A palliative against deforestation:

A process evaluation of Payments for Environmental Services in Marqués de Comillas, Mexico

Donna Stolwijk, B.A.

Reg. no.: 910306808060

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Supervisors: Prof. dr. Esther Turnhout (Forest and Nature Conservation Policy)
dr. ir. Gerard Verschoor (Sociology of Development and Change)

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Cover picture: A signboard sent by the National Forestry Commission and placed at the entrance of Boca de Chajul. Text on the board: "Property: *Ejido* Boca de Chajul, supported by the program: Payment for Environmental Services (PES)"

Abstract

In the municipality of Marqués de Comillas (MdC), located in Mexico's Lacandon rainforest, 60% of the original forest cover has been degraded or converted into agricultural land since migrants settled the region in the 1970s. In order to conserve the remaining forest and the environmental services it provides, the Mexican Forestry Commission introduced the globally promoted Payments for Environmental Services (PES) program in 2003. This study employs an Actor-Oriented Approach in order to investigate how the PES is put into practice through the decisions and practices of local actors in two villages of MdC. By means of a 'process evaluation', which employs ethnographic methods for policy evaluation, I identify and explain the program's local effects. My main argument is that the PES program in MdC does not seem to have the effect of conserving additional forest cover and its related environmental services in the long term, despite the reported immediate effects of halting deforestation. The first problem is the lack of additionality, meaning that PES-enrolled forest parcels would also have been conserved without the payments of the program, for reasons of low soil fertility, inaccessibility, or because they were designated for conservation already before the introduction of the PES. The second problem of the PES is its temporality. Because the PES contracts last for five years, landowners can make strategic choices on what part of their land to enroll when. Besides, I found that most of the PES money is currently not invested in sustainable (alternative) livelihood practices, meaning that people continue to depend on their environmentally harmful livelihood practices – during and after the discontinuation of their PES contracts. Lastly, I identified a number of program-related issues that landowners see as problematic. The main complaints concern the recent near-halving of the payments and the idea that much of the money available for conservation is 'lost' at the multiple government levels and organizations involved in the implementation of the PES. Tackling these program-related issues, though, will not lead to the lasting additional forest conservation that the PES aims for. Because the PES is a sectoral 'project' – disregarding the interrelatedness of conservation with other sectors, specifically livestock production – it is not more than a palliative against deforestation; not instigating conservation but rather increasing the bureaucratic control over it. I suggest that the integration of agriculture- and nature policy (focusing on the sustainable intensification of livestock production) will be more effective in permanently halting deforestation than the PES program.

Resumen

En el municipio de Marqués de Comillas (MdC), ubicado en la selva Lacandona, el 60% de la cobertura forestal original ha sido degradada o convertida en parcelas agropecuarias desde que los migrantes se asentaron en la región en los 1970s. Con el fin de conservar el bosque restante y los servicios ambientales que éste presta, la Comisión Forestal de México introdujo el Pago por Servicios Ambientales (PSA) en 2003, que es promovido a nivel mundial. Esta investigación usa el *Actor-Oriented Approach* ('enfoque orientado al actor') con el fin de estudiar cómo se pone en práctica el PSA a través de las decisiones y las prácticas de actores locales en dos ejidos de MdC. Por medio de una 'evaluación de proceso' que emplea métodos etnográficos para una evaluación de políticas, identifico y explico los efectos locales del programa. Mi argumento principal es que el programa de PSA en MdC no parece tener el efecto de conservar la cobertura forestal y sus servicios ambientales relacionados adicionalmente y a largo plazo, a pesar de los efectos inmediatos reportados de detener la deforestación. El primer problema es la falta de adicionalidad, lo que significa que las parcelas forestales inscritas en el PSA también habrían sido conservadas sin los pagos del programa por razones de baja fertilidad del suelo, inaccesibilidad o porque fueron designadas para la conservación antes de la introducción del PSA. El segundo problema del PSA es su temporalidad. Debido a que el PSA tiene una duración de cinco años, los ejidatarios pueden tomar decisiones estratégicas sobre la inscripción de qué parte de su predio y cuándo. Además, descubrí que la mayor parte del dinero del PSA no se invierte en prácticas (alternativas) de medios de vida sostenibles, lo que significa que los beneficiarios siguen dependiendo de actividades que dañan al medio ambiente – tanto durante como después de la discontinuación de sus contratos del PSA. Por último, he identificado una serie de cuestiones relacionadas al PSA que los ejidatarios consideran problemáticas. Las quejas principales se refieren a la disminución reciente de los pagos a casi la mitad y la idea de que gran parte del dinero disponible para la conservación se 'pierde' en los múltiples niveles de gobierno y organizaciones implicadas en la implementación del PSA. Sin embargo, afrontar estas cuestiones relacionadas al PSA no dará lugar al objetivo de la conservación adicional y duradera de la selva. Debido a que el PSA es un 'proyecto' sectorial – sin tener en cuenta la interrelación de conservación con otros sectores, específicamente la ganadería – éste no es más que un paliativo contra la deforestación; no instiga la conservación, sino más bien aumenta el control burocrático de ella. Sugiero que la integración de las políticas de la agricultura- y la naturaleza (enfocadas en la intensificación sostenible de la ganadería) será más eficaz en detener la deforestación de forma permanente que el programa del PSA.

1. Introduction

The municipality of Marqués de Comillas (MdC) is located in the state of Chiapas, Mexico, in the southern part of the Lacandon Rainforest that borders Guatemala. Although the region is in one of the largest areas of tropical rainforest in Mesoamerica (ca. 800,000 ha; Hernández-Ruedas et al., 2014), a ride through MdC does not give that impression; ample roads, villages, and agricultural plots are evidence for a moving agro-forest frontier. The area became populated for the first time (in modern history) from 1974, when the ongoing civil war in Guatemala instigated the Mexican government to stimulate the population of its southern border region, so as to assure Mexican presence in the face of the immigrant influx from Guatemala (Ordenamiento Comunitario del Territorio MdC, 2012). Peasants from other parts of Mexico were willing to migrate and settle on the cheap land of the Lacandon rainforest, mainly because of scarcity of productive land and agrarian conflict in their places of origin. Today, the municipality encompasses 28 *ejidos* (communally owned territories; villages) ranging from 6 to 1,734 inhabitants (Secretaría de Desarollo Social 2013).

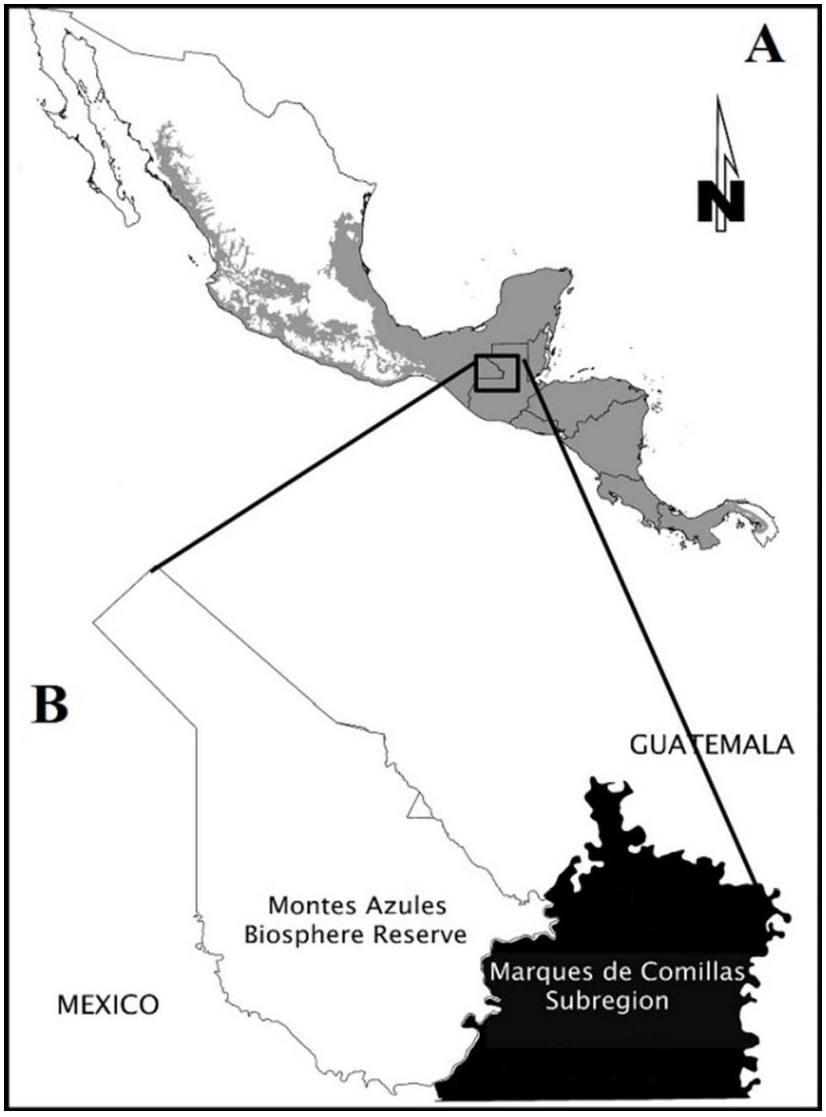

Figure 1. Map of Mexico and Central America (A) and the location of the Marqués de Comillas (MdC) subregion in Chiapas, Mexico (B). The subregion consists of two municipalities: MdC to the west and Benemérito de las Américas to the east. The Lacantún river separates the subregion from the Montes Azules Biosphere Reserve. Source: Hernández-Ruedas et al., 2014: 3.

The pioneers of MdC cleared large parts of jungle to build villages and create crop fields and pastures for cattle. This land-use change continued gradually until up to this day, leaving only 40% of the original forest cover standing, in a highly fragmented way (Hernández-Ruedas et al. 2014). West of the river Lacantún, which forms the western border of MdC, the jungle is legally protected as the Montes Azules Biosphere Reserve, and human settlement is prohibited in this area. The small patches of old-growth forest that remain to the east of the river, within MdC, are highly biodiverse, though, and are judged to be of important conservation value (Hernández-Ruedas et al. 2014).

In an attempt to halt the deforestation rate in MdC, the 'Payments for Environmental Services' (PES) program has been introduced in the area in 2004. This program continues to be the main conservation policy in many of the *ejidos* of MdC today (Carabias, Meli, and Hernández 2012). The present study focuses on the effects of the PES in MdC, investigated from a social science perspective.

The Payments for Environmental Services policy has gained global popularity since the beginning of the 21st century due to its promotion by the World Bank and international conservation organizations (McAfee and Shapiro 2010). The policy stipulates that nature is most efficiently conserved through market-based management, as opposed to state regulation. PES contends that owners of land that provides environmental services (i.e. ecosystem functions that are of importance to humans), are 'service providers', and are to be paid by people or organizations that depend on those services, in order to maintain them. Examples of environmental services are carbon sequestration, water provision, or the conservation of biodiversity. By its design, the PES policy requires environmental services to be closely measured, monetized, and freely traded among (international) actors. The underlying idea of PES resonates with the globally dominant ideology of neoliberal environmental policies (McAfee and Shapiro 2010).

The introduction of the PES in Mexico in 2003 met with resistance from two sources. Firstly, the federal government was reluctant to renounce power to market-based management, as there were constitutional limitations as well as a tendency for strong bureaucratic control (McAfee and Shapiro 2010). That seems to be a legacy from the developmentalist state that Mexico once was, with strong centralized government. Still, this resistance against market-based management is surprising, though, as Mexico has seen many neoliberal policy reforms since the 1980s. That was mainly the result of the structural adjustment programs accompanying loans from the World Bank, and later because of the signing of the NAFTA in 1994 (McAfee and Shapiro 2010). Apparently, however, these neoliberal reforms have not decreased the federal government's eagerness to maintain control over its natural resource management.

The second source of resistance came from well-organized rural civil society organizations, that were gaining momentum for their anti-neoliberalization campaigns at the turn of the century. As a result of this resistance, the Mexican PES scheme was negotiated with its designers and advisors from the World Bank, and it was finally implemented as a hybrid of market-mechanisms and state regulations (McAfee and Shapiro 2010). In MdC, *ejidos* can voluntarily apply to enter the PES since 2004. The *ejidatarios* (or landowners in the *ejido*) are paid a fixed price by the state per hectare of forested land enrolled, during the five years of the contract (Carabias et al. 2012). This means that there are no direct measurements of

the environmental services, nor is there a free market involved, making the PES scheme more similar to a subsidy program than to a market place.

While many authors emphasize the promises of PES to lead to a triple-win situation for nature, the 'sellers', and the 'buyers' (Milder, Scherr, and Bracer 2010; Wunder 2005), there are also ample articles criticizing the foundations of PES (Büscher et al. 2012; McAfee and Shapiro 2010). Scholars such as Büscher (2012) articulate a conceptual aversion to the monetization of nature and argue that the primary aim of this monetization is to expand the global capitalist market to include 'commodities' that were previously not for sale; nature conservation only comes second. Others argue that the translation of the diversity of nature into the single measure of 'environmental services' is a great simplification, and that this understanding is potentially detrimental to social and natural diversity (Turnhout et al. 2013). Moreover, as with other market-based schemes for nature conservation, the PES is criticized for its tendency to reinforce the existing imbalanced power relationships between actors (McCarthy and Prudham 2004).

As can be seen, these critiques are for a large part normative – which is not to say that they are any less important. Fact is, though, that the PES is currently operational in numerous localities, and a thorough appreciation of its effects in terms of its ability to reach its professed goals would add to the debate. Using satellite images, an immediate slow-down of deforestation rates has been shown after the introduction of the PES (Costedoat et al. 2015), but an explanation of the social processes that underlie this trend lacks. Several authors do take a social science perspective, and write about common pitfalls of the PES, followed by how the policy can be improved to increase its effectiveness (Pagiola, 2007; Wunder, 2005). Some of these authors argue for purely market-based PES schemes instead of government-funded ones in order to increase efficiency (Pattanayak, Wunder, and Ferraro 2010). Several papers critique the additionality of the PES-conserved areas, but mainly blame this on the selection of 'low-deforestation-risk' areas as being PES-eligible (Wegner 2016).

Hardly, though, do authors investigate the perspective of the PES beneficiaries, and when they do, this is generally done using quantitative methods (Costedoat et al. 2016; García-Amado et al. 2011). A few studies have focused on factors that may promote participation in PES, mainly emphasizing characteristics of the design of the PES scheme (Bremer, Farley, and Lopez-Carr 2014; Pagiola, Arcenas, and Platais 2005). Other research studies analyzed the effects of participation quantitatively, concentrating on the economic benefits to a community (Muñoz-Piña et al. 2008; Wunder 2005). However, as Nandigama (2013) concludes from her research on natural resource management in India, "it is rather naïve to limit the analysis and evaluation to the formal arena of participation, as it pushes the evaluators to come up with shallow judgments of success and failure" (Nandigama, 2013, p. 105). Indeed, her research shows that such a scope can obscure important (informal) effects.

Alix-Garcia et al. (2012) aimed to evaluate the socioeconomic and environmental effects of the PES for hydrological services in Mexico using a mix of quantitative and qualitative methods. Comparing PES-participants with non-participants, they conclude that the main effect of the PES is the improvement of forest management (activities); not necessarily additional forest conservation or improved livelihoods. The authors make recommendations to CONAFOR (the Mexican National Forestry Commission) on how to improve the additionality, and thus the efficiency of the program (Alix-Garcia et al. 2012).

The research by Kosoy and colleagues (2008) is one of very few that qualitatively investigated locals' perceptions of the program and its effects. They found that the main drivers for *ejidos*' decisions to apply to the PES are specific favorable conditions, and motivating social interaction processes between landowners, *ejido* authorities, CONAFOR officials and PES technical advisors (the intermediaries between CONAFOR and the beneficiaries, also called PES-promotors). This means that without effective communication, *ejidos* generally do not opt to apply to the PES. Eventually, though, a large majority of the PES applications is rejected, and the authors argue that this may be because the community members fail to carefully analyze the rules and implications of adopting the PES. Instead, at first application, many landowners appear to assume that they will 'simply' receive an annual payment. Despite these minor difficulties, Kosoy and colleagues (2008) do not report any resistance nor negative attitudes towards the PES scheme, and thereby offer a generally positive outlook.

Kosoy and colleagues (2008) primarily study *ejidos*' collective motivations for participation in the PES, but they do not investigate how individual landowners work with the program. An understandable reason for why previous studies have focused on the community level (rather than on the individual), is that in Mexico's *ejido* system, decisions concerning land use are generally made communally. However, even when an *ejido* decides to apply to the PES program, *ejidatarios* still have to take the individual, and voluntary, decision of whether to join or not. Besides, how these landowners manage their land and natural resources on a daily basis, is also an individual matter. The *ejidatarios* are thus the principle actors that determine the effectiveness of the PES program to halt deforestation.

The **objective** of the current study is to investigate what the effects of the PES program are in MdC, both in the lifeworlds of the local actors and consequentially on the forest. I will present individual landowners' stories and their perspectives, and through people's practices, opinions, and strategies I aim to explain the PES' effects. By adopting a qualitative approach and by having participated in the everyday *ejido* life, this study intents to offer a new perspective and a more profound understanding of the working of the PES in MdC.

Such an understanding of the PES is both relevant and urgent, as the PES program has been running for over a decade on the Mexican government's budget. Besides, MdC is a municipality with a relatively high level of marginalization, but it has also been termed a biodiversity hotspot (Hernández-Ruedas et al. 2014). Investigating in what way both sustainable development for the region and long-term forest conservation can be ensured is thus a very relevant endeavor. I particularly emphasize the durability of nature conservation, because damage caused by deforestation is near-irreversible; once destroyed, the recuperation of environmental services can take decades – not to mention the money and effort needed. Understanding the role that the PES plays in the lifeworlds of the villagers as well as in forest conservation is of critical importance to this region, and it is the main contribution of this study.

The main argument that I will defend is that the PES program in MdC does not seem to have the effect of conserving additional forest cover and its related environmental services in the long term. I will argue that the immediate effects that have been shown in halting land-use change (Costedoat et al. 2015) will not last with the PES program in its current form. This is because the policy interacts with farmers' traditional agriculture- and livestock production practices, the accompanying subsidies, people's attitudes towards

the natural environment, and many other aspects of actors' lifeworlds. In the presentation of my results, I will identify three main categories of problems, or 'themes' related to the PES.

The first theme concerns the lack of additionality of forest conservation that the PES incites. 'Additionality' refers to the quantity of forest cover that the PES protects additionally to what would have been conserved without the program (Costedoat et al. 2015; Engel, Pagiola, and Wunder 2008: 670). The second problem of the PES that I identified is its temporality. This term indicates what Engel et al. (2008: 671) refer to as 'lack of permanence', or the finite horizon of PES payments. I opt to use term temporality, though, because it better reflects the range of issues connected to the short time span of the PES contracts and its effects. Lastly, the majority of the PES beneficiaries in the *ejidos* that I studied in MdC are dissatisfied with a number of 'program-related issues'. Although this is not a theoretical concept, I use this umbrella term for multiple issues that informants stressed as important in the functioning of the PES.

