mexico. The discourse on sustainability has been constantly resisted and reworked by local populations (e.g. Arizpe et al., 1993; Rocheleau, 2015). In this same period, however, communities in MdC have also experienced an enduring ‘developmentalist’ state agenda carried over from earlier decades and interested in promoting agricultural production and the continued expansion of the agricultural frontier as a practice of ‘development.’ Over the years, these agendas have not followed a linear and consistent progression. Rather, they have undergone different processes of continuity and change, often interacting with each other in subtle and unexpected ways. These projects in MdC have taken place in, and have been influenced by, much broader social, political and economic processes, including a regional armed conflict and a nation-wide transformation of the agrarian sector. This section focuses on these processes in MdC from the 1980s leading to the 2000s when PES came into place.

2.2.4.1. A rising environmental agenda

In 1986, the Commission for the Protection of the Lacandona Rainforest was created³⁶ under the Plan Chiapas (De la Maza, 2015). In 1987, the Commission developed the Programme for the Protection and Development of the Lacandona Rainforest (PPDSL) (SEDUE, 1987). Ending in 1988 (INE, 2000), this Commission and PPDSL would prove to be short lived, largely unsuccessful and ultimately fade into oblivion. Yet, their importance lay in that they represented among the first articulations by the state of a concern about the ecological destruction in MdC and the need for the ‘rational’ use and ‘conservation’ of resources (Arizpe et al., 1993: 87).

³⁶ This was a high-level commission presided by the governor of Chiapas and integrated by PEMEX and multiple state ministries, including urban development and ecology (SEDUE), interior, budgeting and planning, agriculture and hydraulic resources, agrarian reform as well as energy, mining and public enterprise (SEDUE, 1987).

The PPDSL included a series of prescriptions and activities pertaining to MdC structured around an ICDP narrative. Importantly, it characterised MdC as of strategic importance for the RBMA, mainly as a ‘buffer zone’ to absorb landless peasant populations that could danger its viability (Arizpe et al., 1993). It involved an ambitious set of regulations and incentives among communities in MdC: the creation of a ‘core area’ for conservation in MdC under the same rules as RBMA, sustainable forestry and intensification of agricultural activities to avoid the expansion of the agricultural frontier, as well as efforts to improve living conditions (SEDUE, 1987). Further, its operation included the active negotiation with, and participation of, peasant organisations: “this commission and the Unión de *Ejid*os Julio Sabines and Fronteriza Sur signed agreements establishing the government compromise to support colonisers in exchange that they accept a package of measures with the objective that MdC could effective function as a buffer zone of the Reserva Integral de la Biósfera Montes Azules” (González Ponciano, 1995: 433 *my translation*). Finally, it considered the construction of infrastructure in the RBMA, which in negotiated agreements with the Comunidad Lacandona led to the construction of the Chajul Station in 1985 (De la Maza, 2015). In the 2000s, this station would become the operation base of Natura y Ecosistemas Mexicanos (Natura Mexicana), the organisation who would become the PES intermediary among the *ejidos* studied in this thesis.

Yet, the governor of Chiapas Patrocinio González (1989-1992) declared a forestry ban in the Lacandona Rainforest in 1989, banning forestry among communities in the MdC as well as the state’s enterprise COFOLASA (Carabias et al., 2012). Harvey (1998b, 2005) argues that this forestry ban emerged out of pressure from international and national environmentalists at the face of the rapid rates of forest destruction in MdC and other regions of the Lacandona. According to this author, the state had tried to regulate forest exploitation in MdC with permits in 1987 and 1988 but the continued construction of the

border road facilitated illegal logging. Whether Harvey (1998b, 2005) is right on his interpretation on the causes leading to the forest ban is subject to debate. What is less controversial, however, is that this imposition led to a series of conflicts over the following years between the state and communities who continued to extract timber. For instance, a protest by 300 peasants from MdC against timber confiscation by state police and municipal authorities was violently repressed in Palenque (Harvey, 1998b). The police used force, including clubs and teargas, and arrested seven peasants which were forced to sign confessions linking themselves to central American guerrillas and drug trafficking. Harvey (1998a) notes that the Independent Regional Peasant Movement (MOCRI) emerged in 1991 after this event by dissidents of the UEFS as well as young people from MdC seeking independence from corporatist peasant organisations. MOCRI was an active organisation in articulating peasant demands for forestry in the upcoming years.

In, 1994, the forest ban was partially lifted in MdC, with 18 *ejidos* receiving permits for the extraction of already felled and dead trees (Harvey 1998b). Over the following years, SEMARNAP³⁷ put into place the Plan Piloto Forestal in MdC for the ‘rational’ extraction of mahogany and various tropical species of trees, which was inspired, and coordinated by, personnel from ‘successful’ forestry projects in Quintana Roo (Montes de Oca et al., 2015). For its operation, the Plan divided forest resources into three areas: permanent reserve, reforestation and cut area divided in twenty sections for use each year (Harvey, 1998b). The forest ban lift, which had been MOCRI’s main demand in the early 1990s, has been brought forward by Harvey (2005) as an indirect effect of the Zapatista rising in 1994 and part of a broader counterinsurgency strategy. In an interview, the minister in

³⁷ SEMARNAP also supported the creation of the Council for Sustainable Development of the Forest of Marqués de Comillas (CODESSMAC) in 1997. CODESSMAC ended in 2000 shortly after the re-municipalisation process in 1999 and due to internal divisions (Cano Castellanos, 2013).

charge of SEMARNAP from 1994-2000 confirmed to me an indication by the federal government to ‘relax’ regulations in area in the Zapatista aftermath to avoid peasant dissent (Julia Carabias, pers. comm., 28 February 2017). Further, according to this minister, lifting the forest ban obeyed, albeit paradoxically, an environmental rationale as well. The notion here is that the forest ban had induced extensive forest conversion for cattle ranching in MdC because it regulated timber extraction, but not land use change, at a time when peasants were receiving credits for cattle by the state through the National Support Fund for Social Enterprises (FONAES).

Yet, community forestry permits were cancelled, and projects were discontinued towards the late 1990s in MdC. Several reasons have been brought forward to explain the apparent lack of success of community forestry in MdC. Harvey (1998b) notes that all the *ejidos* that were granted permits were fined due to excessive extraction, and that the alliance between authorities, government agencies and the main buyer called Carpicientro in Palenque led to excessive exploitation. Carabias et al. (2012) present similar explanations, including the fact that some *ejidos* finished their twenty-year quota in one year. Harvey (1998b) also notes that projects struggled to find markets for other tropical species besides mahogany, and that they also faced deficiencies in commercialising and investment in local infrastructure. Yet, this author argues that while forestry projects failed to produce desired results, they allowed for greater state intervention and emergence of new peasant organisations. Finally, based on fieldwork conducted among *ejidos* in the Lacantún riverbank, Castro et al. (2015) argue that other factors behind this failure included the loss of economic forest potential, a consequence of intensive logging, as well as the fact that *ejidos* had begun processes of internal distribution of communal lands. This is an issue that I foreground in Chapter 5 as the parcelling of communal lands had important implications for how *ejidos* distributed money from PES. Community forestry would only

be revived in MdC in 2011 when SEMARNAT awarded new forestry permits (Montes de Oca et al., 2015).

At the turn of the 21st century, and with the rise of the ‘sustainable development’ discourse at a global level and in Mexico, the emphasis in MdC moved away from forestry and rather towards ambitious policies and projects framed around ICDP lines. ICDPs in MdC have often been framed around the discourse that extensive deforestation in the region has been caused by the combination of disorderly colonisation processes, low efficiency production, the opening of roads, and low government presence. Thus, these ICDPs have highlighted that the ‘solution’ to environmental problems requires a broad strategy involving the coordination and participation of local communities and organisations, diverse government entities, scientific community and NGOs (Ortiz-Espejel and Toledo, 1998).

In 2001, the Chiapas government began the Integral Programme for the Sustainable Development of the Forest (PIDSS) and, together with the European Commission, created the Project for Integrated and Sustainable Social Development, Chiapas, Mexico (PRODESIS) from 2004-2008 (Muench, 2009). PRODESIS involved the construction of ecotourism centres in MdC as well as the promotion of African palm oil plantations since 2005 (Castro Soto, 2009; Castro et al., 2015). PRODESIS was discontinued in 2008 following a public request of suspension by participating communities in 2007, who denounced corruption and a lack of consultation, as well as an official recognition of its ‘failure’ to meet environmental and development goals (Hampf, 2009).³⁸ Various authors who conducted fieldwork in MdC have provided testimonies of these ‘failures’. For instance, Cano Castellanos (2013) argues that the ecotourism centre in *ejido* San Isidro,

³⁸ In 2007, 58 representatives from participating communities from Comitán, Ocosingo and Palenque publicly presented the Moxviquil Declaration in which they requested the suspension of PRODESIS (Hampf, 2009).

which included a pool and that was envisaged as a ‘spa in the jungle’, failed due to corruption and lack of funding. The author notes that once PRODESIS ended, the *ejido* assembly sold the centre’s furniture and divided the profits among each other. In the case of palm oil plantations, Carabias et al. (2012: 79 *my translation*) argue that PRODESIS caused extensive deforestation: “palm has promoted more than 5,000 hectares in the municipality, and although the rules of operation state that forest cannot be converted, this has indeed taken place”.

The 2000s have also been marked by the emergence of environmental NGOs (ENGOS) operating in MdC, including two that would eventually become PES intermediaries: Cooperativa AMBIO and Natura Mexicana. Cooperativa AMBIO began its work in MdC since 2000 in a carbon project called Scolel’té, meaning ‘tree that grows’ in Tzeltal, that involved planting ‘carbon sequestering’ trees in *ejidos* La Corona and Reforma Agraria (Cano Castellanos 2013; see also, Osborne, 2011; Hendrickson and Corbera, 2015). Since 2004, this organisation has been PES intermediary in the *ejidos* La Corona, Reforma Agraria, San Isidro and San Lázaro.

In 2005, Natura Mexicana signed a collaboration agreement with the National Commission for the Protection of Protected Natural Areas (CONANP) to help support activities in operation in the RBMA (De la Maza, 2015). Since then, Natura Mexicana has operated from the Chajul Station³⁹ under the direction of Javier de la Maza, a renowned lepidopterologist and conservationist who had been working in the region since the 1970s (De la Maza, 2015). Over the years, Natura Mexicana has received funding from diverse private and public sources, mainly from PEMEX and an alliance between the World Wildlife Fund (WWF) and the Carlos Slim Foundation.

³⁹ A research station constructed in 1985 in the RBMA on the riverbank of the Lacantún facing *ejido* Boca de Chajul.

In 2007, Natura Mexicana approached the *ejido* assembly in Boca de Chajul, Playón de la Gloria, Galacia and Quiringüicharo for the first time to gauge interest in participation in national PES schemes. This marked the beginning of a process that would lead to participation in PES among the *ejidos* examined in this thesis. The empirical chapters here will examine different aspects of the evolution and effects of PES in these *ejidos* over the following years. This first approach also set the stage for further collaborations and projects along environmental lines over the following years between *ejidos*, Natura Mexicana and diverse state and private institutions, some of which persist to date. These include a series of community ecotourism centres developed in Galacia, Flor del Marqués, El Pirú and Playón de la Gloria (De la Maza et al., 2015), an environmental education programme with school children, ecological restoration and reforestation activities (Carabias et al., 2015), as well as productive reconversion, aquaculture and wildlife management units (UMA) financed by the ICDP-type Programme of Sustainable Regional Development in Marqués de Comillas (PDRS) from 2008 onwards (World Bank, 2010). In the 2010s, REDD+ came into place in MdC, firstly through the PESL programme in 2010 (CONAFOR, 2010) and subsequently in 2015 when the World Bank commissioned a REDD+ report for a potential Investment Project in the Lacandona Rainforest. It remains to be seen whether this latter programme will be implemented.

2.2.4.2. ‘Development’ in MdC

From the Usumacinta, the rivers Salinas and Lacantún were ever more transited. Together with the new land claimants came border agents and migration officers, health supervisors and supervisors of the Ministry of the Interior, engineers with theodolites and maps, sociologists and economists, biologists and merchants. Those who investigate to conserve the forests in a suffocating race with those who consume until extinguishing them. (Carlos Abascal cited in De Vos 1988b: 307 *my translation*)

Since the early colonisation stages of MdC, and leading to the 2000s and beyond, communities have received a plethora of programmes and supports from the federal, Chiapas and local governments for productive agricultural and ranching activities. These programmes, often intermittent and limited, can be understood as the enduring legacy of a ‘developmentalist’ state concerned with rural development and the expansion of the agricultural frontier and the conquest of the tropics (Revel-Mouroz, 1980). In the 1970s, departing from President Echeverria (1970-76), who promised to restore revolutionary commitments to workers and peasants through land reform, López Portillo (1976-1982) sought to move emphasis away from land distribution and towards increasing rural productivity (Rubio, 1987 cited in Harvey 1998a).

In the early 1980s, the state promoted a series of agricultural and ranching production activities among the new colonisers in MdC. These included a plethora of plantations, including cocoa, coffee, cardamom, rubber and chili, as well as support for cattle ranching (Carabias et al., 2012). For instance, the Programme of Investments for Rural Development (PIDER) from 1985 promoting cocoa led to 160 hectares of plantations in Playón de la Gloria as well as credits for ranching (Carabias et al., 2012).

From the government of President De la Madrid (1982-1988) and particularly during President Salinas (1988-1994), the agrarian sector underwent a process of deep reforms and fundamental shifts. This has involved a series of processes, including modifications to Article 27 in the Constitution, which pertains to the nature of the *ejido*, the end of agrarian reform, the implementation of the land certification programme PROCEDE as well as the enactment of NAFTA. I provide an account on these transformations in Appendix A. In the meantime, however, I will highlight some of their implications in MdC.

Firstly, the deployment of what has been characterised as ‘social liberal’ or ‘inclusive neoliberal’ programmes for productive activities and poverty alleviation (e.g. Craig and Porter, 2006 cited in McAfee and Shapiro 2010; Fox, 1995). Productive support has included PROCAMPO which gives support for maize and bean production since 1994, ranching credit and subsidies through FONAES from 1994 and PROGAN since 2004. Studies conducted in the region have argued that these schemes have often directly financed deforestation (Carabias et al., 2012). Regarding anti-poverty, communities in MdC have received multiple forms of social assistance and social insurance schemes. Primarily, this includes the Conditional Cash Transfer (CCT) scheme PROGRESA since 1997, a programme emerging from Salinas’s PRONASOL, which later evolved into Oportunidades and finally Prospera, and that disburses cash transfers to families every two months conditional on school attendance, health check-ups and the intake of nutritional supplements. In Chapter 6, I will examine the dynamic interactions between PES and this CCT programme. Further social assistance schemes in MdC have included support for infants (Amaneceres, PAL Sin Hambre) and the elderly (70 y Más), as well as social insurance (Seguro Popular).

Another implication of reforms to the agrarian sector has been reconfigurations of land institutions on the *ejidos* in MdC. As part of the PROCEDE programme, landowners (*ejidatarios*) could request the dismantling of the *ejidos* and become private property. When the scheme was first presented in 1994 in MdC, none of the *ejidos* accepted the programme (Castro et al., 2015). In the early 2000s, all the *ejidos* examined in this thesis have only partially accepted PROCEDE, meaning that they chose not to dismantle the *ejido*. In this way, these *ejidos* obtained legal land documentation but maintained communal governance, institutions and management of resources, a finding common in other places in the Lacandona Rainforest (e.g. Rocheleau, 2015). These land institutions

will play crucial roles in Chapters 4 and 5 when I examine how people make land use decisions and how communities distribute money from PES.

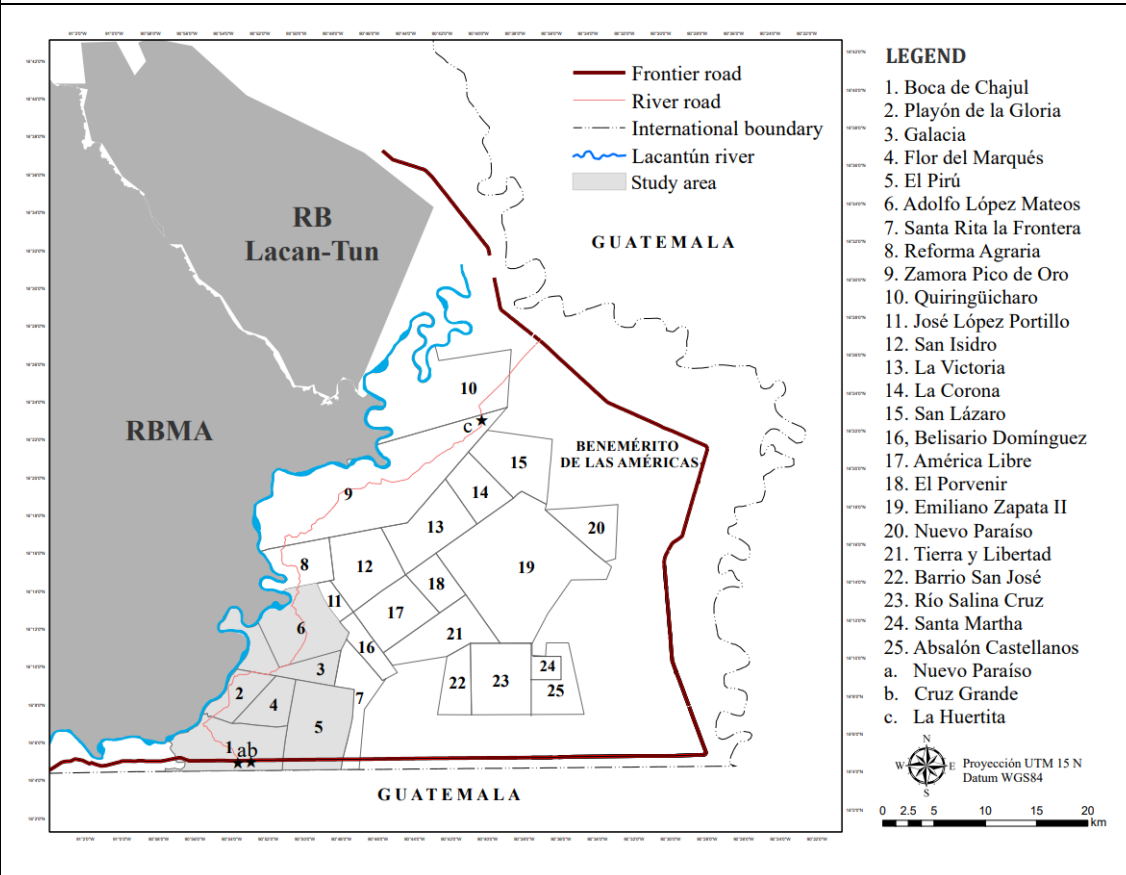
Beyond agrarian reform, social life in MdC from 1994 onwards cannot be understood in isolation from the Zapatista rising on 1 January 1994.⁴⁰ Beyond its effects on the forest ban lift in 1994 that I discussed previously, two other effects are worth noting: the re-municipalisation of MdC and the increased militarisation in the region and associated road construction. These form part of what multiple authors have characterised as a broad governmental counterinsurgency strategy against indigenous autonomy, including Zapatista, and more generally independent indigenous peasant movements (e.g. Burguete Cal y Mayor and Leyva Solano, 2004; Harvey, 2005; Montemayor, 2009).

Firstly, the re-municipalisation processes in 1999 whereby MdC and Benemérito de las Américas were created as individual municipalities instead of being regions of the broader municipality of Ocosingo (Burguete Cal y Mayor and Leyva Solano, 2004; Harvey, 2004, 2005) (Figure 2). Harvey (2005) provides an analysis of the politics around this process, highlighting how it resulted from a combination of a broader counterinsurgency strategy but with the specificity of local interest groups. Specifically, this author states that re-municipalisation was a means for local power groups in MdC to ‘get institutions closer’, a concern rooted in legitimate social demands. Before 1999, MdC was part of the municipality in Ocosingo, its base located more than 350 km away, which meant time and money for acquiring documentation, including birth, death and marriage certificates. Further, communities in MdC partly blamed its distance from Ocosingo for the ‘abandonment’ of the state in terms of services, such as schools, health clinics, and road access. Harvey (2004) notes that the new municipalities received increased funding from

⁴⁰ Multiple studies have sought to understand the causes and implications of the Zapatista rising (e.g. De Vos, 2002; Harvey, 1998a; Leyva Solano and Ascencio Franco, 1996; Montemayor, 2009).

Mxn\$4 million in 1999 to Mxn\$9 million in 2000. He also notes that in the re-municipalisation process, MdC acquired Mxn\$5.4 million from the State Road Commission for the construction of the road along the river (*carretera ribereña*) between Pico de Oro and Boca de Chajul, as well as Mxn\$11 million from CFE for the first set up of electricity in the riverbank, including several *ejidos* examined in this thesis (Adolfo López Mateos, Galacia, Playón de la Gloria, Boca de Chajul and Flor del Marqués). In Chapters 5 and 6, I will show how families and communities have used money from PES to partly compensate for the lack or low quality of state services in health and schooling.

Figure 2: *Ejidos* in MdC



Source: Own elaboration

Note: Nuevo Paraíso, Cruz Grande and La Huertita are small localities inside *ejidos*

Secondly, MdC experienced increased militarisation under the official discourse of controlling *narcos* and illegal markets (González Ponciano, 1995; Harvey, 2004). Many military posts and checkpoints exist to this date in MdC. In this militarised context, the

border road with Guatemala, an earlier project which started in the aftermath of the civil war in Guatemala in the 1980s, was finally completed in 2000 (Harvey, 2005). The importance of this road in shaping different aspects of social life in MdC over the following years cannot be overstated. On the one hand, together with PROCEDE, it allowed for increased land speculation and land concentration in the *ejidos*, with diverse authors emphasising how the opening of roads facilitated colonisation and forest clearing (Carabias et al., 2012; De Jong et al., 2000). On the other hand, together with the re-municipalisation process, this has been associated with increasing state services in the region. For instance, Harvey (2004) notes that by 1999, there were only three secondary schools in MdC (Boca de Chajul, Quiringüicharo and San Lazaro), there were no high schools and there was only one student in the entire municipality enrolled at this level. In terms of health services, Harvey (2004) documents clinics in five *ejidos* (Pico de Oro, Boca de Chajul, El Pirú, Quiringüicharo and Pico de Oro). By 2015, however, many more of the six *ejidos* examined in this thesis already had a secondary school (Boca de Chajul, Playón de la Gloria, Flor del Marqués, El Pirú), but the only high school was available in Boca de Chajul. The case of school clinics had changed less, however, with only one working clinic in Boca de Chajul. Another clinic had been constructed in Adolfo López Mateos but it had been closed for years. I will say more about these services in Chapter 6.

2.2.5. Where PES come there is always something from before

This section has dealt with the history of the forests and people in MdC, and more generally the Lacandona Rainforest, from the 19th century to the time when PES came into place in the 2000s. Throughout this time, these regions have undergone significant transformations, many of them induced and directed by the state. Over the course of two centuries, the region went through many stages. Firstly, it transformed from a largely

unpopulated ‘Desert of Solitude’ to a lucrative site for the exploitation of precious timber and other resources by communities as well as private and governments corporations. It then became an ‘escape valve’ for landless peasants and refugees as well as a strategic geopolitical international frontier. More recently, the region evolved into an incredibly rich ecological hotspot perceived as being depleted at a rapid rate. Many of these processes have co-evolved to this date, often in contradiction with each other, creating a complex mix of land and political institutions, regulation and policy. A bird’s eye view of the socio-ecological matrix in and around MdC attests to this complexity: a series of *ejidos* co-existing with natural protected areas, sharing an international frontier with Guatemala and with a dynamic local population pursuing various goals in interaction with state institutions and environmental non-governmental organisations.

Thus, when PES came into place in MdC in the 2000s, *ejidos* had been firmly established, coloniser families had been engaging with multiple land uses for some time, and the state had been become an increasingly important figure implementing various conservation and development policies often in contradiction with each other. These historical processes will be highly relevant in the following chapters as I examine how people make PES-related land use decisions (Chapter 4), how communities distribute money from PES (Chapter 5), and how people combine social and environmental policies (Chapter 6). In an influential study about PES, Vatn (2010: 1248) argued that “where PES come there is always something from before.” Nowhere does this phrase seem to be more fitting than the case of PES in MdC and the Lacandona Rainforest.

3. Analytical Framework, Research Design and Methodology

This thesis examines the role of PES in the broader livelihood strategies of participating families and communities. For this, I use a multidisciplinary analytical framework that aims to bring to the fore the voice of local stakeholders while paying attention to how aspects of context and design shape PES outcomes at various temporal and spatial scales. The novel research design and methods used here, which combine interviews with geospatial information and other types of data, reflect these considerations. Evidently, the analytical framework, research design and methodology consider the particularities of PES in Mexico as they have been noted in previous literature, as well as the trajectory and evolution of MdC and the Lacandona Rainforest as described in the previous chapter. In this chapter, I proceed to explain the overall analytical framework, research design and data collection methods adopted in this thesis. Subsequently, Chapters 4 to 6 each contain a short section describing the specific frameworks and methods used.

3.1. Capturing local perspectives

Overall, this thesis adopts a livelihood perspective aimed at giving voice to the agency of local stakeholders involved with PES on the ground. The motivation behind this is that, despite being neglected in the PES literature, local perspectives can shed light on how actors shape, resist and reinterpret PES, with potential implications on their outcomes. As suggested by Van Hecken et al. (2015a: 122), “PES interventions are strategically adapted – through encounters with grounded social realities at different scales and involving various actors – in order to achieve multiple social goals.” Indeed, literature on the field of development studies has revealed the usefulness of local perspectives for shedding light on how development policy is experimented on the ground and how local views can provide valuable clues for understanding the theory and practice of policy. For instance, Narayan et al.’s (1999, 2000) influential ‘Voices of the Poor’ revealed how the ‘poor’

understand the concept of poverty not as solely relating to income as often understood by ‘experts’, but rather as a multidimensional, “gendered, dynamic, complex, institutionally embedded, and location-specific phenomenon” (Narayan et al., 1999: 7).

To avoid ambiguity, the terms ‘local’ and ‘stakeholders’ are worth discussing here. By ‘stakeholders’ I refer to three groups of relevant PES actors that I use as my main data sources in the study area. Firstly, families and communities who currently participate or have participated in PES at some point. In Mexican PES, *ejidos* often act as the ‘seller’ of environmental services, both when communities choose to enrol communal lands as well as when they act on behalf of individual families who choose to enrol individual parcels. Literature has shown how participation and other decision-making processes are made both at the level of individual families and collectively in the *ejido* assembly (Kosoy et al., 2008). Recognising that not all families within communities may necessarily participate, or wish to participate in PES, I also seek to bring to the fore the voice of ‘non-participating’ landed and landless families. The second group of stakeholders includes government officials from the National Forestry Commission (CONAFOR) who deal with the day-to-day implementation of PES and who are based in Tuxtla Gutiérrez. CONAFOR acts as the ‘buyer’ of environmental services and oversees the overall operation of PES, including monitoring compliance yearly using satellite technology and on-field visits, disbursing yearly payments to *ejidos* once compliance has been verified, as well as sanctioning non-compliant individuals. For Chapter 6, I also include government officials from SEDESOL, teachers and medical staff who are associated with the operation of the Conditional Cash Transfer (CCT) Prospera (formerly PROGRESA and Oportunidades). The final group includes Natura Mexicana, the local PES intermediary among the six *ejidos* examined in this thesis. Previous scholarship has highlighted the important and multiple roles played by intermediaries in the Global South

for the operation of PES (Pascual et al., 2010; Schomers et al., 2015; Vatn, 2010). As noted by Pham et al. (2010: 64), intermediaries play roles as “service and information providers, mediators, arbitrators, equalizers, representatives, watchdogs, developers of standards and bridge builders”.

By ‘local’ I refer to six *ejidos* in MdC that encompass the case studies in the study area of this thesis. I will subsequently describe and justify these case studies in Section 3.3. Within the study area, I take a multi-level approach examining dynamics at three levels: family, community and inter-community or regional. As noted above, PES literature has suggested that some aspects of PES in the Mexican context involve collective processes, which transcend the realm of individual landowners and families. This has warranted the need to simultaneously examine individual families and individual communities as two interrelated ‘units of analysis’ (e.g. Kosoy et al., 2008). Yet, I also examine here the entire ‘region’ of six *ejidos* as a third level of analysis. The incorporation of regional analysis is motivated by the view that communities who participate in PES may interact with one another and that such interactions may shape PES performance. Exploring dynamics only at the family and community levels may be unsuited to capture higher-level interactions, for instance inter-community cooperation or regional spending processes.

Overall, the choice of the ‘region’ as the broader unit of analysis follows from the aim in this thesis to examine the role of PES in the broader livelihoods of participating families and communities. The view here is that many aspects related to PES are likely to operate within the confines of a region of several *ejidos*. Such regionally bounded dimensions include land use decisions, income distribution and spending, as well as broader issues to do with participation and monitoring of PES activities. Of course, some aspects of local livelihoods may take place at much larger spatial scales. For instance, migration patterns, agricultural markets and remittances may occur at subnational, national or even

international levels. I recognise that these wider spatial scales can have potential implications for PES, which this thesis may not necessarily capture. The extent to which PES may involve dynamics at larger spatial levels is an important question for further research.

3.2. Approaching PES effects: context and policy design

I adopt a livelihood approach to qualitatively examine the effects of PES on different social and environmental aspects at the local level. This livelihood approach is centred on the concept of ‘livelihood,’ which, in its simplest sense, refers to ‘means of gaining a living’ (Chambers and Conway, 1992: 5). This approach has been useful to understand “how households derive their livelihoods by drawing on capabilities and assets to develop livelihood strategies composed of a range of activities” (De Satge, 2002: 2). The livelihood approach can be attributed to the work of Chambers and Conway in the late 1980s and early 1990s (Chambers and Conway, 1992), although recent scholarship has drawn on other strands of development thinking including Amartya Sen’s (1985) ‘capabilities approach’ (Amekawa, 2011; Mazibuko, 2013). Over the last decades, the livelihood approach has gained ground as a key framework guiding the work of development agencies, non-governmental organisations, and academic research centres for designing, assessing and evaluating policies (Ashley and Carney, 1999). PES studies have often used a livelihood approach to examine effects (e.g. Fisher et al., 2014; Landell-Mills and Porras, 2002; Mahanty et al., 2013; Tacconi et al., 2013) based on the notion that they can “provide at least a useful checklist of possible livelihood effects of the introduction of environmental service markets” (Grieg-Gran et al., 2005: 1515).

The distinctive feature of the livelihood approach is its emphasis on assets (Amekawa, 2011), understood as “resources of stores (tangible assets), and claims and access (intangible assets), which a person or household commands and can use towards a

livelihood” (Chambers and Conway, 1992: 25). The notion here is that people use diverse types of assets to achieve livelihood outcomes and that “no single category of assets on its own is sufficient to yield all the many and varied livelihood outcomes that people seek” (DFID, 1999: 5). Thus, the ‘Sustainable Livelihoods Approach’ popularised by the Department for International Development (DFID, 1999) classifies assets under five categories:

- I. Financial: “denotes the financial resources that people use to achieve their livelihood objectives” (p. 15).
- II. Physical: “comprises the basic infrastructure and producer goods needed to support livelihoods” (p. 13).
- III. Human: “represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives” (p. 7).
- IV. Social: “social resources upon which people draw in pursuit of their livelihood objectives. It is developed through networks and connectedness, membership to more formalised groups, relationships of trust, reciprocity and exchange” (p. 9).
- V. Natural: “natural resource stocks from which resource flows and services (e.g. nutrient cycling, erosion protection) useful for livelihoods are derived” (p. 11).

Translating these ideas to the specific case of PES, Table 3 presents a list of potential socioenvironmental effects based on a review of the literature. I present this exhaustive list to exemplify the types of PES effects that can be examined with livelihood approaches, though this thesis involves specifically questions around enrolment and compliance (Chapter 4), distributional outcomes (Chapter 5), and payment spending (Chapter 6).

Table 3: Potential socioenvironmental effects of PES		
Dimension	Asset type	Effect
Human well-being	Financial	• Money inflows and cash income contribute to household economy and income stability • Payment distribution influences income inequality in the communities
	Human	• Additional income provides better access to education and health services • Programme training contributes to capacity building and skill development
	Social	• Participation reproduces power structures and/or creates rifts and tensions • Land management practices improve internal community organisation • Participation changes value systems
	Physical	• Participation improves property rights and tenure security • Additional income contribution to infrastructure at the household and community levels
Environmental	Natural	• Programme motivates participation, i.e. enrolment • Land use requirements are maintained, i.e. compliance • Land use practices change <i>statu quo</i>, i.e. ‘additionality’ • Land use activities are reduced or displaced elsewhere, i.e. ‘spillovers’ or ‘leakage’ • Land use activities are maintained once participation ends, i.e. ‘permanence’
Source: Own elaboration based on Fisher et al. (2014), Grieg-Gran et al. (2005), Landell-Mills and Porras (2002), Mahanty et al. (2013,) and Tacconi et al. (2013)		

With these considerations, I pay attention to the set of factors that potentially shape and help explain PES effects at the family, community and regional levels. As I argued in Chapter 1, an emerging body of literature has begun to shed light on how contextual and design factors shape outcomes (Börner et al., 2017; Engel, 2015). However, there has been insufficient reflection as to how these issues evolve in time and operate simultaneously at various levels. This thesis provides a novel approach to the study of PES effects, which provides insights on how outcomes emerge from the dynamic interplay between aspects of context and design operating at various temporal and spatial

scales. I propose an analytical approach drawing on two different approaches for understanding PES effects: a context-based approach and a policy design-based approach. For both approaches, I explicitly incorporate temporal and spatial dimensions to the analysis.

Firstly, a *context-based approach* that pays attention to how institutional, biophysical and policy factors shape PES outcomes. Under this approach, PES are seen as taking place in dynamic settings where multiple factors interact at various spatial scales to produce both intended and unintended social and environmental effects. Regarding institutional factors, a key notion in the field of new institutional economics is the view of institutions as the ‘rules of the game’ that constrain and structure social life (North, 1990, 1991). This includes “informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights)” (North, 1991: 97). I take from this approach the notion that formal and informal rules structure political, economic and social interactions as they pertain to PES, which, in turn, have socioenvironmental implications.

More specifically, I take from institutional analyses of PES in Mexico the complexity of the *ejido* institution in aspects pertaining to land tenure, collective decision-making and local notions of fairness and equity, and how these issues influence participation decisions, payment distribution and collective conservation activities (Corbera et al., 2007a; Kosoy et al., 2008). For this, I take as a point of departure the notion from the collective action and Common-Pool Resources (CPR) literature that there is no *a priori* reason why certain land tenure or property institutions may outperform others (Coleman, 2009; Ostrom, 1990, 2012). Thus, as suggested by PES literature drawing on insights from the literature on the commons (Gross-Camp et al., 2012; Mahanty et al., 2013; Muradian and Rival, 2012; Tacconi et al., 2013), rather than focusing on property rights

per se, I pay attention to how rule design and stakeholder involvement in PES are locally perceived, how collective action is shaped by local perceptions around fairness and legitimacy, and how this interplay produces socioenvironmental outcomes. Finally, I consider that the ‘rules of the game’ operate at various temporal and spatial scales at the same time. As such, I pay attention to how institutional factors at the family, community and regional levels coevolve with PES. This requires paying attention to two types of changes. On the one hand, institutional changes that are not caused by PES but have implications for PES. On the other hand, PES-driven institutional changes.

Regarding biophysical factors, the literature on PES has suggested that aspects to do with the natural world constrain and structure PES outcomes. Much of the discussion on the interaction between PES and the biophysical world has been framed by environmental economists on the notion of land ‘opportunity costs’ (Engel et al., 2008; Ferraro, 2008; Pagiola et al., 2005; Wunder, 2005). I take from these studies the view that biophysical factors that may not always be subject to short-term human modification, such as location, soil quality or steepness of the terrain and road accessibility, encourage or discourage participation in PES when combined with technological or other factors. Yet, I also bring here a long-term and regional perspective that pays attention to how biophysical factors evolve at various rates, how communities modify their natural world over time, and how such processes shape past, current and future PES outcomes.

Finally, regarding policy factors the literature has suggested that because PES are often part of rural development programmes there is then a need for developing local and regional institutional frameworks to cope with the complexity and diversity of PES (Muradian et al., 2010). Further, the literature on institutional ‘interplay’ suggests that individual policies such as PES may operate and evolve together with broader institutional frameworks at multiple governance levels and that such interactions are

likely to have socioenvironmental effects (Berkes, 2002; Young, 2002a, 2002b). I take from this approach the idea that policies operating simultaneously are dependent on one another at multiple temporal and spatial scales, such that their dynamic interactions have unexpected implications on their individual performance. This recognises policies not as self-contained, piecemeal and isolated interventions, but rather as interdependent, multifaceted and integrated ‘policy mixes’ or policy landscapes. Thus, from a policy interactions perspective I pay attention to how policies combine to shape decisions over land use and payment spending, how they jointly influence norms and expectations over resource use and management, and thus how they overall contribute to produce social and environmental implications.

Further, I use a *design-based approach* that considers how formal and informal PES rules shape individual and collective incentives, influence behaviour and decision-making processes, and thus ultimately determine outcomes. I take Engel’s (2015) notion rooted in behavioural economics that ‘the devil is in the detail’ of a series of PES design features, including: payment details such as amounts, mode and timing, contract length, and whether payments are given to individual or groups; as well as conditionality and targeting. Yet, I also incorporate insights from ecological economics emphasising that the shape of PES on the ground can depart significantly from theoretically envisaged and that actors give different social meanings to monetary transfers (Muradian, 2013). I thus pay attention to how PES involve both ‘official’ and subtle ‘non-official’ rules and practices, how they impose value-laden narratives and discourses, and how actors interpret and understand monetary transfers. Overall, I examine issues of policy design from a dynamic and spatial point of view paying attention to how rules change and operate at different scales.

This is the general approach used in this thesis. Each empirical chapter pays attention to specific aspects at the interface between context and design as they pertain to land use decisions (Chapter 4), community payment distribution (Chapter 5), and policy interactions (Chapter 6). Overall, the approach used here lies at the boundary between the so-called ‘environmental economics’ and ‘ecological economics’ perspectives to PES (Tacconi, 2012). On the one hand, the focus on aspects of PES design and how they shape behaviour falls in line with the environmental economist who seeks to objectify, generalise and quantify the facts to create models. On the other hand, the attention paid to the broader institutional, biophysical and policy context where PES operate align with the ecological economist who also keeps a positivist framework but otherwise tries to tune in local understandings, with all their subjectivity and partiality. My aim is to show that combining disciplines and perspectives, when managed carefully, can become creative and provide a source of revealing insights.

3.3. Research design and methods

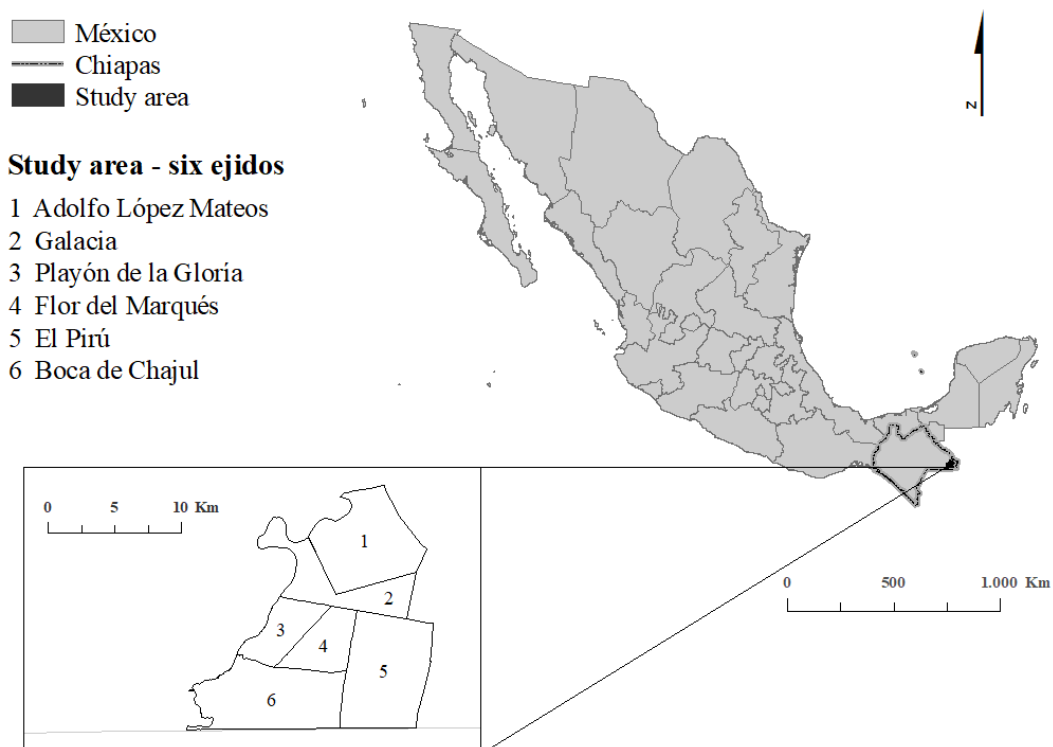
As noted in the previous sections, this thesis adopts a dynamic and multi-level approach concerned with understanding how PES outcomes at the family, community and regional levels are shaped by factors of context and policy design. I justified the choice of the region as the broader unit of analysis under the assumption that this level encompasses a great deal of aspects and processes as they pertain to PES. In terms of data sources, I identified three main groups of actors: participating families and communities, Natura Mexicana as the PES intermediary, as well as local and regional government officials from CONAFOR and other ministries. This section presents the case studies and a discussion of research design, methods and limitations.

3.3.1. The case studies

The empirical chapters, i.e. Chapter 4 to 6, in this thesis focus on a region of six *ejidos* located in the southwest of MdC: Playón de la Gloria, Flor del Marqués, El Pirú, Boca de Chajul, Galacia and Adolfo López Mateos (Figure 3; see also, Figure 2). These *ejidos* are contiguous to one another, have small populations, with most of the families engaging in agriculture and ranching activities. In addition, they have participated in PES since 2007 with Natura Mexicana as the PES intermediary. Table 4 shows the number of hectares enrolled in each contract in all the *ejidos* of MdC, including those in the study area and elsewhere. All PES contract have been five-year long and Table 4 shows that *ejidos* in MdC have participated as the sellers or different types of ‘environmental services’ under various PES schemes.

Below, I present a few clarifying notes on land institutions and then proceed to provide background information on each of the *ejidos*. In the following section, I discuss the motivations for case study selection. Most of the information provided below was collected during fieldwork.

Figure 3: Map of the study area



Source: Own elaboration

The first thing to emphasise about land institutions in the study area is their diversity. While risking simplification, for the purposes of the analysis here I distinguish three different ‘types’ of lands across the case studies (see Appendix A): ‘individual’ parcels, ‘communal’ lands, and ‘*ejido*’ lands. These terms are used locally and mean similar things for people in all the case studies here in terms of their ‘bundles of rights’, e.g. rights of access, management and exclusion (Corbera et al., 2011). ‘Individual’ parcels are generally well-defined land plots that are managed mostly by individual *ejidatarios* but also on occasion by groups of people. Individual parcel holders are generally free to decide over land use, including participation in PES, but are required to consult the *ejido* assembly for sales and rentals. ‘Communal’ lands are mostly large forested lands collectively managed by the *ejido* assembly. Their ‘ownership’ is collective but not

necessarily all *ejidatarios* have claims over these lands. Participation in PES is decided collectively regarding communal lands. Finally, ‘*ejido*’ parcels or lands (*parcelas ejidales*) are small land plots, usually located close to the urban areas, earmarked for some specific purpose and managed by the *ejido* assembly. The purpose of these lands can be inferred by their local names. For instance, ‘School’ (Escolar) lands are reserved for schooling purposes such as setting up school facilities or projects; ‘Women’ (Mujeres) and ‘Young People’ (Jóvenes) parcels are reserved for productive activities for women and young people, respectively. In the study area, ‘*ejido*’ lands often remain forested since they have been unused, and as such are eligible for enrolment in PES.

A second thing to note is that there is often a mismatch between official land classifications and the reality of land ownership. In the case studies, lands officially classified as ‘communal’ are often considered locally as individual parcels despite strict prohibition by the Mexican Constitution to distribute communal lands as well as forested lands among individuals. The way in which the case studies have historically distributed communal lands has been through parcelling processes. Parcelling of communal lands involves establishing well-defined boundaries or limits over specific plots and awarding individual land use rights to whoever is recognised as the parcel owner. When land is parcelled, owners receive exclusive rights for land use decisions but still have to consult the assembly for sells and rentals. In other words, ‘communal’ lands that have been parcelled are treated as ‘individual’ parcels. Thus, when a distinction is required, I will use the term ‘official’ to refer to how lands are formally classified by the National Agrarian Registry (RAN), while I will use the term *de facto* to refer to how people manage lands locally.

Table 4: PES contracts in the study area (ha)						
<i>Ejido</i> (total <i>ejido</i> surface)	PSA-B (cumulative ha)¹		PESL (cumulative ha)¹			
	2008- 2012	2009- 2013	2010- 2014	2013- 2017	2014- 2018	2015- 2019
Flor del Marqués (1784)		672 (672)			659 (659)	
El Pirú (4984)		1231 (1231)	1037 (2268)	656 (2924)	1112 (2805)	221 (1989)
Boca de Chajul (4408)	1071 (1071)	239 (1310)	562 (1872)	988 (1789)		610 (1598)
Galacia (2824)	1058 (1058)	200 (1258)		1,301 (1501)	186 (1487)	
Adolfo López Mateos (4360)		733 (733)	1153 (1886)		693 (1846)	1,105 (1798)
Playón de la Gloria (1700)	252 (252)		58 (310)	432 (490)		
Source: Own elaboration with data collected from Natura Mexicana and CONAFOR online databases (http://www.conafor.gob.mx) Note: 1) Figures in parenthesis indicate total number of hectares enrolled in each <i>ejido</i> from any PES contract at the time. All contracts have been five-years long						

3.3.1.1. Boca de Chajul

First settlements in *ejido* Boca de Chajul date back to the early 1970s when families from the states of Chiapas, Guerrero, State of Mexico, Tabasco and Michoacán moved into the area (see also, De Vos, 1988b). The *ejido* was constituted in 1976. A group of 118 *ejidatarios* received a presidential land endowment in 1982 and an extension in 1984 for 3,810 hectares. Each *ejidatario* received 30 hectares of individual parcels and ~250 hectares were set aside for ‘*ejido*’ and communal lands. When PROCEDDE was enacted in the late 1990s and early 2000s, the *ejido* grew to 4,838 hectares and the number of *ejidatarios* to 156. Though strictly prohibited by Mexican regulation, *ejidatarios* managed to acquire individual titles on forest-covered lands. Internal arrangements stipulated that the ~250 hectares ‘*ejido*’ and communal lands would belong equally to all 156 *ejidatarios* but that new settlers would not receive further claims to these lands. By

the time of the *ejido*'s first enrolment in PES in 2008, the number of *ejidatarios* had grown to 179 and the *ejido* had a population of around 346 people.

Boca de Chajul participated in five PES contracts from 2008-2015. The first PSA-B contract in 2009 included 1071 ha, representing 24.3% of the total 4408 ha *ejido* surface. The 2008 PSA-B included 155 ha of communal lands internally parcelled managed by four *ejidatarios*, 252 ha of '*ejido*' lands, and the rest were individual parcels from 45 out of 179 *ejidatarios*. Further applications were sent to PSA-B in 2009 and to PESL 2010 such that during 2010-2012 the *ejido* participated in three PES contracts simultaneously with a total cumulative surface of 1872 ha, representing 42.5% of the total *ejido* surface. Once the PSA-B from 2008 concluded, the *ejido* reapplied to the PESL 2013 with a similar surface. The same applied for the PESL contract from 2010 under the PESL in 2015.

3.3.1.2. Galacia

Galacia was first settled in the early 1970s by three extended families from the municipalities of Frontera Comalapa, La Concordia and Bellavista from the state of Chiapas. The *ejido* was constituted in 1975 with a total extension of 2,824 hectares endowed among a group of 50 *ejidatarios* each receiving 50 hectares of individual parcels. From early on, the *ejidatarios* agreed to leave forests reserve areas but still undertook extensive efforts to measure and parcel all the land internally. *Ejidatarios* were very interested in knowing exactly what belonged to whom. Land grabbing was widespread at the time, even among relatives, and people believed that parcelling would help reduce land related conflicts and provide land security. When PROCEDE was put in place in the late 1990s and early 2000s, land was classified as individual parcels, '*ejido*' parcels and communal land. In reality, however, the entire surface in the *ejido* was considered individual parcels. As in Boca de Chajul, *ejidatarios* in Galacia acquired

individual titles on forests lands. By the time of enrolment in PES in 2008, Galacia had 53 *ejidatarios* and a population of around 152 people.

Galacia participated in four PES contracts from 2008-2015. The first PSA-B contract in 2008 included 1071 ha, representing 37.9% of the total 2824 ha *ejido* surface. The 2008 PSA-B included 18.8 ha of '*ejido*' lands, and the rest were individual parcels. A further application was sent to PSA-B in 2009 such that during 2009-2012 the *ejido* participated in two PES contracts simultaneously with a total cumulative surface of 1258 ha, representing 44.5% of the total *ejido* surface. Once the PSA-B from 2008 concluded, the *ejido* reapplied to the PESL 2013 with a similar surface in addition to new parcels. The same applied for the PSA-B contract from 2009 under the PESL in 2014.

3.3.1.3. Playón de la Gloria

Playón de la Gloria was first settled in the early 1970s by families from the states of Chiapas and Oaxaca. The first families had originally planned to occupy the lands that would then become the *ejido* of Galacia because the terrain is flatter. However, Galacia families managed to acquire legal paperwork before. Playón de la Gloria was constituted in 1974 with an extension of 1,739 hectares distributed among 49 *ejidatarios*. Each *ejidatario* received an endowment of 28 hectares and around 300 hectares were classified as communal lands. When PROCEDURE took place in the late 1990s, *ejidatarios* chose to parcel the communal lands such that everyone could 'complete' an endowment of 33 hectares. Thus, except for a couple of small communal parcels, the entire *ejido* surface had been distributed to individual landowners by the 2000s. As in other ejidos, *ejidatarios* in Playón de la Gloria managed to acquire paperwork on forest-covered lands. By 2008, the number of *ejidatarios* was 49 and the population was approximately 209.

Playón de la Gloria participated in three PES contracts from 2008-2015. The first PSA-B contract in 2008 included 252 ha, representing 14.8% of the total 1700 ha *ejido* surface.

All the surface in the 2008 PSA-B was distributed as individual parcels. A further application was sent to PESL in 2010 such that during 2010-2012 the *ejido* participated in two PES contracts simultaneously with a total cumulative surface of 310 ha, representing 18.2% of the total *ejido* surface. Once the PSA-B from 2008 concluded, the *ejido* reapplied to the PESL 2013 with a similar surface as well as new individual parcels and ‘*ejido*’ lands.

3.3.1.4. Flor del Marqués

Families from the states of Chiapas, Oaxaca and Veracruz first settled Flor del Marqués in the early 1980s. The *ejido* was constituted in 1984⁴¹ totalling 1,784 hectares among a group of 27 *ejidatarios*. The *ejidatarios* arranged to measure and parcel 20 hectares each but decided to leave aside ~400 hectares as a communal forest area. When PROCEDE came in place in the early 2000s, the entire *ejido* surface was classified as communal land. *Ejidatarios* did not manage to receive individual parcel titles as elsewhere in MdC, seemingly because the *ejido* was mostly forest covered and staff from the National Agrarian Registry (RAN) had got into trouble for extending individual titles on forestlands in other *ejidos*. A group of 25 *ejidatarios* received communal land titles stating proportional ownership of the total *ejido* surface. This group of *ejidatarios*, locally known as *básicos*⁴², was composed primarily by founding settlers but also included newer settlers living in the area at the time of PROCEDE. Though PROCEDE classified the entire surface as communal lands, *ejidatarios* had already diverse forms of land classifications: individual parcels, ‘*ejido*’ lands and communal lands. The area in communal lands was considered henceforth to belong in equal proportion to each of the 25 *básicos*. It was agreed that new settlers could purchase specific segments from

⁴¹ The *ejido* received its presidential resolution in 1987.

⁴² In allusion to the ‘basic folder’ (*carpeta básica*), the official *ejido* land documentation. I will say more about the *básicos* in Chapter 5.

communal lands and that the payment would be distributed among *básicos* but that new settlers would not receive claims to the rest of communal lands. By 2009, the total number of *ejidatarios* was 35 and the population was approximately 159.

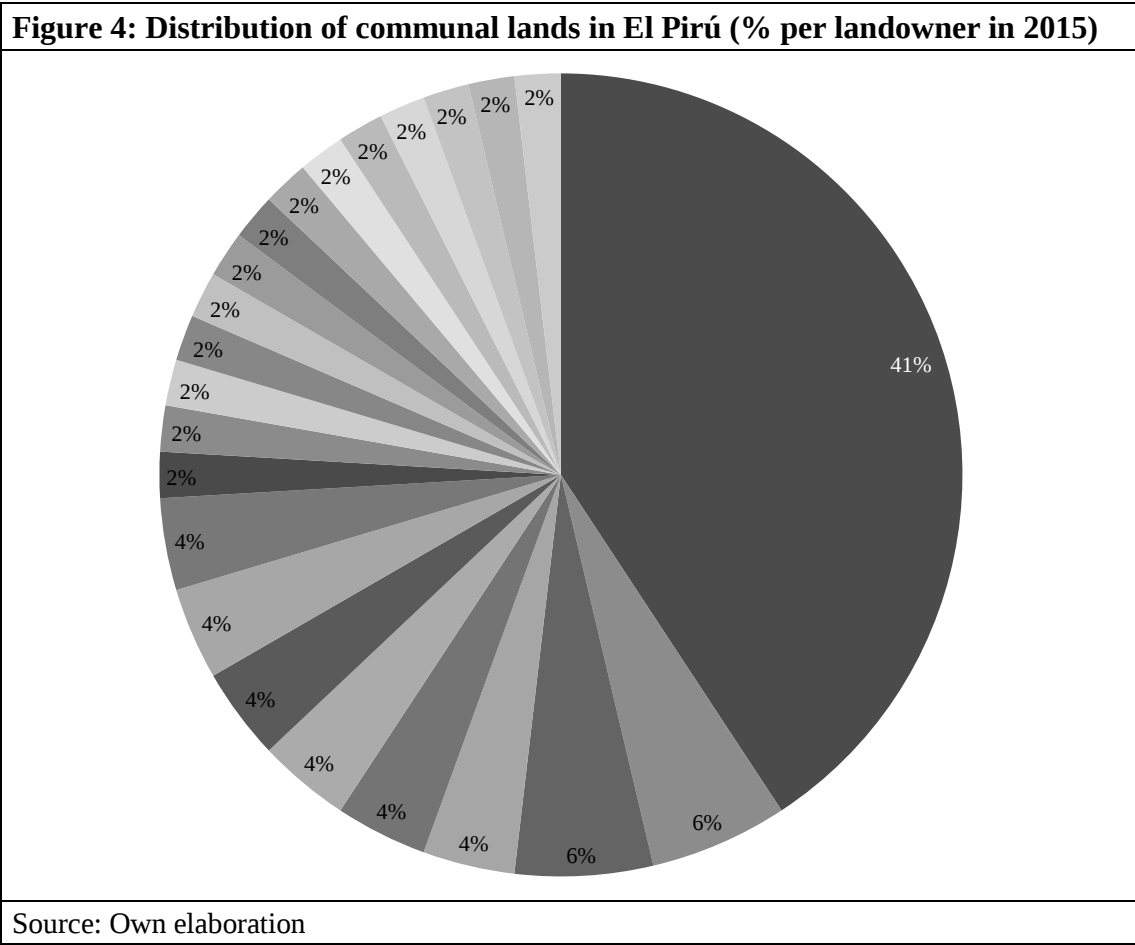
Flor del Marqués participated in two PES contracts from 2009-2015. The first PSA-B contract in 2009 included 672 ha, representing 37.7% of the total 1784 ha *ejido* surface. The 2009 PSA-B contract included 284 ha of lands internally considered as individual parcels, 19 ha of ‘*ejido*’ lands, and the rest were communal lands. The *ejido* reapplied to the PESL in 2014 once the 2009 PSA-B contract concluded with 672 ha.

3.3.1.5. El Pirú

Families from several states across Mexico, including the State of Mexico, first settled El Pirú in the 1970s. A group of 29 *ejidatarios* received land by presidential decree in 1980 but most of these families never showed up or soon left. Over time, newer settlers from Chiapas, Guerrero, Oaxaca and Michoacán began settling the area without documentation. After several years of land-related conflict between founding and newer settlers, the former eventually left (see also, De Vos, 1988b). It was until PROCEDE in the late 1990s when *ejidatarios* were awarded property titles in an extension totalling 4,984 hectares. A group of 54 *ejidatarios* each received an individual parcel endowment of 50 hectares and the remaining forests were classified as ‘*ejido*’ or communal lands. Since PROCEDE, it was decided that communal lands would remain not parcelled, that each of the 54 *ejidatarios* would own an equal share and that new *ejidatarios* would not receive further claims. During the 2000s, there was an active informal market for rights to communal land with important consequences over land inequality. As shown in Figure 4, by 2015 the initial group of 54 communal right holders had been reduced to 22. One single *ejidatario* held rights to more than 40% of all communal lands in 2015,

representing a total of 598 hectares. By 2009, the total number of *ejidatarios* had increased to 60 and the population was approximately 178.

El Pirú participated in five PES contracts from 2009-2015. The first PSA-B contract in 2009 included 1231 ha, representing 24.7% of the total 4984 ha *ejido* surface. The 2009 PSA-B included 721 ha individual parcels from 18 *ejidatarios*, 31 ha from a group parcel belonging to 16 *ejidatarios*, 69 ha of ‘*ejido*’ lands, and the rest were communal lands. Further applications were sent to PESL in 2010 and 2011 such that during 2010-2013 the *ejido* participated in three PES contracts simultaneously with a total cumulative surface of 2924 ha, representing 58.7% of the total *ejido* surface. Once the PSA-B from 2009 concluded, the *ejido* reapplied to the PESL 2014 with a similar surface except for some parcels. The *ejido* applied for the PESL in 2015 with a surface of 221 ha.



3.3.1.6. Adolfo López Mateos

Families from the states of Chiapas and Oaxaca settled in Adolfo López Mateos in the 1970s. The *ejido* was constituted in 1979 with an extension of 3,012 hectares distributed among 54 *ejidatarios* each receiving an endowment of approximately 50 hectares and the remaining being classified as communal lands. *Ejidatarios* internally chose to parcel all the *ejido* lands on the basis that having communal lands could create disputes over land tenure. In the 2000s, the *ejido* received an extension of approximately 800 hectares internally referred to as the ‘surplus’ (*la demasía*) which were considered as communal lands belonging equally among 47 *ejidatarios*. By the time PES took place in 2009, the *ejido* had 45 *ejidatarios* and a population of approximately 266.

Adolfo López Mateos participated in four PES contracts from 2009-2015. The first PSA-B contract in 2009 included 733 ha, representing 16.8% of the total 4360 ha *ejido* surface. Except for an ‘*ejido*’ parcel of 25 ha, all the surface in the 2009 PSA-B was distributed as individual parcels. A further application was sent to PESL in 2010 such that during 2010-2013 the *ejido* participated in two PES contracts simultaneously with a total cumulative surface of 1886 ha, representing 43.2% of the total *ejido* surface. Once the PSA-B from 2009 concluded, the *ejido* reapplied to the PESL 2014 with a similar surface. The same applied for the PESL contract from 2010 under the PESL in 2015.

3.3.2. Case selection

The selection of these six *ejidos* responded to two types of considerations: methodological and practical convenience. The selection criteria used here were influenced both by information that I had prior to fieldwork as well as by evidence during the research process. Before conducting fieldwork from 2013 to 2017 in MdC, I had worked intermittently with Natura Mexicana since 2010. I recognise that this raises questions of positionality so I will discuss these issues in the following section. Before fieldwork, I

was aware of the PES programme and that Natura Mexicana was the intermediary. However, my work at this time was mostly about examining the financial profitability of the community ecotourism projects that Natura Mexicana was supporting in MdC. Working in MdC prior to fieldwork gave me an initial understanding on some of the main differences and similarities in the *ejidos* on general terms, and also specifically as they could potentially pertain to PES. Though my pre-fieldwork experience in MdC influenced some of my case study choices, I subsequently refined selection criteria during the fieldwork process.

A first set of criteria for case study selection were geographical. The original motivation for choosing a region of neighbouring *ejidos* was the notion that some PES dynamics are likely to take place between neighbours. During fieldwork I confirmed that *ejidos* contiguous to one another not only share physical boundaries, but also government services, kinship ties, commercial activities and many other aspects of community life. These issues were particularly relevant when examining policy interactions in Chapter 6. Another early geographical consideration was whether *ejidos* were located in the riverbank of the Lacantún or were landlocked. I chose four of the *ejidos* in the riverbank of the Lacantún (Boca de Chajul, Playón la Gloria, Galacia and Adolfo López Mateos) and two landlocked (Flor del Marqués and El Pirú). The motivation behind this was to select *ejidos* with variations in biophysical factors. I was aware that settlement in MdC took place in different waves, with early settlers choosing riverbank lands because they are considered more productive and of easier accessibility than landlocked terrains. These issues proved to be important when examining land opportunity costs and enrolment decisions in Chapter 4.

A second set of criteria pertained to the experience of *ejidos* with PES. Overall, my intention was to choose *ejidos* that had engaged with PES in ‘similar’ circumstances. I

chose the six *ejidos* as they all had Natura Mexicana as the intermediary or ‘technical advisor’ from the beginning, had participated in PES during similar periods (Table 4) and had experienced the same rules, and their changes, from CONAFOR simultaneously. The motivation for choosing *ejidos* with similar experiences in PES was that this would allow making more valid comparisons between the *ejidos*. During fieldwork, I learnt that despite these initial similarities, the experience of PES was very different between *ejidos*, as well as within families in each *ejido*, on issues such as property rights, payment distribution and access to government services.

A third and final set of criteria for case selection was about data convenience and practicality. Chajul station where Natura Mexicana operates and where I resided during fieldwork is located facing Boca de Chajul on the other side of the Lacantún River. Given the location of the station, it was easier in terms of transport and accessibility to select the six *ejidos* in the study area rather than other *ejidos* farther away in MdC or in other municipalities. The issue of practicality was particularly important as I sought to spend a lot of time interviewing informants or attending PES meetings in the study area in order to better capture their perspectives. Another consideration was the fact that Natura Mexicana had more experience and better-quality information on the *ejidos* in the study area than elsewhere. Precisely because of ease of access to the study area vis-à-vis other *ejidos* in MdC, Natura Mexicana had been working for longer in the six *ejidos* on PES as well as other conservation-related activities. As such, the organisation had longer-term and better-quality ‘hard’ information such as family participation in PES and satellite analyses, as well as ‘soft’ information such as on the ground politics and historical processes. Throughout this research, staff at Natura Mexicana were a valuable source of information and insights.

Overall, these selection criteria were guided by three research design principles commonly used when conducting qualitative analysis and when research seeks to identify causal mechanisms and establish associations between policies and their effects. Firstly, I used a comparative case study approach. Case study analyses have been defined as “the intensive study of a single case where the purpose of that study is – at least in part – to shed light on a larger class of cases (a population)” (Gerring, 2007: 20). This approach was useful for this study as I aimed to uncover “new or omitted variables, hypotheses, causal paths, causal mechanisms, types, or interaction effects” (George and Bennett, 2005: 109). Comparative analysis between families and communities first involved inductively identifying common themes and patterns in the data and subsequently linking these themes to theoretical models to provide explanations for why certain outcomes emerge (e.g. Ryan and Bernard, 2003). For this, I drew on the concepts of ‘equifinality’ or ‘multiple causation’, which can be understood as the idea that similar outcomes may appear under multiple paths (e.g. Mahoney and Goertz, 2006). It is important to note here that none of the chapters in this thesis engage with social or environmental ‘counterfactual’ questions, i.e. what would have happened if PES were not in place, as is common in quantitative research. Rather, the chapters here sought to explore qualitatively why certain outcomes and processes emerged and to develop theories to explain them. I will say more about these issues below and as they pertain specifically to questions in Chapters 4 to 6, though one example of the type of analysis conducted in this thesis is warranted here for clarification. In Chapter 5, I sought to explain why communities distributed PES money in certain ways. A common theme emerging during interviews was that distributional outcomes were associated with the types of claims that individuals or groups had over different ‘types’ of lands. Having identified land ‘type’ as a possible explanation for distributional outcomes, I then linked this finding to the literature on

property rights and land tenure. This helped to provide a consistent theoretical explanation to my empirical findings.

Secondly, I selected informants to ‘capture heterogeneity’ in PES experiences. For this, I sought depth and detail in information by “going after the parts, the items in a list, the particulars” and “asking about distinct points of view while learning enough of the history or context to be able to put together separate pieces” (Rubin and Rubin, 2005: 129-130). Throughout this thesis, I ‘sampled for range’ and selected informants based on a set of criteria relevant to the analysis in each chapter using ‘non-random’ or ‘purposeful’ sampling methods (Guest et al., 2006; Small, 2009). In qualitative research, non-random methods have been seen as useful if the purpose of research is to develop causal explanations or to generate theories, as opposed to random methods that serve to test existing theories on a representative sample (Mosley, 2013). As such, I paid special emphasis on choosing ‘outliers’ or ‘atypical’ cases under the view that these help for theory development.

Finally, the data collection process was guided by the principle of ‘data saturation’. This principle is considered the ‘gold standard’ for qualitative studies and occurs “when all of the main variations of the phenomenon have been identified and incorporated into the emerging theory” (Guest et al., 2006: 65). This guiding principle has two implications over sample size requirements. On the one hand, sample size is unknown before the research is conducted since it depends on the empirical information to be examined. Further, there is no minimum sample size since this depends on the quality of the information and not the number of observations (Sandelowski, 1995: 179). This stands in contrast with quantitative studies where sample requirements are calculated based on the extent of heterogeneity and the strength of claims depends on the number of data units. Thus, saturation is interrelated with capturing heterogeneity “as in any kind of sampling,

the more variability there is within the confines of a qualitative project, the more numbers of sampling units the researcher will require to reach informational redundancy or theoretical saturation” (Sandelowski, 1995: 181).

While I kept the entire study area as the wider level of analysis throughout this thesis, some of the qualitative analysis in Chapters 4 to 6 concerned only a subset of the six *ejidos*. In Chapter 4, I undertook geospatial analysis in all the *ejidos* but conducted qualitative research to explain family land use decisions in Playón de la Gloria, Flor del Marqués and El Pirú. In Chapter 5, I gathered insights from community payment distribution in the entire region but conducted qualitative research to provide an explanation for such distributions in Boca de Chajul, Galacia, Flor del Marqués and El Pirú. In Chapter 6, I examined policy interactions at the regional level in the study area but conducted qualitative research to examine how individual families deal with multiple cash transfers in Playón de la Gloria, Galacia, Flor del Marqués and El Pirú.

I justify the focus on a subset of the case studies for qualitative analysis in Chapters 4 to 6 on the basis of the research design principles of ‘capturing heterogeneity’ and ‘data saturation’ described above. I proceed to describe the general logic of the two-step inductive approach for case selection that I used throughout my fieldwork. Overall, the idea of these two steps was to select a cohort of *ejidos* that would capture most of the heterogeneity in the region so that, because of data saturation, it would not be necessary to conduct qualitative research in all the *ejidos*. I will say more about the specific criteria for case selection in each individual chapter.

In a first step, for each chapter I made an initial case study selection to account for variations in the outcomes of interest. This initial case study selection was based on theoretical insights from the PES literature as well as on empirical material collected in 2013 as part of my MPhil thesis (see Section 3.3.3). For example, for Chapter 5 I had a

preliminary understanding of the different ways, i.e. combinations of cash and investments, in which *ejidos* chose to distribute the money from PES. Thus, I selected a cohort of *ejidos* for qualitative research that would include all the different ‘types’ of distributional outcomes.

Once I had made this initial case study selection, a second step consisted of collecting qualitative evidence in iterations of fieldwork periods conducted one *ejido* at a time. The logic of this iterative process of data collection was that the empirical evidence gathered after each fieldwork iteration would provide valuable information to inform, and potentially re-assess, my initial hypothesis about case selection. Thus, I used the evidence collected during each fieldwork iteration in each *ejido* to guide subsequent research collection and to define my case selection for each chapter. For instance, for Chapter 4 I first conducted qualitative research in Flor del Marqués. This provided me with insights that I used subsequently when conducting research in El Pirú and finally in Playón de la Gloria.

I repeated these two steps until I considered that data saturation had been achieved for Chapters 4 to 6. This explains why I did not conduct qualitative research in all the *ejidos* nor among all the families within each *ejido*. In Chapter 4, for instance, I had originally considered conducting research among four *ejidos* but realised by the third *ejido* that I was not receiving further insights as to how people made land use choices. Though undertaking qualitative research among all *ejidos* would have been feasible for Chapters 4 to 6, I strongly believe that the qualitative research conducted throughout this thesis captured most of the relevant insights on the outcomes of interest.

3.3.3. Data collection

Fieldwork was conducted during various field trips to MdC between 2013 and 2017. During this time at MdC, I resided at Chajul station where Natura Mexicana operates its

activities and commuted to the *ejidos* to gather information using a vehicle from the organisation. Overall, I collected an innovative data set consisting of a combination of interviews, geospatial data, socioeconomic data and participatory observation. These variegated data sources respond to the interest in this thesis in capturing local perspectives and adopting a multidisciplinary approach for the study of the socioenvironmental effects of PES. In the end, the innovation of this data set is that it helps to bridge different bodies of literature and methods, from those commonly used in environmental economics and behavioural economics, to those in ecological economics and collective action scholarship, and finally, to a lesser extent, to more anthropological and sociological oriented frameworks.

I chose semi-structured interviews as the primary data collection method because they are well equipped to provide insights and identify causal mechanisms that are less evident in other forms of data (Mosley, 2013). In line with the objective of this research to bring to the fore the voice of local stakeholders, I spent a lot of time conducting interviews. During fieldwork, I conducted a total of 166 interviews among families in the study area with each lasting about one hour (Table 5). Most of the interviews were conducted with families living in the six *ejidos* in the study area. These interviews were mostly conducted at their homes, frequently in their porches or footsteps of their houses. Often, I re-interviewed informants to gather different types of information as they pertained to the specific topics on each chapter, to clarify inconsistencies, and to trace the evolution of people's experience with PES. In the previous section I have described and justified the general case study selection approach used throughout this thesis, and in particular why some of the analysis concerned only a subset of the six *ejidos* in the study area.

Besides interviews among families in the study area, I conducted an additional 89 interviews distributed as follows: 43 interviews among families in other *ejidos* in MdC,

including La Corona, La Victoria, Reforma Agraria, San Isidro, San Lázaro, Emiliano Zapata and Pico de Oro; 10 among local teachers working in MdC; 6 among local medics and nurses working in health clinics in MdC; 14 among *promotoras* or *vocales*⁴³ of the Conditional Cash Transfer (CCT) Prospera (formerly PROGRESA and Oportunidades) in MdC; 7 interviews among the two PES intermediaries working in MdC, including 5 interviews with the director and other staff from Natura Mexicana, and 2 interviews with the director and other staff from Cooperativa AMBIO; 4 interviews among staff from CONAFOR in the regional office in Tuxtla Gutiérrez; 3 interviews among staff from the Ministry of Health (SALUD) in the regional office in Palenque; one interview with the director of the Social Development (SEDESOL) regional office in Palenque; and one interview with an academic based in Mexico City who focuses her work on CCT. Thus, a total of 255 interviews were conducted for this research.

Though I will say more about the specific selection criteria for informants and the nature and goals of interviews in each chapter of this thesis, a few points are worth emphasising here. Interviews in Chapter 4 focused on why families chose to enrol certain lands to PES and their forest management practices on both enrolled and non-enrolled lands. Interviews in Chapter 5 paid attention to why communities chose to distribute PES money in certain ways and why distributional outcomes change over time. Interviews in Chapter 6 focused on how families and communities manage payments from PES and CCT simultaneously and how they choose to spend the money.

The data collection from Chapters 4 to 6 built upon evidence that I collected during 2013 as part of my MPhil thesis in Development Studies at the University of Oxford submitted

⁴³ *Promotoras* or *vocales* are CCT beneficiaries who “have been selected by their fellow beneficiaries to voluntarily serve as liaisons between themselves and PROGRESA’s personnel, providing beneficiaries with information on how the program works, when transfers will arrive, and identifying operational problems” (Adato et al., 2000: 8).

in 2014 and titled ‘Payments for Environmental Services in Marqués de Comillas, Lacandona Rainforest: Impact and Implications on Human Well-Being and the Environment’. In the MPhil thesis, I examined the following questions: are win-win outcomes from PES possible? If so, under what circumstances are they likely to appear? For this, I used a livelihood approach examining mostly social effects and I conducted research among twelve *ejidos* in MdC. This included the six *ejidos* examined in the current thesis as well as another six *ejidos*, some of which engaged with PES with Cooperativa AMBIO as their intermediary. I presented two main findings in the MPhil thesis. Firstly, the existence of heterogeneous effects between *ejidos* as well as within people in each *ejido*. Further, I showed that these different effects were explained by two main factors. On the one hand, whether PES involved the enrolment of lands held individually or communally. On the other hand, the different roles played by PES intermediaries in reducing transaction costs, facilitating informational exchange, and enabling participation in PES.

The current thesis builds on some of the ideas and previous field observations of the MPhil thesis but it differs from it in significant ways. Firstly, I chose to focus on a smaller region of *ejidos* in MdC. This allowed me to go much more into depth into each of the *ejidos* examined in the current thesis, especially regarding their historical colonisation processes. Further, I focused on different types of questions as they pertain to PES. While the MPhil thesis was about asking whether PES could achieve win-win outcomes, the current thesis focused on the role of PES in the livelihoods of participating families and communities regarding multiple land uses (Chapter 4), community payment distribution (Chapter 5), and ways of combining policies (Chapter 6). Thus, in the end, most of the evidence presented in this thesis for Chapters 4 to 6 was collected after the MPhil (see Table 5). Although I did not use most of the evidence from the MPhil in this thesis, the

insights gathered during this previous time were very helpful for guiding the current research.

Table 5: Interviews conducted among families in the study area					
Ejido	MPhil thesis	Chapter 4	Chapter 5	Chapter 6	Total
Boca de Chajul	11	-	2	-	13
El Pirú	7	10	3	11	31
Adolfo López Mateos	10	-	1	5	16
Flor del Marqués	10	15	3	11	39
Galacia	9	-	3	20	32
Playón de la Gloria	9	14	3	9	35
Total	56	39	15	56	166
Source: Own elaboration					

Apart from interviews, I collected geospatial data from Natura Mexicana that I used in Chapter 4. With the help of two research assistants from Natura Mexicana, I constructed a geospatial database including every individual parcel, enrolled to PES and non-enrolled to PES, managed by the group of families participating in the first PES contract in each *ejido* in the study area. The purpose of this database was to identify land property, both enrolled and non-enrolled to PES, to be able to examine forest cover loss during the PES contracts. I analysed this geospatial information using the high-resolution Google Earth Engine tool (Hansen et al., 2013a, 2013b) and validated the accuracy of this technology qualitatively. I subsequently validated this information during follow-up interviews with participating families.

In the case of Galacia, I could only collect data on enrolled parcels because Natura Mexicana had not previously geopositioned non-enrolled parcels as in the rest of the *ejidos* in the study area. This data limitation was caused by the fact that Galacia authorities chose not to participate in a community spatial planning programme as described in GAIA and Natura Mexicana (2012). In other words, Natura Mexicana did not have geospatial

information on the distribution of non-enrolled parcels in Galacia and therefore I could not construct a dataset of enrolled and non-enrolled parcels among participants. Obtaining this dataset for this study was unfeasible as it would have required mapping each parcel on foot using Global Positioning System (GPS) technology.

In addition, I collected socioeconomic, PES-related and CCT-related data on families and communities in the study area from several second-hand sources. I collected official PES data online from CONAFOR. This included information from accepted and rejected applications by individual and communities and their corresponding land amounts and total payments for all PES programmes from 2003-2016. I collected additional enrolment and socioeconomic data from Natura Mexicana. This included reports submitted to CONAFOR and applicant details in terms of land surfaces and payments distributed for families and *ejidos* in the study area from 2007-2016. This information served to complement the official data from CONAFOR with more precise ‘unofficial’ on the ground information. Further, I used survey data from a study by GAIA and Natura Mexicana (2012) which included information on sources of income, including PES, for people in the study area except for Galacia due to the reasons described above. For Chapter 6, I collected CCT data from SEDESOL online databases. This information included disbursed amounts at the *ejido* level and total number of beneficiaries. Since these SEDESOL online databases were aggregated at the *ejido* level, I travelled to the city of Palenque to gather disaggregated information from SALUD and SEDESOL. Thus, I obtained historical information at the family level, including amounts disbursed, household members, year, enrolment, or withdrawal. This allowed me to construct a database of amounts received by PES and CCT by each family and thus examine joint spending decisions.

Finally, on few occasions I used participatory observation methods to complement interviews and other types of data. In general, this method commonly used in anthropological studies can be understood as the process of learning about the people under study observing and participating in their normal life activities (Kawulich, 2005). I attended one *ejido* assembly in Boca de Chajul to observe how people made decisions over how to spend PES money and how to deal with collective monitoring activities. I also joined an informational PES meeting held by CONAFOR in Nueva Orizaba to see how CONAFOR and *ejido* authorities engaged with each other. Further, I attended a CCT health check-up in Playón de la Gloria to observe how the nurse from Boca de Chajul enforces conditionality on beneficiaries. Finally, I watched how CCT beneficiaries in Playón de la Gloria decide how to assign collective duties among each other. Overall, this method provided me with insights as to how rules and decisions are frequently negotiated among families, as well as between communities and the staff operating PES and CCT on the ground.

This research was conducted in conformance with ethics guidelines at the University of Oxford and received approval from the Central University Research Ethics Committee (CUREC). Overall, this involved considerations over informed consent and informant protection in terms of well-being and confidentiality. Firstly, I personally conducted all the data gathering in Spanish and exclusively among adult individuals from whom I received oral informed consent to collect data and audio-record interviews. This involved providing an explanation to informants on what this research was about and their role within it, explaining why they were chosen for data collection and how I would manage their data, and emphasising that their participation in the research was strictly voluntary. Further, since most data collection was conducted in the private homes of informants, I paid attention to times and spaces considered locally appropriate when collecting the data.

For women, this involved conducting interviews in visible locations outside their homes to avoid potential misinterpretations or conflicts with husbands or other people. For men, this involved conducting interviews during the afternoons to avoid interfering with farm activities. Although this research did not openly explore information of a sensitive nature, I did receive information relating to conflicts, traumas and other delicate issues at the individual, family and community levels. This was particularly the case when asking elderly informants about the historical colonisation process in MdC. In general, I found that most informants saw the data collection process as an opportunity to talk lengthily about their history, their current lives and their aspirations for the future. In the end, only two individuals preferred not to participate in the study: one adult woman from El Pirú and one adult man from Flor del Marqués. Moreover, I protected the confidentiality of informants by maintaining exclusive access to the data during fieldwork and by anonymising information from individuals and families during the writing up. At times, this involved not sharing potentially sensitive information with Natura Mexicana. Finally, I also protected the confidentiality of informants during the interview transcribing processes and data analysis. I transcribed all the interviews myself to Word and Excel documents in their original Spanish to which I kept exclusive access. As described in Ryan and Bernard (2004), I analysed qualitative data by exploring the different themes emerging in the data, building hierarchies on these themes, and finally linking them to theoretical models or predictions.

To summarise, being mostly qualitative in nature, the research design and data collection methods used in this thesis involved ‘logical rather than statistical inference’, ‘case rather than sample-based logic’ and ‘saturation rather than representation’ as main goals (Small, 2009: 28). I acknowledge that qualitative studies of this kind have a series of limitations and I will describe these issues in the following section.

3.3.4. Limitations

While offering a novel way to examine PES effects, I recognise that a qualitative study of this kind faces potential limitations regarding its internal and external validity. The issue of internal validity refers to the extent to which the research offers data that can be considered accurate, credible, reliable or consistent with similar terms of this kind (e.g. Guest, 2012). In qualitative research, a common method for ensuring that information obtained is internally valid is to use ‘triangulation’ which consists of systematically comparing findings on the same topic using various research methods (e.g. Bloor and Woods, 2006). Overall, the multiple data sources and methods used in this thesis sought to triangulate findings and thus contribute to improving the validity of data.

Specifically, one potential drawback of qualitative research regarding internal validity has to do with ‘interviewer effects’ or ‘positionality’. This can be understood as the possibility that the characteristics or position of the interviewer influence the data collection process (Mosley, 2013). This can happen in two ways. On the one hand, the position of the interviewer can influence the information that informants choose to disclose. On the other hand, the interviewer’s position can influence how he or she perceives and interprets information. I recognise that my ‘positionality’ played a part on both of these ways during the research process, especially at the beginning, though I made efforts to avoid this affecting my information. Firstly, throughout my research I was perceived as a member of Natura Mexicana. This was not surprising because I had worked with this organisation for years before this research and because I used their cars. Despite clearly stating that my research was in no way connected with Natura Mexicana or with CONAFOR, I noticed that informants responded to some questions in strategic ways on what they perceived as ‘sensitive’ information to avoid being punished or to appear as ‘environmentally friendly’. These issues were particularly relevant regarding questions

around land use change, distribution of payments and *ejido* internal politics, in which I often received confounding and inconsistent information. To account for this, I spent a lot of time re-interviewing informants and triangulating different types of primary and secondary information to avoid potential bias, misinterpretations and to acquire a nuanced interpretation of my evidence (see Section 3.3.1)

On the other side, I recognise that my perceptions and relationship towards informants were influenced by my previous experience in Natura Mexicana and my background as an economist. Three aspects are particularly relevant here. Firstly, Natura Mexicana has historically maintained a strictly professional relationship with the *ejidos* and its people. By mandate of its director, staff members are highly discouraged to develop personal relationships and are strictly forbidden to attend some social events such as parties, weddings and local festivities, especially when they involve drinking alcohol. Though I have maintained a friendly relationship with informants after years of fieldwork, I recognise some level of personal distance and that this had made harder and more time consuming to establish trust and share information. Secondly, I recognise being influenced by the generalised perception that staff at Natura Mexicana have about people in MdC. Staff generally have a subtle condescending attitude towards people in MdC, often calling them *compas* which would translate as ‘mate’ or ‘pal’, and generally see working with them only as necessary to achieve their environmental goals. This perception is not surprising because of the long history of Natura Mexicana as a conservation-focused organisation, their funding bodies, the scientific biological background of most of its staff and the extensive deforestation processes in MdC. This vision has not been concealed either, and from early on Natura Mexicana has been very upfront with *ejidos* that the main reason why the organisation works with them is because they hold valuable natural resources. Particularly at the beginning of my fieldwork, I

recognise that this influenced how I perceived people in MdC, constraining my ability to understand why they made certain choices. Finally, in the initial fieldwork stages, my background as an orthodox economist from Mexico City influenced not only how I perceived informants but also my conceptual framework and research methods. In this stage, I viewed people in MdC mostly through a lens of rationality and incentives. My MPhil thesis reflects these initial views. Yet, I feel that during the current research I transcended these biases and narrow view of incentives towards a broader understanding of the politics, history, culture and practices of people in MdC. I believe that the combination of research methods and analyses in this thesis aimed at giving voice to people in MdC reflects this evolution of thought.

In turn, the issue of external validity refers to whether it is possible to learn from a specific empirical exercise about the potential effects of similar interventions elsewhere (Acemoglu, 2010). In this regard, I recognise that this research is limited in the extent in which can offer empirical evidence that can be replicated to other settings. After all, the research here was conducted among a handful of small communities with very specific histories and characteristics that can in no way be understood as ‘representative’. Indeed, I will show that even within this region of neighbouring communities there has been much heterogeneity in PES outcomes. Yet, important as empirical insights may be, the goal of this research has been less about empirics than about providing theoretical advancements on how to understand PES effects and their mechanisms. As such, while empirical findings may not be easily transposed to other places, in turn, the framework, methods and theoretical insights in this thesis can be applied elsewhere and provide further theoretical insights for the study of PES.

4. ‘Partial’ Participation in PES: (Non)Enrolment and Forest Loss

4.1. Introduction

This chapter investigates how PES participants make land enrolment decisions and how they manage enrolled and non-enrolled forests during their contracts. In many programmes, participation in PES can be ‘partial’ with families or communities choosing to enrol only a fraction of their eligible property to PES. This potential scenario has been theoretically suggested and observed by empirical literature (Bremer et al., 2014; Grieg-Gran et al., 2005; Zbinden and Lee, 2005). Yet, there is a gap in the knowledge as to the potential drivers of these both enrolment and non-enrolment decisions and their implications for forest management.

I study these questions in the study area of six communities in MdC. For this, I combine geospatial analysis in the region of six *ejidos* with in-depth qualitative research conducted among a subset of three *ejidos*. I present two main findings. First, I show extensive partial participation among families in the region, with contrasting forest loss trajectories between enrolled and non-enrolled surfaces. Further, I show that decisions of which lands to enrol and not enrol are made jointly, reflecting a series of tensions between land opportunity costs, livelihood aspirations and household constraints for expanding the agricultural frontier. I argue that advancing our understanding from *why* to *how* families or communities participate in PES allows us to better capture the multiple and evolving roles that PES play in the livelihoods of landowners, and how this uncovers a series of socioenvironmental tensions.

This chapter proceeds as follows. The following section presents a revision of the literature, describes the framework used, and explains the methods of analysis, specifically regarding the selection of a subset of *ejidos* for qualitative research. Section

4.3 presents the empirical results. Section 4.4 concludes by summarising the main findings and discussing their implications.

4.2. Understanding partial participation in PES

4.2.1. Literature on PES participation

According to Pagiola et al. (2005), participation in PES follows a series of consecutive steps: eligibility, willingness and ability. PES scholarship has shed light on diverse factors influencing each of these issues. Spatial targeting rules, land requirements as well as low skills or capital have been noted as important determinants of eligibility, with mixed ‘pro-poor’ effects, i.e. reaching ‘poor’ landowners (Grieg-Gran et al., 2005; Miranda et al., 2003; Muñoz-Piña et al., 2008; Pagiola et al., 2005; Wunder et al., 2008; Zbinden and Lee, 2005).