The current research forms part of the larger FOREFRONT project, which investigates the dynamics of land-use change in agro-forest frontier areas (Wageningen University n.d.). Specifically, objective 1 (identifying and analyzing ecological and social drivers that shape agro-forest frontier landscapes and their ecosystem services) and objective 2 (explaining temporal changes in the social-ecological system and their consequences for landscape configurations) of the FOREFRONT project are contributed to by this study.

1.1 Theoretical framework, methodology, and research questions

Several theoretical perspectives offer useful lenses with which to investigate the effects or the effectiveness of the PES. I apply the perspective of Critical Institutionalism, which is a school of thought that criticizes mainstream Institutionalism (Cleaver and de Koning 2015). Mainstream Institutionalism assumes that institutions are formal and designed for a (single) specific purpose, such as laws, market institutions, or (government) support programs, and regulate or steer the behavior of citizens (De Koning and Benneker 2013). Ostrom (1990) argues that specifically self-governing institutions (those set up within communities) can ensure sustainable (common-pool) resource use as well as improve social justice. This is based on the assumption that actors make rational (and thus predictable) choices that are in line with the institutions. The success or failure of an institution to reach its goal depends on the proper implementation of it, is supposed by mainstream Institutional thinkers. Many of the above-discussed studies that recommend amendments to the existing PES program (e.g. Pagiola 2007; Wegner 2016; Wunder 2005) seem to be based on this line of thought: 'When the PES is designed and implemented perfectly, it will have its desired effects', seems to be the assumed motto.

However, it appears that similar institutions aiming to govern forest management in different settings around the world, have led to very divergent outcomes (De Koning and Cleaver 2012). There thus seems to be a need to attend to how institutions are put in practice by social actors, in order to understand their effects. Critical Institutionalism emphasizes the diversity and the complexity of institutions in the everyday life of actors (Cleaver and de Koning 2015). It focuses on the interplay between old, new, formal and informal institutions (such as cultural norms and routines) in a locality. Besides, it accepts that actors' rationalities can be 'emotional' or 'moral' as well as 'economic' (De Koning and Cleaver 2012). With this,

Critical Institutionalism does not assume a direct relationship between an institution and its outcomes. I apply this general perspective so as to investigate the effects of the PES as an introduced institution comprehensively, and, at the same time, to understand how these effects come about in the complex lifeworlds of the actors.

In their conceptualizations of the introduction of institutions into actors' lifeworlds, Critical Institutionalism and the Actor-Oriented Approach (AOA; Long, 2001) are highly congruous. The way in which the PES program is introduced could be said to be similar to a 'planned intervention' in the sector of development aid, but then in the sector of nature conservation. Long and Van der Ploeg (1989) warn against seeing such interventions as 'projects', discrete in time and space, but rather envisage them as being part of a "flow of events" of social life (Long and Ploeg 1989: 228). Even though I often refer to the PES *program* for the sake of clarity, I do acknowledge the interrelations it has in time (it interacts with existing government policies, as well as paves a certain way for the future) and space (more than only the PES beneficiaries and PES-enrolled plots are affected by the program). This *program* should therefore not be imagined as a clearly demarcated set of actions and materials (of what is and what is not related to the PES), but rather as becoming part of the lifeworlds of social actors.

The AOA is a qualitative research approach that aims to explain processes of social change by focusing on the social actors that experience and 'live' these processes in their everyday lives – as opposed to explaining them by (macro) structural forces. I apply the AOA in this research, in which the 'social change' to be explained is the transition from rapid land-use change to forest conservation by the *ejidatarios*. The term 'social actors' signifies those entities that have the agency to assess (problematic) situations and to organize responses, and can thus be an individual as well as a group or organization (Long, 2001: 241). The term 'agency' is an important concept that I will use in order to interpret the results. 'Having agency' means that an individual or a group of individuals possess the knowledge and capacity to have impact on or to shape their own or others' actions or interpretations (Long 2001: 240).

I argue that the effects of the policy (the structure) only play out in the everyday practices of the *ejidatarios*; they are not passive receivers of an introduced institution, but they have agency in their decisions and actions. This study therefore takes this micro level as its unit of analysis. The influence of structures is not ignored in this AOA, though, as I carefully consider them as the conditions that constrain or facilitate actors' choices and practices. Next to the influence of actors' agency on the one hand and structures on the other, though, the AOA also acknowledges the role that contingencies play in the everyday-life outcomes of a policy.

Practically, applying the AOA entails the identification and investigation of all relevant social actors relating to the PES in MdC – without taking for granted their categories nor their relevance (Long, 2001), and studying the livelihoods of the farmers. I apply Long's (2001: 241) broad definition of livelihoods, meaning the practices of social actors through which they make a living, handle difficulties, pursue new opportunities, and/or guard current lifestyles. With this, I focus on how landowners take decisions in their daily lives and work. Moreover, I aim to explore the social interfaces (or 'arenas of social discontinuities') that show contestation over meanings and values between different actors' life worlds – in this case mainly between *ejidatarios* and PES technical advisors. I judge that a quantitative approach lacks the necessary

detail to investigate this, and does not provide enough freedom for the actors to inform me about their opinions, feelings, and strategies. I therefore refrained from using questionnaires.

In line with the notion that the PES is not a clearly delineated 'project', it could also be argued that the linear model of the policy process is an unrealistic simplification. Long and Van der Ploeg (1989) argue that there usually is no step-wise policy process that moves from formulation to implementation to outcomes. As a result, an *ex-post* evaluation of the effectiveness or success of the policy becomes a complicated, if not impossible endeavor. A policy or intervention is, after all, not a discrete 'project' in its operationalization, which can be analyzed in and of itself. Besides, as Long and Van der Ploeg (1989) argue, there is no direct line between a policy and its outcomes, and outcomes may be caused by factors other than the policy. Nevertheless, a comprehensive insight in the effects of the PES in MdC is desirable, as that will inform both the Mexican government about the results of their spending, as well as conservation agencies about the legitimacy of the worldwide promotion of this policy. I will therefore briefly discuss four types of policy evaluations, and argue why I opt for a 'process evaluation'.

Kuindersma et al. (2006) explain that there are three main types of policy evaluations. A classic 'goal evaluation' is informed by the system-analytical discourse, and evaluates a policy by its stated goals. It aims to report to what extent those goals are met, and might or might not give reasons for the non- or partial achievement of them. A 'responsive evaluation' is informed by the social-constructivist discourse. With this method, the goals to be evaluated and/or the assessment framework are formulated together with the stakeholders. The outcome of such an evaluation is not claimed to consist of facts, but rather of interpretations of facts by different stakeholders.[1] Thirdly, a 'learning evaluation' is based on the critical-theoretical discourse, and aims to be a mid-way between the above-mentioned types of evaluations. It can take elements from both types in different configurations in order to form a model for evaluation (Kuindersma et al. 2006). Although the AOA is in accordance with the social-constructivist discourse on which the 'responsive evaluation' is based, this type of evaluation does not fully cover the objective of the current study. Inspired by Ferguson and Lohmann (1994), Long and van der Ploeg (1989) and Mosse (2005), I therefore opted to perform a 'process evaluation' (Conley and Moote 2003: 381).

A process evaluation employs ethnographic research methods to investigate in detail how a program is functioning within actors' lifeworlds, how and why actors participate, and how decisions related to the program are made. Through the research methods described in subchapter 1.2.2, I aim to obtain a comprehensive understanding of the functioning and the effects of the PES program in MdC. I define 'effects' broadly, namely all actions, decisions, or processes that may be related to the introduction of the program – not merely (but surely including) the effect on the local forest cover. As Ferguson and Lohmann (1994: 231) argue in the context of development interventions: we should not be looking at whether an intervention can be successful, but rather at what interventions actually *do*. Moreover, I will refrain from using the labels 'success' and 'failure' in this process evaluation, as those terms can be considered as "policy-oriented judgements that obscure project effects" (Mosse 2005: 19).

[1] Guba and Lincoln (1989) promote this 'responsive evaluation', calling it a 'constructivist evaluation', or the fourth generation of evaluations. In their historical typology of policy evaluation trends, the first generation would be one of measuring (quantitatively), the second one of describing (qualitatively) and the third one of judging (in comparison to the professed goal; the classic 'goal evaluation').

Using the theoretical framework described above, the research questions that this study will provide answers to are the following:

1. What are the different social actors' views on the Payments for Environmental Services (PES) program in Marqués de Comillas?
2. How do beneficiaries work with the PES program?
3. What are the effects of the PES program in two participating *ejidos* in Marqués de Comillas?

The first research question will guide chapter 2, in which the implementation of the PES program in two participating *ejidos* is discussed. Besides the details of the program, there is a focus on the views on the PES by participants, non-participants (in the participating and a non-participating *ejido*), *ejido* authorities, and PES technical advisors (NGOs). With actor's 'views', I refer to how actors define the PES (what they think it is and what it means to them), as well as to their opinions about it. Besides, in this chapter I present the main program-related issues that concern many actors.

Research question 2 will be treated in chapter 3, where I discuss the interrelations of the PES program with the general livelihoods of the beneficiaries. I elaborate upon landowners' (traditional) practices, and I operationalize the notion of 'working with the PES' by showing the agency actors have in deciding how they use the program (i.e. what land to enroll when, how to fulfill the commitments, etc.). I will discuss the strategic choices that *ejidatarios* make in relation to the PES program, and I suggest how these lead to the outcomes of temporality and lack of additionality of the PES. It should be noted that because I performed a process evaluation, I did not search for such quantitative aspects such as additionality, but these concepts appeared as important from the data (an inductive approach). Lastly, in chapter 4 I will draw conclusions about the effects of the PES (answering research question 3), where I use a broad definition of 'effects'; both those intended and unintended by the policy.

1.2 Data collection

In this section, I present a short description of the data collection process. I start with an overview of the research field, continue with the research methods employed, and conclude with a personal reflection on the methods and the research period in general.

1.2.1 The research field

For this study, I collected data in four *ejidos* of the municipality of Marqués de Comillas, in the state of Chiapas, Mexico. These *ejidos* were Loma Bonita, Flor de Marqués, Boca de Chajul, and Reforma Agraria (see their locations on figure 2). Upon arrival in Loma Bonita, the *ejido* in which I had a contact person, I discovered that it was not enrolled in the PES program. I decided to conduct a few interviews there, but to focus my research on two *ejidos* that *were* enrolled in the PES. Primarily because of the practical reason of accessibility, I opted for Boca de Chajul and Reforma Agraria. I visited Flor de Marqués merely once, because there was no paved road nor public transport going there, which made additional visits

complicated. I resided in Boca de Chajul (popularly known as 'Chajul') and Reforma Agraria (known as 'Reforma') for one month each, and thus studied those *ejidos* in depth. I will shortly discuss the demographics of these *ejidos* here.

Chajul is an above-average *ejido* in size in MdC, with 398 inhabitants in 2010 (INEGI, 2010, in Carabias et al., 2012); of these, 172 are *ejidatarios*, or landowners. All of the households have electricity and speak Spanish – like the other *ejidos* in the municipality – but Chajul also has several facilities that are unique in the region. There is a secondary- and a high school (that students from the surrounding *ejidos* come to attend), a health center, two relatively large shops selling fresh vegetables, a Wi-Fi point, and a small and basic hotel. During my stay, I rented a room in this hotel – most nights I was the only guest.

Figure 2. The locations of Loma Bonita, Boca de Chajul, Flor de Marqués, Reforma Agraria, and Zamora Pico de Oro marked on a map of Marqués de Comillas, Chiapas, Mexico. (Adapted from Google Earth.)

Chajul and Reforma are both located along the Lacantún river, but Reforma lies more northerly and closer to the municipal head (the main *ejido*) of Zamora Pico de Oro (popularly known as 'Pico de Oro', see figure 2). Reforma has 145 inhabitants (Secretaría de Desarollo Social 2013), and some 50 *ejidatarios* (not all of whom live in the *ejido*). Reforma is known in the region for its eco-tourism center called Las Guacamayas, that primarily rents out cabins, but also organizes jungle tours for its visitors. While all villagers speak Spanish, a group also speaks Chinanteco – an indigenous language from the Mexican state of Oaxaca. In this *ejido*, I rented a spare room in the house of an elderly couple. There are hardly any facilities in Reforma, but for school, medical aid, a bank or fresh vegetables, the villagers make a half-hour ride over a very badly

maintained (but asphalted) road to Pico de Oro. A system of minibuses makes up the public transport between Pico de Oro and the city of Comitán de Dominguez in the highlands to the west of the jungle (about a 5½-hour ride in total), with one minibus leaving every 1 to 1½ hours in both directions.

In both *ejidos,* men are the primary income providers, while women mainly work in and around the house. Most men are farmers and cattle ranchers, but some work in construction or are mechanics. Most people have some fruit trees and keep chickens and/or ducks around the house for own consumption. The population of MdC is relatively young: 53% is under 25, and only 8% is over 60 years old (Ordenamiento Comunitario del Territorio MdC, 2012). The average age at which people start a family is around 20-21, and if the woman is not originally from the same *ejido* as the man, she usually moves to his *ejido* after marriage. Villagers told me that the average family size is slowly decreasing, but there appears to be a divide relating to household income, with the poorest households still getting a high number (6 or 7) of children.

The principal reason for investigating two *ejidos* was to compare the effects of one introduced institution (the PES program) in two different settings. Interestingly, although the *ejidos* differ remarkably in their history, land-use planning, and economic activities, I found that the three main problems of the PES (lack of additionality, temporality, and most of the program-related issues) were recurrent for both *ejidos*. I therefore decided not to juxtapose the two *ejidos* in the presentation of the results, but to emphasize how, despite different circumstances, similar themes are present in the two cases.

1.2.2 Research methods

During my two months of fieldwork, I first stayed for four weeks in Chajul, followed by a break in the city of San Cristóbal de las Casas for a mid-term analysis, and then I continued for almost four weeks in Reforma. The character of this study was emergent; the information obtained in the earlier part of the investigation informed my decisions about the direction of subsequent data collection and analysis. Because I conducted a process evaluation of the PES (Conley and Moote 2003: 381), I employed ethnographic research methods. This means that I was in close contact with villagers by participating in their daily lives, I conducted in-depth interviews, and I performed participant observations of farmers and NGOs in the field.

In the *ejidos*, I started by asking permission for my research to the *comisariado* (the 'mayor' at *ejido* level). In Chajul, I had the opportunity to present myself and my research during the bi-monthly assembly for *ejidatarios*, which helped to break the barriers between me and the somewhat cautious villagers. I did extensive interviews with the PES representatives of both *ejidos,* and asked them for the documents they had relating to the PES, so that I could study the details of the program on paper. Besides this, I conducted short interviews with different villagers in their homes or wherever I met them (in a shop, at the riverside, or in their car when they would give me a ride). With every interview, I tried to find links to people that were willing to show me the lands; whether it was the agricultural zone, ranchlands, plantations or the conserved forest. I made a total of five tours over crop fields, four on cattle ranches, two on oil palm plantations, and two through PES-conserved forests. On each of these tours, I asked the landowners about

their practices, management decisions, and their opinions about the PES program and conservation. Besides, I observed their activities on the land as well as their interactions with others in the field.

Next to this, I contacted organizations that work in the region. I did an extensive interview with a representative of the NGO Natura Mexicana, who works as the PES technical advisor for many *ejidos* in MdC. Besides the interview, I spent two days in the field with Natura Mexicana, observing their work and their interactions with the villagers. The primary reason for choosing to investigate Reforma as the second *ejido*, was that it is one of the few *ejidos* that is not assisted in the PES by Natura Mexicana, but by another NGO, namely AMBIO. Through comparing these *ejidos*, I aimed to get a clearer image of the role of the technical advisors. I conducted two in-depth interviews with a representative of AMBIO in their office in San Cristóbal de las Casas, because coincidentally, none of their employees was in the field at the moments when I was there. In addition, I did two interviews with representatives of the government-supported organization Corredor Biológico, that works in Chajul and other *ejidos* on sustainable agricultural intensification, and spent a day with their field technician to observe his work. Lastly, I paid three visits to Loma Bonita, to interview people about their non-participation in the PES, and I went to Flor de Marqués, to visit its eco-tourism center and be able to compare it to that of Reforma.

During the data collection phase, I wrote analytical notes very regularly. After the data collection, I categorized all field notes into thematic categories, such as “agricultural practices”, “PES opinions”, or “AMBIO”. From my analytical notes, I derived codes, that I used to code my field notes in the relevant thematic categories. Examples of codes are “additionality”, “bureaucracy”, or “strategic choice”. This coded data, in turn, I used to build up the argument that is presented here. When using quotations from interviews, I avoided providing the names of the informants for privacy reasons.

1.2.3 Personal reflection on research methods

Initially, I had planned to ask three *ejidatarios* to be my case studies, and to follow them in their daily routines so as to understand more of their practices and decisions related to the PES and nature conservation. However, once in the field, I quickly learned that following *ejidatarios* would be both inappropriate as well as unavailing for my research. The inappropriateness mainly comes from the strong division in gender roles in the *ejidos.* Since only men work on the fields, just asking them to give me a tour on their land was already looked upon with some ‘surprise’. Besides, having seen their hard work – they were mainly harvesting maize in that period, and carrying sacks of up to 70 kg on their backs – I felt that proposing to help them (being a slim young woman) would have seemed like a joke. In addition, I soon realized that following farmers in their daily activities would not teach me much about their relation to the PES. This is mainly because the agricultural and ranching plots are generally in different areas than the PES ‘reserves’, and are thus not literally encroaching on each other. Because of these concerns, I decided to continue doing interviews with villagers and asking people to show me around on their lands, but not to follow specific people as case studies.

Something that I personally found uncomfortable during the research period was the difference between having consent and being welcome. Although I asked and received permission for my research in both Chajul and Reforma, fact was that nobody had invited me, and that nobody had known about my arrival.

This ‘elitist’ position (being able to just walk into a village and ask people whether I could research them – while they would never be able to do that in The Netherlands) made me feel uncomfortable during the first period of my stay in both villages. Luckily, however, most people were friendly and welcoming after they got to know me, and I felt more at ease during the later parts of my stay. For future research, though, either of myself or other students, I would like to stress the importance of having a contact person in the community that can not only help in obtaining prior consent, but also reassure that the researcher is welcome in the community.