On willingness, there has been different emphasis in the literature as to the role of economic ‘incentives’ versus a wider set of non-monetary ‘motivations’ as drivers of participation in PES (Kosoy et al., 2008). Early scholarship proposed monetary considerations and land opportunity costs as crucial for participation (Engel et al., 2008; Ferraro, 2008; Pagiola et al., 2005; Wunder, 2005). Indeed, studies have confirmed that participants tend to enrol low opportunity cost areas caused by biophysical or other factors (Bremer et al., 2014; García-Amado et al., 2011; Pagiola, 2008; Zbinden and Lee, 2005). Empirical scholarship, however, has revealed other types of non-monetary individual and collective motivations influencing participation, including: ‘intrinsic’ motivations for ecosystem conservation (Rode et al., 2015); ‘prosocial’ aspects such as fairness, equity and legitimacy (Kosoy et al., 2008); as well as land-tenure and food security considerations (Bremer et al., 2014; Osborne, 2011).

Regarding ability, studies have stressed some key aspects of context and PES design for enabling participation and ensuring compliance, including: the role of intermediaries for

overcoming transaction costs and informational asymmetries (Schomers et al., 2015); local mechanisms in multi-level governance structures for solving collective action dilemmas (Clements et al., 2010; Muradian, 2013; Muradian and Rival, 2012; Muradian et al., 2010); monitoring and enforcement capacity by PES implementing agencies (Engel, 2015); auctions, screening processes and other features of contract design that reduce informational ‘rents’ (Engel et al., 2008; Ferraro, 2008).

Despite these advancements, less is known about the ways in which participation in PES takes place within the broader land use strategies of participating families and communities. A handful of studies have noted that owners of larger landholdings may have greater flexibility to engage with PES because they have access to alternative sources of production and income (Bremer et al., 2014; Grieg-Gran et al., 2005; Zbinden and Lee, 2005). Further, studies in Mexico have examined questions of broader land use strategies only indirectly by exploring the extent to which PES is associated with ‘leakage’, i.e. displacing deforestation to non-enrolled forests (e.g. Alix-García et al., 2012; Le Velly et al., 2017; Sims and Alix-García, 2017). Yet, these studies have not directly examined deforestation on both enrolled and non-enrolled lands managed by individual landowners. Rather, because of data limitations on individual holdings in *ejidos*, they have statistically constructed potential non-enrolled data sets using assumptions on the distribution of land property. For instance, Alix-García et al. (2012: 629) noted that “for private properties, individual property boundaries are not available. As a proxy, we calculate deforestation within 1 km and 5 km buffers around each privately enrolled parcel, under the assumption that other private landholdings are contiguous with the enrolled property.” My evidence will show how these assumptions about land distribution are not always valid such that there is a need to directly examine deforestation on non-enrolled lands to better capture leakage.

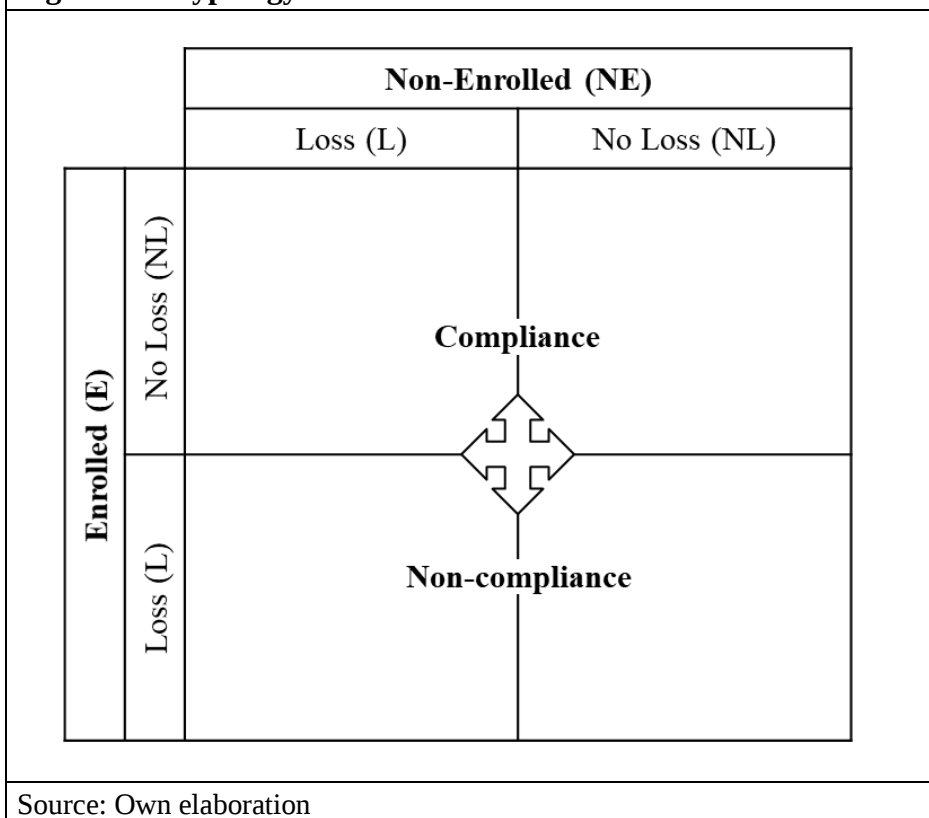
As such, there is a gap in the knowledge as to why PES participants may choose to enrol some eligible forests but not others, and how they manage enrolled and non-enrolled forests during the contracts. This chapter aims to fill in this gap.

4.2.2. Framework: (non)enrolment and forest outcomes

I extend Pagiola et al.'s (2005) framework to include the possibility of 'partial' participation. Resource managers, whether individual landowners or entire communities, may be willing to participate in PES but only with a portion of their property. Thus, willingness is not necessarily a binary choice but a continuum of possibilities. Of course, whether those who wish to partially participate are able to do so depends on the conditions imposed by PES. Some schemes may include provisions for managers to involve all eligible surfaces. Others, including the case of the Mexican PES examined here, informally 'allow' partial participation. As I highlighted in Chapter 2, Mexican PES have been rather ambiguous about the commitments of participants regarding non-enrolled forests. Yet, neither at the national level, nor among the case studies examined here, there has been an active enforcement to regulate forest loss on non-enrolled forests.

I develop a simple framework that links enrolment and non-enrolment decisions with forest outcomes when participants partially participate (Figure 5). Over the course of any given PES contract, enrolled and non-enrolled surfaces are subject to changes in their environmental 'quality'. I use 'forest cover', i.e. the percentage of forest cover, as the measure of environmental quality because it has been typically used as a criterion for eligibility in Mexican PES and because it is the main measure of programme performance. For the sake of simplicity, I classify environmental quality as forest cover 'loss' and 'no loss' during the duration of the PES contract.

Figure 5: A typology of forest outcomes



This gives us a typology of outcomes with four different quadrants. In the vertical axis, enrolled (E) parcels can take two possibilities: forest loss (L) or no loss (NL). Symmetrically, as shown in the horizontal axis, there may be forest loss (L) or no loss (NL) on forests initially non-enrolled (NE) to PES. The top quadrants represent ‘compliance’ cases since no forest loss is a condition of participation in PES. Alternatively, the bottom quadrants represent cases of non-compliance. This framework can be applied at different levels at which enrolment decisions are made, including individual landowners, families or entire communities.

4.2.3. Methods

The analysis presented here is based on the first five-year PES contracts in the six *ejidos* in MdC: Boca de Chajul 2008/2009, Playón de la Gloria 2008, Galacia 2008/2009, Adolfo López Mateos 2008/2009, Flor del Marqués 2009, and El Pirú 2009/2010. In El Pirú, Galacia, Boca de Chajul and Adolfo López Mateos, I took the first two contracts for the

following reason. In these *ejidos*, enrolment in the first year was only partially successful in the sense that CONAFOR only approved a fraction of the lands that the *ejidos* submitted. With the advice of Natura Mexicana, the *ejidos* developed ‘informal’ participation agreements whereby they internally considered the entire surface applied for as though it was enrolled despite only a fraction of it was paid for by CONAFOR. The condition was that everyone had to commit to ‘conserving’ their lands as though they were enrolled. In the second year of enrolment, all these *ejidos* submitted new successful applications and the entire original surface was enrolled. Thus, in these cases I kept both the first and second year contracts as they are highly intertwined. In Chapter 5, I will say more about the causes and consequences of these ‘informal’ participation agreements.

I constructed a geospatial database including every individual parcel managed by the cohort of families participating in PES in my study area.⁴⁴ The objective of this database was to identify property at the time of enrolment and to analyse forest cover loss during the time of contract. Geospatial information on enrolled surfaces was obtained from Natura Mexicana. Non-enrolled property registries were obtained from the intermediary and local informants. I aggregated individual land ownership at the family level based on fieldwork observations that land use decisions are mostly made at the family rather than at the individual level. For instance, when both husbands and wives own individual parcels, men often make land use decisions taking into account all the land available in the household. I validated this information on land ownership and land use management during follow-up interviews with individual families.

I analysed forest cover loss using the high-resolution Google Earth Engine tool (Hansen et al., 2013a, 2013b). This tool is publicly available and measures changes in forest cover

⁴⁴ Except for Galacia, where because of data limitations I cannot distinguish whether non-enrolled forests are owned by participants or non-participants. In other words, non-enrolled forests in Galacia include lands owned both by participants and non-participants.

using images from LandSat 5, 7 and 8 with a resolution of 30 by 30 metres. I validated the accuracy of this technology through qualitative research with CONAFOR, Natura Mexicana, participating families and *ejido* authorities.⁴⁵

To provide an interpretation for my findings, I conducted qualitative research with participating families in Playón de la Gloria, Flor del Marqués and El Pirú. As I described in Section 3.3.2, throughout Chapters 4 to 6 I used an iterative and inductive case selection approach guided by the principles of ‘capturing heterogeneity’ and ‘data saturation’. For this chapter in particular, I selected these *ejidos* based on the results from the geospatial analysis (see Table 7), as well as geographical location. Playón de la Gloria and Flor del Marqués had, respectively, the highest percentage forest loss on enrolled parcels and non-enrolled parcels. In both cases, most families ‘partially’ participated in PES. In turn, I chose El Pirú as a special case because the geospatial analysis revealed that many of the families ‘fully’ participated by enrolling all their property to PES, and because participants had low percentage rates of forest loss on both enrolled and non-enrolled forests. Further, while El Pirú is landlocked, Playón de la Gloria and Flor del Marqués are in the riverbank of the Lacantún. Using the case selection approach described in Section 3.3.2, I first undertook fieldwork in Flor del Marqués, then in El Pirú and finally in Playón de la Gloria. Though qualitative research was not conducted in the other three *ejidos* in the study area, the geospatial analysis revealed similar patterns in terms of parcel selection, participation and forest loss in the three *ejidos* where qualitative research was undertaken. This suggests that the dynamics of parcel selection, participation and forest loss described here are likely to apply for the entire region.

⁴⁵ Citing Burivalova et al. (2015) and Tropek et al. (2014), Sims and Alix-García (2017) note that this data may underestimate forest loss by classifying plantations as forested areas and not identifying selective logging.

I conducted semi-structured interviews to explore family decision-making processes regarding enrolment, forest management, and general perceptions on participation in PES. I interviewed most participating families in each *ejido*: 15 of 17 in Flor del Marqués, 10 of 15 in El Pirú and 14 of 22 in Playón de la Gloria. I also conducted several semi-structured interviews with Natura Mexicana, CONAFOR, as well as current and former local authorities in each *ejido*. In these interviews, I explored the historical processes of colonisation and land use in the *ejidos*, as well the evolving experience of participation in PES.

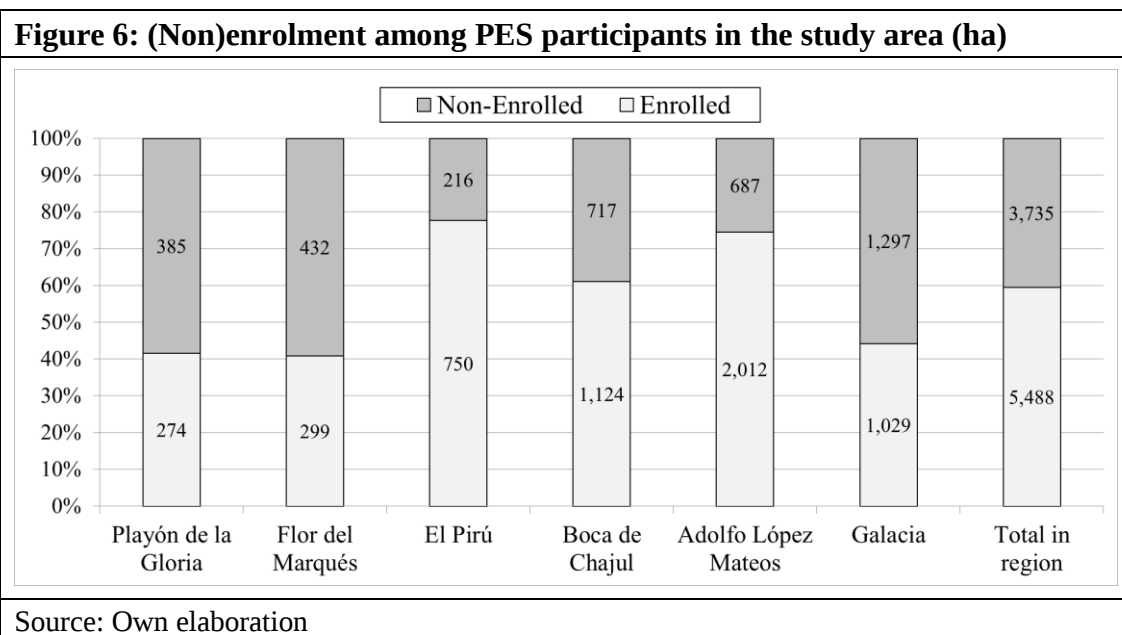
By combining geospatial property data with in-depth qualitative research, this methodology allowed to directly examine land use change on enrolled and non-enrolled forests, as well as the local mechanisms driving these results. To my knowledge, no previous studies have directly examined the environmental performance of both enrolled and non-enrolled lands managed by participants. As noted previously, studies in the Mexican context have only statistically constructed potential non-enrolled property datasets because of data limitations (Alix-García et al., 2012; Le Velly et al., 2017; Sims and Alix-García, 2017). As noted by Gammie and Olander (2012: 102 *original emphasis*) “while the boundaries of communal landholdings like *ejidos* are publicly accessible, the coordinates of individual properties are not always so. Indeed, ideally one could test for substitution effects on all properties owned by the landowner of an enrolled parcel, but this level of cross-referencing would be an onerous undertaking”. This study presents the results of such an undertaking. I will show how developing a deeper qualitative understanding of individual forest management decisions helps to complement quantitative impact evaluation assessments of PES.

4.3. Results

This section presents the empirical results. Section 4.2.1 presents regional trends in the six *ejidos*. Sections 4.3.2 and 4.3.3 present a qualitative interpretation for the results based on the three *ejidos* chosen as case studies.

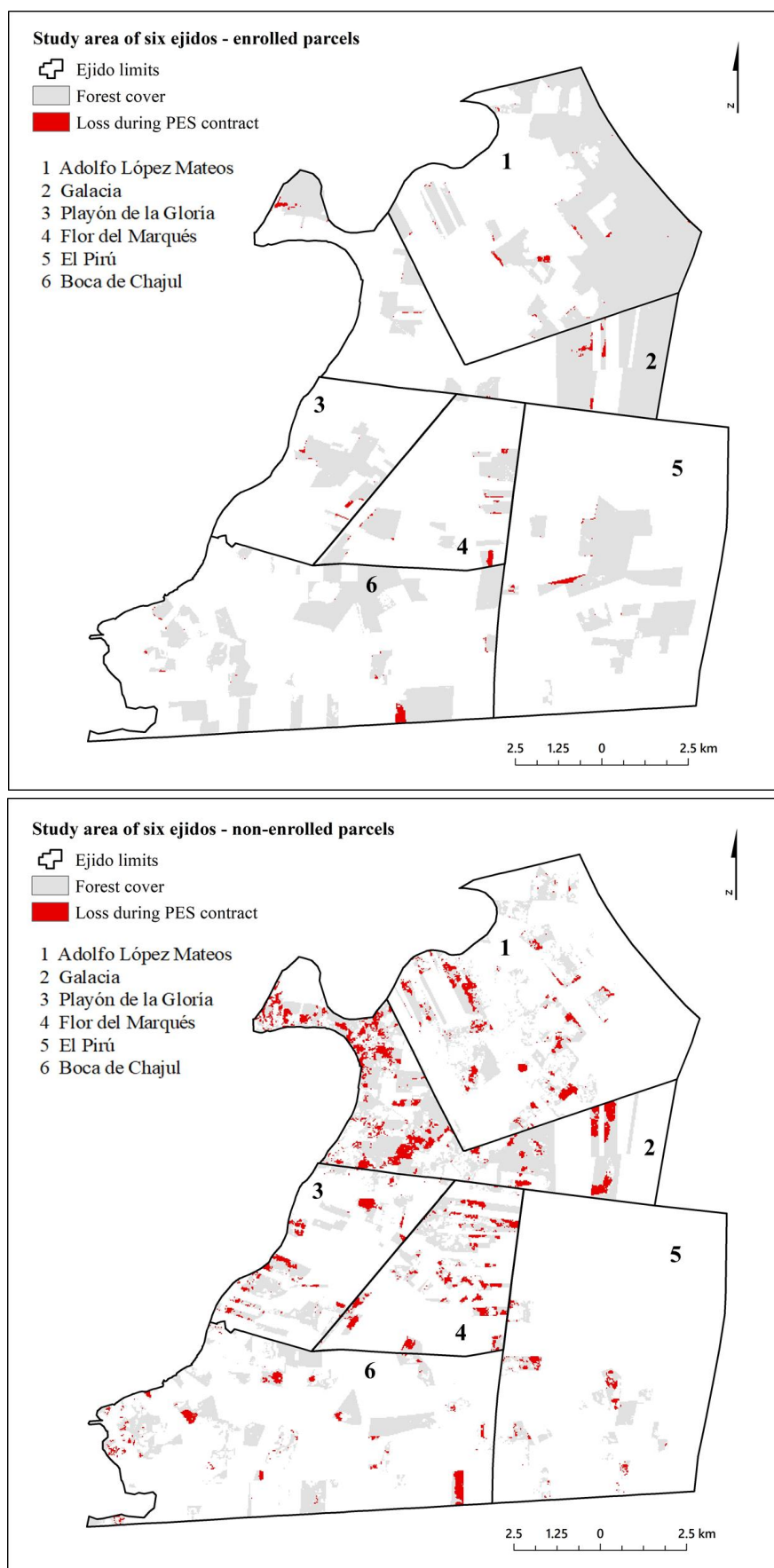
4.3.1. Regional trends

I found widespread partial participation among all *ejidos* in the study area. As shown in Figure 6, extensive amounts of eligible surface managed by PES participants were not enrolled. There were, of course, variations between *ejidos*. At the lower end, enrolled surface as a percentage of eligible surface was around 40% in Playón de la Gloria, Flor del Marqués and Galacia. In the remaining *ejidos*, the contribution was above 60% with El Pirú recording the highest percentage at 77.7%.



My geospatial analysis revealed contrasting patterns of forest loss between enrolled and non-enrolled surfaces during the PES contracts. I show these findings graphically in Figure 7 below.

Figure 7: Partial participation and forest loss in the study area



Source: Own elaboration

I identified few cases of forest cover loss on enrolled surfaces among participating families. Confirming the precision of my geospatial analysis, I correctly identified all non-compliance instances detected by CONAFOR as well additional undetected cases (Table 6). Strictly, according to PES' terms of reference, non-compliance would entail withdrawal from PES for the entire *ejido* as well as the devolution of all previously disbursed payments. However, CONAFOR has enforced non-compliance less severely in MdC using two *ad hoc* methods. Firstly, 'reducing' payments by removing parcels where forest loss has been detected. Further, 'substituting' parcels by requesting non-complaint families to enrol additional parcels in order to compensate for forest loss elsewhere. According to CONAFOR's regional manager based in Tuxtla Gutiérrez, they have been lenient enforcing conditionality in MdC because landowners have generally 'behaved well' *vis-à-vis* other places in Chiapas.

Table 6: Identified cases of non-compliance		
<i>Ejido</i>		Detection and resolution by CONAFOR
Flor del Marqués	#1	Not detected: ~3 ha
	#2	Reduction: ~1 ha
Playón de la Gloria	#1	Detected: ~1 ha
	#2	Substitution: ~5 ha
Boca de Chajul	#1	Reduction: ~7 ha
	#2	Not detected: ~10 ha
Galacia	#1	Not detected: ~10 ha
	#2	Not detected: ~10 ha
Adolfo López Mateos	#1	Reduction: ~12 ha
	#2	Reduction: ~5 ha
El Pirú	#1	Reduction: 12 has
Source: Own elaboration		

As such, overall compliance in PES was very high in the study area (see Table 7). I calculated a regional rate of compliance of 98.53% and rates for each *ejido* above 97.5%. These findings are consistent with a previous study by Hernández-Cárdenas et al. (2015: 565-567) (see Table 8). These results contrast somewhat with those of a previous study

of PES in the entire municipalities of MdC and Benemérito de las Américas by Costedoat et al. (2015). In this study, the authors found 7.83% of forest loss in PES polygons from 2007-2013, which they attribute mainly to selective logging. There are two potential explanations for these variations. Firstly, Costedoat et al.'s (2015) study includes other *ejidos* apart from those examined here. Secondly, they use Spot satellite images with a resolution of 10 metres that may allow to capture more subtle changes in forest cover than the Landsat images used here at 30 metre resolution. If this is the case, then it would only mean that the results presented here underestimate forest loss throughout, including both enrolled and non-enrolled parcels, but it would not make a difference when comparing trends. Replicating this study using other satellite images could shed further light on these issues.

Table 7: Estimated forest loss among the cohort in each <i>ejido</i>						
<i>Ejido</i>	Enrolled		Non-enrolled		Total	
	% loss (ha)	Annual rate	% loss (ha)	Annual rate	% loss (ha)	Annual rate
Playón de la Gloria	2.41% (6.6 ha)	0.41%	16.75% (64.5 ha)	3.0%	10.8% (71.1 ha)	1.9%
Flor del Marqués	1.38% (4.1 ha)	0.28%	23.36% (101.0 ha)	5.2%	14.4% (105.2 ha)	3.1%
El Pirú	1.67% (12.5 ha)	0.28%	14.79% (31.9 ha)	2.6%	4.6% (44.4 ha)	0.78%
Boca de Chajul	1.56% (17.6 ha)	0.26%	11.65% (83.5 ha)	2.0%	5.5% (101.1 ha)	0.94%
Adolfo López Mateos	0.87% (17.4 ha)	0.14%	17.43% (119.7 ha)	3.1%	5.1% (137.2 ha)	0.87%
Galacia	2.04% (21.0 ha)	0.34%	21.81% (283.0 ha) ¹	4.0%	13.1% (304.0 ha)	2.3%
Total in study area	1.47% (79.3 ha)	0.25%	22.41% (683.7 ha)	4.14%	8.3% (763.0 ha)	1.43%
Source: Own elaboration						
Note: 1) Also includes non-enrolled property managed by non-participants						

Yet, my geospatial data shows that forest loss on non-enrolled lands was extensive, measured both in terms of surface and annual rates. As shown in Table 7 above, I estimated 683.7 hectares of forest loss in the region during the PES contracts, representing

22.41% of all non-enrolled surface and an annual rate of 4.14%. Again, there were variations in the ejidos. At 11.65%, Boca de Chajul had the lowest percentage loss while Flor del Marqués had the highest at 23.36%.

Table 8: Annual deforestation rates in the study area (2007-2012)		
<i>Ejido</i>	Forests enrolled in PES	Non-enrolled lands (forested and non-forested)
Adolfo López Mateos	0.41%	4.35%
Boca de Chajul	0.25%	2.82%
Flor del Marqués	0.15%	1.82%
Galacia	0.12%	6.64%
El Pirú	0.24%	3.15%
Playón de la Gloria	0.56%	5.54%
Source: Own elaboration with data from Hernández-Cárdenas et al. (2015: 567)		

Thus, two important findings emerge from my geospatial analysis. First, widespread partial participation in the study area. Further, high rates of compliance coevolving with extensive forest loss on non-enrolled surfaces. In the following sections, I focus in three *ejidos* to provide an interpretation to these findings. As noted previously, I have selected these *ejidos* to account for heterogeneity in geographical location and forest outcomes. Playón de la Gloria is located in the riverbank while Flor del Marqués and El Pirú are land-locked. The first two had higher rates of non-enrolled forest loss than El Pirú.

4.3.2. The case studies

Playón de la Gloria enrolled 274.1 hectares (ha)⁴⁶ to the national ‘biodiversity’ PES (PSA-B) in 2008 at a rate of Mxn\$394/ha (US\$35.3)⁴⁷ for five years. Except for a couple of small ‘*ejido*’ parcels, the entire *ejido* surface had been distributed to individual landowners long before PES (see Section 3.3.1). The entire surface enrolled to PES

⁴⁶ GPS measurements of enrolled areas and CONAFOR payments totalled 252.1 hectares. The variation between this amount and our estimation is due to pixel calculations of forest cover loss.

⁴⁷ Average annual exchange rate of Mxn\$11.15 per US\$1 in 2008 (<http://www.x-rates.com/>).

consisted of individual parcels. The initial PES cohort included 22 families, all of which ‘partially’ participated leaving a fraction of their property out of PES.

Flor del Marqués enrolled 672.1 ha to PSA-B in 2009 at a rate of Mxn\$411/ha (US\$30.4)⁴⁸ for five years. Though the entire surface was officially classified as ‘communal’ lands, 298.9 ha⁴⁹ were internally considered individual parcels, and the remaining a combination of communal and ‘*ejido*’ lands. Excluding a handful of ‘*ejido*’ parcels, all the communal lands in the *ejido* were enrolled to PES. All 17 families who enrolled individual lands partially participated in PES.

El Pirú participated in the 2009 PSA-B at a rate of Mxn\$411/ha (US\$30.4)⁵⁰ for five years. The application included 2288.34 ha, of which: 737.9 ha⁵¹ were individual parcels and the remaining a combination of ‘*ejido*’ and communal lands. The application was only partially successful and the *ejido* received payment for 1231.1 ha. The *ejidatarios* agreed to consider everything enrolled and to pay everyone in proportion to the original application. In this ‘informal’ participation agreement, landowners subsidised each other by receiving a lower payment of Mxn\$253/ha (US\$18.7). According to local accounts, the motivation behind this arrangement was that everyone had applied together and it would have been ‘unfair’ to exclude some families. I will say more about this type of ‘informal’ participation agreement in Chapter 5. Apart from a few small parcels, all communal lands in the *ejido* were enrolled to PES. Among the cohort of 15 families who enrolled individual lands, eight partially participated. The rest ‘fully’ participated by enrolling all their eligible surface to PES.

Forest outcomes on individual parcels

⁴⁸ Mxn\$13.51 per US\$1 in 2009.

⁴⁹ GPS measurements of enrolled areas and CONAFOR payments totalled 284 hectares.

⁵⁰ Mxn\$13.51 per US\$1 in 2009.

⁵¹ GPS measurements of enrolled areas and CONAFOR payments totalled 720.62 hectares.

I identified forest loss on non-enrolled surfaces managed by most partially participating families in the three ejidos: 19 out of 22 (~86%) in Playón de la Gloria, 17 out of 17 (100%) in Flor del Marqués, and 4 out of 8 (50%) in El Pirú. According to local accounts, most cases were caused by purposeful conversion for agricultural and ranching activities using traditional ‘slash-and-burn’ practices⁵². Other cases were caused by alleged ‘accidental’ fire spreads. Agriculture was the biggest driver of forest loss in Playón de la Gloria while conversion in Flor del Marqués and El Pirú was mostly for ranching.

In contrast, only a handful of families did not comply with PES (see Table 6). The few instances of non-compliance here were caused by alleged ‘accidents’. In the two cases in Playón de la Gloria, enrolled parcels were sold during the PES contract and subsequently converted by the new owner. According to local narratives, non-compliance was unintentional and emerged out of ‘misunderstandings’ between buyers and sellers on the commitments associated PES. The two cases of non-compliance in Flor del Marqués, as well as the only case in El Pirú, were attributed to accidental fire spreads caused by neighbours. These claims appear to be truthful since landowners quickly contacted Natura Mexicana and CONAFOR to find a resolution.

Thus, I identify most families in the three *ejidos* as ‘partial’ participants in PES. I situate most of them in the top left quadrant of Figure 5: no loss on enrolled surfaces and loss on non-enrolled surfaces. I identify some families in El Pirú as ‘full’ participants, all of which complied with PES. Below, I provide an interpretation to these findings.

4.3.3. Understanding partial participation

Focusing on these three *ejidos*, this section examines two interrelated sets of questions. Why did families partially participate? How did they select certain lands for PES? I

⁵² See Meli et al. (2015: 230-231) for a description of the ‘slash-and-burn’ practice.

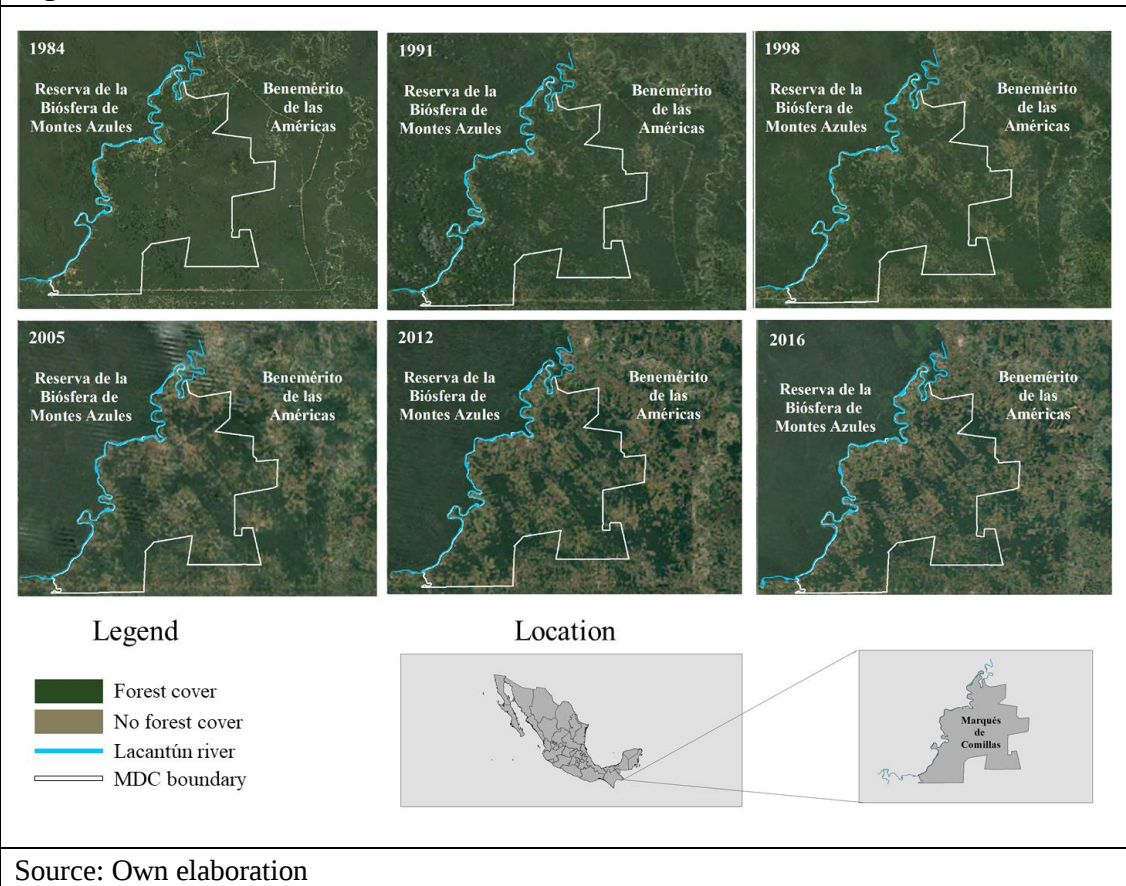
provide two explanations. The first dealing with constraints for expanding the agricultural frontier. The second with perceptions over land opportunity costs.

4.3.3.1. Aspirations meet reality

As evidenced by extensive deforestation and degradation, both before and during PES contracts, families in the *ejidos* here have not proven to be very intrinsically motivated for ecosystem conservation (see Figure 8; see also, Figure 7). On the contrary, there has always been among them a strong aspiration to ‘bring down’ (*tumbar*) the forest (*el monte*) for expanding their fields (*cultivos*) and pastures (*potreros*). Interviewed landowners often stated short-term motivations for wanting to bring down forests, such as increasing household income and productive capacity. Yet, I speculate that aspirations to keep expanding have been much more culturally and historically rooted. After all, many families participating in PES were the initial colonisers in MdC. As I noted in Chapter 2, these landless peasants left *ejidos* and estates (*haciendas* and *rancherías*) in Chiapas and several other states across Mexico since the 1970s precisely to earn a living by working freely on their own land. For these peasants, the Lacandona forests represented idle lands which must be brought down and an opportunity for emancipation. These notions are still very present today as noted in the following interview with a current landowner who arrived in Flor del Marqués as a child:

In my case, I started working since I was little. My father gave me a small parcel. We like a lot when we bring down a forest...The goal of a peasant is to desolate everything and see what one can put there. Sometimes one says ‘I will put pastures and sell’. This is the goal of many *ejidatarios*...The people who came here, like my father, used to work for rich people. They had no land. My brothers wanted to work but we had no land. They told my father that there were lands here.

Figure 8: Historical forest cover loss in MdC



Source: Own elaboration

Nonetheless, families have always faced a series of constraints limiting their ability to expand fields and pastures. Converting forests and maintaining alternative land uses is expensive. Bringing down forests and subsequently preparing the land requires hiring labour, machinery as well as diverse inputs such as fertiliser and herbicides. Interviewed landowners estimated conversion costs to range from Mxn\$5,000-\$6,000 (US\$268-\$321)⁵³ per hectare. This is no trivial amount considering the economic circumstances in which families live. For instance, daily ‘wages’ (*jornales*) are typically between Mxn\$100-\$150 (US\$5.4-\$8.0)⁵⁴. Most families receive diverse forms of cash transfers and governmental support, including support for ranching (PROGAN) and agriculture (PROCAMPO), but amounts are limited (see Figure 18). Financing conversion through

⁵³ Mxn\$18.68 per US\$1 in 2016.

⁵⁴ Mxn\$18.68 per US\$1 in 2016.

credit is not always an option because lending amounts are small and interest rates are high. According to interviews, commercial interest rates in the town of Comitán could reach 15% per month.

Families have also faced capacity constraints. Using traditional methods, individual families can allocate two or three hectares for agricultural systems but not more. Most families grow maize and beans in the *milpa* system for household consumption with most of the work being done by family members. In addition to conversion costs, expanding agricultural fields beyond family capacity requires paying for additional labour or leasing machinery. Individual families can allocate much larger surfaces for ranching pastures but this still requires purchasing additional livestock, building fences and many other additional costs. This is noted in the following interview in Flor del Marqués:

It is expensive to bring down. To bring down one hectare you need to pay for the cut-slash-and burn, then pay for the grass, then you need to clean the clean the pastures, then the posts, then the wire. One invests a lot on ranching pastures.

In this context, PES enrolment and non-enrolment decisions laid at the interface between aspirations and constraints for expanding fields and pastures. Partial participating families calculated to have the means and capacity to work some, but not all, of their property during the PES contracts. Their enrolment decisions reflected these tensions. When leaving forests out of PES, families oftentimes had specific plans on what to do over the following years. In Playón de la Gloria, these plans were mostly about agriculture. In Flor del Marqués and El Pirú, they were more about ranching. Indeed, my geospatial data is proof that these families were willing and able to convert some forests during the contracts for these activities. Yet, the fact that families were not always willing or able to follow through with conversion plans explains why not all non-enrolled forests were converted. Sometimes they changed their mind as time went by or had to adapt to

changing circumstances, such as medical emergencies or poor harvests. This is noted with an interview in Flor del Marqués:

I thought about working them. I said ‘this year I will work it because I want to seed grass’. But I have not been able. That is why it is still there. I wanted to extend the pasture. Many times, one needs to get some money. Sometimes one wants to do this, but sickness gets in the way. Anything in life gets in the way. I said ‘I will use \$4,000 or \$5,000 to work there’ but then my family got sick. So I did not do it.

In turn, enrolment in PES was the counterpart in these feasibility calculations. Apart from opportunity cost considerations, an issue that I will discuss in the following section, families chose to enrol lands for which did not have the means to work. A common expression among landowners was that the forests were there ‘anyway’ (*de por sí*) because they could not afford to work them. Considering that forests would be there anyway, enrolling and receiving a payment from PES was the better option. These notions are highlighted in the following interview in El Pirú:

Between receiving nothing, well it is better to receive something. Besides, this land was in conservation anyway since a long time ago. The difference is that they did not give us anything. What I am saying is that it was there anyway. Because there was no resource to bring down the forest, seed grass and buy cattle to put there.

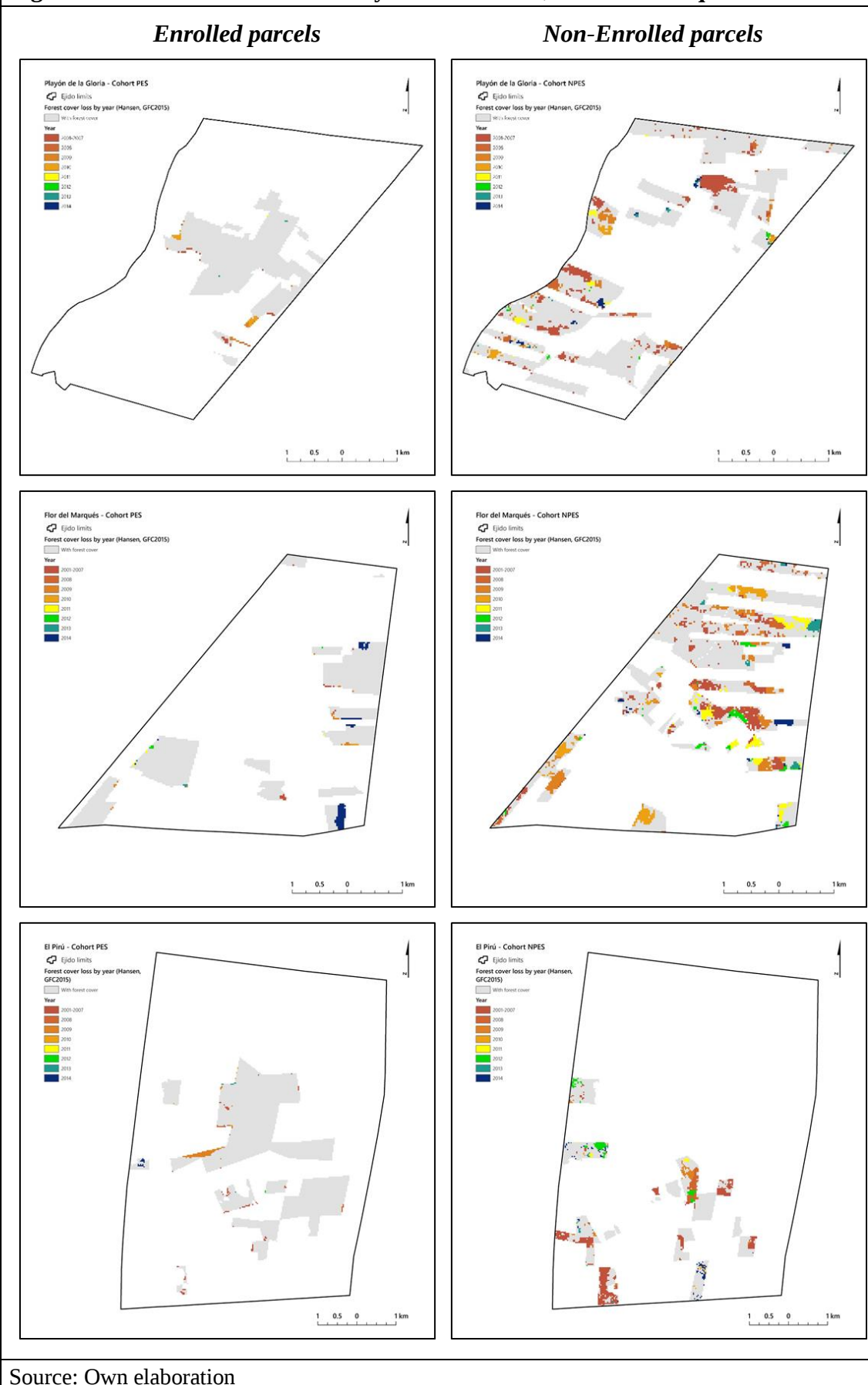
The same types of calculations were made by full participating families, but the outcomes were different. I found that full participating families, all located in El Pirú, could not afford to work their property at all. In their own accounts, they chose to enrol everything to PES because they were ‘too poor’ to do anything else, a notion captured in the following interview among one of these families:

There is no money. One cannot work them there. One who has money can hire people to bring them down with chainsaws and all. But one who is poor and screwed has no way to do it. We conserve the forest because we cannot afford to bring it down.

4.3.3.2. Perceived land opportunity costs

I argue here that perceptions over land opportunity costs largely explain why certain parcels were selected for enrolment in PES and some were not. In support of this argument, I present Figure 9 and subsequently proceed to my analysis.

Figure 9: Enrolment choices in Playón de la Gloria, Flor del Marqués and El Pirú



Source: Own elaboration

Figure 9 contrasts the geographical distribution between enrolled and non-enrolled surfaces in the *ejidos*. My qualitative research revealed that general patterns in parcel selection were influenced by two sets of factors: land quality and accessibility. In Playón de la Gloria, no parcels around the riverbank (*tierra de vega* or *vega*) were enrolled because of their high soil quality for agriculture. In the region, riverbanks are generally considered as the most productive and consequently the most expensive lands. Inland areas in the south and north of Playón de la Gloria were also left out from PES. These are mostly flat terrains with good road access, which have been used more recently for ranching. In turn, all enrolled parcels were concentrated in the mountainous range at the centre of the *ejido*. This area, known locally as La Roquera, which translates to ‘The Rockies’, is considered of poor quality due to its rocky grounds and steep terrain. Access to the area is also burdensome and time consuming because it is located far from the population centre and only reachable by foot or mule on narrow dirt trails. These notions are highlighted in the following interviews with two partial participants in this *ejido* explaining why they never worked the lands in La Roquera and why they chose to enrol them in PES:

We did not bring down there because it is not good for ranching. Neither for cultivating because the soil is not good. The other thing is the distance because it is far away. And since we already have working parcels for corn here then it is not in our plan. So when PES came we said ‘let’s write our name and get a payment instead of just leaving it there’.

They are different forests. The one that is not enrolled has a higher canopy, it is good soil with taller trees. The one in PES is low forest, it cannot be worked. There is no water and there is no way to cultivate or have pastures. The type of soil is clay.

Similar considerations explain parcel selection in the other two *ejidos*. In Flor del Marqués, few parcels in the north were enrolled because they are flat, located alongside the main road leading to Galacia, and as such have been typically used for ranching

pastures. Areas in the southeast were left out because they have ‘black soil’ (*tierra negra*) for agriculture and a recently built road had improved access. In contrast, the mountainous range extending from Playón de la Gloria was enrolled because it was hard to access, with steep terrain and rocky soils. In El Pirú, non-enrolled parcels were mostly located in the south of the *ejido* next to the highway where soils are flat and used for cattle ranching. All enrolled parcels were in the centre and north of the *ejido* because of poor soils and low accessibility. These lands are far away from the population centre and have mostly ‘sandy soil’ (*tierra arenosa*) or ‘clay soil’ (*tierra barrosa*) which are not suitable for agriculture.

Interviews revealed that families did not necessarily make sophisticated cost-benefit calculations to estimate opportunity costs of participating in PES. Rather, they often used heuristics such as ‘rules of thumb’ for thinking about expected productivity and prices on different types of parcels. For instance, according to interviews, maize production could go anywhere from 1-5 tonnes per hectare depending on soil quality and unexpected factors such as weather conditions or pests.⁵⁵ Maize prices could also fluctuate much, from as low as Mxn\$3,500 (US\$193)⁵⁶ to as high as Mxn\$6,000 (US\$330) per tonne depending on market conditions. As such, total revenue per hectare could oscillate from Mxn\$3,500-\$30,000 (US\$193-\$1,651) per hectare. Accounting for costs, PES’ flat rates per hectare, Mxn\$394 (US\$35.3)⁵⁷ in 2008 and Mxn\$411 (US\$30.4)⁵⁸ in 2009, were perceived among landowners to be far from competitive against maize production in good

⁵⁵ Regional land productivity variations were confirmed in a study by GAIA and Natura Mexicana (2012) comparing riverbank production in Adolfo López Mateos, Playón de la Gloria and Boca de Chajul with inland production in Flor del Marqués and El Pirú. The study concluded that “on average, from 2-3 tonnes (of corn) per hectare per period can be achieved when soils are flat (different to river banks) or mountainous; in contrast, from 4-5 tonnes per hectare can be achieved in river banks” (GAIA and Natura Mexicana, 2012: 75 *my translation*). In addition, the study confirmed much higher agricultural productivity in Flor del Marqués than in El Pirú due to soil quality.

⁵⁶ Mxn\$18.17 per US\$1 in June 2017.

⁵⁷ Mxn\$11.15 per US\$1 in 2008.

⁵⁸ Mxn\$13.51 per US\$1 in 2009.

conditions but not necessarily so in poor conditions. Similar types of assessments applied for ranching, as noted in the following interview with an *ejidatario* from Playón de la Gloria:

People are interested in cattle. Because in one hectare there are three cows. If those cows give one calf per year then there are three in total. If I sell each for \$5,000 then I get \$15,000 for that hectare. If this costs me \$5,000 then I earn \$10,000. This is what you need to value. You get much more from cattle than from PES.

As such, based on their calculations, families chose not to enrol their ‘good’ (*buenas*) and ‘strong’ (*fuertes*) lands and instead submit their ‘bad’ (*malas*) or ‘weak’ (*débiles* or *flojas*) ones. Of course, not all alternatives were necessarily about productive activities such as agriculture and ranching. Families factored in their enrolment and non-enrolment decisions the possibility of undertaking a wide array of activities that would not necessarily involve forest conversion but that would not be allowed on PES lands. Based from interviews, I gathered that people perceive that no activities whatsoever are allowed on PES lands except for collecting firewood from already felled trees. Natura Mexicana seems to have played a part in driving this perception among people in MdC. While CONAFOR rules do suggest that PES conditions involve a ‘no touch’ approach to forests, in the sense that land use change on enrolled parcels is not allowed, the terms of reference are rather ambiguous as to what this means exactly. According to interviews among staff from Natura Mexicana, the organisation decided to interpret this ‘no touch’ approach in a strict sense to avoid ambiguity and the risk that people could enrol lands but continue to fell trees or hunt. In other words, they interpreted the ‘no touch’ rule as meaning that only the collection of already felled trees was allowed on enrolled lands. The fact that interviewed landowners commonly stated this exact interpretation of PES’ environmental conditions suggests that Natura Mexicana has been effective in transmitting their views to participants as though they were official CONAFOR rules.

Thus, many families chose not to enrol small areas for felling trees, collecting herbs and fruits, hunting and fishing. In addition, tree lines around streams close to pastures were often not enrolled because they provide shadow cover and access to drinking for cattle. In Playón de la Gloria, families did not enrol parcels where they planned to harvest old cocoa plantations, a legacy of agricultural policies in previous decades that I described in Chapter 2. This further explains why not all non-enrolled forests were converted.

Another aspect influencing opportunity costs calculation was the temporal dimension of the PES contracts. Five years represented a significant time commitment and families valued having the flexibility of being able to work, sell or lease their land to meet emergencies or take advantage of new opportunities. They weighed in shifting expectations such as future household land needs, potential changes in agricultural prices or expectations on the building of new roads providing access to marginal lands. Families with no immediate conversion plans, or means, chose to enrol and wait for the contract to end to re-examine their situation, as noted in the following interview in Playón de la Gloria:

I am still thinking about renewing or not. The thing is that it is five years. I think I do not want to renew because I want land for my son to work. Because he has no land.

I note here that land quality and accessibility have been historically intertwined and strongly path-dependent in the region. As I noted in Chapter 2, early settlers arriving in MdC first occupied lands in the river bank opposite to the RBMA. River bank lands were chosen not only for their agricultural potential but also because there were no inland roads when the region was first colonised and the river made transportation and access to supplies easier. Once riverbanks had been claimed, newer settlers moved further inland. The three case studies exemplify the ‘first-come, first-choice’ settlement process: Playón

de la Gloria was formed by families arriving in the 1970s while inland Flor del Marqués and El Pirú were established by families arriving in the 1980s. In each *ejido*, settlers claimed several plots of land in different areas. First settlers claimed lands of better quality, closer to dwelling sites and of easier actual or potential accessibility. Subsequent settlers received increasingly marginal lands. This explains why most *ejidatarios* have several parcels on different areas in each *ejido*. The highly scattered property landscape in these three *ejidos* is a characteristic that they share with other *ejidos* in MdC. As *ejidos* developed gradually over the years, internal roads were built precisely in areas that had been chosen before because of their quality. Historical forest conversion trajectories have matched riverbank areas and parcels alongside roads in the Lacandona region (Figure 8; see also, De Jong et al., 2000; De Vos, 2002; Hernández, 1992; Meli et al., 2015). Many of these processes are highlighted in the following interviews among initial settlers from Playón de la Gloria, Flor del Marqués and El Pirú, respectively:

We chose the ones before because it was an area with water. Crops or pastures need permanent water. We grabbed a bit of all. Nineteen people grabbed the *vega*, the ones who came later grabbed further up. The first committee wanted around Galacia but they sent their provisional measure before...It was whoever won first. We wanted Galacia because it was flatter.

That land is good for cattle because there is a river and for agriculture because it is *vega*. At the beginning, we did not go there because there was no road. But when we made the road then we got closer.

We all said 'I will get the best lands' and that is how lands were chosen. We checked in which part land was stronger...Those who got here first have their areas for agriculture, cattle ranching and reserve...That is how we chose. There are parcels that are deep down and it costs to get there...We checked that it was close and that it was good. That it had mud, that it was black.

4.4. Discussion and conclusion

Results show that compliance with PES may coevolve with extensive deforestation if families choose to enrol only a fraction of their eligible property. I have provided two different explanations for widespread ‘partial’ participation in PES among families in the study area of six communities in MdC. First, economic and capacity constraints hampering deep-rooted aspirations to continue with the expansion of the agricultural frontier. Further, land opportunity costs, a function of quality and accessibility, defining which lands are chosen or not for PES. These findings allow us to transcend the idea that families may only either participate in PES or not. By showing that participation in PES can be of different ‘types’, and by shedding light on some of their mechanisms, this chapter opens interesting avenues for future research.

Overall, my results emphasise the prominent role of individual family considerations in driving how much, and which lands, to submit to PES. I do not think these findings are inconsistent with previous studies of PES in Mexico showing the important role of pro-social motivations influencing participation (Kosoy et al., 2008). After all, the analysis here has not been about *why* families participate or not in PES, but rather about what appears to be a second-order type of considerations to do with *how*. Indeed, regarding the first type of considerations, families here did reveal strong concerns for fairness and equity as evidenced by the ‘informal’ participation agreements in which people subsidised each other when applications were only partially successful. On a related note, I speculate that partial participation may be a phenomenon pertaining more to individual rather than to collective forms of property. While the study here focused on individual land property, *ejidos* in the study area enrolled most of the communal lands and the type of considerations I elicited here regarding individual property did not seem to have been important. As my small sample and insufficient analysis do not allow to be conclusive, I

simply hypothesise that rules governing land use, formal or customary, may make it more likely for partial participation to emerge in some types of property than others. Future research should benefit from exploring the collective dimensions of the issues raised here.

My evidence supports research suggesting that land opportunity costs caused by biophysical, technological or other factors may encourage or discourage participation in PES (e.g. Engel et al., 2008; Ferraro, 2008; Pagiola et al., 2005; Wunder, 2005). Yet, I shed light on one crucial but less studied aspect, which has to do with how opportunity costs change. From my results, I can distinguish different processes between opportunity costs created by land quality and opportunity costs created by accessibility. My historical accounts revealed that the former might change less and more slowly than the latter. In fact, my research suggests the likelihood that, as rural communities develop, roads and trails are bound to evolve as a function of land quality factors less susceptible to rapid anthropogenic modification, including soil features, access to rivers and streams, as well as the steepness of terrains. These types of shifting dynamics underscore the importance of understanding how participation in PES is influenced by, and may potentially affect, broader rural development processes placing mounting pressure on ecosystems. A rural development perspective to PES may shed light on its interplay with longer-term processes to do with infrastructure, agricultural technology or population growth.

My other finding regarding the role of different types of constraints, including socioeconomic, capacity, legal or political in influencing participation has also been noted before (Bremer et al., 2014; García-Amado et al., 2011). Yet, my evidence suggests that these issues may be much more important than otherwise recognised by the literature. Based on the insights I gathered, it is likely that enrolment in PES would be much lower among families here if they did not face constraints for converting forests. The case of full participating families in El Pirú who were ‘too poor’ to work their land illustrates

this. Indeed, if PES operate among ‘poor’ landowners and communities, as they frequently do, opportunity cost assessments should not assume that they are able to afford alternative activities. Technically, opportunity costs would be zero if families or communities cannot afford to do anything else with their forests. The same applies for other types of socioeconomic, legal or political constraints. For PES’ theory and practice, an implication here is the need for further reflection on how ‘feasibility’ aspects influence opportunity costs and, hence, participation.

More importantly, my evidence shows that enrolment and non-enrolment decisions, and by extension forest outcomes, are made jointly. What families choose to place in PES is a function of what they choose to leave out, and vice versa. This important insight has implications for understanding and examining the environmental ‘effectiveness’⁵⁹ of PES. If partial participation is common, studies on effectiveness of PES will require identifying how both enrolled and non-enrolled property is distributed and managed. Looking exclusively at enrolled forests will tell a positive side of the story but will not fully capture overall levels of ‘additionality’ and will fail to account for ‘spillovers’, positive or negative (leakage), on non-enrolled forests. Further, my evidence reveals that statistically constructing non-enrolled property in Mexican PES (Alix-García et al., 2012; Le Velly et al., 2017; Sims and Alix-García, 2017) is bound to suffer measurement error in contexts like MdC where people own many parcels scattered across the *ejido*. As my evidence shows, land selection is historically rooted, dynamic and non-random at all. As such, obtaining property data that can allow examining directly the performance of ‘non-enrolled’ lands will improve the accuracy of PES effectiveness measurements regarding additionality, positive spillovers and leakage. Thus, the methodology developed in this

⁵⁹ Defined by Börner et al. (2017: 360) as “the change in provision of services induced by the program, compared to a counterfactual without PES.”

chapter offers useful insights and research avenues for PES impact evaluation assessments.

To conclude, my evidence highlights the fundamental roles that culture, history and values might play as underlying factors shaping present and future participation in PES. In this regard, I agree with Kosoy et al. (2008) for a need to look beyond short-term ‘incentives’, such as the compensation of opportunity costs, and rather draw attention towards ‘motivations’, non-monetary and collective. Yet, my empirical evidence suggests that a focus on ‘aspirations’ may provide a better lens to understand the evolving roles and meanings given to PES by participants, as well as to capture emerging tensions at the interface between cultural legacies, current peasant lifestyles and shifting ideas about the future (Van Hecken et al., 2015a, 2015b, 2018). My preliminary insights on these issues are mixed. Most participating families have largely carried on ‘business as usual’, seeing PES as but another source of income and land use strategy among many. Others, however, have seen PES as an opportunity to transition towards off-farm livelihoods, to afford sending their children to study abroad and other forms of ‘conservation by distraction’ (Wunder, 2005). In the end, (non)enrolment and forest outcomes will not only depend on motivating participation in PES, but, more importantly, on the way in which involvement with the programmes encourages local support for conservation (Rode et al., 2015), adapts to changing socioenvironmental conditions (Hayes et al., 2015) and offers opportunities for alternative or more environmentally sustainable livelihoods.

5. ‘Cashing In’ on PES: Community Payment Distribution

5.1. Introduction

This chapter examines how communities distribute the money they receive from PES and the implications of those distributions. When PES takes place in community settings, as in the Mexican case, communities act as the ‘seller’ of environmental services and often enrol combinations of individually managed and communally managed lands. Studies in such settings have noted that communities distribute payments in different and shifting ways, including giving cash to individual landowners, collective investments, set-asides for paid labour or even microcredit (Mahanty et al., 2013; Pham et al., 2014; Tacconi et al., 2013). Some studies have highlighted how distributional outcomes emerge from ‘structural’ factors such as land institutions (García-Amado et al., 2011), as well as ‘agential’ factors to do with preferences and local notions of equity (Pham et al., 2014). Yet, there is a gap in the knowledge as to what factors explain the diversity and evolution of distributional outcomes within communities. This chapter aims to fill in these gaps.

I study these questions among a subset of four communities in the study area in MdC. Using an approach paying attention to both ‘structural’ and ‘agential’ factors through a dynamic perspective, I present two main findings. First, I show that payments in each case have been distributed in complex and changing combinations of cash among individual landowners and community investments. Further, I show that distributional outcomes emerge at the interface between two sets of factors. On the one hand, ‘structural’ factors directly associated with historical land institutions. On the other hand, ‘agential’ factors linked to the interests of local populations and the PES intermediary. While these competing explanations stand in tension with one another, distributional outcomes ultimately depend more on ‘structural’ factors. I argue that there is a need for

continuous reflection on the evolution and trajectory of PES outcomes, social and environmental, to capture the recursive interactions between involvement in PES and the ‘structural’ and ‘agential’ factors in the communities where they operate.

The chapter proceeds as follows. Section 5.2 presents a review of the literature on community payment distribution, describes the framework used, and explains the methods of analysis, specifically concerning the selection of a subset of *ejidos* for qualitative research. Section 5.3 introduces the case studies. Sections 5.4 and 5.5 present the empirical evidence. Section 5.6 discusses some implications from the findings.

5.2. Understanding community payment distribution

5.2.1. Literature on community payment distribution

The way in which communities distribute money from PES, and the implications of such distributions, are important questions of enquiry because many programmes currently operate in settings with communal property rights and social relations and it is likely that this trend will continue as the PES and REDD+ agendas move forward (Milne and Adams, 2012). As I showed in Chapter 2, these issues are particularly relevant for the Mexican PES given the widespread communal nature of forests at a national level.

Studies in Mexico have revealed that *ejidos* and agrarian communities participating in PES often distribute money in different and changing combinations of cash and investments (Corbera et al., 2007a). For instance, in a case study in Chiapas, Corbera et al. (2007b: 375) noted that “in some occasions, the community invested carbon revenues in collective goods (e.g., community roads, land tax) while in some years community members split the total carbon revenue among themselves.” Systematising early work on PES in community settings in Mexico, the Philippines, Mozambique and Indonesia, Mahanty et al. (2013) and Tacconi et al. (2013) argued that whether PES involve

individual or collective contracts had implications for distributional and spending outcomes. While individual payments tended to be distributed individually and used mostly for household needs, collective payments often involved community investments in infrastructure or services. Thus, this literature suggests that there are two types of ‘outcomes’ associated with payments given to communities: distributional and spending. This chapter deals exclusively with the first of these issues while Chapter 6 deals mostly with payment spending.

The literature exploring the determinants of community payment distribution has brought forward a combination of both ‘structural’ and ‘agential’ factors as overlapping, and potentially competing, explanations for distributional outcomes. Studies in Mexico have emphasised how common land property institutions shape distributional outcomes and how this property-distribution link often reproduces or exacerbates pre-existing inequalities. In a study in the state of Michoacán, García-Amado et al. (2011) showed that distributional outcomes from PES depended mostly on historical land institutions. The authors found that *ejidatarios* who had founded the *ejido*, and thus had longer land tenure, received a higher payment from communal lands than more recent *ejidatarios* while landless peasant received only money from paid surveillance activities associated with PES. Thus, the authors argued that their results “show a dual response in equity. PES have an egalitarian effect within landowners and landless groups, but it broadens the gap between them.” (García-Amado et al., 2011: 2367). In another study on a local carbon project in Chiapas, Corbera et al. (2007a) also emphasised the role of common property institutions and property rights in shaping outcomes, and how women and landless were often excluded. The authors highlighted the importance of paying attention to legitimacy and equity dimensions on markets for environmental services to avoid “reinforcing existing inequalities in access to environmental resources and decision making” (Corbera

et al., 2007a). Another study in Ecuador also emphasised how PES reinforced existing property rights and social structures (Rodríguez de Francisco et al., 2013).

A study among three communities in Vietnam by Pham et al. (2014) found that payment distribution was explained mostly by local preferences and notions of equity. The authors found that communities distributed money in different combination of cash to individual families, collective investments, money set-asides for forest protection and microcredit. Yet, this study emphasised the role of trust as an important precondition for diverse distributional outcomes: “where villagers trust their management board, they accept the board’s decisions on the distribution of revenues...By contrast, where the level of trust is low, local communities and authorities insist that the money be divided equally among all households” (Pham et al., 2014: 893).

As such, these studies resonate with literature suggesting how ‘elite capture’, as well as potential equity and efficiency trade-offs, may emerge when PES operate in common property settings (Muradian et al., 2010; Pascual et al., 2010, 2014). As noted by Corbera et al. (2007a: 604), there is a dilemma on “whether to uphold locally rooted, yet unfair, distributive rules, or to establish more inclusive and locally challenging decision-making systems”. Understanding these links between land institutions and equity is important for PES because the literature suggests that equity cannot be fully separated from environmental efficiency. For instance, unequal outcomes may undermine the legitimacy of PES over the long run and as such hamper their environmental performance (Corbera and Pascual, 2012).

Despite these advances, however, three gaps in the literature require attention. Firstly, though the literature has suggested that both ‘structural’ and ‘agential’ factors may jointly explain community payment distribution, it is not always clear which set of factors may be predominant and why. For instance, community elites or powerful groups may use

their ‘agency’ to influence payment distribution according to their local understandings of distributional equity, yet these understandings may be contingent on the ‘structure’ of land institutions. In such a scenario, distributional outcomes will depend on how ‘structural’ and ‘agential’ factors interact with one another. Further, though studies have shed light on the diversity of distributional outcomes within communities, less is known about which factors explain such diversity. In other words, we know little about why different fractions of the payments are distributed in different ways. Finally, though the literature has suggested that distributional outcomes may change over time, most studies have examined these issues from a static perspective. As such, the reasons for why changes in distributional outcomes take place are unclear. This chapter aims to fill in these gaps by exploring the evolution of community payment distributions and their determinants among four communities in MdC. Following the discussion above, this chapter takes as a point of departure the possibility that distributional outcomes may emerge at the interface between ‘structural’ and ‘agential’ factors operating at various temporal and spatial scales.

5.2.2. Analytical framework: structure and agency

As shown above, studies on community distribution of PES money have been rather static and there has been insufficient reflection as to the factors explaining the diversity of distributional outcomes within communities. This chapter provides an approach to shed light on the complex and changing nature of community payment distribution. It draws on two approaches to understand community payment distribution that examine these issues through a dynamic perspective.

Firstly, a *structural* approach, which pays attention to shifting land institutions, socioeconomic conditions, biophysical or other ‘structural’ factors as potential explanations for distributional outcomes. Specifically, I consider literature emphasising

the complex and communal character of Mexican forest land institutions, in terms of various types of ‘bundle of rights’ coexisting with one another (Corbera et al., 2007a, 2011), and how this may have implications for payment distribution. This framework is sensitive to how pre-existing inequalities in land institutions and other factors influence distributional outcomes.

Further, an *agential* approach, which considers how changing local norms and preferences, as well as social and power relations, mediate decision-making processes regarding payment distribution. I thus pay attention to the dynamic interactions among different local stakeholders, including participants, the PES intermediary and CONAFOR.

5.3.3. Methods

The analysis presented in this chapter is based on the first set of PES contracts among four of the six *ejidos* of the study area: Boca de Chajul in 2008, Galacia in 2008, Flor del Marqués in 2009 and El Pirú in 2009. The first set of contracts was chosen in each *ejido* to account for potential self-selection in participation in PES. It is possible that personal traits such as risk aversion may determine whether people may wish or not to participate in PES at different stages. Thus, I selected the first set of contracts in each *ejido* in order to have a more ‘comparable’ cohort of families, i.e. those who were willing to participate from an early stage.

Further, as explained in Section 3.3.2, I used an iterative and inductive case selection approach guided by the principles of ‘capturing heterogeneity’ and ‘data saturation’. I selected four *ejidos* based on fieldwork observations regarding the heterogeneity of their land institutions (see Section 3.3.1) and some preliminary insights on the distribution of money from PES. Galacia and Playón de la Gloria have very little communal lands because most of the *ejido* surface was distributed among individual landowners

(*ejidatarios*) before PES. In turn, Flor del Marqués, Adolfo López Mateos and El Pirú have extensive communal lands but they are distributed very differently within the *ejido*. In the first two cases, communal lands were considered to belong equally among all or most of the landowners in the *ejido* before PES. The case of El Pirú is unique in the sense that people have long engaged in the buying and selling of ‘percentage rights’ to the communal lands. By the time when PES came into place many *ejidatarios* had already sold their rights and a few individuals had accumulated many of these rights. Boca de Chajul falls somewhere in between these cases because it has a moderate amount of communal lands also equally distributed. Yet, in this case, I was aware that the *ejido* had made large investments of PES money for a school truck and infrastructure. In contrast, my initial understanding in the rest of the *ejidos* was that they had mostly distributed the money in cash among *ejidatarios*.

Based on these preliminary fieldwork observations, I selected a group of case studies that could cover most of the diversity in the study area in terms of distributional outcomes and land institutions. Thus, I chose El Pirú as a special case because of their communal lands, Boca de Chajul as another special case because of their community distribution, only one of the two cases with few communal lands (Galacia instead of Playón de la Gloria), and only one of the two cases with extensive communal lands (Flor del Marqués instead of Adolfo López Mateos). Though in the end Flor del Marqués also turned out to be a special case on its own, this case study selection processes did seem to capture many variations in distributional outcomes and their determinants in the study area. This allowed making some claims about applicability of my results for the broader context in MdC.

In terms of data collection, I gathered information on surfaces enrolled to PES from official CONAFOR registries. I also collected information on enrolled amounts and payment distributions from the PES intermediary (Natura Mexicana) as well as

landowners and *ejido* authorities. I conducted semi-structured interviews with individual landowners, *ejido* authorities, non-participating families, Natura Mexicana and CONAFOR. Interviews with people in the *ejidos* explored why certain distributions have been preferred over others, why have distributions changed over time, and how have different actors perceived them. Interviews with Natura Mexicana and CONAFOR explored their knowledge and involvement regarding community distributions, and how they perceived distributional outcomes.

5.3. Distributional outcomes in the case studies

This section presents the distributional outcomes in each of the case studies. Summarising the evidence presented here, Table 9 shows that the case studies have distributed PES money in two main ways, i.e. cash or investment. Table 9 also shows how distributional outcomes vary with land institutions⁶⁰, an issue that I will explore in Section 5.4.

⁶⁰ See Section 3.3.1 for an explanation of land institutions in the study area. See also Appendix A for an explanation of the *ejido* institution in Mexico.

Table 9: Land institutions and payment distribution

<i>Ejido</i> (# <i>ejidatarios</i>)	Land property: classification and distribution			PES distribution (cash and/or investment)
	Official	<i>De facto</i>	Distribution (# <i>ejidatarios</i>)	
Boca de Chajul (179)	Individual	Individual	Parcelled (45)	Cash
	<i>‘Ejido’</i>	<i>‘Ejido’</i>	Not parcelled (179)	Cash and investment
	Communal	Individual	Parcelled (4)	Cash
		Communal	Not parcelled (179)	Investment
	Technical advisor fees (donation)			Cash and investment
Galacia (53)	Individual	Individual	Parcelled (38)	Cash
	<i>‘Ejido’</i>	<i>‘Ejido’</i>	Not parcelled (53)	Investment
	Communal	Individual	Parcelled (38)	Cash
	Technical advisor fees (donation)			Cash and investment
Flor del Marqués (28)¹	Communal	Individual	Parcelled (20)	Cash
		<i>‘Ejido’</i>	Not parcelled (28)	Cash and investment
		Communal	Not parcelled (18)	Cash
	Technical advisor fees (donation)			Cash and investment
El Pirú (60)	Individual	Individual	Parcelled (18)	Cash
	<i>‘Ejido’</i>	<i>‘Ejido’</i>	Not parcelled (60)	Cash
	Communal	Communal	Not parcelled (22)	Cash
		Group	Parcelled (16)	Cash
	Technical advisor fees (donation)			Cash and investment

Source: Own elaboration

Note: 1) Flor del Marqués had 35 *ejidatarios* but only 28 rights were active in 2009

5.3.1. Mixed distributions in Boca de Chajul

In 2007, after hearing about experiences of PES in other *ejidos* in MdC, an *ejidatario* from Boca de Chajul who had worked for many years in the Chajul station asked staff at Natura Mexicana whether his *ejido* could apply to PES.⁶¹ Despite working in RBMA since 1979, Natura Mexicana had only sporadically engaged in projects with the *ejidos* in MdC. They were unaware that *ejidos* La Corona and Reforma Agraria (see Figure 2) had participated in PES since 2004 and 2005, respectively, with another PES intermediary (Cooperativa AMBIO). From early on, however, PES attracted the organisation's interest as a conservation alternative and as a possibility for them to engage in relationships with the *ejidos* in MdC.

Natura Mexicana gauged interest in participation in PES with the *ejido* assembly in Boca de Chajul. While many *ejidatarios* were interested in PES, the first informative meetings raised some concerns. Firstly, many perceived that the payment amounts, set at Mxn\$394/ha per year for five years contracts, were too low and failed to compensate for foregone income and forest resources. Further, some believed that PES formed part of a governmental scheme to indirectly acquire land such that by receiving payments from PES they would ultimately lose their property. Finally, *ejidatarios* did not trust Natura Mexicana at the time. As stated by an *ejidatario* from Boca de Chajul:

The relation with us and them was never good until 2007. It was always a tense relation because we had different visions.

Despite these initial concerns, *ejidatarios* were eventually convinced of participating in PES after a series of meetings with Natura Mexicana where it was emphasised that land rights would not be lost by participating in PES. Working closely with the *ejido* president, who at the time was very interested in enrolling 'ejido' lands and communal land to PES,

⁶¹ Cameron (2015) has also documented this process.

Natura Mexicana gathered documentation from those interested and mapped land parcels on foot using Global Positioning System (GPS) technology as part of the application process.

An application was sent for the national biodiversity PES (PSA-B) in 2008 for 1341 hectares (ha), including the following: individual parcels from a minority group of 45 out of the total 179 *ejidatarios* in Boca de Chajul (933 ha); parcelled communal lands from four *ejidatarios* (155 ha); Escuela (27.6 ha), La Presa (60.6 ha), Astillero (37.7 ha) and Mariposario (126 ha) ‘*ejido*’ lands.

The application was only partly successful, with 1071 ha approved at Mxn\$394/ha per year.⁶² This included all ‘*ejido*’ and communal lands but some individual parcels were left out. This situation triggered a series of internal negotiations. The *ejido* president and Natura Mexicana devised an ‘informal’ participation agreement consisting of the following. The *ejido* would consider everyone from the original application as participating in PES and Natura Mexicana would donate the ‘technical advisor’ or intermediary fees that they received from CONAFOR, at Mxn\$56,797 per year, to compensate for the financial gap. The condition set was that everyone had to commit to conserving their forests and to reapply in the following year. This ‘informal’ participation agreement was approved in the *ejido* assembly and all 1341 ha were internally considered as enrolled. In terms of distribution, the money in 2008 was used to pay all individual parcels in cash at the full rate. This required using a fraction of the intermediary fees as well as money from ‘*ejido*’ and communal lands. After paying individual parcels, the

⁶² The reasons for partial successful enrolment will be discussed subsequently in the chapter.

remaining money was set aside and managed by the *ejido*, and used for investments in education.⁶³

The *ejido* successfully reapplied to the PSA-B in 2009⁶⁴ with 239 ha at Mxn\$411/ha per year. All individual parcel holders were paid at the full rate and the money from ‘*ejido*’ and communal lands was invested in the school and the health clinic. Since there was no more need to compensate individual parcel holders, Natura Mexicana specified that the technical advisor fees could no longer be distributed in cash but had to be invested on a collective project chosen by the *ejido* assembly.

In 2010, the *ejido* successfully applied to the regional PESL and received an additional Mxn\$450/ha for the remaining of the 2008 and 2009 PSA-B contracts.⁶⁵ From 2010-2012, payments were distributed in the same way as in 2009. Payments from donated fees, ‘*ejido*’ and communal lands were pooled together and invested in several schooling, health and infrastructure projects. I will say more about these investments in Section 5.4.

Thus, Boca de Chajul represents a case of mixed distribution of PES payments in each of the five years, including individual cash disbursements and investments in diverse collective projects.

5.3.2. Cash distributions in Galacia

After a successful experience in Boca de Chajul, Natura Mexicana approached Galacia to gauge interest for participation in PES. Natura Mexicana approached Galacia specifically because they were interested in conserving a patch of forest in the river delta on the west of the *ejido*. This area, known locally as El Jolochero, was considered as very valuable

⁶³ Later in the year, CONAFOR modified the approved amount to 1200 hectares and it was agreed that since people had been paid already the funds would be administered by the *ejido*.

⁶⁴ This included additional 160 ha of individual parcels from ten *ejidatarios*.

⁶⁵ The regional PESL awarded payments of Mxn\$1,000/ha for five years. For *ejidos* with earlier national PES contracts, PESL gave additional amounts to standardise payments in the region to Mxn\$1,000/ha per year.

for ecological connectivity importance because “it has well conserved forests that are completely surrounded by the RBMA” (De la Maza et al., 2015: 127 *my translation*).

As in Boca de Chajul, there were some initial concerns in Galacia regarding PES enrolment but people were finally convinced after a series of meetings with Natura Mexicana. While gathering documentation, Natura Mexicana found out that there were many inconsistencies between their satellite surface measurements and the informal measurements made by *ejidatarios* when they parcelled the communal lands of Galacia.⁶⁶ According to staff at Natura Mexicana, the difference lay in that *ejidatarios* often used strings or ropes to measure surfaces. This tended to generate larger surfaces than satellite measurements, especially when terrains were mountainous. Recognising measurement variations as a potential source of conflict, Natura Mexicana chose to consider local measurements when dealing with payment distribution and to donate the technical advisor fees to compensate for these differences. As stated by a staff member:

We accepted their measurements as if they were true.

In 2008, an application was sent for the PSA-B for 1033 ha. The application was approved with 1058 ha at Mxn\$394.43/ha per year for five years. Except for an ‘*ejido*’ land of 18.8 ha, all enrolled lands were internally considered individual parcels. Some of these individual parcels were officially classified by the National Agrarian Registry (RAN) as communal lands, but the *ejido* had long chosen to parcel and distribute most of the *ejido* to individual landowners. In terms of payment distribution, it was decided to give money in cash to each individual parcel holder and to use the ‘*ejido*’ land money for management purposes. In 2009, CONAFOR reduced the surface to 934.5 ha because a portion of the land enrolled was actually located in El Pirú. An application was approved for the regional

⁶⁶ For example, in El Jolochero, Natura Mexicana measured 94.8 ha but people in Galacia had calculated 110.4 ha.

PESL in 2010 and the *ejido* received an additional Mxn\$450/ha per year from 2010-2012. Additional payments were distributed in the same way as in 2009. Natura Mexicana's fees were used every year to compensate differences between satellite and people's measurements.

Simultaneously to PES, Natura Mexicana devised and implemented a community-based ecotourism project in the forests of El Jolochero. As noted by the organisation, the area "is a flooding rainforest area where there is constant fauna crossing from the RBMA. This characteristic makes the area a place with extraordinary ecotourism potential" (De la Maza et al., 2015: 127 *my translation*). In exchange for providing technical support and channelling funds for the construction and operation of the project, Natura Mexicana asked *ejidatarios* to commit to conserving the forests in the area and to form an ecotourism enterprise that would legally own the project. This enterprise was formed in 2008 by a group of 22 *ejidatarios* and the project was completed in 2012 with a total infrastructure investment of more than Mxn\$14 million (De la Maza et al., 2015).

Thus, Galacia represents a case where most payments have been disbursed in cash among individual parcel holders.

5.3.3. Appropriation in Flor del Marqués

After hearing about PES experiences in the neighbouring *ejidos*, authorities in Flor del Marqués contacted Natura Mexicana in 2009. As in the previous cases, Natura Mexicana had never worked in Flor del Marqués and *ejidatarios* had mixed attitudes regarding enrolment. Importantly, the *ejido* had an outstanding debt of Mxn\$115,000 with CONAFOR because they had failed to comply in an earlier reforestation programme which people attributed to fraudulent behaviour by a previous technical advisor.

An application was sent and approved for 672.1 ha in the 2009 PSA-B. Though the entire *ejido* surface was officially classified as communal lands, 284 ha were internally considered individual parcels, 19 ha ‘*ejido*’ lands and the remaining communal lands. Though technically the *ejido* was banned from PES because of their non-compliance in the earlier reforestation programme, CONAFOR allowed enrolment as long as they paid their debt. Natura Mexicana donated the technical advisor fees of Mxn\$41,100 for this purpose in 2009 and the *ejido* covered the rest.

The money from 284 ha was given in cash to the individual parcel holders during the entire PES contract (2009-2013). In 2009, payments from communal lands were distributed equally in cash among all *ejidatarios* whose land rights were considered as *de facto* ‘active’ in the *ejido*. By 2009, Flor del Marqués officially had 35 *ejidatarios*, including 25 *ejidatarios básicos* and ten non-*básicos*, but only 28 were considered as ‘active’ and thus subject to receiving money from PES. This included all 10 non-*básicos* and 18 *básicos*. The remaining 7 *básico* rights that were considered as ‘inactive’ were as follows: one *básico* had passed away in 2004 and his right had been permanently forfeited; three *básicos* had left the *ejido* and sold their lands, thus their rights had been permanently forfeited; three *básicos* had migrated to the United States for work but had not sold their lands, thus their rights were considered as temporarily inactive until their return. In the latter case, lands had been ‘abandoned’ since these people left the *ejido*.

In Flor del Marqués, the term *básico* is used to refer to the 25 *ejidatarios* who were living in the *ejido* when PROCEDA came into place in the early 2000s. At this time, mostly the people who founded the *ejido* in the 1980s as well as a couple of more recent settlers composed the group of *básicos*. The word *básico* refers to the ‘basic folder’ (*carpeta básica*), the official land documentation given by RAN. In other words, *básicos* are those whose names appear in the *carpeta básica*, or their heirs, and as such had official land

documentation. In turn, non-*básicos* are those ejidatarios in Flor del Marqués who arrived after PROCEDA and who purchased lands informally from *básicos* (see Section 3.3.1). Thus, they have no official land documentation.

The money from the '*ejido*' lands was distributed in the following way: money from the 'Women' (Mujeres) parcel was given equally in cash among all female *ejidatarias* or wives of male *ejidatarios*; money from the 'School' (Escuela) parcel was given to the school board to be used for the primary school. Specifically, payments from the 'School' parcel were used for a water tank in the primary school as well as cables and lighting.

The *ejido* successfully applied to the regional PESL in 2010 and received an additional Mxn\$450/ha for the remaining of the 2009 PSA-B contract. PSA-B and PESL payments from individual parcels and the 'School' parcel were distributed as before. However, a distinction was made regarding the distribution of payments from communal lands and the 'Women' parcel. Payments from the PSA-B would be distributed in the same way as in 2009. In contrast, PESL payments would be disbursed in cash equally and exclusively among *básicos*.

Additional distributional changes took place in the following years. These increasingly favoured the group of *básicos*. Except for Mxn\$2,500 from the PSA-B in 2012 and Mxn\$2,350 from the PESL in 2012, no more money was given to the school. The same applied for the 'Women' parcel. Money from the 'School' and the 'Women' parcel were disbursed exclusively among *básicos* or their wives from 2010 onwards. In addition, from 2010 onwards, the technical advisor fees were disbursed in cash among the *básicos*. When the *ejido* renewed the PESL in 2014, all payments from communal lands and '*ejido*' lands

were given in cash to *básicos*.⁶⁷ Nonetheless, individual parcels holders, *básicos* and non-*básicos* alike, were always paid in cash proportionally to the amount of land enrolled.

Concomitant to this process, Natura Mexicana developed a community-based ecotourism project in Flor del Marqués. From early on, Natura Mexicana considered the *ejido* as a place with high ecotourism potential because of its intricate geomorphology, its scenic beauty and panoramic views (De la Maza et al., 2015: 132). Natura Mexicana pitched the idea of a project among *ejidatarios* under the same conditions as in Galacia. Initially, the group of 28 *ejidatarios*, 18 *básicos* and 10 non-*básicos* who received PES money from individual parcels, had been internally considered as part of the ecotourism project. However, the group was eventually reduced to the 18 *básicos*. The project was finally completed in November 2012.

Thus, Flor del Marqués represents a case of evolving distributions increasingly favouring cash disbursements among a specific group.

5.3.4. Reproducing inequalities in El Pirú

As in Flor del Marqués, it was the *ejido* authorities in El Pirú who initially approached Natura Mexicana for participating in PES. An application was sent and approved for the PSA-B in 2009. This included 2288.3 ha, of which: 720.62 ha were individual parcels from 18 *ejidatarios*; 28.8 ha from the ‘School’ parcel and 40.1 ha from the ‘Women’ parcel; 30.6 ha from a group parcel collectively owned by 16 *ejidatarios*; 1,468.1 ha of communal lands unevenly owned by 22 *ejidatarios* (see Section 3.3.1; see also, Figure 4). The application was only partly successful and the *ejido* received payment for 1231.1 ha

⁶⁷ An application was sent for the regional PESL for 699.2 ha and 658.8 ha were approved. The land enrolled was practically the same as in the PSA-B in 2009.

at a rate of Mxn\$411/ha for five years. This included all the individual parcels and ‘*ejido*’ parcels but only a fraction of the communal lands.

The *ejido* assembly and Natura Mexicana devised an ‘informal’ participation agreement, similar to the one in Boca de Chajul. All the money received by the *ejido*, as well as the technical advisor fees from Natura Mexicana, were pooled together and disbursed in cash among individual parcel holders and communal landholders proportionally to their surface contribution. Given the large size of the difference between the surface paid for and the surface applied for, the rate paid was at Mxn\$253/ha instead of Mxn\$411/ha. The *ejido* successfully applied to PESL in 2010 receiving Mxn\$1,000/ha for the surface not accepted in 2009. This additional money was distributed in the same way before.

With the previous ecotourism experiences in Galacia, Flor del Marqués, as well as another project in Playón de la Gloria (De la Maza et al., 2015), Natura Mexicana set out to develop another project in El Pirú from 2012. Natura Mexicana conceived this project as part of a broader ecotourism corridor in which “every project proposed is complementary to each other, and has the objective of constructing an attractive and broad touristic offer” (De la Maza et al., 2015: 77 *my translation*). Natura Mexicana pitched the project to the *ejidatarios* in El Pirú under the same conditions before. After several internal discussions, the agreement reached was that all *ejidatarios* would share benefits equally but that the project would only be linked to a fraction of the communal land and another ‘*ejido*’ land known locally as Agua Caliente. From 2010-2013 almost Mxn\$700,000 of donated technical advisor fees from Natura Mexicana remained unspent⁶⁸ until they were finally used for purposes related to the ecotourism project in 2013-2014. Approximately

⁶⁸ The total donations included five yearly amounts of Mxn\$59,184 from the PSA-B in 2009; five yearly amounts of Mxn\$44,000 from PESL in 2010; four yearly amounts of Mxn\$35,200 from the additional regional PESL in 2010. Thus, in total the technical assistance fees amounted to Mxn\$691,920 from 2009-2013.

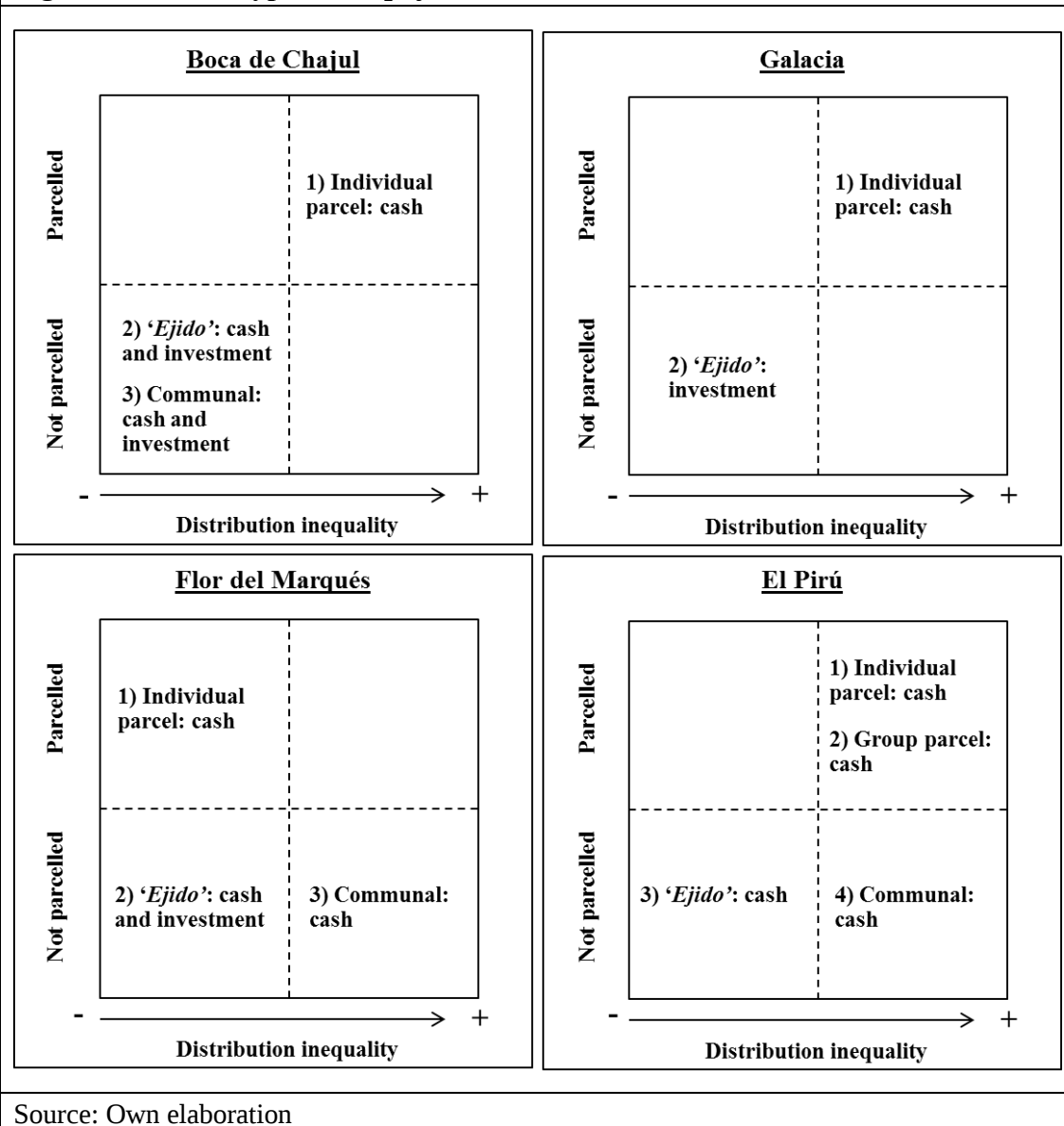
Mxn\$400,000 were used to improve the roads leading to Flor del Marqués and the rest was used to construct a small pier for the tourist water activities. The project was still under construction in 2017.