2. Payments for Environmental Services in Boca de Chajul and Reforma Agraria

Mexico's National Forestry Commission, CONAFOR, is the implementing body of the PES program in the country. The PES forms part of their broader support program called PRONAFOR, that also includes financial support for projects such as forestry studies, governance and capacity development, forest restauration, and silviculture (Comisión Nacional Forestal 2015). In the Rules of Operation of PRONAFOR, the goal of the PES component is stated as follows:

"… to promote the conservation and sustainable management of ecosystems, and to promote the long-term provision of environmental services, such as water catchment, maintaining biodiversity, and carbon capture and storage, benefiting the population itself and the development of productive activities." (Comisión Nacional Forestal 2015: 5)

These aims are meant to be reached by paying *ejidatarios* an annual fee on the condition that they do not change the land use of any of their enrolled forested land during the five years of the contract. This is monitored by means of satellite images. Besides, it is not allowed to hunt in or take wood from the PES-enrolled plots – except for dead wood. PES beneficiaries are expected to make regular monitoring rounds to check the compliance to this condition.

With these aims and conditions, the PES has been implemented in numerous *ejidos* in Mexico, two of which are Chajul and Reforma in MdC. In the following sections, I will describe the implementation and functioning of the program for these two *ejidos* separately. I will put particular emphasis on the views on the PES of the different social actors. Some of the local terminology that I will use is the following: *Ejidatarios* are the landowners, and can be either male or female. Their parcels may be privatized (called "*dominio pleno*", or "full control"), or still under (traditional) *ejido* control (called "*parcela ejidal*"). A *parcela ejidal* is not to be confused with commonly-owned land; there is an individual owner, but major decisions (such as sale or clear-cutting) have to be made in consultation with the *ejido.* A third category of land is communal, to which all villagers have access (although a fee may be charged). Villagers that do not own land are *pobladores* (who are often poorer) or *avecindados* (the children of *ejidatarios*). The head of the *ejido* is the *comisariado,* who has a mandate of three years, and is chosen by majority-vote by the *ejidatarios.*

Related to the PES program, each *ejido* has its own PES representative: a volunteer that represents the *ejidatarios* enrolled in the program (the beneficiaries), and is the contact person with the PES technical advisor. The technical advisor, in its turn, is the intermediary between CONAFOR and the beneficiaries. In the cases of Chajul and Reforma, the technical advisors were environmental NGOs that had already been working in the area, namely Natura Mexicana and AMBIO, respectively.

2.1 The PES in Boca de Chajul

Chajul entered the PES program as one of the first *ejidos* in MdC in 2008, with a total of around 2,000 ha of forested land. According to the accounts of both the *comisariado* and the PES representative, the

enrollment of Chajul in the PES has been "quite a process" (interviews, 11-04-2016 and 25-04-2016). The representative explained that during the first years, many people were suspicious, and besides, little money was offered (M$400/ha/yr.). Every year, new *ejidatarios* can apply to enroll their land, and in 2010, Chajul had 2,800 ha of land enrolled in the PES. From 2010 to 2015, the *Programa Especial por la Selva Lacandona* (PESL) was in force, which was principally the same as the PES, but increased the payments for the municipalities in the Lacandon jungle. For Chajul, this meant that new entries would receive M$1,000/ha/yr., and payments for plots already inscribed in the program were doubled (to M$800/ha/yr.), so as to avoid jealousy or anger amongst neighbors. Chajul's PES representative told that in those years, the amount of land enrolled in the PES grew a lot in the region, but that in Chajul no new contracts had been signed between 2011 and 2014, because of internal problems between him and the *comisariado* of that period.

The PES representative was glad to announce that they managed to re-inscribe the contracts from 2015 on, although some *ejidatarios* had decided not to renew their contracts. The main reasons for that were the termination of the PESL (causing the payments to decrease to M$550/ha/yr.), and a change in the conditions of the contract. The new contracts demand beneficiaries to reinvest 50% of their PES income in one of the areas or activities that CONAFOR proposes. These activities are mainly related to (nature) management, reforestation or the development of ecotourism. The PES representative said about this that:

"What most people dislike is that you have to reinvest. I think it's ok, because you have to do something in return. The government takes care of you, and you have to take care of the environment. But not everybody thinks like this. However, … I also think 50% is too much." (Interview, 12-04-2016)

A further discussion of opinions about the reinvestment of PES income is presented in chapter 2.3. Both Chajul's PES representative and a representative of Natura Mexicana explained that the amount of applications for the PES has decreased since the PESL ended in 2015. Interestingly, though, the number of beneficiaries has not decreased; only the number of rejected applicants has. As the PESL, with its payment of M$1,000/ha/yr., was a popular program in the region, and CONAFOR's budget was limited, *ejidos* had to compete with each other to enter the program. CONAFOR devised a point system, through which *ejidos* earn points according to different criteria, and the ones at the top of the list are 'awarded' the PES support. For example, ten points are awarded to *ejidos* with approved "property planning and monitoring" documents (called P-PREDIAL), ten points to *ejidos* that have a valid forest certification for its protection, seven points can be earned if *ejidos* have never received support from CONAFOR before, etc. (see annex 1 for the complete list).

Chajul's PES representative, Natura Mexicana and AMBIO all seemed to enjoy this bit of inter-*ejido* competition, and all showed some pride in telling that "their" *ejidos* had managed to enter the program. AMBIO's representative, for example, repeatedly used the phrase "in … [year], we [meaning an *ejido* and him] competed and got into the PES" (11-05-2016). Chajul's PES representative said rather proudly that someone from Natura Mexicana had once complimented him on having his *ejido* "*bien peinado*" ("well groomed") to enter into the PES; other *ejidos* were much less organized (25-04-2016). The PES representative of Reforma, on the other hand, did not express enthusiasm for the inter-*ejido* competition related to entering the PES program.

Chajul enrolled all of its forested communal land in the PES, which is around 250 ha divided over two plots. The money received from that is used for common *ejido* expenses. This implies that no one can take fire wood from the communal forest anymore, but interestingly, I have not heard any negative opinions about this – not even from *pobladores,* who do not have their own land to take wood from. When I asked for their reasons for approval, people mainly mentioned environmental concerns, or as one *ejidatario* (who had clear-cut all of his own 30 ha of land) put it plainly: "Trees are good for many things, and a desert is not very useful either" (13-04-2016).

Chajul's PES representative explained that people's compliance to the PES contract is checked via satellite images by CONAFOR. If there is doubt, the technical advisor (in their case from Natura Mexicana) will come to check the plot. Although Costedoat et al. (2015), using satellite images of the area, report some lack of compliance to the PES contracts due to selective logging, I have not been able to find this (obviously, people are likely to hide this from me). The PES representative explained, though, that by having enrolled in the PES as an *ejido* (instead of as individuals or as a group of individuals), compliance is more or less guaranteed: if one beneficiary does not comply to the contract, the entire *ejido* has to pay back all the money received during that contract. That social pressure gives security that people do not cheat the contract. Besides, the PES representative stressed, sharing this responsibility as an *ejido* also prevents people from logging in or setting fire to someone else' plot, because if it is discovered, everyone will pay the price.

2.1.1 Key actors in Chajul's PES

The main promoter of the PES in Chajul – and with that, perhaps in all of MdC – seems to be Natura y Ecosistemas Mexicanos A.C, or shortly: Natura Mexicana. The Mexico City-based NGO was founded in 2005, and has a field station in the Chajul Research Station, which is located in the Biosphere Reserve across the river from Chajul. Some of its employees have already been working there on conservation research and projects for almost thirty years. The founders of Natura Mexicana are De la Maza and Carabias, who are now director and sub-director respectively. Carabias is a well-known public figure, as she used to be the Mexican minister of the environment from 1994 to 2000. When the PES was introduced by the Mexican government in 2004, only two out of the 28 *ejidos* in MdC applied. As a consequence, convincing *ejidatarios* to participate in the PES became one of Carabias' primary aims (Cameron 2015). With that, Natura Mexicana would offer itself as a PES technical advisor; the necessary assistant for the paperwork involved in enrolling in the PES, as well as for checking on beneficiaries' compliance to the contract.

It appears that the initial reluctance of the local population of MdC to apply for the PES can mainly be explained by a disinterest for conservation. It must be understood that up to those days, the farmers had mainly "fought against" nature; the clear-cutting of jungle is no easy job. A 63-years old *ejidatario* from Chajul, who missed one eye, told his story while we stood on his ranch of ~10 ha (roughly estimated):

"Yes, we had to clear the land ourselves. This [pointing at his missing eye] happened in that period. I must have been about 35 years old, when we were cutting some trees, and as I chopped on one side [makes the gesture in the air], a large chip broke off the other side, into my eye." I said that I was sorry. He continued: "it took some 10 years before

this ranchland was cleared. And then we stopped. All the good land was used, and we had enough." (Interview, 22-04-2016)

These *ejidatarios* have cleared large parts of forest by hand, and they have always been supported by the government to convert jungle into productive land through agricultural subsidies (per hectare of productive land or per head of cattle, as explained in subchapters 3.1.1 and 3.1.2 respectively). This causes most farmers in MdC to have a sense of pride and satisfaction in how they developed the region. It can thus be imagined that the option of applying to a program with the exact opposite goal – to conserve the forest – in 2004 did not incite much interest with the landowners, as it demanded a radical change in viewing the human-nature relationship. With its information- and education efforts in the *ejidos,* Natura Mexicana aimed to tackle this problem, and to convince *ejidos* to enroll in the PES program.

Because Natura Mexicana had always had a good working relationship with the people from Chajul (the Research Center is only accessible through the village of Chajul, and the Center hires its supporting staff from that *ejido*), Carabias and her team decided to start their work. They were fortunate to encounter a group of four men there that genuinely cared about the natural environment, and were interested in making their *ejido* participate in the PES. One of them became – and still is – the PES representative for Chajul, and plays a particularly important role in Chajul's PES enrollment.

A feature of his that makes this representative stand out in his role, is that he is both enthusiastic and charismatic. Whenever I saw him on the street, he was having cheerful conversations with other villagers, and if he would ask people to show me around on their land, nobody refused. In other words, he seems to be a popular man, able to convince others of the benefits of the PES. On the other side, the representative also maintains good relations with the people working for Natura Mexicana, who are, for a large part, young women. I observed this in the way they greeted each other after I came back in the car from spending a day with three women from Natura Mexicana:

"As we drove into Chajul, we saw [the PES representative] on the boulevard, and the girls started to giggle. I tried hard not to laugh, because I had understood before that they think he's a charming man – and I can't negate that. We got out of the car to go to the nursery, because a man from Natura Mexicana would be shooting footage for a documentary there. [The PES representative] came to our car and greeted some of the girls – there were also others there, all with a Natura Mexicana t-shirt – with a hug. [The PES representative] greeted me and asked how my day was. After that, he quickly turned back to the other girls and they chatted and laughed. […] I joined, but I was tired and didn't get much of the rapid conversation and jokes." (Observations, 21-04-2016)

Overall, Chajul's PES representative thus seems to be an excellent link between the *ejidatarios* on the one hand and their technical advisor (Natura Mexicana) on the other, in terms of social credit. Besides this, he also has the intellectual ability to handle the information, multitude of forms and documents, and responsibilities of his task well. In an *ejido* where 22% of the adult population has never finished primary school (Carabias et al. 2012), not anyone could take up this role, and even the current representative admitted that "being the PES representative is a lot of work, and unpaid" (25-04-2016). Finally, this representative's influence is clear from what happened in the period when he renounced his role because of personal problems with the *comisariado* at that time (from 2011 to 2014): no new land was enrolled in the PES because, according to himself, "the *comisariado* couldn't do it, and nobody else was interested to take up the responsibility" (25-04-2016).

2.1.2 PES-related activities in Chajul

In Chajul, the most important commitments of PES beneficiaries, as stated in the contract of 2015, are the following: 1) To prevent land-use change and to conserve the forest ecosystem; 2) to set up a brigade for the prevention and fighting of fires and for surveillance; and 3) to choose activities from the Best Management Practices Guide for minimally 50% investment. However, when asking beneficiaries what activities they have to perform related to the PES, almost everyone answered that they (only) have to keep the firebreaks (which also function as paths) around their PES-enrolled plots clean of vegetation; this is one of the activities of the Best Management Practices Guide. Who does that and how often, though, remained rather vague, as people's accounts were not always consistent.

One beneficiary, who signed his second 5-year PES contract last year, told me when I asked what activities were related to it, that: "We have to keep the fire breaks and the paths clean." I asked how much work that was and how often it had to be done, but he said he did not really know that. When I asked whether anything else needed to be done, he said no (04-05-2016). Another beneficiary, though, gave me more detailed information about the PES-related activities:

"For the PES, you indeed have to do certain things. You have to make and maintain fire breaks around the borders of your parcel, and monitor against fires, the felling of trees, and hunting. (…) For the monitoring, we go in groups, every 15 days, to make a round on the PES lands. A group consists of about 5-10 people, and every beneficiary has to join in this. It comes down to that you have to do it twice per year." I asked whether everyone joins in that without complaints, and he said: "Yes, that's the commitment you make. So you have to check whether nothing has changed, in terms of fire, and all that. Actually, the vegetation is really getting higher, you can see that." (Interview, 03-05-2016)

The difference between these two accounts made me wonder how strictly those rules for surveillance and fire prevention are followed. These doubts increased when I realized that during my month's visit, nobody could tell me when the brigade would go out (so that I could go with them). The only person that was willing to show me around in Chajul's "PES reserve" (an area with many adjacent plots of forested land, all enrolled in the PES) was an ecologist assistant who was born in Chajul but now lived in the city of Comitán de Domínguez. He was visiting his family in Chajul for a few days, and voluntarily took me for a long walk through the jungle. It was only later that I realized that that particular walk might have doubled as surveillance, so that that was done for those weeks. During the walk, though, my guide (who was also a PES beneficiary) made two interesting remarks regarding the fire breaks.

As we entered the jungle, coming from expansive fields of pasture, we walked on a relatively broad path; it must have been at least four meters wide. "This is what we call a *"brecha cortafuego"* ["fire break"]; it's a fire break and a walking path at the same time. This one is not clean though." He meant 'clean of weeds' with that, and indeed, the weeds were at least waist-high; there was only a very small path on one side to walk on (see figure 3). "I will report this to [the PES representative]", the guide said (14-04-2016). Indeed, since fires in tropical rainforests spread terrestrially, this would hardly function as a fire break. This example suggests that the conditions that CONAFOR sets to the PES beneficiaries might not be followed strictly.

Later, when we were walking on a well-maintained path of about 1.5 meters wide through the jungle, we passed a smaller path going left. The small path was full of weeds, and a fallen tree blocked the way. I asked my guide for explanation, and he said that:

"We don't keep these firebreaks clean, because it's between two PES plots. First of all, you don't really have to come there anyways, and secondly, firebreaks make the lives of illegal hunters much easier. Hunters, like everyone else, don't move easily through the dense forest." (Interview, 14-04-2016)

Figure 3. The broad fire break into Chajul's 'PES reserve' (this photo is taken in the direction of the pastures). Weeds are high, leaving only the small path on the right to walk on.

This shows that besides, perhaps, some general negligence in performing the activities demanded by the PES contracts, people also have valid reasons for why they do not act in perfect agreement with CONAFOR's guidelines.

2.1.3 Views on government functioning

One issue related to the PES that multiple people were concerned about, was the inefficiency, or perhaps even corruption, of the Mexican government (indeed, corruption still is a major issue in Mexican public administration; Camargo & Rivera, 2016). One PES beneficiary, after having proudly shown me around on his 28-ha oil palm plantation, said that:

"Those people [referring to international organizations] want things; they talk a lot, in their meetings in countries far away, right? [asking me] – and then they give money. But as soon as it reaches Mexico, the amount becomes smaller [making the gesture of a circle between his thumb and index finger, becoming smaller]. And then, when it reaches Chiapas: [making the circle smaller], and when it reaches us: [the circle was closed]. So yes, if they would send metal to keep that circle open wide, then it would work!" (Interview, 29-04-2016)

Although the PES in Mexico is government-funded (and thus not paid by international organizations), more people held misconceptions about this. Besides suspecting corruption or fraud, people also expressed the idea that the government does not care much about the PES. One *ejidatario (*who himself did not receive PES) told me that:

"If you [plural] from other countries want to know what we do, or want us to change, come to talk to us directly; don't play it through the government. Because the government doesn't really care either. It's just indirect, and the government officials also just do whatever they're told. It's much better to speak personally. In Mexico there is a lot of pretending; for example, a reserve can exist on paper, but the reality is different. And then they talk about it, on these kind of conferences, from different countries, but none of them has actually been to the field. They don't know the reality here." (Interview, 13-04-2016)

Only one *ejidataria* that I met in Chajul, who owned 18 ha of forested land with her husband, had decided not to participate in the PES. Timidly, she explained that they used the jungle for medicinal plants and firewood, and that that would be impossible with the PES. When I spoke to her a second time, she said, while avoiding eye contact, that she and her husband generally disliked government interference; telling you what you can and cannot on your land. Although her decision not to enroll in the PES was unique in Chajul, this sentiment against government interference was shared by an *ejidatario* in Loma Bonita. The *ejido* Loma Bonita does not participate in the PES program, because it does not meet the minimum surface of forested land (200 ha) to enroll as an *ejido.* However, many *ejidatarios* I spoke to did not know that, and gave alternative reasons for their non-participation, such as a lack of organization or of interest. One landowner said that:

"I don't like those government programs in general; there are always conditions and meetings you have to go to and all that. I prefer to be free and to dedicate myself to work." (Interview, 20-04-2016)

This man also said that he was planning to conserve his 8 ha of forested land, and that besides making his monthly monitoring rounds, he goes there twice a year to clean the firebreaks.

2.1.4 Administrative issues

Next to these complaints concerning government functioning, there are also a few administrative difficulties with the PES. Not only is the paperwork copious and complicated (relating back to the necessity of a competent PES representative and technical advisor), valuable things also need to be transported over large distances. First of all, the original land ownership documents need to be brought to Tuxtla Gutierrez, Chiapas' capital city, where CONAFOR's office is located. This is a 7-hour ride from Chajul, that partly goes right along the Guatemalan border, which is known not to be very safe due to illicit trafficking activities. According to a Natura Mexicana representative, the fear of handing these valuable documents to someone

else (or the burden of making the long trip themselves) is another obstacle for *ejidatarios* in their participation in the PES. A last problem that this Natura Mexicana representative named, is that the sum of money is transferred annually, and that the cash can only be picked up at a bank in Comitán de Domínguez (a 4-hour ride along the same road). As with the documents, these large amounts of money can be dangerous to travel with.

Overall, PES beneficiaries are almost unanimously positive about the financial benefits that the PES brings, and even non-participants (*pobladores* or *ejidatarios* without forested land) were generally positive, or indifferent to the PES. Nevertheless, this sub-chapter has presented a range of problems and complaints that relate to the design, administration, and functioning of the PES program in Chajul. The main issues are the recent dramatic decrease in payments and the increase in conditions (because of the ending of the PESL program), the complicated procedures (and thus the need for a competent PES representative), organizational difficulties in fully executing the required PES activities, and the critique on the government and international actors. I propose to group these matters under the theme of 'program-related issues' relating to the PES. The general sentiment of satisfaction with the PES program amongst beneficiaries would often quickly disappear when talking in more depth about these practical problems.