Thus, El Pirú represents a case of unequal cash disbursements linked to land inequalities, as well as collective investments.

5.4. Understanding community payment distribution in MdC

The previous section has shown that *ejidos* distribute PES money in a combination of cash or investments, that payment distributions have often changed in time, and that payment distribution is heavily influenced by land institutions. This section aims to systematically analyse the associations between land institutions and payment distributions. For this, I present Figure 10 showing distributional outcomes in each case study along two axes: whether land is parcelled and the inequality of distribution. These choice of ‘parcelled’ and ‘inequality’ as variables for analysis emerged directly from the empirical information presented in the fourth column in Table 9, but was also informed by insights from PES literature on how land property and equity may influence distributional outcomes (Corbera et al., 2007a; García-Amado et al., 2011; Pascual et al., 2010, 2014).

Figure 10: Land ‘types’ and payment distribution



Since there are two categories for each axis, i.e. parcelled/not parcelled and equal/unequal land distribution, there are four possible combinations in Figure 10. Inequality here refers to two types: *within* refers to inequality among those participating in PES; *between* refers to inequality between PES participants and non-participants. For instance, I classify communal lands in El Pirú as unequally distributed because rights are unevenly held among of 22 landowners (see Figure 4), and also because only a small proportion of landowners (22/60) holds rights to communal lands. In turn, I classify individual parcels

in Flor del Marqués as more equally distributed because most *ejidatarios* (20/28) enrolled parcels.

The exercise conducted in Figure 10 is useful because it reveals an association between land institutions and PES distribution in three out of four quadrants. Firstly, as shown in the two upper quadrants in each case study, parcelled lands are always associated with cash disbursements. This includes individual parcels in all case studies and a group parcel in El Pirú. Further, as shown in the two right-hand quadrants in each case study, unequally distributed lands are also associated with cash disbursements. This includes individual parcels in three case studies and communal lands in Flor del Marqués and El Pirú. However, in the last quadrant, i.e. when land is not parcelled and equally distributed, payments are disbursed in cash, invested or both. This includes ‘*ejido*’ lands in all case studies and the special case of communal lands in Boca de Chajul.

Over the following sections, I elaborate on these initial findings to provide explanations for each of these associations. I show that the distribution of PES money emerges from the combination of two sets of factors. First, ‘structural’ factors associated with historical land institutions. Further, ‘agential power’ factors linked to the interests of local actors.

5.4.1. Parcels and voluntary enrolment

The case studies reveal important variations in the historical evolution of parcelling processes. In some cases, land has become increasingly parcelled over time while in others it has remained largely not parcelled. For instance, the entire surface in Galacia was parcelled from early on. In contrast, at least part of the surface remained not parcelled in the rest of the *ejidos*, albeit with variations on property distribution. A historical explanation as to how parcelling processes have come about and why they have evolved in time goes beyond the scope of this chapter. A series of potential factors, nonetheless, seemed to have influenced parcelling processes. First, land biophysical characteristics

and perceptions over land productivity. In the early settlement stages, landowners would parcel the ‘best’ lands for agricultural or ranching activities. Areas deemed as less productive or otherwise difficult to access were often left, at least initially, as not parcelled collective reserves. Further, land security considerations during the initial settlement processes as well as in specific moments in time. Concerns over the risk of invasions from outsiders and land grabbing among *ejido* members motivated an interest to parcel the entire *ejido* in Galacia from early on. PROCEDE gave additional impetus towards parcelling in the region by awarding landowners the possibility of acquiring individual property titles. Whatever the cause triggering these parcelling processes, however, the fact of the matter is that all case studies share similar locally accepted parcel ownership rights.

At the time of initial PES negotiations in each *ejido*, individual parcel holders voluntary decided not only whether or not to enrol to PES, but also which specific parcels or fractions to enrol. Previously in Chapter 4, I showed that parcel selection is highly strategic and contingent on a series of factors, including present and future perceptions over land productivity, household productive capacity, opportunity cost expectations and future aspirations. In this section, I bring forward the voluntary nature of enrolment as the mechanism explaining why cash disbursements have been favoured on parcelled lands. The rationale is as follows.

Under PES programme conditions, land use changes and resource extraction from enrolled forests are heavily restricted. In Chapter 4, I showed how people interpret PES’ environmental conditions on enrolled forests as only allowing to extract already felled timber for household use, and the role played by Natura Mexicana in this regard. Thus, for people in the *ejidos* enrolment implies foregone resources because of reduced access to forest resources, such as timber, as well as income from potential agricultural or

ranching activities. Knowing this *ex ante*, those enrolling parcels voluntarily would only do so conditional on receiving an economic compensation at least loosely proportional to the foregone resources associated with enrolment. Based on a shared understanding of the implications associated with enrolment, it became firmly established and locally accepted from early on, that the ‘fair’ way to distribute payments would be to disburse proportional cash payments to landowners. Indeed, when negotiating the distribution of payments from parcels, other potential distribution types, such as leaving aside funds for investments, were not even considered as a possibility in any of the cases. On the contrary, all case studies revealed a strong preference for prioritising payments on parcels in cash before any other type of land. This is clear when looking back at the ‘informal’ participation agreements in Boca de Chajul and El Pirú where ‘*ejido*’ lands payments and the donated fees were used to pay individual parcel holders. These notions are evident in the following extracts from interviews with *ejidatarios* in El Pirú and Boca de Chajul, respectively, explaining why parcel holders should receive payments in cash:

The land is his. If it is his parcel it is his parcel. No way we can take what is his, his heritage and give it to the *ejido*. That is for him and his family. Otherwise, that person has to use the land, he has to harvest. The person is not working his land so that is his money.

Because it is my parcel and I am the owner of my forest. It is my right to receive the benefits from my parcel. But also, why should I leave my money for a collective benefit when the rancher that has no more forest does not do the same?

Thus, individual parcels are strongly associated with cash disbursements and the mechanism accounting for this relation is the voluntary nature of enrolment. This explains why very similar distribution took place in all case studies independently of important variations in other aspects, such as the number of parcel owners, the size of surface per parcel owner, the ‘official’ land classification or the inequality of land distribution. Of course, these

findings must be situated in a context where most households are deeply cash constrained and as such have a strong preference for cash disbursements. Recognising the potential influence of economic factors, however, the argument made here is that the very specific narratives around cash disbursements and how these take place in practice are deeply connected with the voluntary condition of parcel enrolment.

5.4.2. Inequality and disincentives to invest

As I emphasised in Chapter 2 as well as previously in this chapter, the *ejidos* in MdC have experienced highly complex land distribution processes not only at the time of initial colonisation but also during their historical evolution leading to PES enrolment in the 2000s. In the early settlement stages in the municipality of MdC, migrant families first occupied lands in the riverbank opposite to the RBMA. The riverbank was chosen first because land was deemed as more productive and because transportation and access to supplies more accessible. Once all the riverbank lands had been claimed by settlers, newer families established inland population centres and working areas. The four case studies analysed here exemplify this process. Galacia and Boca de Chajul, located by the riverbank, were settled by families who arrived in the region in the 1970s. In turn, the inland *ejidos* of Flor del Marqués and El Pirú were settled by families who arrived in the 1980s when all the riverbank areas had already been claimed. *Ejidatarios* in each case study received different land endowments depending on a series of factors, mainly the number of initial settlers and available land surface. For instance, more than one hundred *ejidatarios* in Boca de Chajul were endowed 30 hectares while in El Pirú 54 *ejidatarios* received 50 hectares each. As described in Chapter 4, in order to ‘complete’ their endowment and as a way to diversify production, initial settlers often chose several plots of land in different places within each *ejido*. Specific plot choices had much to do with

perceptions on soil quality and accessibility considerations that help to account for the highly scattered landscape in MdC.

After these initial settlement processes, the case studies analysed here underwent remarkably different land trajectories. Some remained practically unaltered in terms of land property while others were severely transformed by active formal and informal land markets. At the time of PES, most of the *ejidatarios* in Galacia were still founding settlers who had arrived in the area as children and who had managed to keep their land throughout the years. In contrast, many parcels in El Pirú had been acquired by a handful of newer *ejidatarios* for extensive ranching activities and, as shown in Figure 4, communal lands had been increasingly accumulated by a small group composed by original and new *ejidatarios*. Understanding the historical trajectory of land distribution in each case study goes beyond the scope of this chapter. However, what is relevant here is the extent to which land distribution influences how payments are distributed.

As shown in Figure 10, unequal land distribution is associated with cash disbursements. In terms of property, this includes individual parcels in most of the cases and communal lands in El Pirú and Flor del Marqués. Previously, I argued that the voluntary nature of enrolment to PES accounts as for why payments from individual parcels are proportionally disbursed in cash. In the case of ‘*ejido*’ and communal lands, however, enrolment is not necessarily voluntary. As described in Section 5.3, in all cases there was some resistance to get involved in the programme. Common reasons included negative previous experiences with external advisors, fears over losing land and concerns over payments being too low on a per hectare basis. While individual parcels holders could voluntarily choose not to enrol to PES, enrolment decisions on ‘*ejido*’ and communal lands were taken collectively at the *ejido* assembly by simple majority vote. The fact that enrolment can be achieved via collective vote despite individual reluctance suggests that

voluntary enrolment cannot be as easily established as the mechanism explaining distribution. Rather, the case of communal lands in El Pirú reveals another type of mechanism.

In El Pirú, communal land payments were never used for investments but were rather disbursed in cash proportionally to communal land ownership among 22 *ejidatarios*. In this case, land inequality favoured cash disbursements because it reduced individual incentives to individually contribute for public investments. The argument is as follows. Communal lands had been increasingly and unequally concentrated among few *ejidatarios* over the years in El Pirú. These lands, however, remained collectively owned since they had not been parcelled and, as such, no individual could freely change land use. At the time of enrolment to PES, though some hinted that investing payments for communal projects could be helpful for the *ejido*, those who owned many rights to communal lands were particularly vocal in opposing this. It is not that they opposed putting aside payments for investments *per se*, rather, they opposed the idea of contributing disproportionately. In other words, if payments were to be invested, the fact that communal land was unequally distributed made it possible for those not owning land at all, or those owning less than others, to benefit disproportionately. This acted as a disincentive, particularly among *ejidatarios* holding many rights to communal lands, to individually invest in public goods. This situation favoured cash disbursements instead. These notions are evident in the following interview with one *ejidatario* in El Pirú:

Because each *ejidatario* has a certain number of hectares there and therefore it is his right. That cannot be given to all because not all have land. When all 100% *ejidatarios* have a right then it is possible to give it to the *ejido*. But when we distributed the *uso común* there were 54 right holders, but only 23 or 24 people now have rights. It is not good for the person that has many rights to contribute that much for the benefit of everyone.

Thus, because it creates possibilities for unequal contributions, land distribution inequality acts as a disincentive for landowners to invest PES payments for the provision of public goods. This finding applies as well for individual parcels as a complementary explanation to the effects of voluntary enrolment as provided in the previous section. *Ejidatarios* in all cases provided similar accounts as the one described in the interview extract above as to the tensions between interests on using payments for investments and the challenges for convincing people to contribute.

Of course, as discussed previously, these findings need to be situated in a context where cash disbursements are often favoured among highly cash constrained households facing strong trade-offs between receiving household income and contributing for collective purposes. In any case, however, these complementary explanations help to account as for why cash disbursements on parcelled and unequally distributed lands are so persistent.

5.4.3. Special purpose lands

All case studies enrolled at least one '*ejido*' land. For instance, 'School' and 'Women' lands were enrolled in El Pirú and Flor del Marqués. Attempting an explanation as to why '*ejido*' lands differ in each *ejido* goes beyond the scope of this chapter but this seems to have been the result of a combination of regional land processes as well as contextual factors in each case study. The fact that this type of lands is stipulated under Agrarian Law and PROCEDA helps to account as to why they exist in the first place but their composition in terms of number, size and purpose, appears to have much to do with settler preferences as well as land biophysical characteristics.

Figure 10 shows that PES payments from '*ejido*' lands, all located in the lower left-hand quadrants, have been disbursed in cash or used for investments. Thus, only based on whether land is parcelled and how it is distributed it is not possible to explain distribution

of payments. As a way to move forward, Table 10 presents further information of ‘*ejido*’ lands and corresponding payment distribution.

Table 10: Distribution of payments from ‘ <i>ejido</i> ’ lands				
<i>Ejido</i>	Local name (ha)	Purpose	Payment distribution	
Boca de Chajul	Escolar (27.6)	School	2008: cash (parcels) and investments (school)	2009-2012: investments (various)
	La Presa (60.8)	None		
	Astillero (37.7)	Timber		
	Mariposario (126.4)	None		
Galacia	Ejidal (2.8)	None	2008-2012: investments (administration)	
Flor del Marqués	Escolar (10.6)	School	2009-2010: investments (school)	2011-2013: cash (communal)
	Mujeres (18.3)	Women	2009-2010: cash (women)	
El Pirú	Escolar (29.7)	School	2009-2013: cash (parcels and communal)	
	Mujeres (40.1)	Women		
Source: Own elaboration				

Table 10 reveals a high level of complexity in payment distribution on any given year in each *ejido* as well as shifting dynamics. In order to systematise the analysis, the following sections focus on particular cases. The first part focuses on cases where payments were disbursed in cash among individual or communal landholders. The second part focuses on cases where there were payment distribution changes.

5.4.3.1. Correcting mismatches

Payments from ‘*ejido*’ lands were distributed in cash among individual and communal landholders on particular instances for avoiding, or correcting, potential payment mismatches. In other words, the objective of using money from ‘*ejido*’ lands to pay other landholders was to eliminate or reduce disparities between how payments *were actually being* or *could potentially be* distributed and how they *should* be distributed according to local perceptions of fairness. In the first PES applications in Boca de Chajul in 2008 and El Pirú in 2009, the application was only partially successful. This is, not all land

originally applied for was successfully enrolled to PES and thus was not officially paid for. Natura Mexicana attributed this partial successful enrolment to a combination of their own mistakes but also CONAFOR's mistakes during the application and evaluation processes. According to Natura Mexicana, surfaces measured with satellite imagery were consistently smaller than those calculated using non-satellite technology. This was particularly the case in mountainous areas. Though Natura Mexicana's staff did recognise making some mistakes in the application processes, particularly in the first years, it also placed at least part of the responsibility on CONAFOR's own mistakes and selection criteria. The following interview extracts with Natura Mexicana's staff describe how they interpreted partial enrolment:

The resources in the first and second years had to be used to correct mistakes made by the *ejido* but also made by the organisation. It was all an adjustment process regarding the amounts enrolled. For example, in one *ejido*, the terrain is very steep and we, the *ejido*, and CONAFOR had different measurement. Then there were differences with the payment. The *ejido* measured this, CONAFOR says this, the map says this, and then we go to the field and conclude that satellite images do not capture reality.

They (CONAFOR) lived under the illusion that everything enrolled was communal lands. There was a moment when they realised that one *ejido* had many contracts and then they would say no. They had the shape files (satellite measurements) but internal land division was not clear to them. Maybe the operators were aware about this but in higher levels I do not think that they knew that people were enrolling parcels. That was a shock to them and then they wanted to reject our applications.

Under the 'informal' participation agreements, it was agreed that all lands applied for would be *de facto* considered as enrolled provided that they were subject to the same restrictions regarding land use change and resource extraction as enrolled lands. There were interests among individual parcel and communal landholders for prioritising payments for these lands and for trying to ensure a payment per hectare as close as

possible to the full amount under each contract: Mxn\$394/ha for Boca de Chajul and Mxn\$411/ha for El Pirú. However, the fact that these arrangements effectively increased the amount of land ‘enrolled’, on the one hand, without increasing the total payment received, on the other, had the effect of reducing the payment received per hectare. Ultimately, this created a potential payment mismatch: allocating payments from individual parcels and communal lands to its owners and payments from ‘*ejido*’ lands for their particular purposes would be insufficient to reach full amounts per hectare.

Facing this situation, payments from ‘*ejido*’ lands were instead disbursed among individual parcel and communal landholders due to a collective interest for avoiding or at least reducing potential payment mismatches. Evidence in support of this argument is not only the actual ways in which payments were distributed, but also how distribution was locally interpreted and understood. The use of language here is particularly revealing. In the first year of the PES contract, payments from ‘*ejido*’ lands were, according to local terms, partially or totally ‘sacrificed’ (*sacrificados*) to ‘complete’ (*completar*) payments or to ‘cover deficits’ (*cubrir déficits*). In the specific case of El Pirú, the size of the mismatch in the first year was such that payments from ‘*ejido*’ lands, as well as those from donated fees by Natura Mexicana, were insufficient to pay full amounts per hectare. Thus, landowners received payments of Mxn\$253/ha, which were much smaller than the full amount at Mxn\$411/ha. In local terms, landowners ‘had to conform’ (*se conformaron*) to receive a ‘discount’ (*descuento*). In contrast, the payment mismatch was smaller in Boca de Chajul such that payments pooled from ‘*ejido*’ lands, communal lands and donated fees were more than enough to pay individual parcel owners at the full rate of Mxn\$394/ha. The successful reapplication to PES in the following year in each *ejido* allowed paying individual and communal landowners at the full amount. In this new situation, however, the response was different between both *ejidos*. In Boca de Chajul,

the ‘spare’ money, i.e. money remaining after paying at a full price per hectare, was used for investments. Section 5.4.4.2 will show that this had much to do with the role played by the *ejido* president. In contrast, in El Pirú ‘spare’ money was simply disbursed among parcel and communal landholders, which yet again reveals a preference for cash disbursements.

Though seemingly different, the case of Flor del Marqués reveals a similar concern for correcting payment mismatches. However, the nature of payment mismatches was quite different. In the cases described above, potential payment mismatches emerged out of a combination of partial unsuccessful enrolment and interests on achieving full payments per hectare on particular lands. In contrast, these arose in Flor del Marqués out of increasing discontent by *básicos* over how payments had been distributed. Payments from ‘*ejido*’ lands in the first two years had been invested in the school and distributed to women. However, from the third year onwards, payments were disbursed in cash among the group of *básicos*. A similar process took place regarding payments from communal lands. In this case, payments that had been originally distributed among *básicos* and non-*básicos* alike, were subsequently distributed exclusively among the former. In fact, except for individual parcels, all payments in Flor del Marqués were increasingly appropriated by *básicos*. Further, non-*básicos* were also effectively excluded from participating in the ecotourism project on the basis that it was associated with the communal lands. Thus, the analysis presented here applies to payments from communal lands as well. The way in which *básicos* conceptualised and justified this process provides evidence in support of the argument that they modified the distribution of payments with the objective of eliminating what they interpreted to be payment mismatches.

In the words of a *básico*, they modified payments ‘to correct previous mistakes’. *Básicos* perceived to have made a ‘mistake’ in the way payments from ‘*ejido*’ lands had been

distributed in the early years. In their view, the ‘mistake’ here had been that they had wrongly decided to award payments to non-*básicos* who otherwise did not deserve them. The reason why they perceived that non-*básicos* did not deserve payments, or at least not as much as them, was deeply connected with considerations over historical land ownership and settlement. For a series of reasons, *básicos* perceived that lands belonged to them, or at least ‘more’ to them than to others. In their view, this justified collecting the payments. The specific explanations given by *básicos* as to why they had decided to claim resources formed part of a narrative whereby they positioned themselves as the only legitimate landowners, and by extension, the exclusive payment recipients. Firstly, for many years they had ‘sacrificed’ (*sacrificado*) working the lands and instead had decided to protect the forests located in ‘*ejido*’ and communal lands. They argued that it was these decisions taken in the past that had now allowed the *ejido* to participate in PES. Moreover, having been in charge of settling the *ejido* and having lived in there for longer than other non-*básicos*, they had ‘suffered’ (*sufrido*) much over the years in bringing services and infrastructure now enjoyed by everyone. This included the roads, electricity, schools and the clinic. There is some truth in these claims, since as I mentioned previously in Chapter 2, the provision of public services in MdC has historically been sluggish. Finally, more formally, *básicos* argued to be the exclusive, rightful and official landowners on the basis that they were the only group in the *ejido* who had actually managed to acquire legal paperwork.

Taken together, these arguments were brought forward by *básicos* to justify claiming not only a one-off compensation for their historical ‘sacrifices’, which would involve a single payment, but rather *all* payment streams associated with the *ejido* and communal forests and even the donated fees from Natura Mexicana. The following collection of extracts from interviews with different *básicos* illustrates the series of arguments described above:

The rest of the people no longer receive because they do not have papers and have only arrived recently. We have suffered much taking care of the forest. We did give them before, we gave them but we decided not to give them anymore. The *básicos* said to have suffered much, my grandfather said that they suffered a lot and those who are just arriving have not suffered anything and they want everything.

Let's say that the people who founded the *ejido* have more right because they founded the *ejido*. They spent, they managed and those who are only starting, one or two years ago do not have the same right. It is true because when I arrived here 15 years ago there was no light, no water and we cooperated two times every week for administering this, for transport, for the road. And that is why they deserve it more, because they are registered in the RAN⁶⁹.

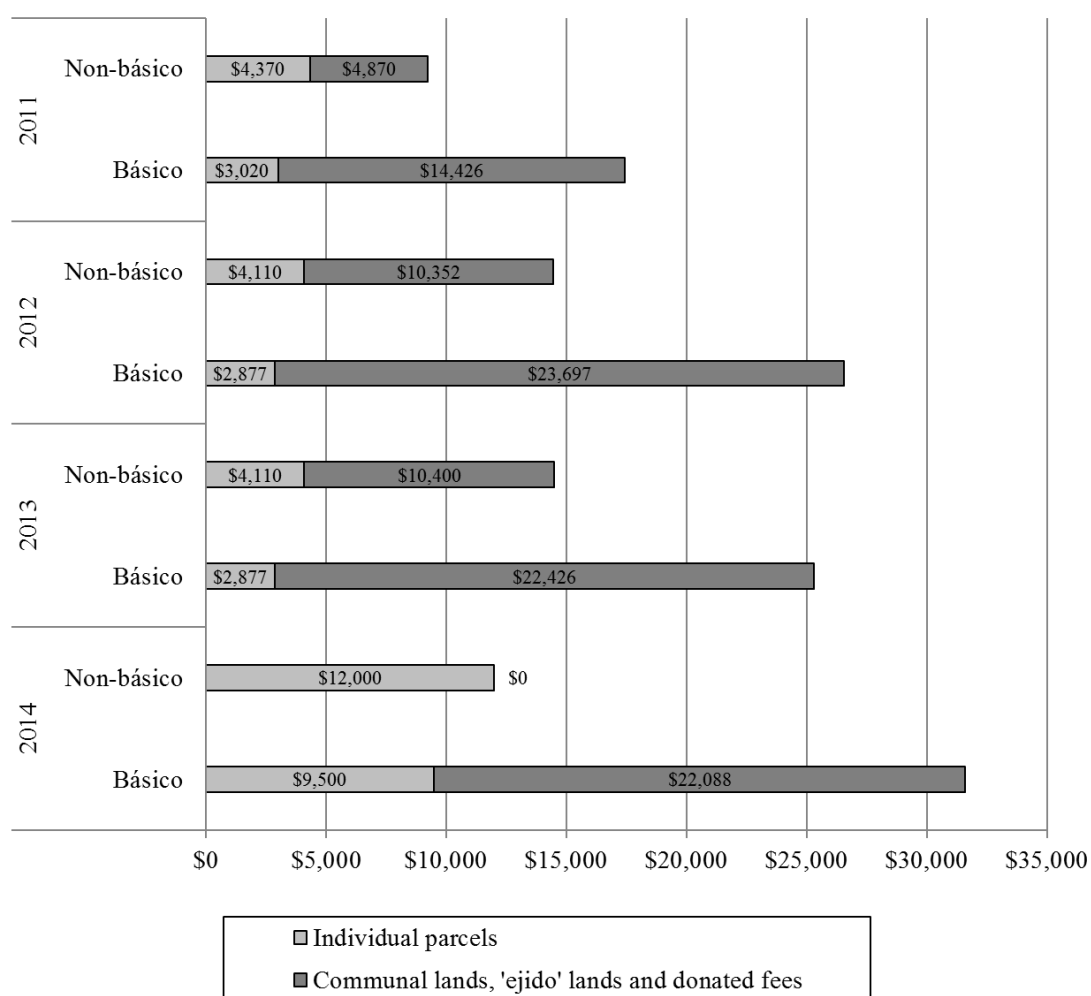
At the beginning we had considered the others but the problem was that we had a big error because some families have only been here one year and we gave them the money. We gave them on two occasions but then the *ejidatarios básicos* were very angry. Before we gave everyone but we realised that we were doing wrong, giving money to people who had just got here.

Motivations aside, the fact is that *básicos* succeeded in effectively claiming payments from PES and subsequently distributing them among the group in cash. Several pieces of evidence suggest that this had much to do with the position of power of *básicos* in the *ejido* as well as the reluctance of external actors to get involved in internal politics. First, *básicos* have historically enjoyed perpetual institutional power as *ejido* authorities because only *ejidatarios* with land titles are eligible for these positions. Newer settlers only informally purchased lands which *básicos* had originally left aside as communal lands but did not receive official land property titles. This has enabled *básicos* to effectively take decisions in the assembly such as those related to distribution of PES payments or the participation in the ecotourism project. Indeed, oftentimes non-*básicos* would use the terms *básicos* and 'authorities' (*autoridades*) interchangeably which hints

⁶⁹ National Agrarian Registry (RAN).

to the fact that *básicos* simply alternate positions as *ejido* authorities. Moreover, beyond this institutional power, *básicos* exert *de facto* control over other *ejidatarios* in multiple aspects of *ejido* dynamics. This is most clear when analysing the effects of losing payments among non-*básicos* as well as their response to this process. Figure 11 shows the total payments received by a *básico* and a non-*básico* who enrolled similar amounts of individual parcels in the 2009-2013 and 2014-2018 contracts: 7.8 has and 9.9 has, respectively, for the *básico*; 9.0 has and 12.3 has, respectively, for the non-*básico*. The figure clearly shows that modification made by *básicos* to the distribution of payments from ‘*ejido*’ lands, communal lands, and donated fees have implied substantial economic losses each year.

Figure 11: Payment appropriation by *básicos* (2011-2014, nominal Mxn)



Source: Own elaboration

1) The figure compares the total payments received from 2011-2014 by one *básico* and one non-*básico* in Flor del Marqués. Both enrolled similar amounts of individual parcels in applications 2009-2013 and 2014-2018: 7.8 and 9.9 has, respectively, for the *básico*; 9.0 and 12.3 has, respectively, for the non-*básico*.

The four non-*básicos* interviewed did express discontent about this and claimed that *básicos* were being unfair with them. However, they have been generally reluctant to openly confront *básicos* by claiming that they would rather lose payments than get into trouble. The following extracts from interviews with two non-*básicos* provide insights as to how they perceive themselves in relation to *básicos* and their opinion regarding the changes in payment distribution:

Why do we all collaborate in the firebreaks? Why were we equal when we have to cooperate but when there are benefits we are completely different?

I see that the authorities do not tell us much and I do not know how they administer the money. We are supposed to receive \$1,000 per hectare but they say that there are contributions. Before, all women received and they gave us but not anymore. They took that from us and now they do not give it to women. We do not know what they do with that. They worked hard for this land, I agree with that. When I came here the roads were already here but not as they are now. I worked too in the road. We do not need to hide our work. This is how we should work, this is an *ejido*, we are also *ejidatarios*.

The only exception was one non-*básico* who did raise his concerns publicly in the *ejido* and who sought to speak with someone in *Natura Mexicana*. The following extract highlights his view:

If there is one thing that I do is claim my rights. Nobody here dares to do that because nobody dares to confront the authorities or those who came here 30 years ago. Everyone expects them to give orders.

Significantly, the non-*básico* cited above sold all his lands and left the *ejido* with his entire family during the course of this fieldwork such that further interviews were not possible. When I asked about him or why he left to *básicos* no one seemed to know where he went and a common explanation for leaving was that he was ‘conflictive’ and ‘never got along’ in the *ejido*. It is not clear whether he was forced or ‘nudged’ to leave in violent or non-violent ways. Yet, the possibility that he was persecuted for confronting the *básicos* would help to explain why other non-*básicos* were reluctant to assert their rights for compensation. More research is needed on this, but other reasons for non-*básicos*’ reluctance to being confrontational would include: not having property titles and as such not having land security; mutual dependence with other families regarding labour and

loans; and more generally the risk that *básicos* could use their power in the assembly at their expense.

As highlighted in the previous extracts, *básicos* have used their position of power to conceal information from other *ejidatarios*. Further, they have also concealed information from Natura Mexicana and CONAFOR. For instance, despite working with the *ejido* for several years, it was only in 2013 when Natura Mexicana realised how payments were being distributed. The process came to the fore when a non-*básico* finally decided to contact them to inform about the situation. Up until then, Natura Mexicana believed that all *ejidatarios* had been receiving payments from communal lands and that payments from *ejido* lands had been used for the school and for women productive activities. Though this process raised concerns within the organisation, it was ultimately decided that they should not intervene since this could risk further collaboration in the *ejido*. This issue will be further discussed in Section 5.4.4.

Thus, this section has shown how concerns for reducing or eliminating payment mismatches explain why payments from ‘*ejido*’ lands have been distributed in specific ways in Boca de Chajul in 2008, Flor del Marqués in 2011-2013 and El Pirú in 2009. On occasions these mismatches arose rather unintendedly as a consequence of unsuccessful enrolment. Other times, they were ‘created’ purposely by powerful actors as a way to appropriate payments. In any case, payments were always disbursed in cash.

5.4.3.2. Earmarking

A very different story emerges when focusing attention on the cases where payments from ‘*ejido*’ lands were not used to pay individual or communal lands. Table 10 reveals an association between how payments were distributed and the purpose of ‘*ejido*’ lands. This is most clear when looking at Flor del Marqués, where payments from the ‘School’ parcel

were used at some point for school purposes and payments from the ‘Women’ parcel were distributed among women.

The association between payment distribution and specific purposes of ‘*ejido*’ lands among the case studies had much to do with land earmarking processes deeply embedded in the collective imaginary of the *ejidos*. In addition to the link between payment distribution and the purpose of ‘*ejido*’ lands, evidence in support of this argument is how distribution has been locally understood and interpreted. A recurrent line of reasoning is the following. ‘*Ejido*’ lands were created long before PES out of interests for achieving certain purposes, such as improvements in education. While the specific purpose of each ‘*ejido*’ land may vary in nature, it is ultimately their purpose what gives these lands their *raison d’être*. ‘*Ejido*’ lands exist precisely because they have a purpose. It would have made not much sense to create ‘*ejido*’ lands in the first place and to keep them as such when they could have otherwise been parcelled. As stated by a landholder from El Pirú ‘that is what they are for’ (*para eso están*).

PES payments from ‘*ejido*’ lands presented an opportunity to accomplish the purposes for which they were originally set aside. Thus, when thinking about how to distribute payments, it was only logical to use them in ways consistent with these purposes. By restricting the use of payments for certain activities, money from these lands was effectively ‘earmarked’. All this reveals payment ‘earmarking’ as the mechanism explaining distribution. I will use the case of the ‘School’ and ‘Women’ lands in Flor del Marqués to exemplify this.

In Flor del Marqués, the *ejido* assembly devolved management of the payment to the school board but with the strict condition that money must be spent for schooling purposes. Thus, while the specific use of the money was ultimately a decision taken by the school board, the range of choices had been earmarked *ex ante*. The ‘Women’ parcel

revealed a similar earmarking effect as payments were distributed among women. In this case, rather than earmarked for a particular purpose, the earmarking process confined distribution to a particular population group.

A similar situation occurred in in El Pirú once the PES contract was renewed in 2013. In here, since there were no mismatches anymore, the money from the ‘School’ and ‘Women’ lands was respectively used for the school and disbursed among women. The following interview with a landowner from El Pirú shows the rationale behind this:

The ‘School’ parcel is for the school. Whatever the school needs. We have like 25 hectares in the kinder and primary school. There is no high school, children go to Chajul or Orizaba. They used the money for doors, construction, furniture, the truth is that I do not know. The school parents decide. When the money gets here, it is given to the committee. The *ejido* decided to give it to the school. The school has always been in bad conditions, there is no more support than that. The ‘Women’ parcel last years they divided it. Before it was used by the *ejido* but we are dividing it now. Some women needed the money.

Thus, earmarking processes explain the associations between payment distribution and the purpose of ‘*ejido*’ lands. Nonetheless, these associations were conditional on whether other claims have been met. Facing competing claims, such as mismatches, earmarking payments for specific goals or investments occupies a second-order priority.

5.4.4. Donated technical advisor fees

Table 11 shows the diverse and changing ways in which the fees donated by Natura Mexicana have been distributed in each case study over the years. This section provides an explanation for these distributions. The first part systematically analyses the cases where donated fees were disbursed in cash. The second part focuses on the cases where they were used for investments.

Table 11: Distribution of fees donated by the PES intermediary	
<i>Ejido</i>	Donated fee distribution
Boca de Chajul	2008: cash (individual parcels)
	2008: investment (school)
	2009-2012: investment (school, lighting, clinic, roads)
Galacia	2008-2012: cash (individual parcels)
Flor del Marqués	2009: investment (outstanding debt with CONAFOR)
	2010-2013: cash (<i>básicos</i>)
El Pirú	2009: cash (individual parcels and communal lands)
	2010-2013: investment (roads, pier)
Source: Own elaboration	

5.4.4.1. Correcting mismatches, again

In the first year of enrolment, donated fees were either partially or totally disbursed in cash among individual parcel or communal landholders in all cases except for Flor del Marqués. In Boca de Chajul and El Pirú, they were pooled together with other payments from ‘*ejido*’ lands and paid in cash to individual parcel or communal landholders as part of the ‘informal’ participation agreements. Similarly, in Galacia they were distributed among individual parcel holders. Focusing attention on the cases of Boca de Chajul and El Pirú, this section will show that specific distributions resulted out of a combination of the influence of local and external actors on using payments for achieving certain goals.

On the side of local actors, donated fee distribution was a consequence of local interests on correcting payment mismatches. Looking closely at how donated fees were distributed in these two cases reveals analogous distribution, rationale, and use of language as in the case of ‘*ejido*’ lands presented previously. As in ‘*ejido*’ lands, donated fees were ‘sacrificed’ to cover the ‘deficits’ caused by partially successful enrolment. In fact, in both cases, donated fees and payments from ‘*ejido*’ lands were actually pooled together and distributed in the same way. This notion is evident in the following extract from an interview with the president of Boca de Chajul:

In 2008, there were many errors. CONAFOR sometimes just accepted half of one parcel but not the other half. An entire parcel was sometimes cut in half. Because of this, we had many negotiations. About 1000 hectares were submitted in 2008. In reality, we wanted to enrol 1200 hectares but CONAFOR only accepted 1070 hectares. This deficit was paid for with the technical assistance and the hectares from the *ejido*.

However, an important distinction here *vis-à-vis* the distribution of '*ejido*' lands had to do with the central role played by Natura Mexicana. Crucially, allocating donated fees to correct payment mismatches was only made possible because the organisation agreed to donate fees in the first place. The organisation could have decided not to donate fees at all or not to agree with certain distributions. In this sense, the actual donation of fees by the organisation can be considered a *sine qua non* condition for any type of subsequent distribution.

Establishing trust within *ejidos* was a key objective within the organisation and one of the main reasons why Natura Mexicana decided to donate the fees from the beginning. According to the director of the organisation who actually made the decision to donate the fees, donating fees could serve strategically as a sign of good faith and a channel to build trust and further collaboration with the *ejidos*. Building trust was a particularly important goal at the time not only because the organisation had only sporadically collaborated with the *ejidos* but also because external advisors had a poor reputation in the region. In the early stages of PES, staff from Natura Mexicana feared that the organisation might be held responsible for instances of unsuccessful enrolment and that this could potentially compromise their relations in the *ejidos*. Additionally, since it was perceived within the organisation that they already had enough funding to cover operational costs, donating fees to *ejidos* was viewed as a means for enhancing autonomy in decision-making. All this helps to explain why the organisation not only donated the

fees but also was rather flexible regarding their distribution. These notions are evident in the following interview extract with the director of the organisation explaining the rationale behind donating the fees:

When the *ejido* hires you then you are subject to what they want. They can tell you ‘I have this surface, I already cut the forest but do not say anything’. It is a relationship in which the technical advisor has to have the power to do an evaluation to say ‘yes or no, you did right or you did wrong’. It cannot be someone who is depending on the *ejidatario* or *ejido* to pay. I realised that it was necessary for us to keep a distance with the *ejido* and also that we had economic resources. It was the second decision point, if we already have the resources why do we need to collect payments? If collecting the payment creates an employee relationship, then we as an organisation cannot do that, we need autonomy. And third, you had to earn the confidence of the people because there were many ghosts around the programme. People thought that CONAFOR paid us to be the instrument of the state to take their lands. We needed a position of trust.

Further, maximising the amount of hectares enrolled to PES was a key goal in the organisation and one that could be pursued with the strategic use of donated fees. In particular, Natura Mexicana showed a special interest on securing the enrolment of individual parcels due to a generalised perception within the organisation that individual lands faced the highest risk of deforestation. This helps to explain why it was willing to allow donated fees to be disbursed in cash among parcel holders. This notion is evident in the following interview extract with Natura Mexicana staff referring to the case of in El Pirú in 2009:

We had the payment for 2009 but did not know how much would go in the next year. To correct we said that we would first pay for parcels and the rest for communal lands. Thinking that people who want to put parcels should go first so that they are calm because they have a higher deforestation risk. We gave priority to individual parcels.

Indeed, the use of donated fees to ensure enrolment is also clear in Flor del Marqués. In this case, donated fees were used in the first year to partly finance an outstanding debt of the *ejido* with CONAFOR without which enrolment would have been compromised. Donating fees for this purpose was a way for Natura Mexicana to achieve the double purpose of securing enrolment and establishing trust in the organisation. These notions are highlighted in the following interview extract with a staff member:

In Flor (del Marqués) they could not be in the programme because they had been deceived. They had a debt. We have heard that advisors deceived them. I think this helped for them to trust us as well as the programme.

Beyond donated fees, Natura Mexicana has spent significant resources throughout the years to ensure enrolment to PES and to maximise the amount of surface enrolled to the programme. As described in Section 5.3, the organisation undertook extensive efforts to explore lands on foot and to measure and map parcels using satellite technology for PES applications. These explorations have involved significant personnel, transportation, logistics and administrative costs. All this provides further evidence to the points made above.

Thus, in light of this analysis, the different distributions of donated fees acquire logical coherence. They resulted out of the strategic interactions between local actors and Natura Mexicana, each pursuing specific interests. However, the fact that donated fees have been used to pay for specific lands, mainly individual parcels and communal lands, provides further evidence that distribution is still heavily influenced by land institutions.

5.4.4.2. The goals of actors

Focusing attention on how donated fee distribution changed in time in Boca de Chajul and El Pirú, reveals yet again, as in the previous section on '*ejido*' lands, a very different story. From being disbursed in cash among parcel or communal landholders, donated fees

were then invested on various purposes. Comparing these two cases, this section will show how particular distributions were a consequence of actors pursuing certain goals.

Additional enrolment from the second year onwards eliminated payment mismatches in both Boca de Chajul and El Pirú. Natura Mexicana became stricter as to how donated fees could be distributed. It communicated to the *ejidos* that donated fees could no longer be disbursed in cash but rather had to be invested on a ‘collective’ project of the choice of the *ejido* under the condition that these projects were not environmentally harmful. The logic behind this was that investments could yield longer-term benefits than cash disbursements, particularly due to the short-term five-year nature of PES contracts. Indeed, this view had motivated Natura Mexicana to develop ecotourism projects with several *ejidos* from early on. This notion is clear in the following interview extract with a staff member:

The director (of Natura Mexicana) always saw (PES) as the first step to stop deforestation but that there had to be something to accompany PES, something that gave people permanent income from the forest through the (ecotourism) projects. These (PES and the ecotourism projects) began in parallel.

In reality, Natura Mexicana had set this investment rule from the beginning but was flexible with its enforcement in the first years due to the issues raised by partially successful enrolment. Once these issues had been resolved by the second year, however, the organisation perceived to have more power to influence distribution. These notions are highlighted in the following interview with their director:

To compensate for this (partially successful enrolment) we agreed that they use the technical assistance to pay for differences. After this, there was spare money. Then we said ‘what is the incentive that the benefit we are achieving as an organisation that is not collecting payment be shared as charity, as a gift? \$500 each and then what? We make the effort not to charge \$50,000 and each collects \$300? No, that

cannot be'. So what we said the next year was that we would use the money to pay the differences and the rest save it for some type of work that makes sense in the community.

Once Natura Mexicana enforced these investment conditions in both Boca de Chajul and El Pirú, donated fees were distributed very differently in the subsequent years in each *ejido*. In the former case, donated fees were distributed every year for investments of different sorts, mainly schooling, health and infrastructure. In contrast, donated fees in El Pirú remained unspent for several years until they were finally spent during 2013-2014 on building roads and constructing a pier. It is shown below that distributions in Boca de Chajul were deeply influenced by the president of the *ejido* while investments in El Pirú had more to do with the role played by Natura Mexicana.

Several staff members from Natura Mexicana, *ejidatarios* in Boca de Chajul and the president himself, described the instrumental role played by the president in Boca de Chajul in shaping the distribution of donated fees as well as payments from 'ejido' and communal lands. Though most *ejidatarios* preferred receiving payments in cash, the president persuaded the assembly that money would be better spent if invested rather than if distributed in cash. In the case of communal lands, the argument made by the president was that because approximately 250 hectares were owned equally by 156 *ejidatarios*, cash distributions would for each person would be very small. However, if the money was pooled every year, the *ejido* would receive an amount large enough for much larger investments. According to the president, the fact that Natura Mexicana had decided to impose conditions on the use of donated fees helped him to legitimise making investments on payments from other lands as well, and he worked closely with Natura Mexicana to enforce the idea of the investment 'conditionality' of the donated fees. This notion is evident in the following interview with the president:

Many people asked to distribute the money from *uso común* and the technical assistance. I have always told the *ejido* that the technical assistance has a particular purpose. I have collaborated with Natura Mexicana to strengthen this idea because if people think that it is my idea they would reject it. I think that it is very stupid to distribute the money between everyone. It is much better to invest it.

Further, the president's role is evident when comparing how negotiations over the use of donated fees took place in Boca de Chajul and El Pirú. In the former case, several staff members from Natura Mexicana and the president alike recalled meeting regularly to discuss and negotiate potential investments. The president would then consult these investments with the *ejido* assembly because decisions had to be made at the assembly level. The specific ways in which payments were invested every year were directly associated with priorities identified by the president. Particularly, several members from Natura Mexicana recalled the president being very interested in the schools. The following extract from an interview with the president shows his motivations for prioritising certain investments:

To me there are three basic things that we need in this *ejido*. Education so that this town improves. Health because I have seen people die from nothing. Social development to help people so that their income is sufficient. We had the school there and needed students so they (the government) would not close it. If we did not have students from other *ejidos* and the high school closed, then children from Chajul would not study. They did not study before. Yes, maybe those with Oportunidades, but maybe from ten only three. The rest only secondary school. People need to know how to read and write. My father does not know. I would have liked to study but there was no opportunity. Then, when I saw the possibility, I wanted to do it. Also thinking about my son. I grew up here and then I left in 2003. When I came back, the health centre was deteriorated and the schools falling to pieces.

In contrast to Boca de Chajul, donated fees in El Pirú remained unspent over several years. *Ejidatarios* in El Pirú did not send an investment proposal to Natura Mexicana nor

met to discuss how to invest the donated fees. Recognizing room for action here, the organization disguisedly ‘steered’ their distribution for ways that could help to consolidate the incipient ecotourism project. Natura Mexicana conveniently reminded the *ejido* that a large sum of money had accumulated by the time when the ecotourism project was taking shape. Further, it suggested to the *ejido* that investing on the ecotourism project would be the best use for the money. While *ejidatarios* ultimately decided how to spend the money, this steering effect is clear when looking at the specific investments made in El Pirú. Donated fees were spent on improving the roads leading to Flor del Marqués, which served as a way to connect the ecotourism projects in both *ejidos*. Further, donated fees were spent on constructing a pier for tourist water activities. The following extract from an interview with an *ejidatario* in El Pirú described the influential role of Natura Mexicana regarding distribution:

The money from technical assistance we used it for the ecotourism project, to improve the road. They (Natura Mexicana) told us to see in what we could invest. It had to be something that benefited not only one person but many. The first time we did not use it and it was left accumulating for five years until it reached \$400,000. Then we used it for roads. We put money in the roads leading to Flor (del Marqués) because the (ecotourism) projects are connected.

Despite deeply shaping the distribution of donated fees, actors such as the president in Boca de Chajul and Natura Mexicana did not attempt to influence the distribution of payments from parcels or communal lands. Though such actors would have perhaps preferred to distribute payments in other ways, they felt otherwise incapable of creating change or were at least discouraged to do so due to the potential negative consequences. In other words, actors behaved very differently depending on the ability that they perceived to have to influence distribution. The experience of Natura Mexicana exemplifies this.

As noted previously, a generalised perception within the organisation from early on was that investments with PES payments could yield better longer-term benefits than cash disbursements. At the same time, however, a deeply rooted notion within the organisation was that interfering with local agreements, including the distribution of PES payments and systems of property, could risk further collaborations in the *ejidos*. Natura Mexicana perceived that land institutions imposed heavy restrictions on their room for action. When dealing with PES distribution, thus, the organisation adopted a pragmatic stance. It chose to adapt rather than attempt to change local institutions. In other words, at the crossroads between pursuing their interests and accepting *statu quo*, the organisation preferred to favour the latter option. The sense of powerlessness and need for adaptation among Natura Mexicana's staff are salient in the following interview with a staff member:

We needed to adapt to the *ejido*. Because we are not the government and we do not deal with agrarian issues. To be able to work with them you cannot violate their agreements and systems of property. If we had done that, they would have expelled us out of the *ejido* forever.

The experiences of the president in Boca de Chajul and the *básicos* in Flor del Marqués reveal similar dynamics. As shown previously, whenever they could exert influence on the distribution of payments, these actors acted very differently: the former preferring investments and the latter cash disbursements. However, in neither case did actors attempt to modify cash disbursements associated with parcelled or unequally distributed lands. Though *básicos* in Flor del Marqués increasingly distributed a larger share of PES payments among themselves, the distribution from parcelled lands remained largely unaltered. Similarly, though the president in Boca de Chajul was very vocal in using payments from donated fees, '*ejido*' and communal lands for several investments, he never tried to influence cash disbursements from parcelled lands. In the following interview extract, the president hints to his powerlessness to influence distribution from parcelled lands:

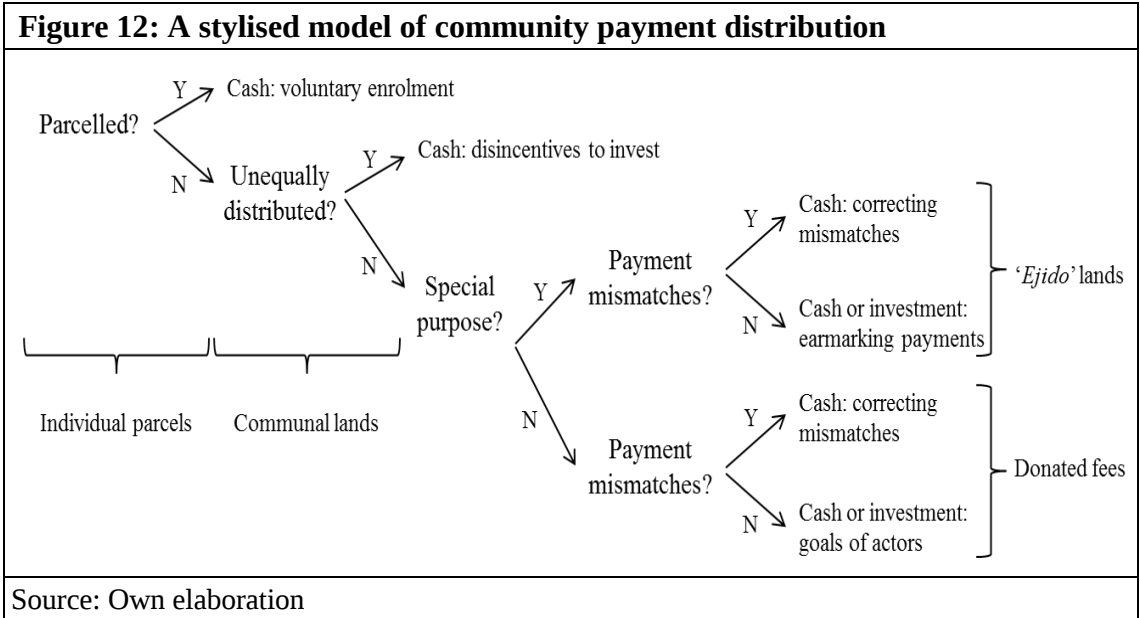
100% of parcels have always been paid. Many people used most of this to improve their pastures, to put live fences. In reality everyone enrolled their parcel and the *ejido* gave them the money from their parcel. We leave aside very little in the case of parcels, only \$10 per hectare. First, because it is my parcel and I am the owner of the forest. In a way, it is my right to receive the benefits from my parcel. Also, I see it in this way. Why should I leave money for a collective benefit if the rancher does not do the same? The rancher deforested everything and with what I am conserving I have to share with him who does not care.

Thus, the analysis presented above reveals the important role played by actors pursuing certain goals regarding the distribution of donated fees. Yet again, however, pre-existing land institutions appear as important factors shaping distribution. Land institutions constrain the ability of particular actors to influence distribution. The tension between structural factors associated with land and the power of agents to influence change is further discussed in the following section.

5.5. Taking stock: a stylised model of community payment distribution

The findings presented in the Section 5.4 serve to advance a stylised model of PES community payment distribution in the case studies, shown in Figure 12. The model presents the distribution of payments as well as their corresponding determinants and underlying mechanisms in these case studies. It depicts distribution outcomes as a series of consecutive steps. Firstly, if payments involve parcelled lands, the expected outcome is then proportional cash disbursements. The causal mechanism behind this association is voluntary enrolment to PES. If payments are associated with unequally distributed and not parcelled lands, then the expected outcome is also cash disbursements. In this case, however, the explanation is that land inequality creates disincentives to invest payments. The remaining cases correspond to instances when payments are associated with lands that are not parcelled and less unequally distributed. There are three scenarios. On the one hand, the expected outcome is always cash disbursements when there are payment

mismatches. This is because payments are used to correct those mismatches. On the other hand, if payments are associated with special purpose lands, such as ‘*ejido*’ lands, *and* there are no perceived payment mismatches, the outcome can be investments. The mechanism behind this is the earmarking of payments for specific purposes. Finally, if payments are associated with non-special purpose lands or not even associated with lands *per se*, as in the case of donated fees, *and* there are no perceived payment mismatches, the outcome is then either cash disbursements or investments. In this case, the interest of actors of using payments for achieving certain goals explains the outcomes.



Overall, the model above offers two parallel explanations for distributional outcomes among the case studies. On the one hand, a ‘structural’ explanation which positions land distribution and property rights as important outcome determinants. On the other hand, an ‘agential’ explanation which centres the attention on the interests of particular actors and the extent to which they influence outcomes. As such, the model is consistent with PES literature on PES on the role of both structural and agential explanations for community payment distribution.

Bearing in mind that a comprehensive explanation for distributional outcomes requires looking at both structural conditions and agential power, it appears here that the structural explanation is ultimately more useful in MdC. The line of reasoning supporting this argument is the following. As is clear from the previous sections, structural factors such as land institutions operate by shaping actors' incentives and their room for action. Different local and external actors involved in PES may vary in their interests. Though actors would willingly choose to distribute payments in particular ways to cater their interests, their ability to do so is ultimately contingent on the structural constraints that they face at any moment in time. Constraints associated with land distribution and property rights impose different restrictions on the ability of agents to determine outcomes and influence change. Of course, both structural factors and agents' interest may change in time. In any case, however, at any given moment specific outcomes appear as the result of the dynamic interplay between structure and agency. Whether structure trumps agency, or vice versa, is what ultimately determines the outcomes.

Following the discussion above, whichever explanation is more useful becomes then an empirical question. When evaluating the evidence presented in this chapter, it is evident that structure trumps agency most of the times. Outcomes on increasingly privatised or unequally distributed land property settings, together representing by far the highest proportion of land enrolled to PES and therefore the bulk of the total payments, are largely determined by the structure of land ownership. As argued previously, these structural factors operate by deeply constraining the set of feasible choices possible among actors. In these cases, specific forms of cash disbursements are directly associated with considerations over land ownership. Outcomes in these instances are so persistent that they can be regarded as stylised facts. Indeed, it would be hard to envisage a scenario where either local or external actors could trigger unexpected outcomes. This would

require coercive power far beyond what was demonstrated by otherwise already quite powerful actors such as the *ejido* president in Boca de Chajul, the *básicos* in Flor del Marqués or even Natura Mexicana. In the end, it is only on limited instances where actors seem to be able to play a major role. This includes the case of payments associated with ‘*ejido*’ lands, which typically represents very small land surfaces, equally distributed communal lands, which are increasingly rare at least in the context of MdC, and donated fees by Natura Mexicana, payments that are not even an explicit component of PES. Under this light, though it is true that the stylised model provides two competing explanations, the structural explanation appears as ultimately more useful.

The model reveals that whether it is structure or agential power that ultimately determines outcomes, both explanations offer problematic perspectives regarding the prospects for PES to achieve equitable outcomes. When structure trumps agency, PES distribution mechanisms largely reproduce the structural characteristics of pre-existing land property institutions. Increasingly privatised lands favour increasingly privatised cash payments. Unequal land distributions favour unequal cash distributions. Taken together, both structural factors imply that the lion’s share of PES payments is distributed not only in cash, but also among those who had more resources to start with. This is not to say that cash disbursements are problematic *per se*. Rather, the issue lies in the fact that cash disbursements reproduce deeply unequal pre-existing institutions. Alternative outcomes with equalising potential, such as progressive cash disbursements or investments on social projects, are unlikely to take place and expected to occupy the last place in a long list of priorities

In turn, when agency trumps structure other types of dynamics take place but they are equally, or potentially even more problematic. The analysis presented above revealed that the ability of actors to influence payments is largely a function of their power. This means that *ex ante* unequal power structures are at risk of being reproduced by powerful actors

through specific types of payment distribution. Though it is possible that a particular actor or group of actors exert power to pursue progressive and inclusive goals, alternative scenarios where local elites capture payments are much more likely. The case of the group of *básicos* in Flor del Marqués epitomises this risk. Further, powerful actors may exert their influence to capture benefits from PES on spheres beyond the distribution of payments in deeply problematic ways. This is most clear in the forging of relationships between local and external actors. In contexts with local power asymmetries, relationships are likely to provide disproportionate benefits among powerful groups. The cases of the ecotourism projects promoted by Natura Mexicana in several *ejidos* provide good examples of this. Further, two very problematic issues here are the ways in which deeply unequal outcomes are rendered invisible where unequal power relations abound and the reluctance of external actors to interfere when their interests might be compromised. Thus, the evidence points to the real risk of PES sustaining highly unequal outcomes in a largely de-politicised way. Again, the case of the *básicos* in Flor del Marqués exemplifies these issues.

Thus, whether it is structural or agential factors which ultimately explain outcomes in MdC, in both cases PES advance diverse forms of unequal development where those with more resources and power to start with effectively ‘cash in’ on PES. This resonates with the notion of ‘elite capture’ suggested in the literature on PES (Pascual et al., 2010, 2014).

5.6. Discussion and Conclusion

Overall, my evidence supports research in Mexico emphasising the prominent role of ‘structural’ factors, related mostly to historical land institutions, in explaining community distributional outcomes (Corbera et al., 2007a; García-Amado et al., 2011). My evidence also supports this research in that it suggests how payments may reproduce or exacerbate pre-existing land inequalities. Yet, I shed light on a less studied but crucial aspect that has

to do with land ‘types’. My evidence reveals that different land ‘types’ are associated with different payment distributions. I showed that some land ‘types’ are more likely to be associated with cash distributions, e.g. individual managed lands, while others with collective investments, e.g. earmarked lands. These findings underscore the importance of understanding the ‘types’ of lands, in terms of their management and bundles of rights, as well as their distribution in PES applications, to shed light on the potential equity implications of community payment distribution.

On this last point, though the stylised model presented in Section 5.5 may provide useful insights to understand distribution in other ejidos in MdC and potentially more generally in Mexican *ejidos*, I would be reluctant to extend its applicability to settings elsewhere. After all, the ‘types’ of lands in the case studies here have very specific histories and characteristics. This said, the stylised model may indeed provide useful clues as to the extent to which the variables of pre-existing land ‘inequalities’ and degree of ‘individualisation’ of land institutions shape distributional outcomes when PES involve collective decision-making processes. Studying these questions in other setting may shed light on the external validity of the stylised model presented here.

Further, my findings are also consistent with studies suggesting that local preferences, equity considerations, and issues of trust help explain distributional outcomes (Pham et al., 2014). Yet, my evidence sheds light on the dynamism of ‘agential’ factors and the various interactions between different actors, and how this accounted for much of the changes in distributional outcomes in the case studies. I showed that communities devise ‘informal’ participation agreements to avoid conflicts when PES applications are not entirely successful. I also showed that local preferences explain why communities spent PES money on certain collective projects, mainly on schools and health clinics. More evidence is required on this, but it is possible that many of the cash distributions among

my case studies were influenced by a general lack of trust between *ejidatarios*. In Flor del Marqués, for instance, lack of trust was mentioned by several *básicos* as part of the explanation for why they chose to distribute the money from communal lands in cash. Thus, contrasting my findings with other case studies with higher levels of trust could provide some comparative insights that could help refine the stylised payment distribution model presented here.

Finally, my findings show that ‘structural’ and ‘agential’ factors not only influence PES distributional outcomes, but that involvement in PES may also in turn influence such factors. The case of Flor del Marqués presents an example of how participation in PES may inadvertently influence communities to re-examine their notions of land property, how powerful actors may devise new types of land claims to legitimise exclusionary processes, and how such processes may create social tensions and reproduce inequalities. In turn, the case of Natura Mexicana presents an example of how trust building between communities and PES intermediaries may create new spaces for cooperation and further projects, and how such new arrangements may both contribute to increasing or decreasing inequalities depending on their nature. The fact that interactions between PES and these factors are bound to be recursive suggests a need for continuous reflection on the evolution and trajectory of PES outcomes, social and environmental, and the diverse political arenas in which they take place (Milne and Adams, 2012; Rodríguez de Francisco et al., 2013; Van Hecken et al., 2015a, 2015b).

Of course, the distributional outcomes examined in this chapter are only one dimension of the social consequences of PES that are in a way ‘preceding’ or ‘intermediate’ to spending outcomes. Community investments may not necessarily achieve broad and collective benefits, while distribution in cash among individuals may have positive spillover effects if money is used for collective purposes. Transcending the findings

presented here, the following chapter deals directly with how families and communities spend PES money and how they combine policies to achieve various unintended goals.

6. PES in the ‘Policy Mix’: Interactions with Conditional Cash Transfers

6.1. Introduction

This chapter investigates how PES interact with Conditional Cash Transfers (CCT), a very popular ‘social assistance’ policy which disburses cash transfers to ‘poor’ families with the condition that they invest in their ‘human capital’ by attending medical check-ups and sending children to school. The role played by PES in a broader environmental and socioeconomic ‘policy mix’ has been frequently emphasised as an important area of study but remains a largely empirically unexplored topic. A limited body of PES scholarship has turned its gaze towards the theory and practice of CCT, with a series of conceptual similarities being suggested between these policies (Persson and Alpízar, 2013; Rodríguez et al., 2011; Wong, 2014) and geographical overlap being documented (Zabala, 2015) between both policies. Yet, there is a gap in the knowledge as to the extent of the actual overlap between PES and CCT, and how these policies interact at multiple spatial and temporal scales.

I study these questions among the six communities of the study area in MdC. Using a multi-level livelihood approach paying attention to policy interactions and payment spending practices, I present three main findings. First, I show extensive historical overlap between PES and CCT in the communities, with many families receiving both payments over the years. Further, based on qualitative research conducted among a subset of four *ejidos*, I show that CCT and PES play complementary but different roles in the livelihood strategies of families receiving both payments, the former being used mostly for short-term household needs and schooling while the latter being placed as an important component in longer-term farm and off-farm strategies. Finally, I show that interactions between PES and CCT take place at different levels, household, community and regional, with very different results and determinants in each case. Overall, this shows that adopting

a ‘regional’ approach to PES allows us to better capture their interactions with socioenvironmental policies at various levels and emphasises the need for inter-institutional coordination and planning to build synergies that are more meaningful.

This chapter proceeds as follows. Section 6.2 presents a revision of the literature, describes the framework used, and provides an explanation for the methods of analysis, particularly regarding the selection of a subset of *ejidos* for qualitative research. In Section 6.3, I present the empirical results. Section 6.4 concludes by summarising the main findings and discussing some implications.

6.2. Understanding PES in the (social) ‘policy mix’

6.2.1. The scope for policy interactions

Regardless of the setting where they are implemented, PES are bound to operate as part of a much broader environmental and socioeconomic ‘policy mix’. In forest settings, PES are likely to overlap with a wide array of ‘carrots’ and ‘sticks’ for environmental protection offering diverse types of voluntary incentives for conservation and command-and-control regulation (Börner et al., 2011). In the context of ‘poor’ forest-dwelling communities, the socioeconomic policy mix is likely to include a wide range of ‘social protection’ programmes pursuing poverty reduction goals as well as other forms of governmental ranching and agricultural support schemes. In this complex socioenvironmental ‘policy mix’, interactions will surely emerge, creating room for conflicts and synergies (Barton et al., 2013). Indeed, the literature on institutional ‘interplay’ (e.g. Berkes, 2002; Young, 2002a, 2002b) has suggested that policies such as PES operate and evolve alongside broader institutional frameworks at various governance levels, and that policy interactions are bound to have a series of socioenvironmental effects.

Despite being emphasised over and over again as an important area of enquiry, the topic of policy interactions with PES has been largely neglected in the literature (Barton et al., 2013; Baylis et al., 2016; Börner et al., 2017; Engel et al., 2008; Muradian et al., 2013; Rodríguez et al., 2011). A handful of empirical studies have examined how the environmental performance of PES may be shaped by their interplay with other environmental protection policies and environmental regulation (Barton et al., 2013; Begossi et al., 2011; Ring and Schröter-Schlaack, 2011; Robalino et al., 2015; Sverdrup-Thygeson et al., 2014). Yet, the potential and actual interactions between PES and other socioeconomic policies with which they may frequently operate together have not been empirically examined. The following section introduces Conditional Cash Transfers (CCT) as one of such policies and reviews the limited body of joint PES-CCT scholarship.

6.2.2. PES and CCT: theory and practice?

CCT programmes have come to the foreground since the 1990s as a key strategy for poverty alleviation across the Global South. CCT form part of the broader family of ‘social assistance’, which deals with the distribution of public income and resources to ‘poor’ segments of society (e.g. Norton et al., 2001). CCT typically disburse cash transfers to ‘poor’ families conditional on ‘human capital’ investments, such as school attendance, preventive medical check-ups and uptake of nutritional supplements. Transfers are often given directly to mothers under the assumption that they are more likely to spend the money in more ‘family-friendly’ ways than men (Handa and Davis, 2006). By linking income transfers with conditions, CCT intend to reduce short-term vulnerability while at the same time incentivising long-term human capital formation, as such breaking the ‘intergenerational transmission of poverty’ (De la Brière and Rawlings, 2006). The ‘demand-side’ approach of CCT of directly supporting beneficiaries instead of traditional ‘supply-side’ interventions, such as general subsidies and investments in

public services, has represented an important shift in ‘social assistance’ (Rawlings, 2005). Following early initiatives in Mexico and Brazil, CCT have become ‘star social programmes in Latin America’ (Sánchez-Ancochea and Mattei, 2011) and have steadily expanded to other regions and continents (Ferguson, 2015).

In a seminal contribution, Rodríguez et al. (2011) noted PES and CCT as sharing key features in their conceptual design and practice. This despite that the two policies pursue different objectives and that their extensive bodies of literature have hardly met. The authors highlighted mutual aspects in the general concept of PES and CCT, such as being framed around a ‘market based’ narrative, involving structured targeting exercises to identify participants and incorporating concerns over cost-effectiveness and efficiency in their design. Yet, more importantly for the purposes of this chapter, both PES and CCT provide cash or in-kind incentives conditional on a certain behaviour. While the nature of these conditions varies, based on a review of existing programmes the authors argued that PES and CCT were ‘broadly similar’ in the amounts of payments disbursed, the payment vehicle and their frequency: both tended to represent a modest share of household income, were distributed mostly in cash, and were provided with a regular and predictable frequency. In light of these common features, Rodríguez et al. (2011) reflected on the potential design of ‘integrated’ or ‘unified’ schemes to achieve ‘both environmental and socioeconomic goals’. More recently, other authors have made further remarks on the conceptual similarities between PES and CCT and the potential for shared ‘lessons’ in policy design and implementation (Persson and Alpízar, 2013; Wong, 2014).

I contribute to this limited body of joint PES and CCT literature by suggesting two additional links between these policies: shared goals and shared geographies. The studies mentioned above emphasised PES and CCT as having similar designs but otherwise pursuing different goals. Yet, a growing body of PES scholarship has highlighted the need

to consider ‘social’ goals as those pursued by CCT, such as poverty reduction and equitable and fair distribution, as intrinsic components of the PES agenda (Corbera and Pascual, 2012; Muradian et al., 2010; Pascual, 2010, 2014). This scholarship challenges the dominant and persistent so-called ‘narrow’ or ‘socially-empty’ view of PES as a tool primarily designed to achieve ‘environmental’ goals and one that considers ‘social’ goals as beneficial side-effects (e.g. Adhikari and Agrawal, 2013; Engel, 2015; Kinzig et al., 2011; Wunder, 2015; Wunder et al., 2008). The argument for not treating environmental and social goals as ‘fully separate objectives’ (Börner et al., 2017: 364) has been justified not only in terms of intrinsic concerns over ethics and morality, but also on the basis of empirical studies showing how ‘social’ aspects of PES may play an instrumental role on shaping the environmental performance of the programmes. Studies have shown, for instance, how local support for PES may be ‘crowded-out’ if procedures and outcomes are perceived as inequitable (Alpizar et al., 2013).

Further, PES and CCT are likely to overlap geographically due to the targeting rules that they use to identify participants. Many forest areas ‘rich’ in the provision of ‘environmental services’ and as such targeted by PES, are individually or communally owned by ‘poor’ forest-dwelling families and communities (Bulte et al., 2008; Wunder, 2008). These ‘poor’ families and communities are often targeted by CCT and other cash transfer programmes. In the case of Mexico, Muñoz-Piña et al. (2008) showed that more than three quarters of the payments in the first three years of the national hydrological PES scheme in Mexico went to forest areas inhabited by people living in population centres identified highly or very highly ‘marginalised’, a criterion used for selecting CCT participants. Indeed, Zabala (2015) documented joint participation in PES and CCT in a case study in Chiapas. Yet, the extent of this overlap and the interactions between these policies have not been empirically examined.

6.2.3. (Separate) literature on effects

In their respective bodies of literature, empirical studies on PES and CCT have shed light on their diverse socioeconomic ‘effects’, how they often involve a mix of intended and unintended ‘spillovers’, and how they are influenced by different aspects of context, design and delivery. Reviews of PES studies have shown how payments received by families and communities contribute to the accumulation of different types of financial, human, social and physical assets (Grieg Gran et al., 2005; Mahanty et al., 2013; Tacconi et al., 2013). Similarly, reviews of CCT studies have shown how payments increase consumption, reduce income poverty, improve access to different types of productive assets, and thus play an important role for income security and risk management strategies (Adato and Hoddinott, 2007; De la Brière and Rawlings, 2006; DFID, 2011; Fiszbein and Schady, 2009; Handa and Davis, 2006; Valencia Lomelí, 2008). These studies on CCT, however, have emphasised that the programme has been more effective at meeting ‘short-term’ goals in schooling and health attendance than ‘longer-term’ objectives in human capital, educational and health service provision and quality.

PES scholarship has empirically examined or theorised about the various and unexpected ways in which programmes are strategically adapted by local actors for different purposes, with a series of positive and negative ‘spillover’ effects (McElwee et al., 2014; Van Hecken et al., 2015a, 2015b, 2018). PES have contributed to collective investments in infrastructure and services (Mahanty et al., 2013; Tacconi et al., 2013), created spaces for agrarian organisations to voice their demands (Shapiro-Garza, 2013a, 2013b) and contributed to land security (Osborne, 2011). Yet, studies have shown that PES may exclude poor and landless groups from payments and forest resources, and ultimately may reproduce land, income and power inequalities (Corbera et al., 2007a, 2007b; Milne and

Adams, 2012; Rodríguez de Francisco et al., 2013; Rodríguez de Francisco and Budds, 2015).

Similarly, studies have shown positive ‘spillover’ effects among non-participants in the communities where CCT operate, such as increased consumption through community insurance and credit markets (Angelucci and De Giorgi, 2009) and increased educational enrolment through peer effects (Bobonis and Finan, 2009; Lalive and Cattaneo, 2009). Yet, studies have also shown how CCT may exclude some members of the community from participation (Rawlings and Rubio, 2005), the problematic ways in which they may reinforce traditional gender roles (Molyneux, 2006, 2007) and how they might even increase deforestation by increasing consumption of land intensive goods such as beef and milk (Alix-García et al., 2013).

Finally, PES and CCT scholarship has emphasised how contextual factors and features of their design and delivery influence the effects of the programmes. There has been increasing recognition that ‘the devil is in the detail’ (Engel, 2015) regarding the design of PES transfers in terms of amounts, mode, timing and other dimensions. The fact that both PES and CCT disburse fixed, predictable and regular payments has been suggested as playing an important role as a ‘safety net’ for participants as well as in the risk management strategies of participants when other forms of income are highly volatile (Rodríguez et al., 2011). The literature on PES has suggested higher impacts and spillovers when programmes involve collective payments or large lump-sum individual payments (Mahanty et al., 2013; Tacconi et al., 2013). This because collective payments are frequently invested in community services and infrastructure which are less common on individual payments, and because lump-sum payments enable larger investments by individual families. The effects of conditions and gender targeting in CCT, however, have

been less clear and subject to significant debate (e.g. De Brauw and Hoddinott, 2011; Handa et al., 2009).

6.2.4. A multi-level livelihood approach to study policy interactions

As shown above, despite some interest in the conceptual similarities between PES and CCT, their bodies of empirical and theoretical literature have hardly met (Rodríguez et al., 2011). More importantly for this chapter, there is a gap in the knowledge as to the extent of the geographical overlap between PES and CCT, and the interactions emerging when these policies operate simultaneously. To study these questions, I propose an analytical framework drawing from different approaches for understanding the complex, evolving and multi-level operation of policies and their interactions.

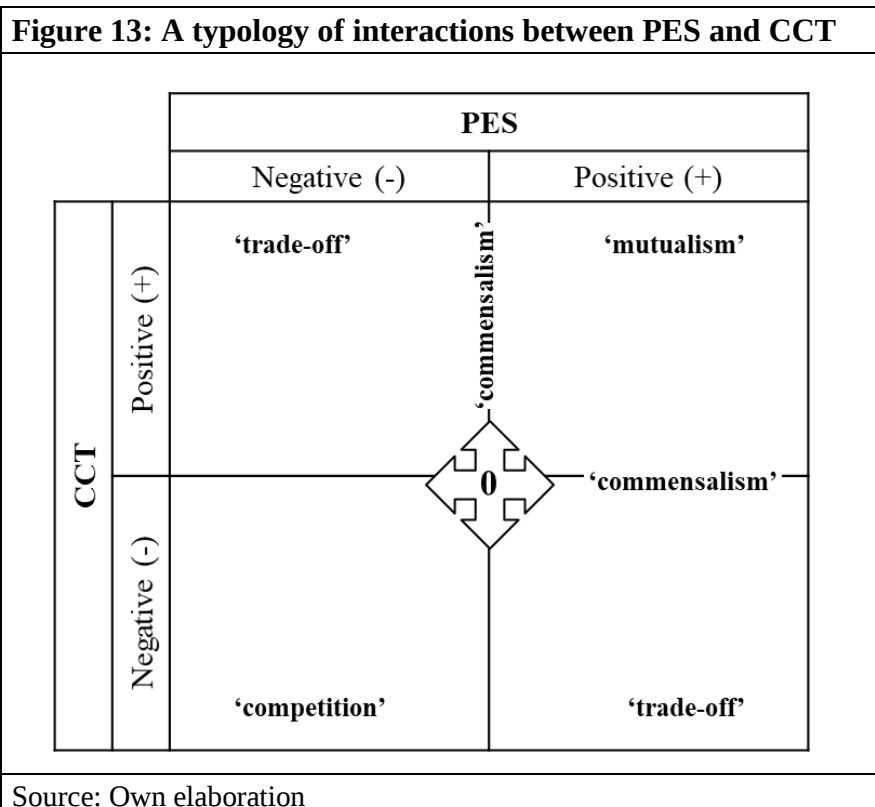
Firstly, a *long-term livelihood* approach that looks at the diverse economic and non-economic effects of policies from the perspective of participants. I adopt a ‘weak-theory’ approach that pays attention less at what policies are intended to achieve and more to what they actually do at different scales and involving a mix of structure and agency among participants and implementing agencies (Van Hecken et al., 2018).

Secondly, a *payment-centred* approach that examines how families and communities jointly distribute, manage and spend different types of revenues and benefits simultaneously (Mahanty et al., 2013; Tacconi et al., 2013). This requires paying attention to how formal and informal aspects of payment design, delivery and everyday practice are experienced by participants and how they shape incentives and behaviour.

Finally, a *multi-level policy interactions* approach that focuses on how policies may spatially and functionally overlap at various temporal and spatial scales, creating spaces for both synergies and conflict. The literature on policy interactions suggests different types of association between policies operating in the same geographic area (e.g. Barton

et al., 2013; Begossi et al., 2011; Grosh et al., 2008; Klassert and Möckel, 2013; Pfaff et al., 2015; Ring and Schröter-Schlaack, 2011; Robalino et al., 2015; Sverdrup-Thygeson et al., 2014).

Figure 13 shows a simple typology characterising interactions between PES and CCT as ‘positive’, ‘negative’ or ‘neutral’. Synergies or ‘mutualism’ may take place, for instance, if participants or implementing agencies achieve economies of scale by pooling different types of revenues for a given purpose or if their joint operation enables cost synergies at the operational and transactional levels, informational exchanges or behavioural spillovers. Cases of ‘competition’, in turn, could appear if policies compete for funding or if they create overcrowding and policy fatigue by jointly imposing time or administrative burdens among participants. ‘Trade-off’ scenarios could emerge if participation in one policy undermines the eligibility, willingness or ability to participate in the other. Finally, ‘commensalism’ scenarios, i.e. where one policy benefits but the other is not benefitted nor harmed, may emerge if there are learning processes or investments associated with policy implementation such that current policies benefit from pre-existing policies.



Of course, it is possible that several of the effects described above operate simultaneously. In other words, PES and CCT may have various types of interactions coexisting at the same time. For instance, these two policies may compete for funding, and as such be in 'competition' with one another, while at the same time have synergetic effects if people combine the money together for a common purpose, and as such be in the 'mutualism' quadrant. In any case, the framework in Figure 13 is useful to examine the various types of interactions between PES and other payment-based policies operating in a policy mix, whether they are of single type or several types, as well as whether some of these interactions are more prominent than others. This is because the 2x2 matrix may include various types of interactions and it can be disaggregated at various temporal and spatial scales. Further, the flexibility of the framework allows to take into account 'hidden' or unexpected mechanisms and dynamics shaping the practice and interactions between policies, as well as the aggregate and disaggregate effects of these interactions.

6.2.5. Methods

The focus here is the study area of six *ejidos* who have participated in CCT since 1999 and in different PES contracts since 2008: Boca de Chajul, Playón de la Gloria, Galacia, Adolfo López Mateos, Flor del Marqués and El Pirú.

I constructed a database of families residing in the *ejidos* as of mid-2015 with the objective of identifying those families receiving money from both PES and CCT. For this, I merged information from official CONAFOR and SEDESOL registries. I also gathered information over how *ejidos* distribute and spend money from PES. This allowed to trace the joint distribution of money from both programmes, and to examine interactions between PES and CCT, at the family, community and regional levels.

I conducted semi-structured interviews among the cohort of families receiving payments from both PES and CCT in four *ejidos*: Playón de la Gloria, Galacia, Flor del Marqués and El Pirú. As I described in Section 3.3.2, throughout Chapters 4 to 6 I used an inductive and iterative case selection approach guided by the principles of ‘capturing heterogeneity’ and ‘data saturation’. In this specific chapter, I selected these four *ejidos* mainly because of their population size (See Section 3.3.1). I sought to interview a high percentage of families receiving both PES and CCT in each *ejido* in order to capture variations in amounts received, payments spending and other uses of the money. Thus, I selected these four *ejidos* because they have smaller populations than Boca de Chajul and Adolfo López Mateos. Additionally, I conducted some interviews among families in Adolfo López Mateos. These interviews provided similar insights as those conducted in the previous *ejidos*, thus suggesting that the evidence gathered applies for families in the entire region.

In the end, I interviewed many joint participating families in the four *ejidos*: 16 of 17 in Galacia, 7 of 18 in Flor del Marqués, 7 of 20 in El Pirú, and 9 of 26 in Playón de la Gloria. In many cases, I interviewed husbands and wives separately to understand intra-

household dynamics regarding joint management and spending practices. The selection of families for interviews followed the principles of ‘capturing heterogeneity’ and ‘data saturation’ as explained previously in Section 3.3.2. This explains why not all families receiving both PES and CCT were interviewed for this chapter.

To explore interactions between PES and CCT at the *ejido* and regional levels, I conducted qualitative research with all the institutional actors involved in the implementation of the programmes. I interviewed two members of staff from the regional offices in CONAFOR in Tuxtla Gutiérrez, three from the regional office in the Ministry of Health (SALUD) and one from Social Development (SEDESOL) in Palenque. I also interviewed several medical and school staff operating in the *ejidos* as of mid-2015 (see Table 12). This information was complemented with interviews among non-participant families in CCT, the PES intermediary, and local authorities in each *ejido*.

Table 12: Interviews with CCT stakeholders			
<i>Ejido</i>	School	Health	
	School teacher	CCT <i>promotoras or vocales</i> ¹	Medical staff ²
Boca de Chajul	1 (high school)	2	2 (nurse and former medic)
Playón de la Gloria	1 (primary school)	1	
Galacia	2 (primary school)	-	Closed clinic
Adolfo López Mateos	1 (primary school)	1	
Flor del Marqués	2 (primary school)	1	
El Pirú	-	2	1 (nurse in <i>ejido</i> La Unión)
Source: Own elaboration Note: 1) <i>Promotoras</i> and <i>vocales</i> are CCT beneficiaries who “have been selected by their fellow beneficiaries to voluntarily serve as liaisons between themselves and PROGRESA’s personnel, providing beneficiaries with information on how the program works, when transfers will arrive, and identifying operational problems” (Adato et al., 2000: 8) 2) The clinic in Boca de Chajul also covers Playón de la Gloria; the clinic in Adolfo López Mateos also covers Galacia and Flor del Marqués; El Pirú is covered by a clinic in <i>ejido</i> la Unión			

6.3. Results

6.3.1. Prospera in the study area

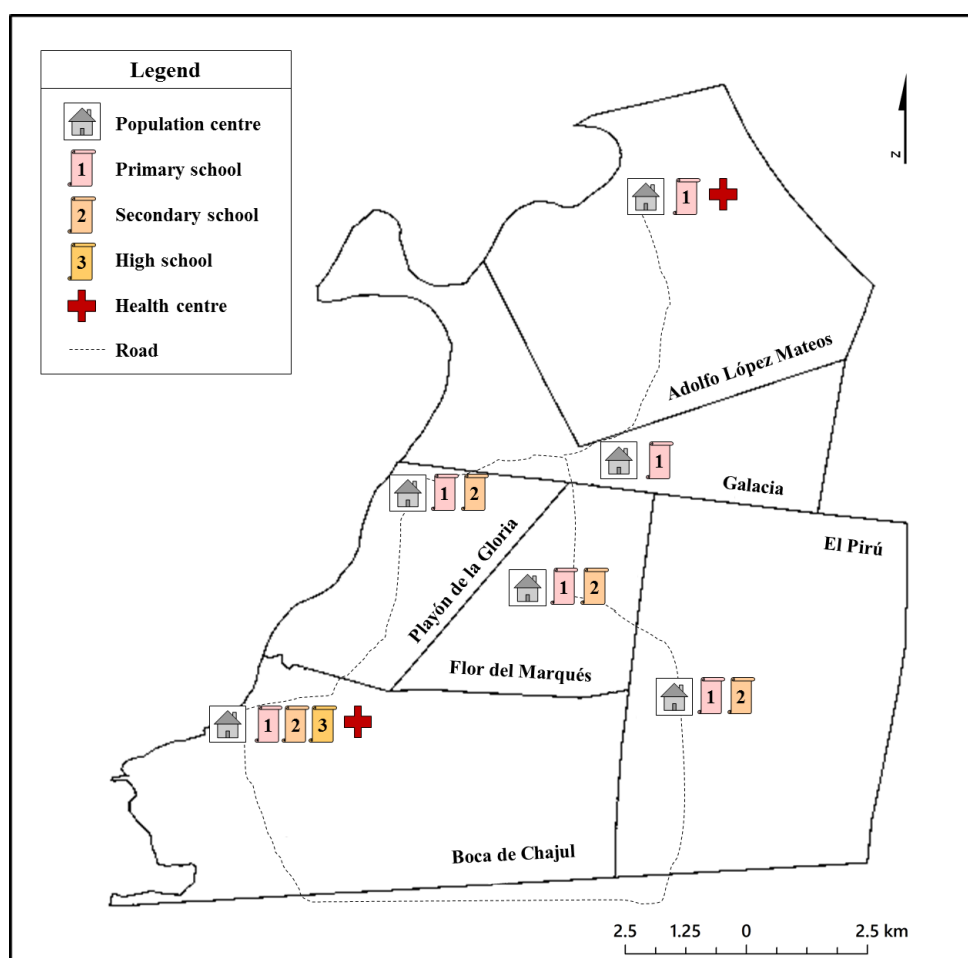
Prospera (formerly PROGRESA and Oportunidades) was rolled out in 1999 in the study area. Prospera is implemented by the Ministry of Social Development (SEDESOL) who liaises with the Ministries of Health (SALUD) and Public Education (SEP) to monitor ‘co-responsibilities’ (*corresponsabilidades*). SEDESOL assigns someone in each family as the programme *titular* or ‘holder’ to be in charge of meeting these co-responsibilities. *Titulares* are typically mothers or adult women but men can also be assigned as *titulares* in exceptional cases, such as families with single fathers or when mothers lack paperwork. SEDESOL disburses payments directly to *titulares* in the *ejidos* every two months at pop-up delivery stands. Each payment consists of a ‘food support’ and a ‘scholarship’ for children attending school varying in amount by grade and gender. Table 13 shows the historical amounts provided by Prospera.

Table 13: Maximum monthly Prospera amounts per family (constant 1999 Mxn)			
Year	Food support	Scholarship	
		Primary and secondary school	High school
1999	\$115	\$580	\$580
2000	\$117	\$594	\$594
2001	\$119	\$607	\$607
2002	\$117	\$599	\$1098
2003	\$120	\$611	\$1117
2004	\$118	\$605	\$1106
2005	\$115	\$598	\$1092
2006	N.A.	N.A.	N.A.
2007	\$108	\$550	\$1006
2008	\$105	\$569	\$1016
2009	\$171	\$580	\$1037
2010	\$172	\$588	\$854
2011	\$167	\$578	\$1033
2012	\$163	\$574	\$1028
2013	\$207	\$589	\$1080
2014	\$199	\$564	\$1035
2015	\$206	\$586	\$1073
Source: Own elaboration with data from SEDESOL online databases (www.gob.mx/sedesol)			

To receive payments, all family members are required to attend periodical health check-ups, children are required to attend school, and *titulares* must attend health ‘seminars’ (*pláticas*) which take place every two months in each *ejido*. In these *pláticas*, *titulares* receive information on different topics related to health, including nutrition, use of contraception and hygiene. Families in each *ejido* are assigned to a regional health centre but they are free to choose where to send their children to study. Figure 14 below shows the availability of schools and clinics by mid-2015. All six *ejidos* had primary schools but secondary schools were available only in Boca de Chajul, Playón de la Gloria, Flor del Marqués and El Pirú. The only available high school in the region was located in Boca de Chajul. By 2015, there were two health clinics in the region. The clinic in Boca de Chajul, which also covered Playón de la Gloria, has been operational for years but most of the

times but persistently understaffed. A ‘full’ squad would involve one doctor and two nurses, but the clinic in this *ejido* has been mostly operated single-handedly by one male nurse. The clinic in Adolfo López Mateos, which also covers Galacia, Flor del Marqués as well as three other *ejidos* in MdC, has been closed since 2012. There are no medical check-ups in these *ejidos* and *titulares* simply gather documentation and send it to SEDESOL’s regional offices in Palenque to continue receiving payments. Families in El Pirú are assigned to another operational clinic in *ejido* La Unión.