2.2 The PES in Reforma Agraria

Reforma Agraria was one of Mexico's very first *ejidos* that entered the PES in 2004. A representative of the NGO AMBIO, who is the technical advisor for Reforma, explained that their organization had been working in that *ejido* (as well as in La Corona, located close to it) already before the introduction of the PES, in a carbon-credit sales program. That program, called Scolel'te, helped *ejidos* commercialize carbon credits, by means of avoided deforestation and reforestation, since 1998. The AMBIO representative explained that because of this, Reforma already had the necessary organization, baseline carbon measurements, and local capacity to enter the PES in 2004 for the environmental service of carbon sequestration, which had a slightly higher payment than other environmental services. The *ejido* thus made a rather smooth transition to the PES, for which it enrolled the same forested area ("*la reserva"* or "the reserve") that they had been selling the carbon credits from.

The *ejidatarios* of Reforma say that this reserve, of 1,463 ha of continuous old-growth forest, has been protected ever since they first came to settle in the area (more on this in chapter 3.2). The reserve is divided among the *ejidatarios:* each of them owns more or less 30 ha of it. For the PES, however, the entire reserve was registered as communal land, because communal forests give more points in CONAFOR's point system (as described in chapter 2.1). This means that the sum of the annual PES payment is transferred to Reforma's PES representative, but subsequently, it is informally divided among the *ejidatarios,* according to the number of hectares they own in the reserve. The individual *ejidatarios* are responsible to reinvest 50% of their benefits in some of the (conservation) activities proposed by CONAFOR. Twenty percent of the *ejido's* total PES income, though, is reserved for communal expenses.

In those first years, the AMBIO representative told, Reforma was the country's model for the PES program in carbon sequestration. A group of *ejidatarios* was responsible for counting and measuring samples of trees in the reserve, sending proof to CONAFOR, and doing small reforestation projects. However, the *ejido*

grew discontent with the amount of work and the stringent requirements of CONAFOR. They learned that neighboring *ejidos,* that enrolled for the environmental service of biodiversity conservation, did not have to perform all of those activities, and seemed to be controlled less strictly. As a consequence, in 2010, Reforma renewed its PES contract, but this time for hydrological environmental services, meaning that the *ejido* was not required to take measurements of the vegetation anymore. Moreover, the PESL started in that year, increasing the payments to M$1,000/ha/yr., regardless of the type of environmental service. Now, in 2016, Reforma is in its third PES contract, which is simply called 'environmental services' (without specification), and the payments reduced to M$550/ha/yr. due to the ending of the PESL.

Besides the enrollment of Reforma's communal reserve, some *ejidatarios* that owned additional forested parcels (along a small river leading from the reserve into the Lacantún river) grouped together to register their land in the PES as well in 2012. It is 170 ha in total (with the minimal contribution of 5 ha per owner), and the beneficiaries receive the high payments of the PESL for it. The AMBIO representative explained, though, that this construction will not be possible anymore when they have to renew the contract in 2017: the minimum area for a group has changed to 200 ha, with a minimum of 20 ha per person. "But," the AMBIO representative said, "the payment will then also be $550/ha, so they won't be interested anyway" (07-06-2016).

2.2.1 Key actors in Reforma's PES

As in Chajul, it appears that also in Reforma, the PES technical advisor – in this case AMBIO – plays a large role in enrolling the *ejido* in the PES. AMBIO's representative described that he did not have to convince the *ejidos* with which he was already working to enroll in the PES. With some *ejidos,* he assisted in the carbon credit program, and with others in setting up brigades to fight forest fires, and these *ejidos* showed much interest in the PES. "But then," said the representative, "starts the whole process of convincing them of how much per hectare, who can enroll, what are the rules and guidelines, what the benefits of the program are for them… all of that" (11-05-2016). Then, after their application, which is quite an extensive process in itself, *ejidos* can still be rejected by CONAFOR. That is a waste of time and effort, and many *ejidos* that have been rejected once do not apply another time because of the disappointment, according to the AMBIO representative.

According to the PES' rules of operation, part of the annual PES benefits from CONAFOR is reserved for the salary of the *ejido's* technical advisor, or the 'PES-promotor'. A major difference between Natura Mexicana and AMBIO is that Natura Mexicana reimburses 'their' *ejidos* this money for technical advice, on the condition that it is spent on common *ejido* expenses. Apparently, Natura Mexicana can afford to do that, because it receives stable funding from three large donor organizations: The World Wildlife Fund, PEMEX (the Mexican state-owned petroleum company) and the Carlos Slim Foundation (owned by a Mexican business magnate). AMBIO, a much smaller NGO with project-based (and thus less stable) donor funding, cannot afford to reimburse that money. The AMBIO representative called that "unfair competition" between the two NGOs, because it attracts many *ejidos* to ask Natura Mexicana to be their assistant.

In fact, many of the *ejidos* that AMBIO had worked with in the past (in capacitating fire brigades), have indeed chosen Natura Mexicana to be their PES technical advisor. It may actually be questioned why Reforma does *not* work with Natura Mexicana. When I asked this question in Reforma, though, it turned out to be a sensitive topic, and it soon became clear that the people in Reforma do not have a good relationship with that organization. Although the villagers in Reforma were reserved in telling what had exactly happened between them and Natura Mexicana, I strongly suspect the reason to be related to Reforma's ecotourism center.

A group of people from Reforma formed an association and founded the ecotourism center Las Guacamayas in 1996, initially with the aim of providing lodging for the ecologists that regularly visit the area for research. Natura Mexicana, though, hosts their researchers, students, and volunteers in their own research station across the river from Chajul. The people from Las Guacamayas suspect Natura Mexicana to hosts tourists there as well, and this might be a cause for tension between the two, as tourists are (very) scarce in the region. To make things worse, Natura Mexicana recently (2006) opened a second research station across the river from Reforma, including luxurious lodgings where they host their donors when they come for a field visit. When an employee of Natura Mexicana invited me for a tour around that research station, he explicitly told me not to let anyone in Reforma know that I had been there, because officially, they were not allowed to bring outsiders (i.e. tourists). He said this when we were in his car, driving from Chajul to Reforma:

… So I said that I wanted to come, but I had to change shoes because I was wearing sandals. Then he got a bit more serious, and said: "We could pass by your house, but there is the risk that if people see you're hanging out with us, they will think you're from Natura Mexicana, and they may not talk to you anymore." I laughed, but he remained serious. […] He said: "It's your own choice. The people of Las Guacamayas think that we're taking tourists there, so that we're a 'competitor'. But we have it exclusively for research." (Observations, 22-05-2016)

I went with them to the station, and luckily, people in Reforma still talked to me afterwards. What this quote shows, though, is that social tensions are an important factor in the choice for a technical advisor for the PES. This, again, has implications for the implementation of the PES, because even though Natura Mexicana and AMBIO are supposed to do the same job, they do have different visions about the investments of the PES money (as will be discussed in chapter 2.3).

Reforma's PES representative seems to fulfill the tasks he is required to do adequately, but he does not appear to be the enthusiastic 'spokesman' that Chajul's PES representative is. In any case, there is no need for Reforma's representative to actively convince the other *ejidatarios* to join the PES, because it concerns their communal reserve; a forested area that was already designated to be protected long before the introduction of the PES (more about this in chapter 3.2). However, Reforma's representative did not seem to be very positive about the working of the program, as the first thing he said when we started talking about that topic was:

"We won't touch that forest, but we do need government support! Because in some way, our children need to have work here; we need to develop. So that our children don't move off to Cancún or the USA to find work!" I ask if this support isn't here already, in the form of the PES, but he said: "No, that's way too little. We have the PES now for the 12th year, so we're in the third term. During the second term, the payment was $1000/ha/yr., but now it's $550! We really don't agree with that, because other prices are steadily rising, like food!" (Interview, 14-05-2016)

This upset sentiment about the decrease in price was expressed by almost all the *ejidatarios* I spoke to in Reforma. A reason for their frustration may be that their reserve is now legally protected; more about this in sub-chapter 2.2.3.

2.2.2 PES-related activities in Reforma

Interestingly, during my time in Reforma, I have not managed to get my hands on their copies of the official PES documents and contracts. My aim was to see the specified required PES-related activities, but I will assume they are equal to those in Chajul (as they most likely are in the rest of MdC). While the PES representative of Chajul kept the documents in his house, showed them to me with enthusiasm, and even lend them out to me for further study, Reforma's representative seemed to be unsure where the documents were. He referred me to his son, the current *comisariado*, for that. Unfortunately, Reforma's *comisariado* does not live in Reforma, but in the municipal head of Pico de Oro. I have met the *comisariado* a few times in Reforma for a short chat – in which I did get permission for my research – but he was always too busy for an interview. Later, I learned that the PES documents were in the *casa ejidal*, the *ejido* "town hall", but it was unclear where the keys were. During one of my last days in Reforma, I tried my luck to find the *comisariado* in Pico de Oro, but unfortunately, he was out of town. I am sure that it was not their intention to try to hide the documents from me, but these occurrences do show a lack of enthusiasm and organization regarding the PES and its administration in Reforma.

One helpful *ejidatario* did show me some PES-related documents that he had lying at home. They were three annual reports written by AMBIO for the PES in carbon sequestration, from 2006 up to and including 2008, called "Sequestration and reduction of carbon dioxide emissions in the *ejido* Reforma Agraria, municipality Marqués de Comillas, Chiapas." The owner of the documents showed them to me with some pride, telling that he had been a forester for the *ejido* in those years. He said that had taken a course for that, and explained rather enthusiastically how they would count and measure the trees in samples of the reserve. When I asked whether he had more recent reports like these, he said with some sadness in his tone:

> "No, that's over now. We're now in the PES for biodiversity, not for carbon sequestration anymore. So we don't have to measure the trees anymore, and these reports aren't made any longer. Yes, they make a report once every five years, at the end of a contract, but that's it." I asked whether anything had changed in the activities they had to do, and he said: "The group as it used to be for *this* [pointing at the reports] doesn't exist anymore. The only thing that we still have to do is the fire monitoring, and I'm the head of that. We have to do that only during the dry season, from January till May; once a month. […] And when someone is going to burn his land, he has to let us know at least a few days in advance, and then someone of us has to come with him to keep the fire under control." I asked whether he meant people from Reforma or from neighboring *ejidos*, and he said: "No, nobody in Reforma burns forest anymore, so this is for the *ejidos* neighboring our reserve. And it's only about the part that borders our reserve. If it's further away, it's not our business." […] I asked whether anything else had changed in the reserve during the switch from carbon sequestration to biodiversity, and he said: "No, only the name changed." (Interview, 20-05-2016)

Although the monitoring and fire control thus seem to be well-organized, another *ejidataria* told me that in practice, it was not done as often as it should be:

"There is monitoring against hunting, because that might be done by people from neighboring *ejidos*. This checking is done 3 times per week, and it's done by people from the *ejido*." I asked who I can go to for that, because I would be interested to go along on one of those rounds. She said: "I think that that won't be possible at the moment… There was no money for this squad to be paid, so they haven't gone out for a while." (Interview, 15-05-2016)

As the squad is supposed to be paid from the PES benefits, I assume that the reduction in frequency of their monitoring rounds is likely to be related to the recent near-halving of the *ejidos'* PES income.

For the cleaning of the firebreaks around and across the reserve, every *ejidatario* is responsible for a fragment, and it seems to be done whenever it is deemed necessary. A young *ejidataria* (around 18-20 years old) who inherited her father's land some years ago, told me that: "Everyone has to keep a part clean, you have to do that about twice per year. I remember that I went there two years ago. I had to ask my uncle where I had to clean, and how much" (15-05-2016). Another woman, the daughter-in-law of an *ejidatario,* told me that: "We do that once per year, when the vegetation is growing tall and it's really needed. We go with a group, and I also help." (15-05-2016)

Although it thus seems that the PES-related activities are not performed as strictly as they should be, a positive point is that there is regular human presence in the reserve due to the tours of the ecotourism center (see chapter 3.4). In other *ejidos,* such as Chajul, there is no such human presence which adds to the monitoring against fires, hunting, and logging in the PES-protected forests.

2.2.3 Other program-related issues in Reforma

It should be noted that in 2010, Reforma's 1,463 ha reserve officially received the status of "communal natural protected area" by CONANP (Mexico's national commission for natural protected areas); a certification that lasts for 99 years. Upon asking villagers why they opted to apply for that certification, most replied that they did it because they care about the forest, and that they had been protecting it for so many years, that they might as well certify it for the coming 99 years. A few elderly *ejidatarios* told me that certification is a more secure way of conservation than the PES, because they expect – due to the near-halving of the benefits – that the PES will sooner or later cease to exist.

The answer of the AMBIO representative, though, was somewhat more pragmatic: having a valid forest certification gives ten points in CONAFOR's point system for the PES, thus giving more security to the *ejido* of being accepted to the PES in the future. AMBIO, according to its representative, was the stimulating force behind this certification. None of the beneficiaries told me this though; they either did not want to, or they did not know it.

Nonetheless, as hinted at above, having the reserve certified may also have negative consequences for the *ejidatarios.* As they have pledged not to deforest the reserve anyways, the landowners lose the negotiation power that the PES is based on: "I will refrain from deforesting as long as I am paid for that." This powerlessness can already be seen, as beneficiaries are forced to accept the recent decrease in PES payments; they cannot convincingly 'threaten' CONAFOR to discontinue the PES contract if payments would be lowered, because their reserve is now a protected area anyway. In other words, the certification

of the reserve for 99 years effectively lowers the deforestation threat to zero. In case the PES in Mexico ever becomes a free market mechanism, Reforma may have difficulties 'selling' their environmental services, because there is no deforestation threat (while in other areas, there is). However, when I subtly tried to bring up this topic in conversations with *ejidatarios,* they usually said that they never considered that, but also that they do not believe that would be true.

As in Chajul, beneficiaries' most frequent complaints concerned the recent near-halving of the PES payments. Some people even got slightly upset when I mentioned the PES, and people stressed that a higher payment was absolutely necessary (again, some people seemed to think that their message might reach CONAFOR through me). I asked one of the *ejidatarios* who got somewhat upset, whether anything was not better than nothing (referring to the PES money), and he said:

"Well, when the PES program started, it was very much welcomed by us indeed. We had the feeling that the government was finally acknowledging our efforts for nature conservation. But well, now that the benefit has dropped so much… It's nothing; as if you give a child a candy! Others [other *ejidos*, I assume] are looking at us and mockingly ask why we're still conserving; it's nothing that they pay now!" (Interview, 27-05-2016)

In addition, just as in Chajul, many people in Reforma think that the PES funds are coming from foreign countries, but that corruption in the Mexican government is keeping the money from reaching the *ejidatarios.* Of all beneficiaries, Reforma's PES representative seemed to have the strongest feelings about that, and he expressed his mistrust in the government:

"In the news, I've heard that rich countries would give money to us, because of climate change, well, I've never seen that money! […] We wonder what is going on, where does that money go to? It seems to get lost somewhere in the hands of the government, or at least it's not arriving in our *ejido*… we're angry for that!" (Interview, 14-05-2016)

All of these issues make that none of the beneficiaries in Reforma was overly enthusiastic about the PES program. However, they did see the income as a very necessary addition to their household economy, as well as a much-needed compensation for the conservation efforts they make. However, over the last twelve years of PES benefits, it does not seem that much structural change has taken place in the *ejido* to become more environmentally sustainable, and neither to become less dependent on a source of income such as the PES. Different social actors have expressed their visions about how the PES could (and should) add to a long-term solution for the problem of land-use change, which will be discussed in the subsequent chapter.

2.3 Investing PES money

One way in which the PES program could bring about long-term change, is by investing the money received in changing livelihood practices so that people are not compelled to deforest any longer. At the moment, cattle production forms the largest threat to the remaining forest cover in MdC (see chapter 3). In order to avoid land-use change for livestock production, one can thus consider two options: either move towards alternative economic activities, or intensify livestock production, so that no extra land is needed when the business is expanded.

As described above, with the new guidelines of CONAFOR since 2015, beneficiaries are expected to re-invest 50% of their payment in conservation, and to report back about this to CONAFOR. Beneficiaries can choose from a list of activities provided by CONAFOR what they want to re-invest their money in. A good part of the sum is spent on the basic PES activities, such as cleaning firebreaks, making monitoring rounds, and paying the fire squad. But besides that, CONAFOR proposes the beneficiaries to invest in other conservation activities (such as building a watchtower for the prevention of forest fires), productive activities (such as starting a communal nursery), initiating communal silviculture, or ecotourism projects (CONAFOR 'Best Management Practices Guide', 2015). Although the list of options is extensive, possibilities for the sustainable intensification of agricultural- or livestock production practices are not included.

Natura Mexicana assists several of 'its' *ejidos* in setting up ecotourism projects. In Galacia, they supported the building of some luxurious jungle lodges, in Flor de Marqués a campsite for large groups, in Playón de Gloria a butterfly garden, and a canopy walk has recently been constructed in El Pirú. The Natura Mexicana representative said: "The long-term idea is to make MdC an ecotourism municipality, where people can make a tour between *ejidos*. So every *ejido* should have something else to offer, to complement each other: you sleep in one, then visit the butterfly pavilion, then eat in the third *ejido*, etc." She must have seen in my look that I doubted the feasibility of the plan (the region is very far off the standard tourist route), because then she laughed a little, and repeated: "it's a *very* long-term plan." The investments in the tourism projects are made with the 50% of the benefits that has to be reinvested, as well as with the money for technical advice that Natura Mexicana reimburses to the *ejidos.*

When I asked whether Natura Mexicana also helped farmers to increase their productivity, the representative simply said no. It was clear that agriculture and livestock production were not areas of expertise of the NGO: their projects included reforestation, breeding of endangered species (in this case the scarlet macaw, *ara macao*), and environmental education. AMBIO, on the other hand, has a different view on this. Their representative says to notice from his work with the *ejidatarios* that what they are interested in, is to improve their current practices of livestock and agriculture. This is what the people have been doing all of their lives, and for most of them, it is all they know. Changing livelihood practices to tourism or silviculture does not even seem to be considered as an alternative by most farmers. As the AMBIO representative explains about his experience in another *ejido* in MdC (La Corona):

"So for those who entered the PES in 2016, they require a reinvestment. But, for example, CONAFOR says: 'I want you to invest in a wildlife breeding program.' But in one of my *ejidos,* they told me: 'I'm not interested in that. What I want to invest in, is livestock, because that's what has been giving me money.' The example is from Corona. They said: 'I have been investing in livestock, […] I'm improving the genetics, the grass, building sheds, I'm giving the best nutrition, and all of that. The money that comes from *there* [referring to the PES reserve], I invest *here* [referring to the pastures]. […] In order not to encroach *there,* I have to invest *here*.' And that's the part that CONAFOR doesn't want." (Interview, 11-05-2016)

There seems to be a tension, then, between two types of reinvestment: one that promotes the development of alternative livelihoods (e.g. tourism) and direct nature conservation (e.g. a fire brigade, wildlife breeding programs), and another type that promotes the intensification of 'traditional' economic

activities (mainly livestock production). CONAFOR and Natura Mexicana endorse the former type of investment, while AMBIO favors the latter type. AMBIO's representative continued:

"I believe that with the intensification of livestock, deforestation will be halted. That should be the point. But when I tell you: 'I give you the money, but only invest it in the PES-related activities,' then the PES will become a time bomb. […] As soon as it ends, deforestation will start again." (Interview, 11-05-2016)

According to the AMBIO representative, then, the beneficiaries themselves also prefer investing their PES income in livestock improvement. Indeed, I have met a few ranchers that were interested in that. However, most *ejidatarios* did not seem to be as entrepreneurial. They mentioned that the obligatory PES-related activities alone would already take up the good part of the required 50%. For example, when I asked the following beneficiary in Chajul about the new reinvestment condition of the PES, he answered:

"I think that that's fine, because I'm already doing that. With the making of the fire breaks, building fences, maintaining the paths, the monitoring walks, that's already the 50% that they ask for, so not much will change." (Interview, 03-05-2016)

It might be wondered, though, how strictly this re-investment clause is complied with. Even though the *ejidos* are supposed to send annual reports about their activities (under supervision of the technical advisor), many beneficiaries could not (or did not want to) tell me exactly what they are reinvesting their PES money in. Besides, I have not spoken to anyone who was outspokenly positive about this re-investment requirement (including the NGO representatives).

One beneficiary from Reforma had a strong opinion about the lack of entrepreneurship amongst his fellow *ejidatarios.* While we were driving in his rather expensive-looking car (which was equipped with a parking sensor – something that seemed quite a superfluous luxury to me in a jungle village) back from Pico de Oro to Reforma, he told me the following:

"I have been a *comisariado* once, and I heard all the complaints of the people here. Some people complain that '*somos jodidos aquí*' ['we're screwed here'], and more of that. But I don't think that's true. Look, in Reforma, every *ejidatario* owns the same amount of land surface, but still, some are better off than others, right? Well, that's because some people are '*floja*' [literally: 'loose' or 'lax']; they don't want to work." I asked for clarification, and he continued: "Well, everyone works their land, but not all in the same way. Some don't work hard, or not in a way aiming to increase their profits. They don't spend their income smartly: they don't invest, aiming to technify or intensify their production. People who *did* do that, have it quite good now. And with the PES money, the same happened. We received a good sum of money, but that's also spent again easily. It hasn't been invested for long-term development. And that's not the government's fault, that's people's individual responsibility. Some people just don't use their income smartly." (Interview, 27-05-2016)

I have heard the adjective *"flojo"* in many more occasions during my time in MdC. Usually, like in the quotation above, it was used to describe people who do not work hard (also in the sense of keeping their parcels clean of weeds), who depend much on government support, or who do not have the mind-set of business expansion (but work just enough to feed their families). The abundant use of this term indicates to me a sense of lack of motivation to work for real change, or improvement. This corresponds to the fact that very few people told me about how they invested the PES money that they received over the years in

their economic activities (whether in livestock, tourism or anything else); most people said that the PES income was a welcome addition for their everyday household expenses.

As a result, most beneficiaries understand the PES as a remuneration for the conservation activities they do (and have been doing for long, in some cases). However, not using the PES income to instigate changes in livelihood practices, so as to decrease dependence on forest encroachment, means that the PES will only have immediate effects. Indeed, deforestation rates decrease dramatically as soon as an *ejido* enters the PES, but they may rise just as quickly when the PES contracts are discontinued for any kind of reason. Chajul's PES representative said when I asked him about the effectiveness of the PES:

"I think that the PES indeed works, but as a palliative, not in the long term. Before the PES, deforestation happened at about 200 ha/yr., and with the entry of the PES, it went down immediately to 20 ha/yr. But as soon as there's a change in government, or there is no more money available for whatever reason, the deforestation will increase again." (Interview, 12-04-2016)

This PES representative did not speak about investments of the PES money as a solution during that interview. In a later conversation, though, he did explain me his vision regarding communal development. He proudly showed me Chajul's '*Ordenamiento Comunitario del Territorio'* (OCT; a big book on their community's land-use planning), finalized in 2012, that he helped writing. He explained that it contains ideas for regional economic development, such as setting up an infrastructure to grow and sell a greater diversity of crops than only maize and beans. However, nobody takes up these ideas, because nobody seems to be interested. He said that he cannot do it himself because of personal issues, but it seems that nobody else even showed interest in the OCT. "I think differently than the average person here", the PES representative said somewhat disappointedly (25-04-2016).

Interestingly, when I studied the content of the OCT (Grupo Autónomo para la Investigación Ambiental and Natura y Ecosystemas Mexicanos 2012), I noticed that the primary focus was on ecological issues; not on economic development. It was written from the perspective of nature conservation, but with participation of the *ejido*, so that it would also improve their socio-economic situation. As the PES representative had introduced the book to me as being focused on economic development, and the villagers had not even shown interest in that, it makes me doubt very much whether *ejidatarios* will ever be interested in nature conservation in itself.

2.4 Conclusion

This chapter discussed the details of the PES programs in Chajul and Reforma, and gave an account of the range of program-related issues that beneficiaries and other key actors struggle with in their compliance to it. Besides, an analysis of how this government program is viewed by landowners is presented. It can be concluded that many of the PES beneficiaries see the PES income as a welcome subsidy. The majority does not seem to be interested in investing it for long-term sustainable development, but rather spends it freely on household expenses (this is in accordance with findings of Costedoat et al., 2016). This, combined with the persistent notion that the PES will one day stop (or have even less favorable conditions to offer its beneficiaries), and the fact that few people are intrinsically interested in nature conservation, indicates that the likelihood that the PES will incite positive long-term change is very slim.

CONAFOR's recent amendment requiring beneficiaries to reinvest 50% of their PES income is not likely to change much to this, as the investments are not permitted to be made in the intensification of livestock production; the major threat to the remaining jungle in MdC, and the main interest of the *ejidatarios.* The institutional cleft between natural areas (governed by SEMARNAT; the Mexican ministry of environment and natural resources, under which CONAFOR is a commission) and agriculture (governed by SAGARPA; the ministry of agriculture, livestock, rural development, fisheries and nutrition) in Mexico is a large, but artificial one. I argue that in reality, nature conservation, agriculture, and livestock production are so interrelated in MdC, that an approach to sustainably develop one of these areas, needs to take into account the other two to be effective. The following chapter will discuss the general livelihood strategies of landowners, with a specific focus on agricultural and livestock production practices. The relation between these fields and forest conservation will be examined. Subsequently, the implications of this relation for the PES program's goal to lastingly conserve additional forest cover will be explored.

3. Beneficiaries' livelihood practices

3.1 Introduction

As I stated in the concluding paragraph of chapter 2, landowners' choices concerning conservation cannot be seen as separate from their general livelihood practices, especially because those are mostly based on land use: agriculture and livestock production. In this chapter, farmers' production systems in MdC will be explained, as well as the government subsidies that are available to the farmers. Subsequently, I will elaborate on farmers' land-use decisions for Chajul and Reforma separately, and show how this is interrelated with the implementation and the effectiveness of the PES program. I will show that actors' agency as well as contingencies and material constraints play important roles in how beneficiaries work with the PES program.

3.1.1 Crop cultivation

The basic livelihood practice of villagers in MdC is the cultivation of maize and beans; whether it is on their own land, rented land, or as a (seasonal) employee of an *ejidatario.* In the two *ejidos* that I studied, the crops are cultivated in a specified area: the agricultural zone of the *ejidos.* Both Chajul and Reforma have the good fortune of being located along the Lacantún river, which floods its banks annually at the end of the rain season (in October and November). As the water level decreases again in December, nutrients are deposited in the soil, leaving it fertile for the next sowing cycle. Because MdC's first *ejidatarios* quickly noticed this significantly higher fertility of the land along the river, these areas became destined for crop cultivation. Most farmers rotate the sowing of maize and beans annually, while some use a system of intercropping. Bean plants fix nitrogen into the soil, fertilizing it for the future growth of maize plants. The large majority of the yield of these staple crops in MdC is used for auto-consumption, and most *ejidatarios* only sell what is left of the produce after deducting the amount of maize and beans that their family annually consumes. Besides these crops, a few *ejidatarios* reserve a part of their land for pumpkin and sugar cane cultivation, which is exclusively grown for auto-consumption.

The extent to which the river enters inland differs per year, depending on the amount of rainfall. This causes some land to flood annually consistently, while for other parts, it is less predictable. For the annually flooded land, there is only one crop cycle, which starts in December or January. If beans are sowed, they are generally harvested in March or April, after which a green manure crop is sowed (usually *Mucuna pruriens*, called "*nescafé"* by locals) to improve soil fertility until the flood comes again. If maize is sowed after the flooding, *nescafé* is sowed in between the maize rows in January or February, and the maize is harvested in April or May.

On land with a slightly higher altitude, which is therefore not flooded, two crop cycles can be made per year. The second cycle starts with the beginning of the rain season, in May, and the maize can be harvested in September. In November, the field has to be cleaned of weeds, before the next cycle can start again in December. There is a wide strip of land along the river where floods are unpredictable; after all, it depends on the increase of the river's water level, which varies annually. Whether to sow that land for a second

cycle is thus a risk for these farmers: it might lead to a second harvest, but if the land floods before the maturation of the maize, the entire harvest will be lost. Yet, farmers hardly complain when their land is flooded; it means a natural fertilization of the soil, and thus an increased yield during the next years.

For the cultivation of land that is further removed from the river, a fallow period of minimally one to two years is required to maintain soil fertility. In the *ejido* Flor de Marqués, where that is the general practice because it is not located along the Lacantún river, an *ejidatario* explained that they normally only cultivate crops on 1 to 2 ha of their agricultural plot, while they leave the rest of it (5 to 6 ha) fallow. Although some authors report this as a slash-and-burn system for crop cultivation (for example Carabias et al., 2012), it should be noted that no new (forested) land is systematically cleared for cultivation. The term slash-and-burn may thus be misleading, and it is surely not applicable to *ejidos* along the Lacantún river.

Upon asking landowners why they only cultivate maize and beans, I received a range of explanations. The two most important ones, though, seem to be the following. First of all, the villagers' staple foods are based on maize and beans. Cultivating those crops therefore gives people nutritional security. Secondly, maize and beans can be stored well, and do not need to be sold as soon as possible after harvesting. That is important for these *ejidos*, that are logistically badly connected to the outside market. Besides, as one *ejidatario* explained, the price at which you can sell your produce varies continuously, and with maize and beans, you can wait to sell until the price is favorable. A consequence of this lack of diversity in cultivation is, though, that other commonly-consumed vegetables, such as onions, tomatoes, and potatoes, have to be transported into MdC from places at least as far away as Comitán de Dominguez.

Most of the agricultural labor is done manually in MdC. The farmers draw lines in the field with ropes along which to sow, and harvesting is usually done by hand as well. The weeds are cleared either with a machete (meaning heavy manual labor), using herbicides, or with a mechanical (diesel-fueled) bush cutter. The government organization Corredor Biológico supports farmers who commit to sustainable agricultural practices in the acquisition of bush cutters: they pay 70% of the total M$10,000. With this, they aim to reduce the use of herbicides, as a representative of Corredor Biológico explained. Besides, being able to use a bush cutter to clean the land completely at the start of a new cycle, reduces the likelihood that people fumigate and burn their land to kill all weeds. The Corredor Biológico representative said that these fires are destructive, as they may kill the microflora in the top soil, produce large amounts of CO_2, and because they may spread to the jungle. Although none of the farmers I interviewed claimed to still burn their land (this is most likely due to a selection bias favoring the more environmentally concerned farmers wanting to talk to me), they did report that it was still a very common practice. Besides, people told me that the haze that hung in the air in those months before the rainy season (April and May), was caused by those fires. The most frequently stated reason was that burning a field was less work than cleaning it by hand; not that it was done to improve soil fertility. Some *ejidatarios* explained that leaving cut weeds to rot on the fields during the rainy season similarly enhances fertility.

When Chajul's PES representative gave me a tour around Chajul's agricultural zone on his tractor, he told that he was one of the few in the *ejido* that owned large machinery. He said that those are very big investments, and that for most people, who have small plots of land, that is not viable. He would, however, rent himself out (with his machinery) to sow or harvest on others' lands. In Reforma, the case was similar, although there, the harvester that was hired would come from another *ejido.*

The national government supports these smallholder farmers in MdC by means of an agricultural subsidy program called "PROAGRO Productivo" (*Programa Agricultura Productiva*, or productive agriculture program), operated by SAGARPA (the Mexican ministry of agriculture, livestock, rural development, fisheries and nutrition). A SAGARPA representative, who worked in the regional office in Pico de Oro, explained that the municipalities of MdC and Benemérito de las Américas have recently been classified as being "highly marginalized", and the PROAGRO payments have thus increased for landowners cultivating a total surface of 5 ha or less. Farmers cultivating 1 to 3 ha receive M$1,500/ha per production cycle, meaning once or twice per year. Farmers that grow crops on 3 to 5 ha receive M$1,300/ha/cycle, and from 6 to 80 ha, farmers receive M$975/ha/cycle. If *ejidatarios* cultivate more than 80 ha of land, they only receive this subsidy for the first 80 ha.

Comparing these amounts of subsidy with the payments of the PES (M$550/ha/yr.), it is no surprise that most people decided to enroll in the PES for other reasons than merely for financial reasons (see subchapters 3.3 and 3.4 for elaboration). As one *ejidatario* in Chajul expressed with some astonishment:

"… I've never understood anything of public policies in Mexico anyways. You get subsidy to protect your jungle, but you also get agricultural support. And you get even more money when you start with cattle ranching. So they are fighting amongst themselves up there, and what are we supposed to do?!" (Interview, 29-04-2016)

3.1.2 Livestock farming

Whereas most of the crop cultivation in MdC is done for subsistence, cattle are primarily produced to be sold on the market. Livestock farming takes up the majority of land in many *ejidos*, because the production system is extensive: the average density is one head of cattle per hectare. The farmers explained that there are two types of cattle herding: "*pie de cría"* (brood stock) and *"engorda"* (fattening).

Ejidatarios keep brood stock mainly as a form of savings; they are not meant to make (much) profit. Primarily because the Mexican peso devalues easily, and secondarily because the closest banks are in Pico de Oro and Comitán de Dominguez, many people prefer not to keep their savings in a bank. Most transfers are therefore made in cash, and when people want to save a large amount, they may opt to place a golden lining around one (or a few) of their teeth, buy a cow, or buy a piece of land. Apparently, the risk of a cow being stolen is judged as lower than the risk of a large amount of cash being stolen from people's houses. Additionally, one elderly farmer explained:

"A cow keeps its value, and you can't take a little bit from it. If you have M$1,000 on the bank, and every time you take M$100, your money will soon be gone. But from this [pointing at the cow next to him] you can't just take a bit. When someone in your family gets ill, you can sell a cow, and you have enough money to pay the treatment. And besides, they give you new ones!" (Interview, 22-04-2016)

This brood stock is held extensively on a plot of pasture, where it lives from grazing (see figure 4). This type of livestock keeping does not require much maintenance, besides feeding them mineral salts once in a while (containing the minerals that the poor jungle soil lacks), and keeping the pasture clean of weeds. Many farmers burn their pastures once a year to kill the weeds (the grass grows back by itself), but others

(supported by Corredor Biológico) use a bush cutter for cleaning. The primary goal of keeping brood stock is to keep the animals alive and healthy, and when a new calf is born, it may be sold to a rancher that has the resources to fatten it, so that the density of one cow per hectare is more or less maintained.

Figure 4. Example of a ranch for keeping brood stock. The small stable is visible in the background. Boca de Chajul.

Figure 5. Example of a large stable for the 'fattening' type of livestock farming. Ranchers with this type of livestock production generally have much more cattle, and a large surface of pastures. Boca de Chajul.

The ‘fattening’ type of cattle production is much more profitable, but also requires more work by the farmer (figure 5). Here, the aim is to fatten cattle as quickly as possible, so as to sell them for their meat to slaughter houses. Besides grass, the cattle are fed mineral salts daily, and they often get additional fodder that might or might not be grown by the farmer himself. Likewise, calves may be bought or bred from the current stock. Ranchers who are in this business, may choose to expand their production by buying and/or deforesting more land to keep more cattle on, or by improving fodder, facilities and the genetic stock so as to increase profits with the same amount of land used.

Corredor Biológico promotes this second option as a strategy for nature conservation. Their employees, but also farmers, Chajul’s PES representative, and a representative from AMBIO were unanimous that ‘fattening’ cattle production is the main threat to the remaining jungle cover (further explained in subchapter 3.3). Corredor Biológico, as described above relating to crop cultivation, financially supports farmers to sustainably intensify their production, on the condition that farmers make certain commitments. For ranchers, these commitments are that they reduce the use of fire to clean the land of weeds, to conserve the forest cover, and to use the support they receive for investments in their livestock production. Corredor Biológico has a technical assistant in every *ejido* they work with (who are originally from that *ejido*), who checks whether the farmers comply to those commitments. If they do, they can receive annual support to build simple stables and mangers, to buy seeds to grow nutritious fodder, and to build fences to protect those fodder banks.

Corredor Biológico’s long-term aim is to realize the complete conversion to silvo-pasture in MdC. This entails having trees on the pastures; some dispersed on the field and the majority lining the fences, making ‘living fences’, or hedgerows. Besides, fire is not used in a silvo-pastoral system, so that the soil is conserved. A technical assistant from Corredor Biológico saw that in the following way:

“Having dispersed trees on your ranchland […] you could see as a trick: When you need to conserve trees on your land, you can’t burn it anymore! You’ll have to clean the land from weeds with a machete or bush cutter.” (Interview, 22-04-2016)

The dispersed trees have the multiple functions of providing shade to the cattle, sequestering CO_2 during growth, and they can serve as firewood or timber when mature. Besides the reforestation, a part of the ranchland should be dedicated to the cultivation of nutritious fodder, which the cattle should be fed with regularly. Lastly, ranchers should have a stable for the cows as a place for food and shelter.

Two of the main threats from the jungle to cattle are jaguars and venomous snakes. Although jaguars are unlikely to cross large distances over pastures, chances are higher that they kill calves when the ranchland is enclosed by jungle from two or three sides. Snakes only bite cows when they are (nearly) being stepped on; which is more likely in high grass and land with weeds. A bite can kill a mature cow in one or two days, several ranchers assured me. For both types of attacks, ranchers can apply for a government compensation, but this does not seem to work in practice. Farmers have to show proof of the killing in the form of photographs, and most of them do not own a camera. If they would, though, it is still difficult, because calves taken by jaguars simply disappear into the jungle to be eaten there. This fear for jaguars causes some ranchers to hunt them, but many use other solutions. Some of those are to keep the calves in stables at night (with the protection of mature cows), to keep the pasture clean and short, and in general

to plan land use so that different plots of pastures are adjacent, without fragmented pieces of jungle in between where wildlife can hide.