Figure 14: Education and health services in the study area (2015)

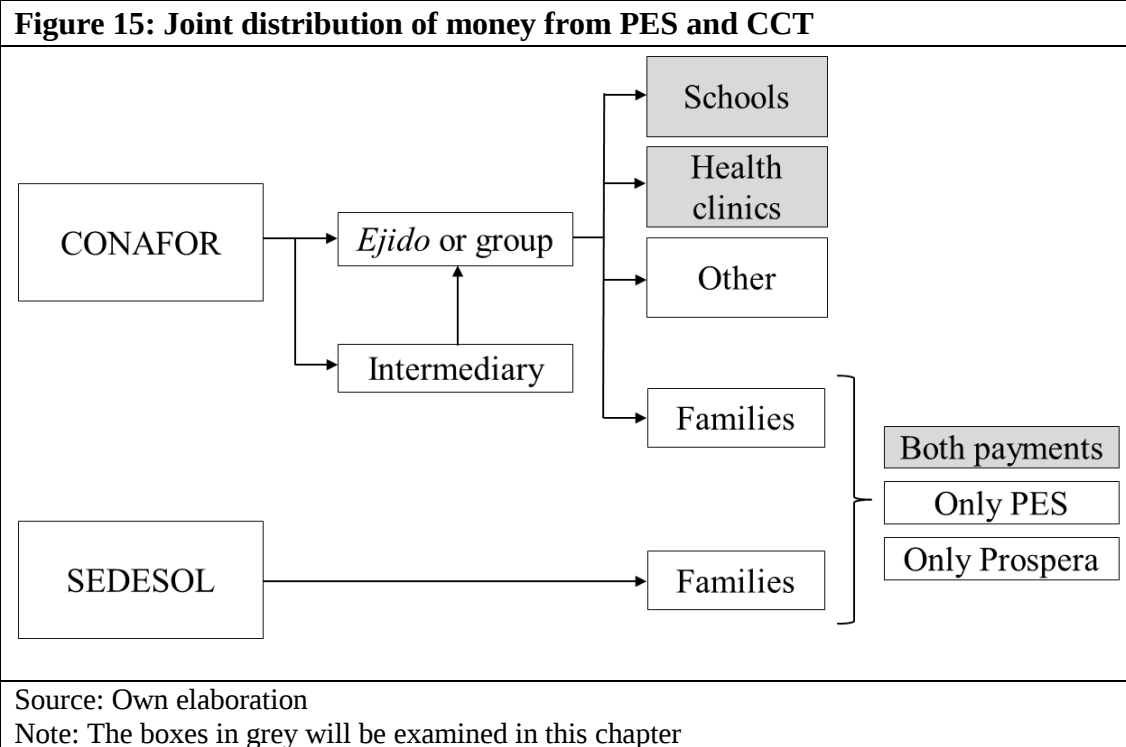


Source: Own elaboration

6.3.2. PES and CCT: distributional outcomes at two levels

Figure 15 below presents a schematic representation of the joint distributional outcomes of PES and Prospera in the *ejidos*. SEDESOL has always disbursed Prospera directly to

participating families while CONAFOR has disbursed PES to *ejido* authorities or groups of landowners. As shown previously in Chapter 5, *ejido* authorities have subsequently distributed PES in two ways: giving money directly to individual families or managing funds collectively for investments in infrastructure and services. CONAFOR also disburses money to the PES intermediary Natura Mexicana who, as also shown in Chapter 5, has chosen to give the money to the *ejidos*. Thus, in the end, payments from PES and Prospera have been jointly distributed at two different levels: family and community. Individual families in each *ejido* may end up receiving money from *both* PES and Prospera, money from either exclusively or neither. The figure also shows that collectively managed funds may be invested in schooling and health services, both for which are associated with Prospera. Based on this result, I will examine the interactions between PES and Prospera at these two levels in the following section. For this, I will focus on the group of families receiving both payments as well as on cases where collectively managed PES money has been used for investments in schooling and health as they pertain directly to Prospera. In this section, I proceed to provide further information on the joint distribution of PES and Prospera at both levels in the *ejidos*.

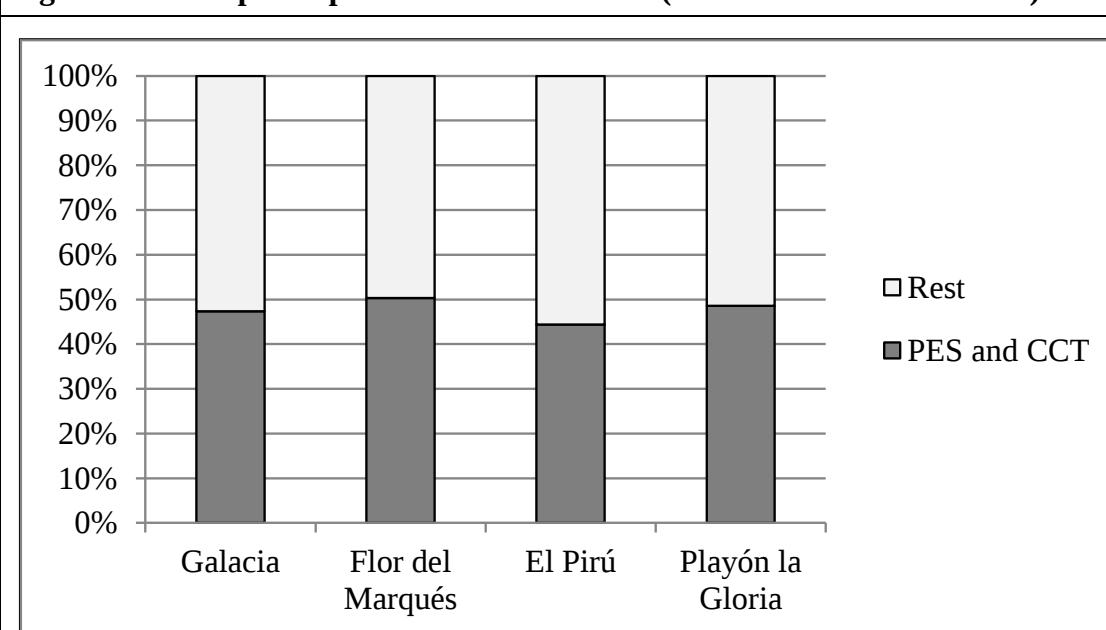


In general, all *ejidos* here have historically distributed most of the money from PES to individual families. There are variations, of course, with some *ejidos* distributing practically all of the money to families while some collectively managing more (Table 14). Except for Boca de Chajul, the rest of the *ejidos* have distributed more than 90% of the payments to individual families throughout the years. As I have shown in Chapter 5, this outcome emerged from the fact that ‘individual’ parcels and ‘communal lands’, which together represent most of the surface enrolled to PES, have been consistently paid to individual landowners. In turn, *ejidos* have only tended to collectively manage payments associated with small ‘*ejido*’ lands, such as ‘School’ and ‘Women’ parcels, as well as the money received from the intermediary. This money has often been used for different types of investments in schools, clinics, roads, and even the church in one case. Recognising the complexity of the politics of distribution in the *ejidos* here, I will not delve further to why money from PES has been distributed in certain ways since this has been discussed in Chapter 5. Rather, in the following sections I will discuss the implications of such distributions at the intersection between PES and Prospera.

Table 14: Distribution and spending of PES money in the study area					
Ejido	PES contract	Annual payment (nominal Mxn)	Distribution ¹		Examples of collective spending
			Families	Collective	
Boca de Chajul	2008/2009	\$521,043	81%	19%	School, health clinic, public lighting, sewers
	2010	\$561,740	93%	7%	
	2013	\$987,610	74%	26%	
	2015	\$610,070	94%	6%	
El Pirú	2009/2010	\$1,543,564	95%	5%	School, church, road, surveillance
	2013	\$655,760	95%	5%	
	2014	\$1,111,870	92%	8%	
	2015	\$220,750	100%	-	
Playón de la Gloria	2008	\$99,458	100%	-	School, cattle scale
	2010	\$58,160	100%	-	
	2013	\$432,340	90%	10%	
Flor del Marqués	2009	\$276,258	97%	3%	School
	2014	\$658,820	96%	4%	
Adolfo López Mateos	2009/2010	\$1,453,858	99%	1%	School
	2014	\$692,760	100%	-	
	2015	\$1,104,820	99%	1%	
Galacia	2008/2009	\$448,241	98%	2%	General expenses
	2013	\$1,139,430	97%	3%	
	2014	\$186,440	100%	-	
Source: Own elaboration					
Note: 1) Estimated amounts					

At the family level, the household mapping analysis revealed extensive overlap between PES and Prospera. As shown in Figure 16 below, around half of total families received money from both programmes by mid-2015. In general, the rate of family participation in Prospera has been more extensive than PES, with only a handful of families not receiving Prospera in each *ejido*. Of course, the rates of joint participation in each *ejido* have been fluctuating over time as families may voluntarily join and leave each of the programmes.

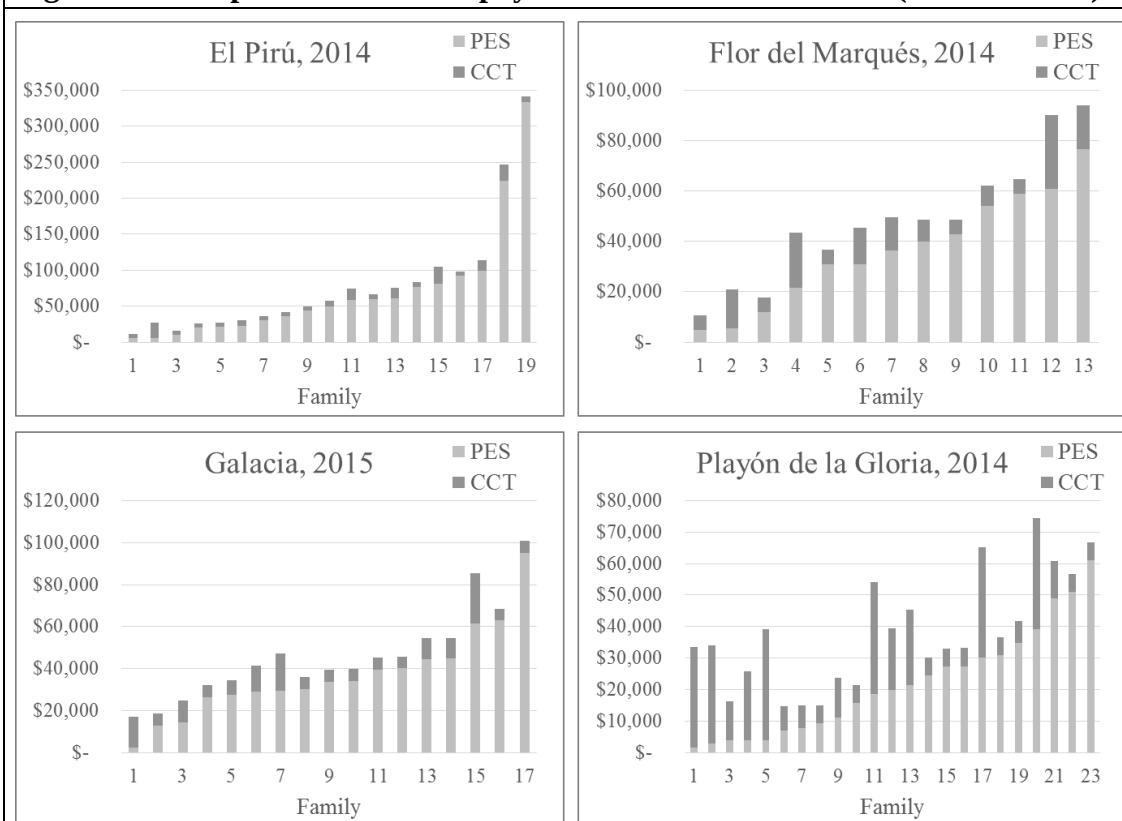
Figure 16: Joint participation in PES and CCT (% of total families in 2015)



Source: Own elaboration

Further, the mapping analysis also revealed that the amounts received from PES at the family level have tended to be significantly larger than Prospera. Figure 17 below presents the annual amounts among all the families receiving PES and Prospera in Galacia in 2015 and El Pirú in 2014. There are, of course, variations between the two *ejidos* but the general pattern is the same: the average Prospera and PES amounts among families receiving both payments in Galacia were, respectively, Mxn\$9,247 and Mxn\$36,933 in 2015; in El Pirú, these amounts were Mxn\$10,343 and Mxn\$66,657 in 2014. For many of these families, PES money has represented a significant contribution of household income (see Figure 18). These amounts are very large considering that the average annual income for rural households in Chiapas during 2016 was Mxn\$56,460 (INEGI, 2016).

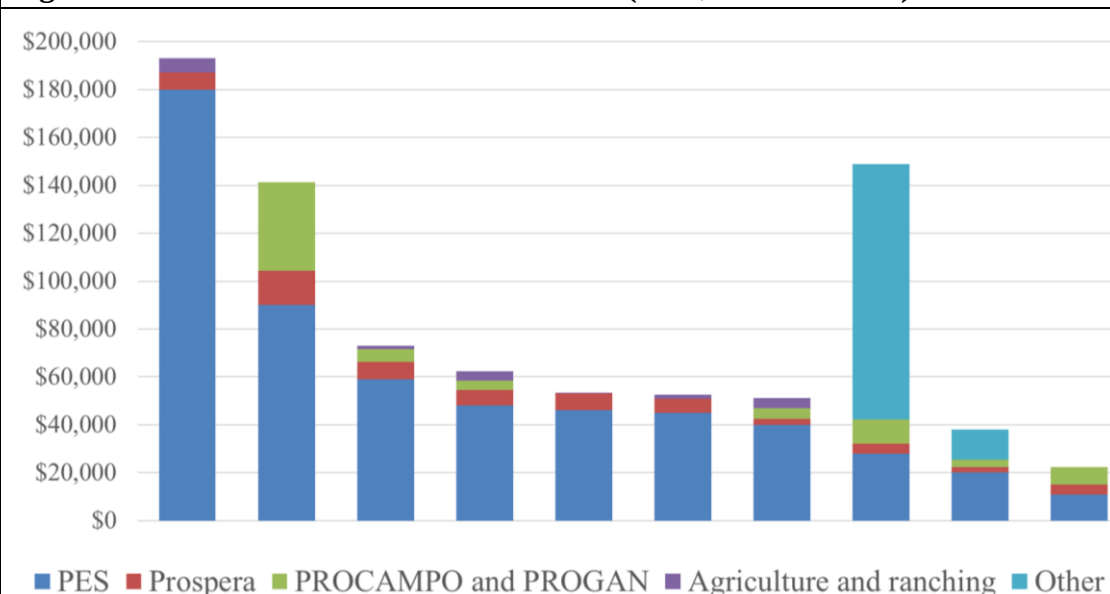
Figure 17: Comparison of annual payments from PES and CCT (nominal Mxn)



Source: Own elaboration

Apart from PES and Prospera, the policy mix in the region has also included other types of governmental cash transfers, mainly governmental support for agriculture (PROCAMPO) and ranching (PROGAN), social protection of diverse types (PAL Sin Hambre, 70 y Más, Amaneceres) and social insurance (Seguro Popular). Yet, as shown below in Figure 18, amounts from PES and Prospera has been much greater than the rest.

Figure 18: Annual income sources in El Pirú (2012, nominal Mxn)



Source: Own elaboration with data from GAIA and Natura Mexicana (2012)

Note: 'Agriculture and ranching' includes income from commercial agricultural activities; 'other' includes other governmental programmes (e.g. 70 y Más) and other forms of income (off-farm commercial activities, waged labour)

Thus, two main results emerge from this analysis. First, joint distribution between PES and Prospera taking place at two different levels, family and community, with most of the combined payments accruing to families. Further, extensive joint participation in both programmes at the family level, with both payment representing a significant contribution to family income and amounts received from PES being much larger than Prospera for most families. The following section examines the interactions between PES and Prospera at the family and community levels.

6.3.3. Interactions at different levels

6.3.3.1. PES and CCT in the household economy

PES and Prospera have tended to play different but complementary roles in the livelihood strategies of families receiving both payments. Families have used Prospera payments predominantly to cover short-term needs and to pay for the schooling costs of their children. Within the household, Prospera payments have been mostly managed by female *titulares* who often keep separate accounts between the 'food support' and the

‘scholarship’ disbursed by SEDESOL, which they often refer to, respectively, as ‘mine’ (*el mío*) and ‘my children’s’ (*de mis hijos*) money. *Titulares* spend ‘their’ money for ‘household expenses’ (*el gasto*) because ‘it is not enough’ (*no alcanza*) for much else. By the time payments are disbursed, families already owe some money to local shops where they have borrowed with no interest (*fiado*). Frequently, *titulares* spend the money right after collecting it at pop-up markets that are commonly set-up when payments are being disbursed in the *ejidos*. In this way, Prospera has become inserted in important local commerce networks attending the needs of households. This is noted in an interview with a *titular* in El Pirú:

We always go to collect it to Orizaba and well I decide to buy there and sometimes when I come back, I have nothing. I spend it coming out of there. One takes advantage because it is cheaper and because there are many stalls. Many people do that. Most people do that. I always spend mine and I set aside my children’s money.

Titulares tend to manage their ‘children’s’ money and to give a daily stipend for meals and transport to children attending schools in other *ejidos*. They prefer giving their children a daily stipend instead of all at once because children are likely to ‘waste it’ (*malgastar*). Over the years, children from Playón de la Gloria, Galacia and Flor del Marqués have attended the secondary and high schools in Boca de Chajul. Children from Adolfo López Mateos travel to Pico de Oro because it is closer and children from El Pirú attend either Boca de Chajul or Nueva Orizaba. In 2014, CONAFE⁷⁰ secondary schools were opened in Flor del Marqués, Playón de la Gloria and El Pirú but some families do not use them because they are considered of poorer quality than federal schools as the one in Boca de Chajul. This is noted in the following interview in El Pirú:

My daughter studies primary school and I took her to Comitán to see if she studies there. The schools are better. My sister lives there. She went to present her exam.

⁷⁰ CONAFE are community schools taught often by local students who receive a scholarship for teaching.

Schools there take English and computing. In CONAFE, they send teachers who have a scholarship and they are very young. The ones from federal schools are more qualified. Even in how they treat people. A technical school would be better.

Travel expenses to attend schools tend to represent a large percentage of the scholarship given by Prospera (Table 15). Most *titulares* say that the scholarship is not enough to cover all the schooling costs, which include uniforms, equipment and different types of school contributions. They complement Prospera by asking their husbands for more money. These views are highlighted in an interview with a single mother from Galacia who also receives PES money:

Mine (the payment) is now like \$950. My daughter's the truth is that I do not know how much she gets in high school. I collect that money because it says it is mine and I manage it. Now I will give it to my daughter. I give everything to my daughter and she uses it for her. I give it to her daily because if I give her everything she wastes it. The rest for the kitchen, the house, to buy soap. It is spend different from the one in conservation (PES) because since it is not much, it is not enough. I spend it on different things.

Table 15: Travel costs for commuting students (2015, nominal Mxn)

Student (age)	High school grade	From: <i>ejido</i> of residence	To: <i>ejido</i> of schooling	Costs		CCT transfer	Cost as % of scholarship	
				Daily (monthly) ¹		Monthly		
				Transport	Meals	Scholarship	Transport	Transport and meals
Female (15)	1 st	El Pirú	Nueva Orizaba	\$40 (\$880)	\$40 (\$880)	\$990	89%	178%
Female (17)	2 nd	Galacia	Boca de Chajul	\$20 (\$440)	N.A.	\$1,055	42%	N.A.
Male (16)	1 st	Playón de la Gloria	Boca de Chajul	\$20 (\$440)	\$30 (\$660)	\$865	51%	127%
Source: Own elaboration								

PES money, in turn, tends to be managed by male spouses or adult men within the household. The *ejido* authorities distribute PES money from individual parcels directly to *ejidatarios*, which are men most of the times. Yet, non-*ejidatario* husbands tend to

manage money distributed to their wives who are *ejidatarias*. Interviewed *ejidatarias* frequently said that they ‘let’ their husbands manage PES money because they are the ‘household head’ (*jefe de familia*). Symmetrically, men avoid getting involved in Prospera activities or being around when the money is being disbursed because it ‘looks bad’ (*se ve mal*) in the community. Further, among the few couple-headed families with male *titulares*, I found that husbands often gave the money to their wives because that was the ‘right’ or ‘normal’ thing to, as noted in the following interview in El Pirú with a male *titular*:

I give it to her because it is like a support for her. I feel that it is the most normal, what is fair. She manages it, she does the shopping and expenses.

Thus, most spouses tend to administrate separate accounts rather than pooling the money from PES and Prospera. During interviews, husbands enquired about Prospera often failed to provide basic details such as amounts and conditions, and they commonly referred to their wives as a better source of information. The same applied when *titulares* were asked about PES. More generally, I found that families generally ‘specialise’ on different sources of household income and decision-making. Men typically make ‘important’ family decisions and manage ‘large’ and land-related forms of income, including PES, agricultural income and other programmes disbursing money such as PROCAMPO and PROGAN. Women tend to take care of daily household needs and manage ‘small’ sources of income, such as Prospera and personal money, which they earn by selling crafts, food or small farm animals. These issues are highlighted in the following interviews with a female *titular* in Galacia and the husband of a female *titular* in Playón de la Gloria, respectively:

He is the head of the household so if I buy big things it would be disrespectful. But I buy small things or use the money for emergencies. When he is not around, I have to make decisions.

If I managed Prospera maybe I will neglect the house because she is more conscious of what we need. That helps me a lot. When there is not enough, she tells me. Now she asks me for less. It is a great help. I see that they make the money work better.

More than for short-term needs, families have aimed to use PES for ‘investments’ (*inversiones*) as part of longer-term family strategies. Since joining PES, families have often made some plans with what to do with the money over the five-year course of the contracts. Every year, they make plans based on their expectation of receiving PES and ‘wait’ in anticipation for CONAFOR to disburse the money. For most families, plans have been about agriculture and ranching, with PES being used for inputs, labour, machinery and other types of land-related ‘work’ (*trabajo*) on fields and pastures. In Galacia and Playón de la Gloria, the emphasis has been mostly on agriculture while in Flor del Marqués and El Pirú it has been on ranching. A few families have used PES and other savings to purchase land plots. Some families have planned instead to use the money from PES for off-farm purposes and activities. A couple of families have invested PES in off-farm businesses. Several families in El Pirú, and a handful in other *ejidos*, chose to ‘set aside’ (*apartar*) PES money from the beginning to pay for the university education of their children. This has involved significant costs over the years because Prospera provides no support for this level and children have to move to other places to study since there are no universities nearby. These notions are highlighted in the following interview in El Pirú with a male parent explaining how the family spends PES:

100% on the school. We have one in university and one who graduated this year. I feel it is the best and something very necessary at least for us as a family. If we give education it is something that no one will take it away later. I prefer that instead of buying things that do not yield. I chose the school instead of cattle. It is easier to earn a living. We could not study. We did not have that opportunity.

Yet, these plans have been frequently hampered because household needs and unexpected expenses, such as family sickness and *ejido* contributions, get in the way and take priority

in the use of the payments. In the study area, income is highly unstable due to fluctuating harvests and agricultural prices. In addition, families have found it hard to match the timing of seasonal expenses, such as agriculture and schooling, with PES payments because they never know when CONAFOR will disburse the money. Year by year, families are told by CONAFOR that the payments will be disbursed towards ‘the end of the year’. Sometimes they wait for months to receive the money, which causes a lot of distress and uncertainty among families. Receiving money ‘on time’ (*a tiempo*) is highly valued because investing on agriculture at the right time allows the money to ‘yield’ (*rendir*) while payments disbursed ‘late’ in the agricultural season ‘go to waste’ (*se desperdician*) due to changing weather conditions and pests. Using credit to close these gaps is not always feasible nor desirable because local credit networks are limited and lending abroad is expensive, with monthly interest rates going as high as 15% in the town of Comitán. These issues are highlighted in the following interviews with a male *ejidatario* in El Pirú and a female *ejidataria* in Galacia, respectively:

They take too long to pay, this time they paid in January. On December, we thought that we would not even have money for the Christmas dinner. If they gave it in October or November it would be fine. Or maybe in August because it is when children start school, it is when we have expenses. This time we thought that they would not give us anything.

There are moments when it is time for land work, for corn and beans, and this time has passed when the conservation payments comes. Many people get money with interest and when the money comes they pay. They are interested in doing work on time because if it is done later there is a lot of harm from animals, from plagues. Many go to Comitán to get money. Some charge 5% and others 10% per month.

Thus, I have shown here that families have generally spent, or at least planned to spend, the money from PES and Prospera for different things, with each payment being often managed by different family members.

6.3.3.2. Community and regional level policy interactions

At the community level, PES have made positive but limited contributions to Prospera in the form of direct investments to schools and health services. Over the years, all *ejidos* in the study area except for Galacia have used some of PES money for infrastructure investments in schools, clinics and other *ejido* services (Table 14). In Boca de Chajul, the *ejido* has spent some of PES to finance a school truck to bring children from other *ejidos* to attend the secondary and high school. As mentioned in Chapter 5, according to local accounts, the schools in Boca de Chajul were facing pressure for closure because they were not meeting the minimum student quota requirements established by SEP. The *ejido* set aside PES money to purchase a school truck in 2011 and have since used around Mxn\$100,000 per year to pay for maintenance and gasoline expenses. This is noted in the following interview with the *ejido* president at the time:

I spent all the (PES) money from the first year and also the next year on the truck. Fortunately, that investment left me with less expenses and gasoline that allowed me to get out of debt quickly...We suffered the first six months to solve the school problem. It was a problem every day. The truck is now too hot, it does not work, it needs gasoline. People there collaborated a lot. They lent their cars to bring children.

Importantly, I found no evidence of these types of direct investments on schools and clinics being made with Prospera money or with PES money distributed to families. *Titulares* often contribute for some collective expenses, such as to pay for cleaning equipment or to handle paperwork, but these are very small and usually around Mxn\$5-\$10 per payment received. Families receiving PES also make these types of small contributions for conservation activities, such as monitoring or doing firebreaks. Surely, however, some of Prospera and PES money received by families has been invested in *ejido* infrastructure but only indirectly in the form of contributions made by individual

ejidatarios and school parents. These types of collective investments are typically managed by *ejido* authorities and involve negotiating favours and funding with the municipal government, as noted in the following interview with the president of Adolfo López Mateos during 2017 referring to funding for the kinder garden:

The municipality helped us with a part. Twenty trucks trips to carry stones and cement. The parents also cooperated. The municipality gives everything in an ‘I give you and you give me’ way. When I went to negotiate, they help with things but then ask for favours. They asked for truck trips with soil and stones from the *ejido*. Everything is a negotiation.

Investments with PES money have subsidised some of the schooling and health costs for users of these services in each *ejido*. The spillovers of these investments for Prospera have been widespread because many of the school and clinic service users are families participating in Prospera. For instance, the percentage of children receiving Prospera scholarships from 4th to 6th grades in primary school as of 2015 were the following: 14 out of 14 (100%) in Playón de la Gloria; 15 out of 18 (83.4%) in Flor del Marqués; 5 out of 8 (62.5%) in Galacia; 12 out of 18 (60%) in Adolfo López Mateos.

Similarly, the school transport in Boca de Chajul has subsidised some of the schooling costs for children attending the secondary and high school, most of which receive Prospera scholarships. In this case, however, spillovers have been regional because the secondary and high schools are shared by children from several *ejidos*. As of 2015, the truck collected and returned students from El Pirú, Playón de la Gloria and other four *ejidos* in the neighbour municipality of Maravilla Tenejapa at a subsidised rate of Mxn\$10 per day. Some children from Galacia or Flor del Marqués also used it by commuting to Playón de la Gloria.

Interviewed families who have used the school truck consider that it has been of ‘much help’ because transportation costs represent a significant amount of money and often a large percentage of the scholarship given by Prospera (see Table 15). Families living in *ejidos* farther away have benefited the most because Prospera scholarships include no provisions for schooling costs and alternative transportation costs increase with distance. Public transportation costs to Boca de Chajul range from Mxn\$20-\$30 from Playón de la Gloria and Mxn\$30-\$40 from El Pirú (see Table 15). Similar considerations apply to private transportation due to gasoline costs.

Yet, these types of investments have been short-lived and limited in their size and scope. Infrastructure investments have been enough to cover some repairs and improvements to schools and clinic facilities but not more. As shown in Table 14, the amounts that *ejidos* have chosen to distribute for collective purposes have been very small in absolute terms, and also relatively when compared to the total amounts disbursed by PES. The following interview in with an *ejidatario* in El Pirú provides some examples of these investments:

We used it for doors, constructing, furniture, but to be honest I am not sure. The parents decide. We decided to give for the school. The school has always been bad. There is no more support other than that.

More importantly, there is no evidence that *ejidos* have been collectively spending more over time. As I showed previously in Chapter 5, investments in schools and clinics have been sporadic and consistently given a second-order priority to distributing the money directly to families or collectively investing on agricultural activities. This matters because in the *ejidos* it is still widely believed that lack the poor quality and availability of schooling services, as well as the general lack of resources among families, are important deterrents for children pursuing further education. These issues are highlighted

in the following interviews with *ejidatarios* in Playón de la Gloria and Galacia, respectively:

We put \$5,000 (from PES) for a water pump and other materials. Here the *ejido* supports the schools. It is an agreement to support, whether *ejidatarios* have children or not. A way to organise. The women parcel it is the same. Now we put \$18,000 for a scale to weigh cattle.

The reason why children stop studying is due to lack of resources. If there were more resources, then young people would study more. If there is no money, they do not go. Here many do not study, there is a CONAFE secondary and a federal one in (Boca de) Chajul. They say CONAFE does not even count.

Overall, examined from a long-term perspective, collective investments with PES seem to have made little improvements on the provision of educational and health services and, more importantly, on their quality. Historically, access to services has been sluggish in the study area because the region is isolated and poorly communicated, issues that I raised previously in Chapter 2, and also because *ejidos* are small and rules governing service provision are dependent on minimum user quotas. The region was colonised from the 1970s but primary schools were set up until the 1990s and secondary and high schools only by the 2000s after the re-municipalisation process which led to the creation of the municipalities of MdC and Benemérito de las Américas in 1999. Existing schools and clinics in the study area have been poorly and persistently understaffed because ‘unions’ (*sindicatos*) give first choice in geographical placement to public servants with more tenure and many prefer not to be placed in rural and isolated settings.

By 2015, primary school teachers taught as many as children from three grades at the same time, were all in their first position after coming out of university and were frequently absent allegedly because they had long commutes to their homes over the weekend. Oftentimes, teachers commute to MdC on Mondays and leave on Fridays, such

that they only teach three full days per week. The provision and quality of health services in the region is even worse. For instance, the clinic in Adolfo López Mateos, which was also supposed to attend Prospera families in Galacia and Flor del Marqués, had been shut down since 2012. No staff has been present and medicine has not been disbursed since then allegedly because a nurse was threatened by the locals and staff from SALUD have not been able to find a replacement. Based on the evidence collected, PES investments, and more generally participation in PES or Prospera for that matter, do not appear to have made a dent on the broader political economy factors causing these shortages in service provision and quality. This is noted in the following interview with a female *titular* in Flor del Marqués:

There has not been a doctor for some time. People go to the clinic in Boca de Chajul or Pico de Oro. They go to Benemérito if it is more serious. Pregnant women need to look where to go now, either in Boca de Chajul or Pico de Oro. Only they go often now. There is no health verification now. I go to check my health to Boca de Chajul every six months. There is no follow up on the clinic because there is no doctor. Only the doctors can manage medicine. We really need a doctor. They say that in Adolfo López Mateos they went to Palenque to look for a medic. People look for this, paperwork has been sent but they do not come.

Thus, my results show some positive, yet very limited, community and regional spillovers from PES to Prospera in the form of direct investments in schools and clinics.

6.3.4. Understanding interactions: policy design and delivery

This section highlights some aspects of policy design and delivery that help explain the results above. I emphasise some payment features as influencing why families have tended to spend PES and Prospera money in different ways. Further, I underscore the lack of coordination and planning among the institutions disbursing PES and Prospera as hampering potential synergies between the programmes at different levels.

6.3.4.1. Different payment features

I argue here that variations between PES and Prospera in terms of amounts disbursed, frequency, temporality and conditions help to explain why families have chosen to spend money in different ways. The small sample size, and the fact that each policy includes several distinct features, do not allow being conclusive on these issues. As such, I simply present them as hypotheses to be further tested.

Interviews revealed variations in the amounts of payments between PES and Prospera (see Figures 17 and 18) as influencing the types of things that families have been able, or at least aspired, to do with the different money. According to husbands and wives, larger amounts from PES allow to make the money ‘yield’ (*rendir*) more for bigger or longer-term investments than smaller payments which are ‘wasted’ on small household expenses as is frequently the case of Prospera. This ‘size’ effect emerges in the context of a family economy where credit is limited, alternative income sources are small and households find it hard to acquire large amounts of money at any given time. Further, single mothers and single fathers tend to manage and spend PES and Prospera in similar ways as couple-headed households, which suggests that the gender of recipients may matter more for how payments are managed than for how they are spent. The following quote among a single mother in El Pirú exemplifies this:

I receive it and manage it (Prospera). I spend it on the house, on food, vegetables. I spend it differently than the one from conservation (PES) because it is a little bit and is not enough to buy many things. The one from Prospera for food but the one from PES for ranching pastures. If we manage to buy a calf we invest. The one from PES I always invest instead of spending. The Oportunidades one sometimes I invest, to buy a little pig, but it is small. It is different because it is small and everything is expensive and we do not manage to buy much. With the other (PES) you can achieve more.

Variations in the amounts disbursed by PES and Prospera have been further accentuated by the contrasting frequency schedules between the programmes. Since Prospera is disbursed every two months while PES only once per year, the amounts received from PES have often been much larger than those from Prospera even when yearly amounts are within range. During interviews, families often emphasised a tension between the frequency and amounts of the two payments for what they can ‘achieve’ (*alcanzar*) with them. The fact that Prospera is received frequently, i.e. every two months, makes it better suited to cover short-term needs than annual PES payments since, in the words of a titular in Galacia ‘we do not eat once per year’. Less frequent disbursements, however, allow the payments to ‘accumulate’ (*acumularse*), as noted in the following interview with a female *titular* in El Pirú:

For me the minimum would be two or three payments (per year). One is very little. But once per month would be too frequent. They (people) would not want this, they would not be working as they would only be waiting for the payment. One also has to work. So minimum two times. I would choose prefer four times per year so that I did not have so many debts. This way one receives a little more. That would work for my expenses, it accumulates a little more.

Another aspect has been the contrasting temporal dimension of participation between PES and Prospera. Families have found it hard to make long-term financial plans with Prospera because *titulares* are generally uncertain regarding their continued participation in the programme. Though Prospera has operated for much longer than PES, and many families have received payments since the early 2000s, *titulares* constantly fear being removed from the ‘list’ (*lista*) of eligible participants even if they are meeting co-responsibilities. The eligibility criteria used by SEDESOL is unknown to *titulares* and there is no one to hold accountable when people are removed from the programme. I found that *titulares* often attributed participating in Prospera to good or bad ‘fortune’ (*suerte*). PES, in turn,

have involved well-defined five-year contracts with fixed and known payments per hectare enrolled. This has played an important role in shaping the aspirations of families and to commit to long-term financial decisions with money from PES.

Finally, the contrasting spending patterns between PES and CCT have been influenced by the different ‘formal’ and ‘informal’ conditions imposed by the programmes. Families have generally been able to do whatever they want with the money from PES because, at least until 2015, CONAFOR has not emphasised how families should spend the money and meeting environmental conditions has generally not been costly. Monitoring and doing firebreaks takes time but generally does not require spending money. In turn, families spend a significant amount of Prospera money on meeting ‘formal’ schooling conditions, particularly when children study in other *ejidos* (see Table 15). Yet, on a more subtle and informal level, Prospera institutions have imposed expectations to *titulares* over desirable behaviour regarding the payments and this appears to have influenced how payments are understood, perceived, and spent by families. *Titulares* are constantly told by SEDESOL staff, medical staff and even teachers not to ‘waste’ the money on petty things, such as CDs and toys, and are made to falsely believe that they can lose the payments if they are caught doing so. This is noted in the following interview with a female *titular* in Flor del Marqués:

The programme says that we should not spend the money on some things. They take the payment if they find out. If they find out that we buy music CDs or other things they take it away.

6.3.4.2. Lack of coordination and planning

Despite operating in the same geographic area for several years and disbursing revenues to the same *ejidos* and *families*, the institutions implementing PES and Prospera have ran their respective operations independently from one another. CONAFOR and SEDESOL

have used their own participant selection criteria, payment disbursement mechanisms, communication channels, monitoring practices and ways to evaluate performance. When research was conducted, interviewed staff from CONAFOR and SEDESOL were not aware of, nor showed an interest in, the fact that money from PES has been collectively invested on schools and clinics over the years. Nor did SEDESOL seem to realise that the significant amounts of money accruing to families through PES would probably render many of them ineligible for Prospera. Importantly, the evidence gathered suggests that institutional lack of coordination is hardly a specific issue pertaining to CONAFOR and SEDESOL, but one example of a broader tendency among the set of educational, health, agricultural and ranching government institutions in the study area.

The fact that families and communities receive both PES and Prospera, and share multiple services associated with these programmes, would suggest much space for various synergies in costs, spending, information exchanges or behaviour. Yet, the lack of institutional coordination and understanding of interactions between CONAFOR and SEDESOL has hindered the scope for building more significant synergies between the programmes beyond those that have inadvertently emerged out of the creativity and expense of local actors. The following interview with a regional manager from CONAFOR based in Tuxtla Gutiérrez discussing why they have chosen to disburse payments to *ejidos* instead of families presents one example of these potential cost synergies:

For payment (of PES) the *ejido* has always been paid. At the beginning we paid checks, we gave checks to the president of the *ejido*. Because it is complicated to distribute like SEDESOL. That brings a cost, taking a truck to the forest makes the operation complicated.

Further, changing aspects of payment design and a lack of long-term planning by CONAFOR and SEDESOL have added strain to already fragile and limited interactions

between PES and Prospera emerging from collective investments. Though CONAFOR has chosen to deal with *ejido* authorities rather than individual families, little emphasis has been placed on facilitating transitions when *ejido* authority positions change every three years or when contracts are renewed every five years. Authority changes and contract renewals create a lot of uncertainty regarding participation in PES and the distribution of payments and possibilities for investments in schools and clinics. For instance, when the 2008 contract ended in Boca de Chajul, the new authorities failed to reapply in 2012 allegedly out a ‘lack of interest’ such that participation in PES, and by extension finance of the school truck, was discontinued until the *ejido* reapplied again in 2013. The following interview in 2016 with the *ejido* president who first used PES for the school transport system highlights these tensions:

Lately the new authority has done nothing. There has not been a single peso spent in physical investment. When I saw that the new authority was doing nothing I took the programme (PES) from him. Because I stopped earning \$50,000. My family stopped receiving money.

More recently, reaching consensus in the *ejidos* for earmarking money from PES for collective investments has been hampered by CONAFOR’s rule from 2015 onwards that *ejidos* must ‘reinvest’ 30-50% of the payment exclusively on conservation-related activities in what they call a change from ‘passive’ to ‘active’ conservation. According to the regional CONAFOR manager, the motivation behind this change was so that they could be able to ‘see’ where all the money was going. Though this rule was ultimately removed by CONAFOR in 2018, its inclusion during the previous years was deeply criticised by the Natura Mexicana and beneficiaries, and often caused internal conflicts in the *ejidos*. These issues are noted in the following interview with a female *ejidataria* in Flor del Marqués:

Before they (CONAFOR) were not strict but now they are. We know that we will receive 60% and the rest we need to prove. We bought cameras, rakes for firebreaks, backpacks, many things...We prefer how it was before because we will have problems. We have not done it but I know we will have problems. They (people) will ask why we give them their \$6,000 if they put 10 hectares. The other \$4,000 we need to prove, then people are not going to like it.

6.4. Discussion and conclusion

I have shown widespread overlap between PES and CCT in the region of six communities in MdC, with many families receiving both payments over the years. In the study area, interactions between PES and CCT take place at multiple levels, family, community and regional, with different results and determinants. The empirical evidence presented in this chapter confirms an assumption carried over when introducing the typology of policy interactions in Figure 13 that several types of interactions may coexist simultaneously between PES and CCT at various levels when operating on a policy mix. Overall, following Figure 13, I characterise interactions between PES and CCT at the family, community and regional levels to be largely ‘mutualistic’, and proceed to explain such interactions below.

At the family level, CCT and PES play complementary but different roles in the livelihood strategies of families receiving both payments, the former being used mostly for meeting short-term household needs and schooling while the latter being placed as an important component in longer-term strategies. Most family plans are about improving pre-existing agricultural and ranching activities, but some families have used PES instead to pursue off-farm livelihoods or to pay further university education to their children for which there is no support from CCT. In the study area, PES amounts have been much larger than CCT, often representing the largest source of family income. This stands in contrast with studies in other settings where the contribution of PES to household income has been

much smaller and ‘within range’ of CCT (e.g. Mahanty et al., 2013; Rodríguez et al., 2011; Tacconi et al., 2013). This result emerges out of a combination of two factors: individual landowners enrolling large surfaces to the programme and a collective preference for distributing money to individual families.

At the community and regional levels, PES have positively contributed to CCT by directly financing investments in school and health services that many families attend as explicit conditions of participation in CCT. Some investments have regional effects because multiple *ejidos* share these types of services. The use of PES for investments in shared services here is consistent evidence from previous studies when the programmes involve collective payments (Mahanty et al., 2013; Tacconi et al., 2013). Yet, my analysis suggests that the effects of these types of investments may be much more limited and short-lived than otherwise recognised by the literature. Despite participation in both PES and CCT over a relatively long period of time, communities in the study area still face persistent deficiencies in service quality and access, outcomes which I have traced to the broader political economy of educational and health service provision. Based on the evidence gathered, it seems highly unlikely that small and intermittent initiatives by individual communities with money from either PES or CCT can make further and sustained improvements in the provision and quality of services. These types of limitations of ‘demand-driven’ and payment-based policies to improve service provision and quality have been mentioned previously in the CCT literature (e.g. Levy and Schady, 2013; Sánchez-Ancochea and Mattei, 2011) but they have not yet been discussed in the context of PES. This chapter presents an empirical contribution in this regard by highlighting the limitations of PES regarding questions of ‘community-driven’ or ‘community-led’ development (e.g. Mansuri and Rao, 2013).

Further, my evidence shows that despite many apparent similarities in their theory and practice (Persson and Alpízar, 2013; Rodríguez et al., 2011; Wong, 2014), PES and CCT may in reality be experienced and understood by participants in very different ways. I have highlighted some aspects of payment delivery and design as influencing how families manage and spend the money, as well as the roles they place for PES and CCT in their livelihood strategies. Some of these are ‘formal’ programme rules purposefully designed to achieve certain goals, such as attaching socioenvironmental conditions to the payments. In turn, others are subtler ‘informal’ or unintentional everyday practices, such as CONAFOR disbursing payments ‘late’ or SEDESOL agents warning *titulares* not to ‘waste’ the money. The fact that seemingly trivial aspects of payment design and delivery may have important and unexpected consequences for PES and CCT individually, and more so in their multiple and dynamic interactions, underscores the need to uncover and understand these types of ‘hidden’ features and the complex contextual factors through which they operate. I believe that the methodology developed in this chapter provides a useful tool for shedding further light on the real similarities, and more importantly the differences, in the theory and practice of different policies disbursing payments to the same families and communities.