A government subsidy called PROGAN is available to ranchers that have brood stock; it is not given for the fattening of cattle, because "those ranchers are richer anyways", as a SAGARPA representative explained. If farmers have between one and 35 reproductive females, they receive M$300 per cow per year, and from 35 to 100, this is M$250, with 100 as the maximum to receive subsidy for. When I remarked to the SAGARPA representative that much more subsidy could thus be received for crop cultivation, he laughed a little, and said that from that, I could deduce how much more profitable cattle ranching must be. Farmers wishing to start with cattle production usually get a loan from the bank.

A rancher in Reforma has both brood stock and he fattens male calves, and receives the subsidy only for his 30 cows of brood stock. When I asked him whether there are conditions that you have to fulfill in order to receive the subsidy, he told that the cows need to be vaccinated and earmarked. Besides that, a veterinarian pays an annual visit to check whether the cattle are healthy, he said. Apparently, there is no condition that prohibits farmers to expand their pastures and encroach upon the jungle, as there is for the government support for palm oil (see subchapter 3.5).

3.2 Land use in Boca de Chajul

As described above, Boca de Chajul has a specific part of its land dedicated to crop cultivation; 200 ha along the Lacantún river. That area has been divided into small parcels over eighty of the pioneering *ejidatarios.* Since then, though, land trade has taken place, causing some farmers to own considerably larger plots in the agricultural zone. The rest of Chajul's land surface (4,208 ha; Carabias et al. 2012) is a fragmented mix of pastures, secondary vegetation, and some old-growth forest. This land is divided into the privately-owned plots (*dominio pleno)* and *parcelas ejidales* (private, but under *ejido* control) of the 172 *ejidatarios*, with most of them owning more than one parcel. Lastly, 250 ha of Chajul's land is communally owned, the large majority of which is forested and enrolled in the PES.

Chajul has one large compact forested area, which is completely enrolled in the PES program, and which connects to PES-enrolled areas of the neighboring *ejidos* Playón de Gloria and Flor de Marqués. Most *ejidatarios* own several (unconnected) plots of land, that are all dedicated to different uses. Some farmers told that when they cleared and burned new plots, they indeed used it for crop cultivation for one or a few cycles, but they would then sow grass when the productivity of the soil went down. Soon after formation of the *ejido* it had been discovered that only the river beds stay fertile, and this is the reason why there is no slash-and-burn agriculture in this area. Moreover, the image of 'forest encroachment' does not seem to be a perfect reflection of current processes either, as landowners' ranchlands and forest plots are usually in two different areas, thus not literally 'encroaching' on each other.

Several farmers explained that there are reasons for why there are still parts of old-growth forest remaining in the *ejido*; and "not because we didn't manage to cut it down", as one *ejidatario* reassured. Firstly, the low soil fertility is the most important reason for why those areas in particular (and not others) have maintained their forest cover. Although less-fertile soil is used for cattle ranching, there is a border

below which exploiting the ground for livestock production is unprofitable: grass does not grow well (in competition with weeds), and it would lack too many nutrients. However, when I asked landowners whether they would thus never clear and exploit those forested plots, they could not guarantee that. One *ejidatario* said that recently cut and burnt land will serve for maize cultivation for at least a year, and that "something is better than nothing. […] When you're hungry, you do that" (interview, 22-04-2016). He stressed that that still happens despite the PES, because the opportunity costs are higher – at least on the (very) short term.

Secondly, the inaccessibility of the forested plots plays a role in which parts are cleared and which are conserved; farmers first cleared land closest to the village or most easily accessible by roads. As a result, the *ejido's* most remote areas still maintain their forest cover, because taking wood from there, and bringing and visiting cattle regularly would all have to be done by foot. This costs much time and thus greatly decreases the profitability of such an endeavor.

A third major reason for the conservation of Chajul's forest cover, is that *ejidatarios* generally feel that they have sufficient surface to work on and to feed their families. As Chajul's PES representative told when he showed me the agricultural zone: "In principle, we have enough land to sustain our *ejido* now. Using more would be just for extra profit." Another *ejidatario* agreed with this statement, saying that his father used to tell him: "We have enough to live off, so why would we cut more?", and that he thinks that that still holds. Later, however, this man did tell me that he has a side job in tourism for some extra income. A field assistant from Corredor Biológico in Chajul explained it to me in the following way – after we had been discussing the issue of oil palm production for a while:

"It really depends on the person. A rich man, he will do something bad like that [referring to deforestation for oil palm], I mean, that's why he's rich. He doesn't work to survive; he wants to make more money. But the people from here – think of the founders of the *ejidos* – we think differently. We work to survive, for our own consumption. […] It's the people from outside, who buy large parcels at once, because the land here is relatively cheap, cheaper than in other states of Mexico. But we don't think in that way. When we deforest, it's hectare per hectare, and only because the family grows, not more. Because we need to feed more family members. But well, of course I don't deny that that's also a threat to the jungle." (Interview, 22-04-2016)

Although, as can be expected, people are aiming to improve their economic situations, it indeed seems to be the case that many people do not have so much of an 'entrepreneurial spirit' to maximize their profits at all costs (i.e. to clear-cut more forest cover than necessary). As the quote also describes, though, forest *is* often cleared when a son turns eighteen and wants to be a cattle rancher like his father. When I asked farmers in Chajul what they would do after the ending of their current PES contracts, some gave their son's eighteenth birthday as a reason for doubt whether to re-enroll in a next contract. One *ejidatario*, who currently has 20 ha of his land enrolled in the PES, said that:

"I have three daughters and one son. My son is still going to school, but he wants to have his own land later. I don't know yet whether we will buy new land for him, or to clear a piece of my own land – we will see about that by then." (Interview, 03-05-2016)

For most of the landowners that doubted about re-enrollment in the PES, the fact that payments would significantly decrease in the next contract played an important role for withdrawing.

If this suggests that not business expansion but family expansion is a bigger threat to the remaining forest cover in Chajul, a few favorable trends should be noted. First of all, families in Chajul are slowly becoming smaller, due to better family planning and health-care facilities. While the pioneering families in Chajul often had six to eight children, this decreased to two children in many younger families. The poorest families in Chajul are bigger, though, and one woman confided to me that they did not have access to contraception, even though she wanted it. Yet, these poorer families are *pobladores,* meaning that these sons will not inherit land from their fathers (they may, however, potentially buy and clear land themselves).

Secondly, education in the region is slowly improving. One *ejidatario* told enthusiastically that while Chajul used to have only a primary school, now they also have a middle school and a high school, and a college is even being built just outside of the village. This enthusiastic man explained the benefits of education he saw on the environment:

"You know, when children get education, they don't learn how to work [on the land, I assume]. Look [he showed me his hands], this is what you get from working on the land, and you [he took my hand] these are the hands of someone that studied. When you get education, you don't learn how to deal with the ticks, with the spines, and with the burning sun in the fields. Then, you don't want to work on the land later, and you're not going to clear a field, because you want to work in an office." (Interview, 13-05-2016)

As there are not many jobs in the tertiary sector in Chajul, though, improved education also promotes migration to cities. Lastly, emigration to the USA is the third trend that decreases the pressure on the forest. Young people's (mostly men's) desire to move to the USA in search of better economic conditions does not seem to be class- or education level related. Many people (proudly) said to have a relative "on the other side", and some of them received remittances from them. One *ejidatario* bought a tractor from the remittances received from his brother in the USA. Although there was one story of an *ejidatario* serving jail time for crossing the border illegally, most people seemed to view the emigration positively, with hope for a better future, rather than as acts of desperation.

Considering the reasons described above for the continued presence of the forest cover, and considering the trends that decrease the deforestation pressure, it may be wondered who actually own the remaining forested plots (i.e. who receive the PES benefits), and why. As I hinted at before, both cattle and land may be used for keeping savings by *ejidatarios*, and is generally preferred over monetary savings, mainly because of the infamous devaluations of the Mexican peso. Indeed, *ejidatarios* who claimed to have large parts of jungle, and who said not to "do anything with that", explained me about this way of keeping savings. One *ejidatario*, who owned a relatively large shop in Chajul, said that 40 out of the 120 ha he owns is jungle. He confirmed when I asked whether he enrolled that land in the PES, and when I remarked that that must be nice, he said:

"Indeed, that's a nice bonus, because otherwise I wouldn't have done anything with that land anyways – I've got enough terrain. I think the PES is more effective for people with little land; they would have cut it if it wasn't for the PES." (Interview, 13-04-2016)

In a later interview, the same man explained:

"I came here 27 years ago, and the land had already been divided, so I had to buy everything. Ten years ago I bought a big part, but also two years ago some, and last year." I asked why he keeps expanding, and he explained: "Whenever I have money, I buy a new parcel; it's because land doesn't devalue, so it's a secure way of having savings." (Interview, 04-05-2016)

As these quotes illustrate, owning land but not using it productively (i.e. maintaining the forest cover) could be seen as somewhat of a luxury; only people with much land can afford to do that – and indeed, it is only these rich people who own land as savings. To them, the PES benefits are therefore a "bonus" for the conservation they would have done anyway.

The landowner quoted above suggests, however, that the PES may have more effect on those *ejidatarios* with little land. Another villager (a *poblador*, who works as a lawyer) did not seem to agree with that point, and reasoned the opposite:

"Personally, I think that the PES is a good thing for those that have enough land. Because people who have little land don't profit; they have to use it – mainly as ranch land." (Interview, 13-04-2016)

This contrasting idea shows that indeed, the PES program in Chajul has different effects on different groups of people. The *pobladores*, who are usually the poorest families, do not profit from the PES at all, because they do not own land. Neither do the *ejidatarios* with the smallest land surface profit, because they will have cleared all land they could afford for productive activities. *Ejidatarios* with intermediate amounts of land (some 20 to 50 ha) seem to make strategic choices regarding the PES: enrolling in the program or not will depend on the soil quality of their forested parcels, their accessibility, and on whether they have a son that wants to work the land during the subsequent five years. Lastly, the *ejidatarios* who own the largest areas of land do not seem to doubt enrolling their forested parcels in the PES, as that land is generally used as savings and is not meant to be worked on in any case. To them, the PES income is a welcome extra, and because they own the largest surface areas, they also receive the highest amounts of PES benefits. The inequality that the PES thus seems to reinforce or even create, however, has not been reported to be problematic by the villagers. *Pobladores* and *ejidatarios* not receiving any individual PES benefits mainly said that they are not jealous because it concerns small amounts of money anyway.

From this analysis, it can thus be seen that for those landowners with intermediate land surfaces, a pitfall in the effectiveness of the PES is its temporality. Since deforestation in Chajul now mainly seems to occur to meet the needs of a new generation – which has a timeframe that is much longer than the 5-year contract of the PES – *ejidatarios* can effortlessly decide to enroll their forested land in the PES for at least one or two contracts. During this time, they profit from the income, and when a son wishes to work the land, no new contract will simply be applied for. Although no *ejidatario* stated this strategy explicitly in an interview, the above-described data does suggest that such strategic considerations are being made.

Another important issue of the PES is mainly illustrated by the acts of *ejidatarios* with the largest land surfaces: they receive the PES benefit over land they hold as savings, meaning that there is no additionality of the PES program in conserving those parts of jungle. The PES income can, in this sense, be regarded as the interest over their savings. The lack of additionality, though, also holds for landowners of smaller

surfaces. Many of them would not have cleared the forest in any case, for one of the reasons mentioned above; low soil fertility being the most obvious one.

Interestingly, upon asking *ejidatarios* how much land they owned and what they used it for, they would usually start by explaining about their agricultural- and ranch lands. Lastly, they would mention the surface of forested land they own, but sometimes I explicitly had to ask for that. It would sometimes seem as if they almost forgot about that land. When I subsequently asked whether they received PES benefits for those plots, some would say that that is indeed their 'PES reserve'. The PES program thus seems to somehow give a label to lands that would otherwise be 'just' nature, or that would even be forgotten.

3.3 Land use in Reforma Agraria

Figure 6. A map of Reforma Agraria as presented at the entrance of ecotourism center Las Guacamayas. The white letters 'El 21' and the white dashed line have been added to indicate the agricultural zone of Reforma. 'Reserva ejidal' means 'Ejido reserve', and the dark square to the East along the river represents the village.

The history of land use in Reforma Agraria is a rather different one from that in Chajul, and, in fact, quite unique in MdC. As in Chajul, the pioneers of Reforma quickly learned where the river floods and what is thus the most fertile soil to cultivate crops on. The villagers of Reforma call their 172-ha agricultural zone

"*El 21*" ('The 21', see figure 6), and interestingly – even though I ended almost every interview with this question – nobody seemed to know where that name came from. *El 21* is located at some five kilometers' distance from the village, and one *ejidatario* explained that the current location of the village was in fact the second one. Initially, the pioneers had planned to live closer to *El 21*, but a few years after their settlement, the village flooded due to a heavy rain season. As a result, the village was rebuilt a few kilometers away, still along the river (as this used to be the main means of transportation), but in a higher place. The current village is equipped with a rather advanced system of waterways so as to guide high water levels.

The rest of Reforma's land surface is divided between pastures (768 ha; the yellow area – excluding *El 21* – in figure 6) and one compact area of jungle (1463 ha); Reforma's communal nature reserve (*'Reserva Ejidal*' in figure 6). The early communal decision to keep one area of jungle completely intact is the reason for why Reforma's landscape is not as fragmented as that of other *ejidos*. As can be seen in figure 8, Reforma's *ejido* reserve is one large area, and this is unique in MdC. There are different arguments and narratives, though, for why this decision to conserve was taken in Reforma.

The first narrative that any visitor to Reforma will hear is the one promulgated by Las Guacamayas¸ Reforma's ecotourism center. It tells that the community of Reforma, that was indigenous to a jungle area in Oaxaca, was dedicated to conservation from the moment of its settlement, and that it therefore designated the area which is now the reserve to nature protection since that moment. The reserve has never been "touched" (meaning 'worked on'), and the whole community is dedicated to conservation activities. In 1996, the villagers set up the ecotourism center, which provides jobs and income to the *ejido*, while also conserving the natural environment. When I asked employees of the ecotourism center for the reasons why the community had decided for conservation, they said it was because we have to protect "*nuestra tierra*" ('our earth'), and that since the pioneering families came here, they had had the feeling that they wanted to do something good for the area.

Upon asking the older *ejidatarios*, though, I heard bits and pieces of a slightly different history, as well as different motivations for conservation. One *ejidataria* said that the reserve was once used for the cultivation of shade crops, namely cacao and coffee. Another woman confirmed that, but neither of them could indicate exactly to what extent that was done (except for that it was "quite a common practice") – either because they did not know, or because they felt reluctant to tell me. Both women, though, told me that the shade crop cultivation stopped long before the introduction of the PES program, and they gave reasons such as falling market prices and the proliferation of pests for it. Indeed, when I visited the reserve, I noticed the presence of old and tall cacao trees in the area close to the road. Besides, the jungle vegetation was not as dense as in other reserves that I had visited; even off the paths it was easy to walk through. I have, however, not visited the entire reserve, so I cannot make inferences about the area further away from the main road.

After having been in Reforma for a few weeks, the landlady of the house where I resided told me her version of the story of the settlement of the *ejido*. She said about their place of descent in Oaxaca:

"There was '*tierra primera*' or low land, that was good for agriculture. Every *ejidatario* had 1 ha of that. And then you had 4 ha of ranch land, which was a different type of soil, it was called the '*tierra alta*'. There was also jungle, on a hill. That soil was rocky, so you couldn't do agriculture there, and so that was conserved."

Then she continued about Reforma:

"When we came here, it was purely jungle. Then everyone got the 'right' to 50 ha of land, and it was decided by a majority from the beginning that we would only work on 20 ha, which was already a lot. […] It has been tried to grow maize there, on the higher ranch lands, but the harvest was very bad; the plants stayed very small. So the soil is bad. Also in the reserve, or what they cut from there, they tried maize, but it didn't give much." (Interview, 25-05-2016)

This comparison between people's place of origin and their new settlement explains much about their 'decision to protect the jungle'; twenty hectares of land to work on was "already a lot" compared to the five that they used to work in Oaxaca. Besides, the *ejidatarios* had no access to agricultural machinery in the first decades, making fifty hectares almost impossible to work. The decision, however, to conserve one compact area of jungle (as opposed to letting every *ejidatario* decide for themselves, which leads to a fragmented landscape) is likely to be based on ecological conservation reasons. One *ejidatario* explained:

"You know, the jungle was already here, and we came to disturb it, so we had to respect it as much as possible. I think we were about the only *ejido* that decided to leave one part of jungle intact, as a whole. Now they're trying to teach these things to the other *ejidos*, about conservation, but we already had this notion, this understanding." (Interview, 15-05-2016)

The agreement to protect the reserve – which may have been relatively easy to reach in the era before access to agricultural machinery – managed to persist up to today, most likely due to this conservation ethics, but probably also because of the subsequent commercial exploitation of the reserve by the ecotourism center and because of the PES program.

The ecotourism center Las Guacamayas promotes itself primarily by its unique location in the jungle. It is, nonetheless, not allowed by law to offer tours in the protected biosphere reserve Montes Azules across the river. What Las Guacamayas does offer, are boat tours over the Lacantún river (including a smaller river that goes into the biosphere reserve), and guided walks through Reforma's communal PES reserve. This commercial exploitation of the reserve interacts with the PES-related activities in several ways. First of all, the regular human presence in the reserve compensates for the slight negligence in the execution of the monitoring requirements of CONAFOR. Secondly, there is a convenient overlap in the activities related to ecotourism and the PES, such as keeping the fire breaks (or paths) clean and putting up artificial nests to promote the reproduction of the scarlet macaw. While these activities have been done since long to improve the attractiveness of Las Guacamayas for tourists, now they also contribute to the 50% of reinvestments that are required by the PES program. Reforma's reserve, it could thus be said, creates a double income: both from tourism as well as from the PES.

As a result, Reforma's *ejidatarios* see the PES benefits as a (much-needed) compensation for the conservation work that they have been doing for a long time. The PES does not conserve additional forest cover, and people are frank about this: nobody claimed to consider clearing their part of the reserve if the PES program would stop. Besides, the only group of *ejidatarios* that enrolled forested land outside of the reserve, will not re-enroll for a second phase (as explained in chapter 2.2). Indeed, one *ejidatario* told that his 14 ha of land that is in the zone of pastures is still completely forested. When I asked whether he had enrolled that in the PES, he said:

"No, I chose not to do that, because it's so much work, there are so many conditions, and all of that. [He sighs.] And then you can never get some wood from it anymore, so no, I decided not to do it for that parcel."

Even though this *ejidatario* thus decided not to enroll this parcel in the PES, he did seem to be genuinely interested in conserving it, because when I asked why that parcel was still completely forested, he said:

"I just never cleared it. I have worked with biologists, and I got really into birdwatching. You know, sometimes you see one that you never saw before! I took three courses in birdwatching. So yes, I like that, and I never got to clearing the land." I asked if it was not a shame to buy 50 ha while only using 4 for agriculture, and he said: "That's the way it works with the 'rights'. […] Just like when you buy a house here, you buy the 'rights' to 50 m² of land for the yard." (Interview, 18-05-2016)

This quote illustrates another side of the argument that the PES program lacks additionality: even when additional jungle vegetation (outside of Reforma's reserve) is conserved, this may not be instigated by the PES, but rather by other, more intrinsic, motivations. It can be said, though, that there is a difference in the level of strictness of conservation between the PES-enrolled plots and those conserved 'voluntarily', as the latter are generally used for timber and firewood extraction.

As stated before, rather than pushing landowners to conserve their jungle, the *ejidatarios* of Reforma see the PES money as a government compensation for practices that they have already been doing. Some see it as an acknowledgement by CONAFOR of their efforts. Others said that the current PES benefits are just sufficient to cover the expenses of cleaning the fire breaks and to do the required monitoring in the reserve, meaning that there is no extra financial incentive to enroll land in the PES. Reforma's motivation to apply for the PES program was thus clearly because it was already collectively conserving a jungle area, and receiving money for that was more than welcome. This lack of additionality of the PES has recently been formalized, when Reforma's reserve was certified to be protected for 99 years, and the deforestation threat thus entirely disappeared. On the other hand, as the representative of AMBIO explained, the certification itself was incited by the PES program – as it would lead to ten points in CONAFOR's point system – and it can thus be said that the PES did create (at least on paper) more security in nature conservation in Reforma.

The issue of the temporality of the PES is somewhat different in Reforma than in Chajul. In Reforma, as the PES-enrolled land is communal, people do not have the individual freedom to make strategic choices concerning their participation in the PES. In this way, the problem of the temporal conservation effect of the PES (where *ejidatarios* merely enroll their plots for as long as they do not plan to use it) is not present in this *ejido.* However, this owes more to the organization of and agreements made within the *ejido* than to the impact of the PES program. The other aspect of the temporality problem though, which considers the lack of long-term sustainable change, is present in Reforma. As discussed in chapter 2.3, most *ejidatarios* spend their PES income on household expenses, and not on investments for the intensification of agricultural practices. In Reforma, people thus continue to rely mostly on traditional (extensive) agricultural practices, which pressures the remaining forest cover in the zone of pastures (outside of the reserve). Besides, this may be a cause for many of the new generation to migrate to cities to find jobs in the tertiary sector (as will be discussed below). For the PES program to create systematic change, which causes landowners to no longer rely on deforestation for economic improvement, the PES income should

be used to invest in sustainable agricultural intensification or in alternative livelihood practices, the former of which is currently not accepted by CONAFOR for the 50% reinvestments.

3.4 Alternative livelihood practices

As said before, in both Chajul and Reforma, almost all fertile land is already in use by the *ejidatarios.* The most fertile land is completely used for crop cultivation, less fertile land for pasture, and what is left of jungle, is located on the poorest and least accessible soil. This fact has led people to explore ways to increase their income in ways different to clear-cutting more land. Besides intensifying their agricultural practices by using improved maize seeds and cultivating nutritious fodder for cattle, some people have opted to pursue alternative livelihoods. This trend is specifically strong in Reforma, because the certification of the reserve makes much agricultural expansion impossible (except for the small forested parts in the zone of the ranchlands). There is no evidence, though, that the PES program has instigated or promoted these alternative economic activities, and I argue that these developments have taken place independently from the introduction of the PES. In the next subsections, I highlight three of these alternative livelihood strategies.

3.4.1 Oil palm cultivation

The cultivation of oil palms in order to increase the profitability of farmers' land is somewhat controversial in MdC. Since the beginning of this century (around 2003) only a handful of farmers switched to oil palms in Chajul, and only two in Reforma. While these landowners told me about their plantations with satisfaction and even some pride, others had heard more negative stories about palm oil, and had thus decided against the cultivation of the African palm tree (see also Castellanos-Navarrete, 2015). The plantations in these *ejidos* are relatively small, because landowners simply own plots of fertile land that are not more than a few tens of hectares in surface, and because the system of *ejido* regulations makes the acquisition of large plots of land complicated. SAGARPA (the government ministry in charge of agriculture, animal husbandry, rural development, fisheries and nutrition) provides financial support for starters in oil palm cultivation, but there is no sustained subsidy for this economic activity. This government support, though, can only be received on condition that no old-growth forest is cleared for the plantation.

This condition (if adhered to) ensures that oil palm cultivation only takes place on former maize fields or pastures, and does not pose a threat to the forest. When I asked two farmers about this, they confirmed that oil palm was not much of a threat to the jungle. One said:

"I don't think oil palm is as much a threat to the forest as cattle. Look, you only get M$1/kg of fruits, while meat is M$50/kg. And then all those inputs you have to buy for oil palm… like fertilizer and herbicides." (Interview, 16-04-2016)

The other farmer said he agreed with the statement. Other reasons that people gave for not engaging in oil palm cultivation were also of an economic and practical nature: people had heard that after some

twenty years, the quality of the fruits decreases, and the palms are so tall that it becomes difficult to harvest them. Lastly, when it is no longer profitable to harvest the fruits, the trees can be felled, but the roots will survive in the soil, making it hard to cultivate a new crop afterwards. One cattle rancher in Reforma explained why he decided not to cultivate oil palm:

"The land here [in MdC] is not very fertile, it's quite bad in fact. That's why many people convert their land from pasture to palm oil plantations, but it seems to turn out not to be as profitable as was promised. And after that, you can't go back. The problem is the roots; you can cut the palm, but the roots go so deep, and they stay green, they don't die. So you can't use your land again… They also came here to convince us of the benefits of palm oil, but we didn't want it." (Interview, 23-05-2016)

These 'promotors' of palm oil were most likely representatives of the municipal government who used to have a special project in which rubber and oil palm plantations were actively promoted as a means for long-term regional development. Many people have, however, also heard the counter-arguments which stress the environmental harm that oil palm plantations may cause. These villagers thus criticized the plantations for needing too much fertilizer, consuming too much ground water, and for bringing pests. Overall, the plantations are not very popular in Chajul and Reforma, and those *ejidatarios* that did opt for it, cultivate the oil palms on plots not larger than 30 ha. Interestingly, these *ejidatarios* usually also own parcels of forested land (for which they receive the PES benefits). It can thus be said that in this case it is not the PES program itself but the government condition which causes the remaining forest cover to be conserved.

3.4.2 Ecotourism

Besides the initiation of plantations, some landowners have found alternative livelihoods in activities that are not directly based on land-use. Ecotourism forms the most important part of this tertiary economic sector. As described before, Reforma's Las Guacamayas was founded in 1996; almost a decade before the PES program was introduced in Mexico. It was borne out of the necessity to gain income from alternative sources. Although it is promoted as being a community effort, the association that was founded for it has only twenty members who jointly run the center. The treasurer of the association explained:

"The ecotourism center came here through the entire *ejido*. It had started in an *ejido* assembly but for some people it was something… new. [Sounding like a euphemism for disagreement.] They preferred just to grow and fatten their cows, and nothing more. They had no interest. So a group started, but the beginning was tough. We had to work hard, and there was no income. A lot of people left, they didn't believe in it anymore, and the work was heavy. When I was 17, 18, I got the opportunity to become a member because I had already been working for them. Now, there are 20 members, and all of them live here, in Reforma." (Interview, 18-05-2016)

Besides these twenty owners, there are also people employed by the center. However, these are not all from Reforma, as quite a number of Guatemalan immigrants are hired for the low-paid jobs. One *avecindado* said critically:

"The people who work there don't get fixed contracts, and they're often fired because they [the members] know the people will come back asking for work anyways. And then they can always keep the same low starting salary. But

now mainly people from Guatemala work there; immigrants who are willing to work for those low salaries." (Interview, 15-05-2016)

The reason why people are willing to accept these lowly paid jobs is because the ecotourism center forms the only employment in the tertiary sector in the *ejido.* Especially for the younger generation, for whom no more new land can be cleared, working for Las Guacamayas is one of the very few options besides migrating to a city or working on their parent's land.

In Chajul a few tourist cabins have been constructed outside of the village, along the river, to host tourists. These tourists are mainly Mexican, and come primarily during the Christmas and Easter holidays. This provides sporadic construction-, cleaning- and hosting jobs to *pobladores* in Chajul, and the manager is one of the *ejidatarios*. However, since the cabins are empty for most of the year the income for the *ejido* is negligible. Unlike in other *ejidos* where Natura Mexicana operates, these cabins have not been constructed with the support and advice of the NGO, and they have no direct relation with the PES program.

3.4.3 Migration

Finally, the third main form of pursuing alternative livelihoods is constituted by migration out of the *ejidos*. While a few high school graduates and young families move to the municipal head Pico de Oro for work, a larger proportion of migrants decides to move to larger cities to study or look for work, such as to Comitán de Dominguez, or to cities in other states of Mexico. Also, many families have at least one member that crossed the border to the USA in search for a higher standard of living. Nonetheless, the population size of MdC is steadily increasing, from 8,538 in 2005, to 9,856 in 2010, to 11,444 in 2015 (INEGI 2015; Secretaría de Desarollo Social 2013), and both Chajul and Reforma show a similar steady increase in their population sizes.

In Reforma, though, with its certified nature reserve, and where there is very little trade in land, there appears to be somewhat more migration out of the *ejido* than in Chajul*.* One *avecindado* who came from a large family with eight sons, explained:

"The land of my parents would not be enough to feed all those families. But we knew that from a young age, so most of us looked for other jobs. Me, for example, I work as an assistant for biologists here; a brother works as a waiter in the ecotourism center, another has a job in Pico de Oro, and another in Tuxtla [Tuxtla Gutiérrez; the capital of Chiapas]. So everyone started doing different things, and found their ways to earn an income." (Interview, 15-05-2016)

Migration to cities seems to be viewed by most as an inevitable trend, but not as something negative. Several people in Reforma explained that those who want to start a business generally move to larger cities in the region because the market is simply too small in the *ejido.* Out migration to the USA is generally regarded as something positive (as described for Chajul in chapter 3.3); however, those who stay and work in the *ejido* (the large majority) do seem to be content about their lives, and most young people seem to wish to stay in their *ejido.* Overall, people have no attitude of complaining about their situation; if there is a need for some of the younger generation to move away, that is accepted. Only one *ejidataria* in Chajul,

who has merely 2 ha of fertile land to work on with her husband, said humbly when I asked about their income:

"We don't earn much, but I'm satisfied. [Then, in a lower voice:] It can be lonely here though, because all my children left. It's quiet." (Interview, 13-04-2016)

3.5 Conclusion

To conclude, people in Chajul and Reforma have found three main ways to increase their incomes, alternatively to intensifying their agricultural practices. Some of the crop fields and pastures have made way for oil palm plantations, although this is not a very popular practice in the *ejidos*. In Reforma, ecotourism offers an alternative source of income, but in both *ejidos* migration to cities or to the USA is a common phenomenon. All of these trends, though, have started (long) ago and can be seen as unrelated to the PES program. Although Natura Mexicana, through their role as technical advisor for the PES, promotes ecotourism in some other *ejidos* in MdC, in Chajul and Reforma villagers have started setting up alternative livelihood practices independently. This is driven by the imminent shortage of fertile land (and in Reforma by long agreed-upon conservation values) rather than by the PES program.

The processes unfolding in Chajul and Reforma show that the PES program alone does not bring about systematic change. First of all, the PES hardly seems to conserve additional forest cover. In Chajul, people explained that they enrolled forest parcels that they did not plan to use anyway, first and foremost because of low soil quality. In Reforma, the communal nature reserve had been agreed upon to be conserved long before the introduction of the PES program, thus causing the additionality of the PES to be zero. Second, there is evidence for the temporality of the conservation that the PES induces. In Chajul, landowners claimed to still consider expanding their ranch lands after the ending of their PES contracts, if they had a son wanting to inherit the (rights to) land. In Reforma this is not possible because the reserve has been officially certified to be protected. The temporality of the PES effects can nevertheless be seen here, as the PES benefits are hardly invested in the sustainable intensification of livestock production, nor in the development of alternative livelihoods. All in all, it can be said that the PES program has simply been 'fit in' with the many other institutions, traditions and practices that were already in place in these two *ejidos*, in ways that best fit the *ejidatarios.* This demonstrates that *ejidatarios'* agency, rather than structure (the design of the PES itself), would determine the outcomes of the PES in the *ejidos*.

4. Conclusion, discussion, and recommendations

4.1 Conclusion

In this study, I applied a process evaluation of the PES, through which I aimed to obtain a comprehensive understanding of the functioning and the effects of the PES program in two participating *ejidos* in MdC. As my results show, even though Chajul and Reforma have rather different formation histories, planning of land use, and economic activities, the introduction and effects of the PES program in both *ejidos* present some striking similarities. In this section, I will draw conclusions by answering the research questions that this study is based on:

1. What are the different social actors' views on the Payments for Environmental Services (PES) program in Marqués de Comillas?
2. How do beneficiaries work with the PES program?
3. What are the effects of the PES program in two participating *ejidos* in Marqués de Comillas?

4.1.1 What are the different social actors' views on the PES program in MdC?

The first research question has mainly been treated in chapter 2. PES beneficiaries are generally content with the program, primarily because of the (little) extra income it brings, and secondarily because many people welcome (or are at least neutral towards) the forest conservation that it promotes. In general, people view the PES as a subsidy for having and maintaining forested land; in Reforma, beneficiaries regard the PES as a government compensation and acknowledgement for the conservation efforts they had been doing for long.

Non-beneficiaries did not seem to be jealous of the PES income of fellow *ejidatarios. Pobladores* either did not know the program or said that it was not too much money the others received, and some held the opinion that conservation was indeed a good idea. *Ejidatarios* that do not have (enough) forested land to participate in the PES also seemed to be perfectly agreeable and not jealous of the participating *ejidatarios*. This is probably because those landowners are richer than average, exactly because they work all the land they have. Only one family I met in Chajul deliberately decided not to participate in the PES, and gave the aversion to governmental interference in their lives as an important reason.

The representatives of both Natura Mexicana and AMBIO seemed to be convinced of the benefits and necessity of the PES program. Natura Mexicana's representative, however, did stress a few program-related issues as considerable drawbacks of the PES. A representative of AMBIO was more critical in tone, though, as he emphasized the need to see the PES as an opportunity to invest in sustainable livestock intensification, because it would be a 'time bomb' to the forest if the PES money is simply used for household expenses.

Interestingly, I encountered no critical opinions in the field regarding the framing of nature as 'ecosystem services' or about the 'monetization of nature' that is much debated in academic literature (as discussed in chapter 1). Apparently, these issues are not striking nor seen as problematic by the inhabitants of MdC and the organizations working in the region.

There is, however, a range of program-related issues that many beneficiaries named when talking in more depth about the PES. The most important ones relate to the ending of the PESL-program for new contracts since 2015. This means that the PES benefits return to the 'normal' level of M$550/ha/yr., instead of the 'special' level of M$1,000/ha/yr. Next to that, the beneficiaries are obliged to reinvest 50% of the benefits in conservation- or alternative livelihood activities, and to report those activities back to CONAFOR. This leaves very little money to be spent 'freely' and this is the main reason for discontent among beneficiaries. Besides, many people said that the procedures related to making a PES application are complicated, and that there are several administrative issues concerning it. The NGO representatives said that according to them, those factors can be important reasons for *ejidos* to refrain from application. I observed that the presence of a motivating technical advisor (in these cases Natura Mexicana and AMBIO) and a competent PES representative in the *ejido* are essential to the functioning of the PES program.

In addition to these issues, both Chajul and Reforma seem to have organizational difficulties with the full execution of the required PES activities, such as making regular monitoring rounds and having a clear schedule for the maintenance of the fire breaks. Lastly, various beneficiaries (as well as non-beneficiaries) expressed some discontent with the functioning of the government and international actors. Some beneficiaries had the idea that the Mexican government diverts money from international donors that was destined for the *ejidatarios*. Besides, a few non-beneficiaries gave the dislike of governmental interference in their private lives as their main reason for non-participation in the PES (while they did claim to be conserving the forest on their land).

Overall, these complaints form the ground for some dissatisfaction with the PES in Reforma, although hardly anyone was outspokenly negative about the program (which may have been out of fear of losing the benefits). In Chajul, the general opinion about the PES is positive (despite these complaints), which is probably because most *ejidatarios* still receive the high benefits of the PESL program, and because they have the freedom to choose whether or not to re-apply for a new PES contract when the benefits will be lower. In Reforma, indeed, the *ejido* has no choice but to accept any level of PES benefit that CONAFOR is willing to provide, because their reserve is certified to be protected. So to *ejidatarios* in Reforma, not re-enrolling only means losing income.

The above-described program-related issues form the main problems as indicated by different actors. To many *ejidatarios* in Chajul, these issues play a role in the decision of whether to apply to the PES. This, it could be said, relates to a very basic measure of effectiveness of the PES: the level of participation. One could say that if CONAFOR, or the federal Mexican government in general, wishes to continue with the PES program in its current form, these above-named issues should at least be addressed to improve or maintain the current levels of participation. With this, one could think of increasing the level of the PES payments, simplifying the procedures for applications, and investing in capacity-building of local PES representatives and, for example, of fire brigades. However, I argue that because of the subsequent research question to be discussed, the PES program in its current form does not have the effect of

conserving additional forest cover on the long-term, and I would therefore not recommend the continuation of this program with only minor adjustments.

4.1.2 How do beneficiaries work with the PES program?

The second research question has been addressed in chapter 3. It seems that *ejidatarios* decide to participate in the PES if that does not change too much to their traditional livelihood activities. It could thus be said that the PES benefits are too low to prevent landowners to change their land use on the long term. Rather, *ejidatarios* 'fit in' the PES to their everyday practices in a way that is beneficial to them, by choosing to enroll plots that they were not planning to deforest in the next five years. At the same time, they continue to depend on extensive cattle ranching practices, the activity that forms the major threat to the remaining forest cover, according to different participants in this research.

The PES-related activities seem to be executed (more or less) adequately by the beneficiaries. Many justify their participation by the notion that they 'should do something back for the money they receive'. However, there is considerable discrepancy in different beneficiaries' accounts of how and how frequently these activities are done and in Reforma, one *ejidataria* admitted that the monitoring squad had not gone out for a while because of lacking funds. I assume that this is directly related to the ending of the PESL, which people in Reforma are quite upset about. Their 'retribution' for the near-halving of the benefits, it may be argued, could be this reluctance in spending the money on PES-related activities.