To conclude, my evidence highlights the complex ways in which families and communities experience planning and coordination failure between the institutions implementing PES and CCT. I have shown that this occurs at all stages of programme implementation, including participant targeting and selection, monitoring of conditions, disbursement of payments and evaluation of performance. At times, this lack of coordination has brought disputably ‘positive’ outcomes, such as SEDESOL not realising that some families would potentially be ineligible because they receive significant amounts of money from PES. Yet, the fact that families and communities must cope and adjust to

uncertain participation and payments, as well as changing rules and limited support suggests that the overall balance is largely ‘negative’. The inevitability of PES and other policies in the ‘policy mix’ interacting at multiple levels in dynamic and unexpected ways suggests the need to move away from their analysis as isolated interventions operating independently from one another. Thus, my evidence show how a ‘regional’ approach to the study and implementation of PES captures multiple policy dynamics and spillovers that are bound to be overlooked in household or community-level analyses. Further, such an approach provides evidence in support of the need for inter-institutional coordination and planning to enhance cost, spending, informational and behavioural synergies between policies. Questions revolving around institutional ‘fit’, ‘interplay’ and ‘scale’ have a long legacy in Common-Pool Resources (CPR) and ecosystem governance literature (e.g. Berkes, 2002; Folke et al., 1998; Young, 2002a, 2002b) and have been recently noted as important areas of study for PES (Baylis et al., 2016; Börner et al., 2017; Corbera et al., 2009). Indeed, my evidence supports the literature on institutional ‘interplay’ (e.g. Berkes, 2002; Young, 2002a, 2002b) which suggests that individual policies such as PES interact, operate and evolve alongside broader institutional frameworks, creating both intended and unintended socioenvironmental consequences. The analysis and methods presented here provide valuable insights to study the multiple interactions, as well as their effects and determinants, of PES in a ‘policy mix’. As the PES agenda moves forward and becomes integrated within broader socioenvironmental policy initiatives seeking to innovate in policy design and delivery, including REDD+, ESPA and IPBES⁷¹, it may be worthwhile instead to recognise that PES already play diverse roles within a multi-scale

⁷¹ Reducing Emissions from Deforestation and Forest Degradation and Sustainable Development (REDD+), Ecosystem Services and Poverty Alleviation (ESPA), Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (Chan et al., 2016; Fisher et al., 2014; Pascual, et al. 2014).

‘policy mix’ and to develop tools to examine the effects and determinants of these interactions in the past and present.

7. Conclusion: Understanding PES

This thesis examined the role of PES in the broader livelihood strategies of participating families and communities in a region of six forest-dwelling communities. The study area was the municipality of Marqués de Comillas (MdC) in the Lacandona Rainforest, state of Chiapas, Mexico. To examine this question, I developed a multidisciplinary, dynamic and multi-level approach that brought to the fore the voice of local stakeholders while at the same time paid attention to how evolving aspects of context and design shaped PES effects at the family, community and regional levels. Using this novel approach, I studied three sequential and interrelated dimensions of PES: people's strategies about land use (Chapter 4), people's ways of distributing money (Chapter 5), and people's ways of combining policies (Chapter 6).

In Chapter 4, I showed that participants only enrol a fraction of the land that they manage. In compliance with PES conditions, participants mostly 'conserve' the lands that they choose to enrol. Yet, at the same time, participants often deforest the lands that they choose not to enrol. I showed that participants make enrolment and non-enrolment decisions simultaneously and that these are a result of individual aspirations and constraints, as well as geographically and historically determined opportunity costs. In Chapter 5, I showed that land institutions (structure) tend to shape the distribution of PES benefits and tend to move distributions towards cash. Yet, in some cases, the structure creates some room for manoeuvre for key actors to use the money effectively for community projects. In this way, the chapter emphasises the importance of land institutions, and the tendency towards distributing money in cash even in 'communal' forms of land ownership. Overall, I showed how these processes tend to perpetuate and even exacerbate pre-existing land and power inequalities. In Chapter 6, I showed that families tend to use money from PES and CCTs for different things, the former more for

‘investments’ in land while the latter for household ‘expenses’, and I highlighted how features of payment design influence these spending patterns. Additionally, I showed how, despite some efforts made by families and *ejidos*, the lack of coordination between the government agencies implementing PES and CCT has missed opportunities to build synergies and links that are more meaningful at the family, community and regional levels.

This concluding chapter reflects on the common themes and implications emerging from the findings presented throughout this thesis. The following section highlights how the evidence here contributes to the literature on how to understand PES and their effects. It discusses the findings in relation to broader debates around the ‘neoliberal’ nature of PES and their prospects for ‘win-win’ outcomes. It also brings forward ‘decision-making’ as a third analytical category to complement ‘context’ and policy ‘design’ for the study of PES effects. Section 7.2 introduces the concept of the ‘policy matrix’ as a heuristic device for the study of policy interactions. Section 7.3 concludes this thesis with some final remarks.

7.1. Revisiting PES’ concept and effects

Overall, the evidence presented in this thesis supports research suggesting that PES outcomes, social and environmental, emerge from the interplay between ‘contextual’ dimensions and aspects of policy ‘design’ (Börner et al., 2017; Engel, 2015). Yet, my evidence further reveals how aspects of context and design dynamically interact at various temporal and spatial scales, and how this produces shifting and multi-layered socioenvironmental PES effects. Chapter 4 showed that environmental outcomes at the family and community levels emerged from the interplay between evolving biophysical land characteristics (context) and rules on environmental conditionality and enforcement (design). Chapter 5 revealed that distributional outcomes among families and community

emerged at the interface between historical land institutions (context) and rules assigning communities as the ‘sellers’ of environmental services (design). Chapter 6 uncovered that spending outcomes at the family, community and regional levels were the result of interactions between socioeconomic conditions and policy interactions (context), and payment features regarding amounts, timing and frequency (design). Overall, this suggests that grasping a better understanding of manifold PES effects requires examining aspects of design and context not only simultaneously, but also at various temporal and spatial scales.

Further, this evidence is also consistent with research suggesting that local stakeholders give different meanings, continuously resist and reshape PES in multiple ways, and that these processes have social and environmental implications (e.g. Van Hecken et al., 2015a, 2015b, 2018). The findings from Chapters 4 to 6 revealed that while PES are designed as short-term incentives for narrow conservation goals, participants think about their livelihoods at wider temporal and spatial scales. This broader and longer-term thinking allows them to exert some degree of control on the various environmental ‘carrots and sticks’, as well as other development policies, that they encounter along the way. From this wider and longer-term livelihood perspective, it is not surprising that landowners often only choose to ‘partially participate’ in PES by enrolling only a fraction of their property as shown in Chapter 4. The evidence from Chapter 5 shed light on how community involvement in PES created new spaces for participants to reflect on their collective forms of land ownership, local, yet contested, notions of fairness and long-term community development goals. Landowners developed ‘informal’ participation agreements to avoid conflict when some lands were rejected and they tailored mechanisms for benefit sharing according to their local norms. PES also opened a space for the PES intermediary to ‘set foot’ in the communities, thus marking the first stage in

a series of collaborations between the organisation and communities that exist to this day and include several community-based ecotourism projects, school environmental educational programmes, and the channelling of extensive government resources for various conservation-related activities. Similarly, Chapter 6 showed how landowners and the PES intermediary saw money from PES as an opportunity for investing in a regional school transport system and thus temporarily solved a regional collective action dilemma in schooling provision. This chapter also revealed how some aspects of PES design that have often been neglected or belittled, such as when, how often, and who receives payments, are actually very important for the livelihoods of participants. All these varied local responses and creative arrangements are in many ways *sui generis*, but they hold valuable lessons for PES design and implementation in the present and future.

At the same time, however, these findings lend support to the view that we should not over-romanticise the potential benefits of these types of local resistance and negotiation processes, “as they will not miraculously lead to decreased inequality and the inclusion of more vulnerable actors at the local or community levels” (Van Hecken et al., 2015a: 122). On the contrary, the findings here reveal the likelihood for PES to reproduce and exacerbate pre-existing inequalities, to exclude vulnerable actors from benefits and land decision-making, to take place in contexts with contested notions of fairness and equity, to be associated with ‘elite capture’, and to distract policy-makers attention away from the political processes that produce these outcomes.

Chapter 4 revealed that many ‘poor’ families in one of the poorest communities of the study area willingly chose to enrol all of their lands to PES because of low opportunity costs and lack of economic alternatives. The chapter traced the historical dimensions and trajectory of opportunity costs in the region, showing how these ‘poor’ families were the last colonisers and as such received the ‘last-come, last-choice’ of lands in terms of access

and productivity. All this shed light on the deeply political and historical nature of land opportunity costs, thus providing empirical support to the idea that ‘the poor sell cheap’ (Martínez-Alier, 2002). Chapter 5 revealed that the way in which communities devise payment distribution mechanisms increasingly benefited some groups but at the same time increasingly excluded others, such that distribution ‘broadened the gaps’ between different local actors (García-Amado et al., 2011). This chapter also traced the historical dimensions of distribution mechanisms, emphasising how groups of founding community members used their political power in the assemblies and historical narratives to legitimise excluding more recent colonisers from receiving PES money. This lends support to the view that it is not useful to conceptualise communities as homogenous entities solely based in networks of solidarity and reciprocity, but rather as highly heterogeneous associations where diverse forms of inclusion and exclusion coevolve with each other in complex and dynamic ways (e.g. Agrawal and Gibson, 1999; Li, 1996). Overall, the chapter emphasised how these inherently political processes remained largely invisible to the intermediary and local government staff implementing PES who otherwise preferred not to get involved in community politics. All these issues require further addressing and understanding, both out of ethics and morality because they have real implications on the poorest of the poor, but also because disregarding equity aspects may undermine the environmental effects of PES over the long run (Corbera and Pascual, 2012; Pascual et al., 2014).

In turn, Chapter 6 revealed how families and communities simultaneously face several government policies concerned with achieving narrow environmental and development goals, but that otherwise pay little attention to contradictions and synergies in the ‘policy mix’, as well as to the local reality of such policies on the ground. I will say more about the issue of policy interactions in the following section. On the issue of local realities, this

chapter revealed that as long as families complied with the environmental conditions, it did not seem to matter much to PES implementers if participants were deforesting much of their non-enrolled forests. Also, as long as families met their CCT conditions on paper, it did not seem very important to policy implementers if families sent their children to very poor quality local schools or if they ‘attended’ clinics that had actually been closed for years. Nor did it seem to matter much to CCT implementers the fact that some families did not have to spend money or time on school transportation, while others spent most of their scholarships and significant amounts of time commuting because there were no schools or services in their own communities. Again, these issues should not be ignored, not only because they matter intrinsically but also because they are bound to have implications for policy effects in the present and future. Some of these issues could be resolved through policy design, which would require two consecutive steps: first, to incorporate into policy evaluation a deeper understanding of the manifold experiences of policies on the ground and their drivers; further, to account for these variations through policy design. In the example above about education costs in Prospera, for instance, one possibility would be to include an additional variable transfer to compensate families for transportation costs between their communities of residence and the schools they attend.

Overall, all this evidence confirms a central assumption carried over throughout this research of the value of capturing local perspectives for gaining a better understanding of PES. In other words, the findings here provide support to the notion that bringing to the fore the voice of local stakeholders contributes to a better understanding of the theory and practice of PES because it sheds light on the heterogeneity, complexity and nuances of their operation on the ground. Below, I discuss how the overall findings here contribute to broader themes and debates in the PES literature on two issues: conceptualisation and understanding of effects.

7.1.1. ‘Neoliberal natures’ and ‘win-win’ outcomes

The findings presented here, together with the vast body of existing PES literature, suggest that engaging in general debates around whether PES are ‘neoliberal’ policies or ‘win-win’ solutions is no longer very useful. After all, there is now an extensive amount of empirical and theoretical literature showing how PES take multiple forms and shapes (e.g. McElwee et al., 2014), pursue various goals and (e.g. McAfee and Shapiro, 2010; Shapiro-Garza, 2013a, 2013b) and have manifold effects (e.g. Börner et al., 2017; Ezzine-de-Blas et al., 2016).

In this regard, the findings in this thesis contribute to the recent and ongoing debate between scholars who continue to understand PES as inherently ‘neoliberal’ (Fletcher and Büscher, 2017) and those who welcome a call for examining the structural power dynamics upon which PES operate, but that also believe that overly structural analyses risk ‘silencing’ the agency of local actors (Van Hecken et al., 2018). Overall, the evidence presented in this thesis supports the second school and gives empirical support to their theoretical claims.

For instance, the evidence presented here reveals that universalising and static concepts related to ‘neoliberal natures’, such as ‘green grabbing’ (Fairhead et al., 2012) or ‘payments for renouncing development’ (Karsenty, 2007), fail to capture the nuances, specificities, and patterns of local resistance and reshaping of PES by local actors. In Chapter 4, I showed that some families ‘partially’ participated in PES by enrolling a fraction of their land while others ‘fully’ participated by enrolling all of their land. Further, I showed a great deal of variation among those ‘partial’ participants in terms of the percentage and amounts of lands enrolled, location of parcels and their historical colonisation processes. Similarly, in Chapters 5 and 6 I showed that families and communities distribute and spend money in very different, complex and changing ways.

Yet, when seen from a lens of ‘neoliberal natures’, all this rich complexity, heterogeneity and dynamism is lost in homogenising concepts such as ‘green grabbing’ and ‘payments for renouncing development’. In other words, these concepts are too broad and too static to be able to distinguish subtleties, nuances and change. All this suggests the need for developing ‘narrower’, more precise and context-specific concepts that can capture the richness of local experiences with PES. Throughout this thesis I have often used local terms as they have provided valuable clues as to the social representations, moral framings and ideas of fairness that guide local understandings of PES. This suggests that engaging more deeply with local terms and their usage may provide a useful avenue for advancing more empirically rooted and precise conceptualisations of PES.

Similar considerations apply to the debate about whether PES are, or should be, ‘win-win’ policies. Based on the evidence presented here, it is clear that some of the outcomes might be classified as ‘win-win’ but only for some groups of individuals and communities, on specific dimensions of their livelihoods and natural resources, and for particular temporal and spatial scales. Thus, overall I take side with the ‘ecological economics’ perspective in that “win-win solutions at the interface of conservation and development are possible, under particular institutional and governance contexts” (Muradian et al., 2013: 275). The evidence here has revealed that PES are just as likely to produce negative and positive ‘social’ effects and that the scope of ‘environmental’ effects is rather constrained because PES do not pay much attention to what happens outside of enrolled forests. Yet, based on the history of environmental ‘carrots and sticks’ as they have unfolded in the study area, I share a somewhat more optimistic view of PES in line with the ‘environmental economics’ perspective (Wunder, 2013). PES have been by no means a panacea, but studies in Marqués de Comillas have shown that they have been quite environmentally effective at reducing deforestation (Costedoat et al., 2015). In

addition, they seem to have been much less prone to social conflict than the previous forest bans, protected areas and other command-and-control instruments of earlier decades. PES have been more sustained over time, transparent and widespread than the multiple ICDPs that have come and gone since 2000s. Clearly, more research is needed on how PES compare with other environmental policies in the area, and most importantly, how they interact with each other.

7.1.2. ‘Context’, ‘design’, and ‘decision-making’

The evidence presented here highlights that ‘decision-making’ by local actors matters as much as ‘context’ and ‘design’ for determining PES outcomes. For instance, it is true that participation outcomes in Chapter 4 depend a great deal on opportunity costs based on biophysical factors (context) and the conditions set by PES (design). Yet, context and design do not explain the subtle decisions made by landowners around how much land to enrol and which parcels (decision-making). Similarly, it is clear that when devising distribution mechanisms in Chapter 5, communities pay attention to historical land institutions (context) and are enabled to make collective decisions by PES rules (design). Yet, these two factors alone cannot explain why communities develop ‘informal’ participation agreements and why distributional outcomes change constantly over time (decision-making). Context and design cannot explain why the PES intermediary chose to donate its technical advisor fees to the communities. The same applies to Chapter 6, since one community chose to purchase a school truck (decision-making) to be used by children not even living in that same community (context) and made an investment that was not required by programme rules (design).

The common theme in these examples is that aspects of context and design fail to explain some of the dynamism and variation of PES outcomes because these issues respond much more to how different local actors use their agential power in different ways and to pursue

various purposes. This suggests the need for explicitly incorporating ‘decision-making’ as a third and distinct analytical category to complement ‘context’ and ‘design’ for the study of PES effects. Below, I briefly discuss how a research agenda paying attention to ‘decision-making’ might look like.

Studying ‘decision-making’ would involve engaging deeper with questions such as how cultural norms and values coevolve with, and are reshaped by, local PES experiences, how participants jointly understand and continuously reinterpret their social and natural worlds, i.e. their ‘socio-natures’ (e.g. Swyngedouw, 1996), and how PES stakeholders negotiate individual and collective aspirations and realities.

Evidently, such a research agenda requires multi-dimensional and long-term empirical studies that are able to capture the workings and evolution of discourse and practice of PES at the micro level (Van Hecken et al., 2015a, 2015b). In this regard, I agree with some PES scholars who have recently turned their gaze towards the broad and multidisciplinary field of development studies as a potential source of clues to guide further research (e.g. Milne and Adams, 2012; Rodríguez de Francisco et al., 2013; Van Hecken et al. 2018). Indeed, my evidence confirmed a hypothesis brought forward in Chapter 3 on the value of bridging PES literature with development studies scholarship, such as Narayan et al.’s (1999, 2000) influential ‘Voices of the Poor’, for acquiring a better understanding of the theory and practice of policy on the ground.

Other types of frameworks and methods from development studies that could be useful for understanding ‘decision-making’ are Foucauldian discourse analysis frameworks (e.g. Foucault, 1971, 1980) and anthropological methods, such as ethnography and participatory observation. Studies of this kind have provided valuable insights on how the development industry recursively constructs discourses and practices that legitimise local interventions (Escobar, 1995; Mosse, 2004). They have also shed light on how

development policies advance technical discourses that, on the one hand, de-politicise what are otherwise inherently political processes, while on the other hand have important ‘side effects’ such as strengthening and expanding the power of the state (Ferguson, 1994).

Though more research and analysis is needed, some of these aforementioned findings resonate with the experience of PES in the study area. On the one hand, PES can indeed be understood within a discourse about ‘environmental services’, at odds with a persistent ‘developmentalist’ state agenda, that has legitimised the existence of, and continued funding for, these widespread policies in Mexico. On the other hand, the empirical information in the study area has shed light on how the ‘technical’ emphasis of PES by CONAFOR, and its narrow view of effectiveness, de-politicises the deeply political and historical processes explaining participation and land use (Chapter 4), community payment distribution (Chapter 5), and the political economy of public service provision in Marqués de Comillas (Chapter 6). Using these types of analytical lenses to examine ‘decision-making’ among local stakeholders, while also paying attention to aspects of context and design, may help advance a deeper and more cultural understanding of PES effects.

In the end, all these questions on ‘context’, ‘design’, and ‘decision-making’, bring us back to discussions over the structure-agency divide. An important finding emerging in this thesis is to have confirmed the value of bridging different perspectives, academic disciplines and epistemological divides for achieving a better understanding of PES. In line with Van Hecken et al. (2015a, 2015b, 2018), I have shown that neither will overly structural neo-Marxist and political ecology frameworks, nor overly agential behavioural or transaction costs economics analyses, will do justice to how PES operate on the ground. Rather, this thesis has revealed that understanding PES requires multidisciplinary

frameworks and methods ranging across the sciences, from economics to anthropology, and that simultaneously explore aspects of context, design and decision-making.

Yet, for all these discussions on the conceptualisation and understanding of the effects of PES, there is still a need for further reflection on these issues from a perspective of policy interactions. After all, my findings confirmed that PES are bound to operate as part of a broader ‘policy mix’ where interactions emerge between policies pursuing different agendas, thus creating unintended synergies and contradictions at different temporal and spatial scales. This warrants a need to reflect about not only the individual concept and effects of PES, but more generally about the concept and effects of the ‘policy mix’. This is the topic of the following section.

7.2. PES and the ‘policy matrix’

In the book ‘The Social Lives of Forests’, Hecht et al. (2014: 1) outline the dynamism of what they call the ‘ecological matrix’: “the world of working landscapes that connects old growth fragments, rejuvenating them through working landscapes, daily life, and livelihoods in the creation of a society of nature”. Clearly, this is inspired by the earlier work of ecologists John Vandermeer, Ivette Perfecto and co-authors (e.g. Vandermeer and Perfecto, 2007, 2014), who have used the notion of a ‘matrix’ to emphasise the complex and dynamic interconnections between fragments of natural habitat and agricultural landscapes, and thus have made the case for new paradigms that conceptualise biodiversity conservation as inseparable from peasant livelihoods:

A reorientation of conservation activities, away from a focus on protected areas and towards the sustainability of the larger managed landscape; away from large landowners and towards small farmers; away from the romanticism of the pristine and towards the material quality of the agricultural matrix, nature’s matrix. (Perfecto et al., 2010: 10)

I argue here that such a view, its logic and principles, offers a novel way to think about PES when transported to the world of policy. One where PES is conceptualised within a broader set of social and environmental policies, rendering ‘legible’ the dynamic interplay between different conservation and development agendas, exposing their synergies and contradictions at the interface between decision-making processes, the context where they operate, and aspects of policy design and implementation. One where PES is part of a world of working policy landscapes that connects old policy legacies with new visions about how regions should develop, transforming society and nature through daily practice, discourse and power. This is, thinking about PES and the ‘policy matrix’.

The idea of PES and the ‘policy matrix’ is not about overloading the PES agenda with ‘side objectives’, such as “poverty alleviation, gender, indigenous people, human rights, and other noble causes” (Wunder, 2005: 22). My findings in particular, and the history of environmental policy in general, suggest that ‘win-win’ policies are hard to come by: “during the past two decades we have been lulled into complacency by the allure of ‘win-win’ solutions and we have assumed rather too quickly that simple policy tools (either ICDPs or PES) can solve complex policy problems” (Muradian et al., 2013: 277).

Rather, the view that I put forward here is about placing policies in conversation with one another. It is about thinking more broadly about the means and objectives of policy, and asking different questions around policy performance. Because if PES performance is a function of the broader policy landscape, as I have shown, then the overall performance of the policy landscape will be a function of its individual policies. This includes PES but also other many policies operating among each other, from conservation to agriculture and poverty alleviation, which come together to influence multiple aspects of society and nature. If individual policies are means for achieving certain individual goals, but their effects are dependent on other individual policies, then what is needed is to examine the

joint effects of the collection of policies. In other words, to conceptualise policies as collectively forming a ‘matrix’, a bundle of sorts, that achieves certain outcomes.

Thus, thinking about the ‘policy matrix’ would be less about understanding the success or failure of individual social and environmental policies, and more about understanding their combined effects and trade-offs for rural development. Because if the effects of individual policies often transcend original intentions, as I have shown for PES and CCT in this thesis, then studying them in isolation from one another will fail to capture their manifold contributions for rural development. In the same way that a focus on pristine conservation may be a ‘doomed strategy’ for conservation because it ignores non-pristine landscapes and the biodiversity they hold (Perfecto et al., 2010), a focus on individual policies may be a doomed strategy for rural development. This is because it ignores the dynamic interactions between policies, and how such interactions create synergies and contradictions at multiple temporal and spatial scales. This suggests that there are real implications in conceptualising rural development policy as an overall, integrated socioenvironmental ‘policy matrix’, instead of piecemeal, isolated, self-contained social and environmental policies with narrow objectives.

Evidently, these ideas about PES and the ‘policy matrix’ raise more questions than they answer. I hereby present two themes for further research and point out some thoughts for their study. One first set of questions would be around how to conceptualise and empirically examine the overall performance of the matrix as well as the individual contribution of each policy within the matrix. For Vandermeer and Perfecto (2014: 117), the concept of ‘quality’ of the ecological matrix refers to levels of biodiversity, which are determined by the dynamic interplay between various fragments of natural habitat and agricultural practices. Translating these views to the realm of policy, what emerges is the notion of socio-ecological ‘quality’: a socio-ecological system being jointly ‘conserved’

and ‘developed’ through complex and dynamic interactions between various policies. Yet, what would ‘quality’ mean in the conservation-development nexus? How could social and environmental trade-offs be navigated in a matrix? What types of methods might be useful for understanding joint and individual policy effects? Providing answers to such questions would require much reflection on the normative underpinnings of the ‘policy matrix’, over their concept and purpose. As I have emphasised previously when discussing the shifting debates on the concept and purpose of PES, aspects of design and implementation are not only interesting on technical terms, but most importantly because they involve different normative assumptions and worldviews which have not always been easy to reconcile. Engaging with these types of discussions has proven useful for advancing a more empirically grounded PES agenda and such lessons are useful for reflecting about the ‘policy matrix’.

Another set of questions would be around intrinsic motivations. The question of whether monetary incentives ‘crowd-out’ or ‘crowd-in’ intrinsic motivations for environmental conservation has been of much interest and contestation in the PES literature (Muradian et al., 2013; Rode et al., 2015; Wunder, 2013). Yet, if forest-dwelling families and communities engage with various socioenvironmental policies at the same time, then it is possible that some of them crowd-in different types of motivations while at the same time others crowd them out. For instance, agricultural or ranching subsidies may crowd-out motivations to protect forests because they crowd-in motivations to become ranchers or peasants. Thus, from a ‘policy matrix’ perspective it makes more sense to ask broader questions about motivations, such as how do various policies combine with each other to crowd-in or crowd-out intrinsic motivations for environmental conservation and other motivations? What types of policy combinations are likely to crowd-in or crowd-out different motivations?

Clearly, the notion of the ‘policy matrix’ brings a great deal of complexity into PES analysis. Yet, if the histories of conservation and development policy have taught us something, is that seemingly simple interventions operate as extremely complex phenomena. As such, the challenge emerging here for the study of PES and their role in a ‘policy matrix’ is to develop frameworks and methods that can grasp with their complexity but can also provide clear insights on their performance. This section hopes to have shed some light on some ways to move forward a much-needed research agenda that explicitly examines and brings to fore the topic of policy interactions, one that conceptualises policies as forming a collective matrix, thus exposing their synergies and contradictions at various scales in space and time. I believe that the multidisciplinary, multi-level and dynamic framework and methodology developed in this thesis might be useful to undertake such as research agenda.

7.3. Final remarks

We live in world where forests in the Global South have come to represent a global concern, where ‘solutions’ to environmental ‘problems’, such as deforestation and forest degradation, have been increasingly framed around the need to establish markets for ‘environmental services’, and where the narrative of ‘sustainable development’ brought forward most forcefully in the Rio Earth Summit 1992 continues to shape and define an international conservation and development policy agenda involving forests and their dwellers across the Global South. Over the last two decades, the forests of the Global South, first in Latin America and then elsewhere, witnessed the mushrooming of nation-wide and site-specific initiatives literally paying ‘poor’ forest-dwelling families and communities, most often in the form of cash transfers, for conserving millions of hectares of forests.

These policies, called Payments for Environmental Services (PES) emerged in a specific ideological and policy juncture: the incipient creation of markets for environmental goods and services under the ‘ecosystem services’ or ‘environmental services’ framework (Gómez-Baggethun et al., 2010); at the ‘centre of calls for more direct conservation approaches’ (Wunder, 2005: 1) viewed as potentially more cost-effective and efficient alternatives than previous approaches such as ICDPs (Ferraro and Kiss, 2002); and in a world of ‘sustainable development’, carried over from the Brundtland Report (WCED, 1987) and the Rio Earth Summit 1992, where environmental and development ‘problems’ are seen as going inextricably hand in hand such that ‘solutions’ require addressing both issues at the same time. In an early stage, as an artefact of international aid, PES were firmly rooted in ‘neoliberal’ ideology. Environmental economists, influenced by Hardin (1968) and Coase (1960), envisioned PES as a market where ‘buyers’ and ‘sellers’ could trade ‘environmental services’ provided by forests which were being depleted at a rapid rate. In reality, however, PES have evolved into market-framed hybrids, with a strong role played by governments who have increasingly incorporated these programmes in broader rural development strategies. This is the case of the Mexican PES examined in this thesis, a programme that pays thousands of families and communities for conserving more than 3.4 million forest hectares, respectively representing 1.7% and 5% of the total national and forest territory.

Thinking about the future, it is unclear whether PES will continue as they are, take different forms, be further incorporated into broader agendas, or just become another conservation ‘fad’ in the cemetery of broken promises along with previously hailed ‘silver bullets’ such as ICDPs, ecotourism and eco-certification (Redford et al., 2013). Indeed, debates have risen recently as to whether ‘REDD is dead’ or whether it should die

(Angelsen et al., 2017; Fletcher et al., 2016, 2017). Only time will tell which of these possibilities hold true.

In any case, the forests in the Global South have been ever more gazed by the sustainable development industry since the 1980s (Lund et al., 2017) and it is likely that this trend will continue in an era of climate change. Further, a series of developments during the 20th century among countries in the Global South, and particularly in Latin America, suggest a departure from an agrarian agenda towards a forest agenda in the following decades. Such processes have involved extensive land devolution processes among communities and indigenous peoples (Sunderlin et al., 2008), as well as increasing experimentation with new types of forest policies, including PES and REDD+. As noted by Hecht (2014b: 277), “if agrarian reform galvanized rural politics in the twentieth century, forest tenurial reform may well be the axis of rural politics in the twenty-first”. This warrants a need for further reflection about proper forest governance and institutions, not “just agrarian “legibilities” slapped on top of forested landscapes, the norm for much of the twentieth century” (Hecht, 2014b: 278).

This thesis has outlined such a research agenda for the study of PES. One that conceptualises PES within a broader ‘policy matrix’, rendering ‘legible’ the dynamic interplay between different conservation and development agendas, exposing their synergies and contradictions at the interface between family and communal decision-making processes, the context where they operate, and aspects of their design and implementation. Such a view, I have argued, requires thinking about rural development policy not as piecemeal and isolated interventions pursuing narrow goals, but rather as an integrated, intertwined, multi-layered socioenvironmental ‘policy matrix’.

Overall, this thesis hopes to have provided a better understanding of a policy experiment turned reality. One neither simple nor obvious but rather complex and obscure. One

originally imagined around markets, commodities and valuation, but that has really been about payments, ecosystems and development. A policy called Payments for Environmental Services giving payments to families and communities for doing nothing to their forests.

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Glossary

This thesis contains a number of vernacular and technical terms in both Spanish and English. I use italics for terms in Spanish throughout. Here I provide a list of frequently used terms and provide an explanation on their usage. I distinguish between terms mostly used by locals who live in Marqués de Comillas, terms coined by technical government staff that implements policies in the area, and those that I coined myself.

Avecindado – Local term for a person who lives in an *ejido* but who does not usually own or have received rights to work lands from the *ejido* assembly. These are frequently recent settlers.

Básico – Local term used in Flor del Marqués to refer to a group of landowners whose names appear in the official *ejido* land documentation. Most of the people in this group were the founding *ejidatarios* of Flor del Marqués (see Chapter 5).

Carretera fronteriza – Local term for the road in Marqués de Comillas that runs along the border with Guatemala.

Carretera ribereña – Local term for the road in Marqués de Comillas that runs along the Lacantún River.

Communal lands – Term coined by myself as a literal translation from the Spanish *tierra de uso común*, which refers to land collectively managed by the *ejido* assembly. These lands are frequently large and forested surfaces.

Cultivo – Local term for any type of harvest.

Ejidatario – Term used by both locals and technical staff, which refers to a person from an *ejido* who owns land and who has voting rights in the *ejido* assembly (see Appendix A).

Ejido – Term used by both locals and technical staff, which refers to a land tenure and governance system in Mexico that involves a combination of individual and communal land use (See Appendix A). Its use at the local level is synonymous to community.

Ejido assembly – Term coined by myself as a literal translation from the Spanish *asamblea ejidal*, which refers to the supreme governance organ and decision-making body of an *ejido*.

‘Ejido’ land – Term coined by myself as a literal translation from the Spanish *parcela ejidal*, which refers to a small land plot, usually located close to the urban areas, often earmarked for some specific purpose and managed by the *ejido* assembly.

Finca or **hacienda** – Local terms for a large plantation or ranching private estate. Both terms are often used interchangeably.

El gasto – Local term for household expenses, mainly food and other subsistence needs.

‘Informal’ participation agreement – Term coined by myself referring to an arrangement made in some *ejidos* in MdC, with the advice from Natura Mexicana,

whereby lands were internally considered as though they were enrolled in PES although they were formally not accepted nor paid for by CONAFOR.

Individual parcel – Term coined by myself as a literal translation from the Spanish *parcela individual*, which refers to a land plot managed by an individual *ejidatario* or a group of *ejidatarios*.

Jornal – Local term for a paid day of work.

Milpa – Local term for a rotating crop system that often involves the simultaneous cultivation of maize, beans, pumpkin and other crops.

El monte – Local term for land with forest or high canopy.

Narco – Local term for a drug dealer or drug trafficker.

Núcleo agrarios – Term used by both locals and technical staff, which refers to ejidos or agrarian communities in Mexico.

Plática – Term coined by staff from Prospera but also used locally, that refers to compulsory health seminars for *titulares* conducted every two months. These seminars are often carried out by staff from the Ministry of Health or by a *promotora* and they provide information on different topics related to health, including nutrition, use of contraception and hygiene.

Poblador – Local term for any person who lives in an *ejido* but who is not an *ejidatario*.

Posesionario – Local term for a person who lives in an *ejido* and who has been granted permission from the *ejido* assembly to work some lands but is not an *ejidatario*.

Potrero – Local term for a ranching pasture.

Promotora or **vocal** – Terms coined by staff from Prospera but also used locally, that refer to a *titular* of Prospera who serves as an intermediary between staff from Prospera and other *titulares*. Both terms are often used interexchangeably.

Solar – Local term for a land plot in the urban area where people have their houses.

Tierra negra – Local term for soil that has a dark colour and muddy consistency, and that is considered of high quality for agriculture.

Tierra arenosa – Local term for soil with that is mostly sandy and that is considered of low agricultural quality.

Tierra barrosa – Local term for soil that has a red colour and clay consistency, and that is considered of low agricultural quality.

Titular – Term coined by staff from Prospera but also used locally, that refers to a beneficiary of the Conditional Cash Transfer (CCT) Prospera (formerly PROGRESA and Oportunidades) (see Chapter 6)

Tumbar – Local term for bringing down the forest or deforesting. Frequently carried out for agricultural or ranching activities.

Vega – Local term for riverbank lands that are considered of very high agricultural quality.

Appendix A. The Mexican *ejido*

After the Mexican Revolution (1910-1920), the country's agrarian sector underwent a series of deep transformations. From 1917-1972, large landholdings were expropriated and devolved to masses of landless peasants claiming Emiliano Zapata's revolutionary cry 'land and freedom' (*tierra y libertad*) (Nuijten, 2003). A large-scale land reform and redistribution paved the way for the establishment of communal governance institutions on a nation-wide scale (Bray et al., 2006). As pointed out by Barnes (2009: 394), "for the first time since colonization, land was viewed as having a 'social function' as opposed to merely being seen as an economic factor of production" which "marked a complete reversal of the land policy pursued during the pre-revolution Porfiriato era (1880-1915)".

The newly drafted Mexican Constitution of 1917 set the framework for the establishment of three broad rural property 'types': national lands, private property and *núcleos agrarios* consisting of *ejidos* and agrarian communities (*comunidades*). Agrarian communities were formed by indigenous communities who could demonstrate long occupation of land, while *ejidos* were formed by new land grants distributed during the agrarian reform process (Bray et al., 2006). As noted by Nuijten (2003: 477), the establishment of *ejidos* was much more common than agrarian communities because it proved very difficult to present land titles that would allow to "reclaim rights to lands that had been taken away from them in the past". The *ejido* institution expanded dramatically across Mexico, especially during President Cárdenas (1934-1940) to become the country's main common property type, accounting for more than half, 52% or approximately 105 million hectares of the total national territory (Barnes, 2009). Importantly, though figures differ, somewhere from 70% to 80% of forests are currently held in common property among *ejidos* and agrarian communities (Bray and Merino-Pérez, 2004; Corbera et al., 2011).

Ejidos consist of groups of twenty persons or more organised to work land (Hamilton, 2002). *Ejidos* have three different tenure regimes: an urban settlement zone with individual house plots (*solares*); individual parcels (*parcelas individuales*); and communal lands (*tierras de uso común*) which are often large forest or pasture surfaces. There is another subtype of communal lands called ‘*ejido*’ parcels (*parcelas ejidales*) which are often small surfaces earmarked for specific use, such as schooling activities. At a national level, communal lands account for twice as much land as individual parcels (Barnes, 2009).

In each *ejido*, landowners (*ejidatarios*) are entitled to individual parcels but also have rights over communal forests (Kosoy et al., 2008). In addition to *ejidatarios*, other dwellers (*pobladores*) can be classified into two types: *posesionarios* and *avecindados*. As noted by Alix-García et al. (2005: 43), *posesionarios* are “those who have permission to work on the *ejidal* lands, usually in the commons area”, while *avecindados* “have their homes located within the *ejido*, but are not entitled to use of land for agricultural or pastoral purposes”. *Pobladores* have neither tenure rights nor voice in *ejido* decision-making processes (García-Amado et al., 2011).

Ejido governance is organised around main three bodies: the ‘*ejido* assembly’ (*asamblea ejidal*), the ‘*ejido* authority’ (*comisariado ejidal*) and the ‘vigilance council’ (*consejo de vigilancia*). The functions of each of these bodies are as follows:

The assembly regulates access to and use of the forest commons and is composed of all *ejidatarios*, who have voting rights, and other household heads who do not have voting rights. Its functions consist of formulating and modifying the internal rules of the *ejido*, providing *ejido* members with information about productive, social and political activities, informing the State of the *ejido*’s economic accounts, deciding on the acceptance of new *ejidatarios* and further division of *ejido* lands, and approving contracts with third parties for the use of the forest

commons. The *ejido* authority is responsible for executing the assembly's agreements, organising collective work in the forest commons, proposing programmes for productive and organisational development, contracting third parties which can give professional and technical service to the community and ensuring that smallholdings are regularly cultivated. Finally, the council oversees the authority's governance tasks, and comprises of a president and two secretaries who are elected every 3 years. (Kosoy et al., 2008: 2075)

Prior to reforms to the *ejido* institution from 1992 onwards, which I will detail below, *ejidos* had strict rules for land transfers, sales or rentals and inheritance. *Ejidatarios* were not legally allowed to rent or sell land and could only bestow their land rights to a single descendant (Corbera et al., 2007a). *Ejidatarios* were free to decide on the land use of their individual parcels but “decisions regarding the activities in common areas, such as enrolment into PES, are taken communally in the official *ejido* assemblies” (Balderas Torres et al., 2013: 74). According to Nuijten (2003), these strict regulations reflected a series of ‘revolutionary’ objectives inherent in the land reform processes. Firstly, a concern for the *ejido* as an agrarian community with a series of ‘social duties’ in which *ejidatarios* could receive ‘use rights’ but not property rights. Further, an Agrarian Law and *ejido* institution consistent with Emiliano Zapata's famous revolutionary cry ‘land belongs to the tiller’ (*la tierra es de quien la trabaja*). Finally, the notion that *ejido* lands were meant to provide an economic basis for peasant families and not economic commodities. According to Barnes (2009: 395), single inheritance as the main mechanism for acquisition of land rights has meant that “membership in *ejidos* is usually strictly controlled to the extent that it has become difficult for a new generation of members living and working in the community to gain membership as official *ejido* members.” This helps to explain the dominance of males and old age among *ejidatarios*. According to the 2000 and 2001 censuses, 84% of *ejidatarios* were male and 28% of them were over 65 years (Barnes, 2009; Robles Berlanga, 1999).

The administration of President Salinas (1988-1994) marked a significant shift in agrarian sector regulation whereby “the focus shifted from the land distribution to land regularization—clarifying, measuring and certifying existing rights” (Barnes, 2009: 395). Reforms in the Mexican agrarian sector in the last decades of the 20th century formed part of a larger ‘neoliberal’ process in the national context, epitomised by the enactment of the North America Free Trade Agreement (NAFTA) (Nuijten, 2003; Perramond, 2008). The neoliberal ideology permeated to agrarian and forest laws, embarking the country “on a path of open markets, international integration, export promotion, and decreased public expenditures” (Klooster, 2003: 111). This can be situated within a much broader regional context in which many countries in Latin America ‘reversed course’ regarding questions around land distribution (Haenn, 2006). Indeed, some have gone as far as to say “Mexico’s long experiment with state-led agrarian reform (SLAR) between 1917 and 1992, has ended” (Perramond, 2008: 356).

At the heart of these reforms was a pursuit for efficiency and increase in land productivity, which were allegedly hampered by the collective and smallholder nature of the *ejido* system. Firstly, the smallholder nature of the *ejido*, with three quarters of *ejidatarios* owning less than ten hectares each, was viewed as hampering productivity (Nuijten, 2003; Robles Berlanga, 1999). Further, communal ownership was conceived as fostering more waste and underutilisation of resources than privatised ownership (Barnes, 2009). Finally, the *ejido* system was viewed as corrupt, unlawful and leading to legal insecurity (Hamilton, 2002; Nuijten, 2003). Thus, reforms in the agricultural sector were intended to “improve legal security, create dynamic and effective land markets, assure a rational use of resources, and increase agricultural productivity” (Nuijten, 2003: 476-476).

The main mechanism behind land reforms in the 1990s was the PROCEDURE programme, which emerged from the newly created Agrarian Law and reforms in Article 27 of the

Mexican Constitution. As pointed out by Nuijten (2003: 475), “the new Agrarian Law would make the privatization of previously communally held *ejido* land possible, while the PROCEDURE programme would take care of the measuring and mapping of boundaries and registration of plots.” These reforms have allowed *ejidatarios* the possibility to acquire full ownership of their land and to legally sell and lease plots (Kosoy et al., 2008).

PROCEDURE involves three consecutive steps (Haenn, 2006: 138). In the first step, *ejidos* receive information and decide whether to join. If they do, *ejidos* and parcels are measured and delineated. In a second step, *ejidatarios* vote on titling their land, which allows them to receive land titles over *solares*, individual parcels and communal lands. In a third and final step, *ejidatarios* vote on whether to privatise their land and dismantle the *ejido*. The last step concludes by legally changing the land regime to ‘private property’ (*dominio pleno*) but the Agrarian Law “states that only agricultural parcels may be privatized and then sold to outsiders. Common use land may only be “transmitted” to outside companies for purposes of developing projects with the *ejido*” (Barnes, 2009: 397).

Since 1992, many *ejidos* have been certified under PROCEDURE but only a few have moved towards full privatisation. There is a great deal of variation across the country, with certification being more popular in the north while southern states such as Oaxaca and Chiapas having less than 51% of *ejidos* certified by 2005 (Barnes, 2009). Official registries showed that more than 90% of *ejidos* had joined PROCEDURE but that only 5.3% had chosen to convert to private property and dismantle the *ejido* by 2005 (Galeana Rodríguez, 2005). Similarly, Assies (2008) notes that only 1% of communal lands were privatised from 1992-2006 throughout the country.

Several explanations have been brought forward to explain why people have generally been reluctant to dismantle the *ejidos*. Firstly, the economic and non-economic benefits

of the *ejidatario* 'status', including access to government programmes such as credit programmes and subsidies, a sense of identity, and a source of economic and political control within the *ejido* (Nuijten, 2003). Further, land sales and rentals, specific aims of the reforms, were already widespread despite not being legally allowed (Perramond, 2008; Robles Berlanga, 1999). In other words, PROCEDE would only serve to 'legalise existing practices' (Nuijten, 2003: 494). Finally, PROCEDE was unable to resolve inconsistencies or flaws associated with forest legislation. Under Mexican Agrarian Law, individual parcels cannot contain forestlands, as these can only be held collectively. Yet, it is common for *ejidatarios* to *de facto* own standing forests in individual parcels. Thus, *ejidatarios* rejected certification because this could mean losing individual parcels with forest covered land (Haenn, 2006).

In the end, the agricultural reforms introduced in Mexico in the 1990s fell short on their expectations. They seem to have failed because they disregarded the reality and complexity of the *ejido* institutions while at the same tried to reduce deeply socio-political institutions into simple technical problems to be addressed by land privatisation and mapping (Nuijten, 2003).