In both *ejidos*, I found that the way in which *ejidatarios* use the PES results in a lack of additionality; not much forest is conserved additionally to what would have been conserved otherwise. In Chajul, most beneficiaries said not to have planned to do anything with the PES-enrolled land anyways – at least not for the coming five or ten years. They gave several reasons for this. The main reason is that the *ejidatarios* identified the areas with highest soil fertility, which had therefore been cleared first. They explained that the areas that are still forested today, are often so because they are least fertile. Some had tried to sow maize there, but the low yield would not be worth the labor put in. Moreover, the grass that grows there would be too poor to fatten cattle.

Other reasons that landowners named for the continued presence of the forest cover in Chajul are the bad accessibility to those plots (a lack of roads); because there had been no need to clear-cut it (*ejidatarios* said they had a sufficient amount of land, and did not have so much of an 'entrepreneurial' spirit); and some gave a conservation ethics as a reason. Besides, *ejidatarios* with much (forested) land often own that as a form of savings – thus not intending to work it. Some landowners explained that if they would have wanted to use their land, they would simply not have enrolled it in the PES, because the opportunity costs – at least for a year or two – would be much higher. What the PES, then, does appear to do in Chajul is that it ceases the occasional firewood extraction from the enrolled plots, and it improves the execution of conservation activities such as the maintenance of fire breaks and monitoring against hunting, tree felling, and forest fires.

In Reforma, it is rather obvious that there is no additionality of conservation due to the PES program. Since the *ejido's* foundation and because of the exploitation by the ecotourism center, villagers have been

conserving 'their reserve' since long before the introduction of the PES. Besides, the reserve has recently been certified as a protected area by CONANP. In other words, *ejidatarios* have committed not to clear the land for 99 years – that means even if the PES benefits would stop. Nonetheless, it is important to note that this official certification was instigated by the PES program itself, as it secures ten points in the competitive PES application process. This suggests that the real effect of the PES program in Reforma is not that it additionally conserves forest cover, but that it makes sure that what is still there, is officially registered as being conserved. In other words, it creates a certain increased bureaucratic control related to forest conservation. Indeed, the same might be argued for the case of Chajul, where the additionality of conservation is similarly low.

Another result of how landowners work with the PES is the temporality of the conservation effects. Because deforestation is near-irreversible, a mechanism or system that ensures long-term conservation is essential. The PES program, however, does not do that: its contracts last for five years, after which beneficiaries have to re-apply, risking even to be rejected by CONAFOR. This possible rejection is caused by the fact that CONAFOR does not have sufficient funds to grant the PES benefits to all applications, and applicants are therefore in competition with each other for enrollment. In Reforma, some landowners expressed their consternation about having to re-apply every five years, even though CONAFOR knows that their reserve is officially protected for 99 years.

In Chajul, the short time-span of the contracts has a different effect. Many participants seem to make strategic choices about the enrollment of their plots. They would enroll their forested plots for as long as they are not planning to use it, or as long as conditions are favorable (given that they are changed by CONAFOR every few years). This often means that they would enroll their forested plots until a son – who wants to work his own land – would become eighteen. In other words, in *ejidos* like Chajul that have no internally agreed-upon conservation norms, the PES program does not seem to instigate long-term forest conservation, but *ejidatarios* rather profit from the program when they can afford to. Besides, the regular changes in payments and conditions do not provide the *ejidatarios* with a stable incentive to conserve their forest cover on the long term.

In both *ejidos*, there is also another issue that relates to the lack of long-term conservation effects of the PES. This is associated to the expenditure of the PES money. In neither of the two *ejidos*, much of the PES income has been invested in sustainable agricultural intensification or alternative livelihood practices. This suggests that any of the conservation effects that the PES has, are unlikely to extend beyond the timeframe of the contract. After all, *ejidatarios* and AMBIO's representative agreed that traditional expansion of the 'fattening' type of livestock production is the principle threat to the forest, and with the discontinuation of a PES contract (be it CONAFOR's necessity or the landowner's choice), ranchers will continue to rely on deforestation for the expansion of their production.

Since 2015, though, CONAFOR requires 50% of the PES benefits to be reinvested by the beneficiaries. CONAFOR provides a list of what activities are allowed to be invested in, and beneficiaries are required to report back about this to CONAFOR. This list consists primarily of conservation activities and secondarily of suggestions to develop alternative livelihoods (which are mainly focused on ecotourism). Investments for the sustainable intensification of agriculture and livestock production are, however, not mentioned, even though this is what mainly interests the *ejidatarios*, is most closely related to their everyday activities,

and is what can effectively relieve the pressure on the forest. AMBIO's representative went as far as to call the PES program that does not promote the sustainable intensification of livestock production a "time bomb".

Next, it should be considered how these results of the temporality and lack of additionality of the PES come about. I argue that these outcomes can be understood if we consider how the PES program interacts with other aspects of the life worlds of *ejidatarios*. Indeed, in line with the reasoning of Long and Van der Ploeg (1989), the PES is not a discrete 'project' in time and space, that *ejidatarios* relate to separately from their other considerations in life. Land-use planning and traditional livelihood practices (mainly crop cultivation and cattle production) have historical origins, and the introduction of the PES program in the region clearly does not seem to have 'overridden' these practices, but rather interacts with them.

To landowners, the PES is a voluntary monetary incentive to conserve their forested land. In the operationalization of the program, or in *ejidatarios'* decisions of whether and how to work with this program, they will consider what consequences it may have to their current and future livelihood activities, how profitable it is in comparison to other subsidies (in this case from another ministry, specifically the 'PROAGRO' and 'PROGAN' subsidies), their historical interactions with (and trust in) governmental bodies, and possibly with many other factors. In Reforma, for example, the interrelatedness of the PES and the internally agreed-upon conservation norms leads to an overt lack of additionality of conservation, while the interrelatedness of the PES and the ecotourism center greatly decreases the additionality of the conservation activities executed by PES beneficiaries. In Chajul, the interrelatedness of the short time-span of the PES contracts, the imminent ending of the PESL, and many boys' interest in becoming ranchers like their fathers, leads to the clear temporal effect of the PES.

Overall, it could thus be said that the PES does not lead to the systematic change that is required to stop land-use change on the long term. Because it is a sectoral approach, that does not (fully) acknowledge its interrelatedness with other aspects of villagers' life worlds (especially with agricultural practices), it results that the PES may conserve many hectares of forest on paper, but that the additionality and permanence of that conservation are negligible.

This conclusion thus shows that actors are not simply or directly influenced by an introduced institution (as is assumed in mainstream Institutionalism), but rather that they have the agency to assess the situation and to organize their response. This goes further than the decision of whether to apply to the PES or not; it involves choosing which plot(s) to enroll, for how long, whether and how to execute the required PES-related activities, and how to spend the benefits. Indeed, the results of this study show that *ejidatarios* have both the knowledge and capacity to make the PES work to their benefit in the first place, and to the benefit of the to-be-protected ecosystems in the second.

Besides the *ejidatarios*, also the PES' technical advisors have agency. Even though the advisor from Natura Mexicana (working in Chajul) and the one from AMBIO (working in Reforma) have the same task to support the *ejidos* in their implementation of the program and to monitor their compliance, the two technical advisors hold dissimilar views on the PES. While Natura Mexicana holds the long-term vision of developing ecotourism in the region, AMBIO does not see that as a solution and tries to convince CONAFOR to include livestock investments in the list of options for reinvestment. This difference in visions has effects on how

the technical advisors support the PES beneficiaries, and therefore on the effects of the program. I argue that this is a result of the agency of the technical advisors.

However, the argument of actors' agency does not claim that the structure of the PES does not have any influence at all. For the landowners, it adds to the institutions already in place in MdC, and thereby affects the options that they have in their land-use decisions. A clear effect of this is the immediate slow-down of the deforestation rate in Chajul after the implementation of the PES. Apparently, at least on the short term, applying to the PES seems to be a beneficial choice to many *ejidatarios.* Lastly, besides the influence of structures and agency, this study shows that contingencies and straightforward material constraints (such as low soil fertility in specific areas) also play an important role in *ejidatarios'* land-use decisions.

4.1.3 What are the effects of the PES program in two participating *ejidos* in MdC?

So far, I have concluded that the stated goal of the PES ("…to promote the conservation and sustainable management of ecosystems, and to promote the long-term provision of environmental services") is not being reached by the PES, or at least not additionally to what would have been the case in the absence of the PES program. That is not to say, however, that the PES does not have any effect at all. The conservation-related activities required by the PES seem to be executed better and more frequently than before the introduction of the PES, according to many landowners. Besides, because I performed a process evaluation, I have also investigated any unintended effects that the program might have in MdC.

An important effect that the PES program has, and which should not be overlooked, is that there is now a formal registration of the forested plots being conserved. Before, only the owners of the parcels had an idea of what parts of the forest were designated for their son's inheritance, what land was a 'saving', and what soil too infertile to be worked. To an outsider, it would therefore be completely uncertain whether and what parts of the forest cover would be conserved. With the introduction of the PES, however, every to-be-enrolled plot is delineated, visited and judged by the technical advisor, and officially registered to be conserved for the next five years. Besides, CONAFOR gains control over what is (i.e. the creation of fire breaks) and what is not (i.e. the felling of living trees) being done on these parcels.

In other words, the bureaucratic control over what *ejidatarios* do with their forested land has increased as an effect of the PES. As an alternative to powerlessly seeing the forest cover of MdC decrease every year through satellite images, CONAFOR now has some assurance of the conservation of certain plots, and is legitimized to audit that conservation. Also the view that landowners themselves have of their forested plots seems to be somewhat affected by this official registration. What used to be considered as 'unworked land' or 'just nature', is now labelled a 'PES reserve' and thus became 'something'. Clearly, this change took place primarily on paper; not much has changed physically on the land.

Another indication supporting this conclusion is that in CONAFOR's point system (for applicants' competition to enter the PES), approved forest certification and/or "property planning and monitoring" documents (P-PREDIAL) are highly rewarded (see annex 1). It could be argued that the legal certification of a protected forest effectively lowers the deforestation risk to zero, and with that, eliminates the necessity of the PES benefits to ensure conservation. Nonetheless, the PES actually promotes official

documentation, registration, certification and approval, indicating that the increase of bureaucratic control over conserved land (and not conservation itself) may be the most important effect of the implementation of the PES program. This may or may not have been the intention of CONAFOR; the data of the current study does not allow for conclusions to be drawn on that matter.

By having performed a process evaluation that allows for an understanding the situated practices of the *ejidatarios* (as described in chapter 3), and that acknowledges the role of actors' agency, I have shown that *ejidatarios* fit the PES into their livelihood strategies so that it costs least effort or other kind of 'loss'. This results in the PES seemingly not bringing about any real change (in terms of nature conservation) apart from the actual signing of the contract. It can thus be said that the registration and documentation that are necessary for the PES to be implemented are, in fact, the main effects of the program in Chajul and Reforma. I argue that a 'classic' policy evaluation is unlikely to draw such a conclusion, as it takes the bureaucracy related to the implementation of a program for granted.

4.2 Discussion

As discussed in chapter 1, McAfee and Shapiro (2010) explain that the PES was introduced in Mexico as a hybrid of a market-like instrument and government regulation. The authors argue that the original free-market logic of the PES was negotiated because of Mexico's tendency for strong state control as well as peasants' opposition to neoliberal restructuring. Besides, McAfee and Shapiro (2010) argue that the neoliberal environmental discourse (promoting the monetization of nature) clashes with local peasants' more integrated view of nature and society. The current study, however, did not find this divergent view among *ejidatarios*. The interviewed villagers and NGOs seemed to find the monetary expression of nature and its services not problematic, contrary to the critiques of Büscher et al. (2012) and Turnhout et al. (2013). One beneficiary in Chajul in fact argued that a free market mechanism for environmental services would be better than the current system, because he thought that much money destined for conservation was lost at different governmental levels, and that this would not be the case with a direct market mechanism for the PES. Overall, my findings are thus not in accordance with McAfee and Shapiro (2010), although further research into local views on the human-nature relationship is needed to propose explanations for this.

The outcomes of this study contribute to the argument of Critical Institutionalism in the debate on the role of institutions in actors' decisions. While I acknowledge that landowners are influenced by the introduced institution (the PES), in the sense that it provides them with a monetary incentive to conserve their forest cover, this does not fully dictate landowners' behavior. Rather, I showed that landowners have agency to take decisions of whether to apply to the PES, with which plots, and when, depending on many other factors besides the monetary incentive of the PES. In line with De Koning and Cleaver (2012), I contend that the outcomes of the PES may be very different in other localities, due to the different circumstances interacting with the implementation of the PES. De Koning and Cleaver (2012) show, in line with Critical Institutionalism, that similar institutions can lead to very different outcomes in different settings. I therefore stress not to extend my findings beyond MdC, as I concede that the PES may have different effects in regions as close as the highlands of Chiapas.

Authors that suggest improvements in the design of the PES that would increase the likelihood of the PES to reach its professed goals (Milder et al. 2010; Muñoz-Piña et al. 2008; Pagiola 2007; Pattanayak et al. 2010; Wegner 2016; Wunder 2005) seem to base themselves on mainstream institutional thinking; they assign problems to policy design flaws or other structural causes, because they investigate the PES from a macro- or structural perspective. As Behagel (2012) argues relating to participatory institutions: "[authors] who ascribe all the outcomes, successes and failures of public policy making to institutional design […] fundamentally misunderstand the nature of policy practices" (Behagel 2012: 145). I agree with this, in that it is crucial to take the way in which the landowners put the PES into practice into account, if one aims to provide a comprehensive explanation of the PES effects.

I argue that the current study draws different conclusions than those of Milder et al. (2010), Muñoz-Piña et al. (2008) and Pattanayak et al. (2010), exactly because I scrutinize the way in which the policy is put into practice. Indeed, I contend that improvements to the PES could be made to address, among other things, the program-related issues discussed. However, a focus on these issues may overlook the importance of the interrelatedness of the PES with other aspects of landowners' lifeworlds, as well as the role that agency plays in the effects of the PES. I argue that minor adjustments to the PES will not lead to long-term additional forest conservation, but that structural changes need to be made (see recommendations in 4.3).

Many other social scientific studies evaluating the effectiveness of the PES start (and often end) by investigating factors that promote farmers' participation in the program (Bremer et al. 2014; Kosoy et al. 2008; Pagiola et al. 2005). Although the findings of the current study do not contradict those of the above-mentioned authors, I do argue that a focus on participation is too short-sighted. It assumes the positive (additional and lasting conservation) effects of the policy, and therefore that a higher the level of participation means more 'saved' forest cover. I contend, based on the data of this study, that this assumption is a great simplification. There is no 'pre-PES condition' in which all forest is under the threat of imminent destruction, after which the PES is introduced and everything is saved – if only all landowners would participate. The current study shows that farmers' realities are much more complicated than this, because the PES program is interrelated with many aspects of actors' everyday lives. Even when landowners participate, as this study shows, this does not mean that additional forest cover is conserved in any lasting way.

Comparing the results of the current study with those of the 'classic' type of policy evaluation by Alix-Garcia et al. (2012) shows that the outcomes are consistent to a large extent. In their comparison of participating and non-participating *ejidos* and private landowners (aiming to have a 'control group'), they find a moderate 'avoided-deforestation' impact of the program using satellite data, while also reporting no significant differences in agriculture and livestock production livelihoods between participants and non-participants. Although the findings of the current study are in accordance with this, Alix-Garcia et al. (2012) draw very different conclusions. They state that it is "reassuring" that the PES "largely preserved livelihood strategies that would have been chosen in the absence of the program." In other words, the authors claim that it is positive that PES beneficiaries continue to rely on the same economic activities as before the introduction of the PES or as non-beneficiaries. The authors thus recommend only minor changes to the PES, mainly regarding the targeting of high-deforestation-risk plots (Alix-Garcia et al. 2012).

I disagree with this conclusion and recommendation, as I argue that it is exactly those 'preserved livelihood strategies' that cause farmers to continue to depend on deforestation for economic improvement. Applying a narrow vision of nature conservation that does not take other aspects of actors' livelihoods into account (or that even promote the continuation of traditional production methods) is, to my opinion, what makes the PES no more than a temporary 'palliative' to land-use change. Rather than addressing the root of the problem, it makes the current situation more bearable; much like the working of a painkiller as opposed to changing to a healthier lifestyle.

Comparing the outcomes of this study to the satellite-image data of Costedoat et al. (2015), also shows mostly consistent results. For example, Costedoat et al. (2015) report a significantly higher deforestation risk for non-PES enrolled parcels than for those that are enrolled in the PES. My findings are consistent with this, as *ejidatarios* told that they enrolled parcels that they were not planning to deforest. From this, I induced that there is low additionality, and Costedoat et al. (2015) estimate that the additionality of the PES is around 13% (using a hypothetical baseline). Interestingly, though, they call this level of additionality high. The authors conclude, nevertheless, that the PES has been insufficiently effective to halt deforestation in MdC, and that additional measures are needed. They argue for a comprehensive conservation and development strategy; a proposal that I endorse, and will elaborate on in the subsequent section (4.3).

The conclusion that the main effect of the PES in MdC is the increased bureaucratic control over conservation efforts, shows interesting parallels with Ferguson and Lohmann (1994). They argue that the principle effect of a multitude of development interventions in Lesotho is not poverty alleviation (their professed aim), but the introduction or intensification of bureaucratic or governmental control in remote localities. Similar to the case of preventing deforestation in MdC, poverty alleviation in Lesotho requires systematic change involving a wide range of aspects. A specialized and issue-specific 'project' (whether this is the avoidance of deforestation or poverty alleviation) seems more often than not to fail to achieve its goals, while introducing bureaucracy-related aspects such as local state control (Ferguson and Lohmann 1994) or the official documentation of conservation (this study). Whether this is the intention of the designers and implementers is open to debate, although I presume it to be an unexpected effect in the case of the PES in MdC.

Next to this, Ferguson and Lohmann (1994) argue that development projects transform political issues such as employment, resources and land as technical 'problems', in need of technical development interventions. Ferguson therefore named development interventions "anti-politics machines" (Ferguson and Lohmann 1994: 232). A discussion of whether this might be the case, too, with the PES as a technical 'conservation intervention', directs the focus to the field of political ecology. Indeed, it can be argued that the complexity of farmers' land-use is, at least in part, a political matter. The PES, or any other conservation strategy for that matter, would reduce that complexity to a simple dichotomy of either conservation or utilization. Besides, a governing body (in this case CONAFOR) would dictate through which technical activities that conservation is to be achieved (in this case the PES-related activities). However, I suggest that in order to substantiate the argument that frames the PES as an "anti-politics machine", further research in this field, with a specific focus on political ecology, is needed.

The application of the AOA has been essential, I contend, for the three conclusions of the present study to be drawn. The AOA argues for the analysis of government interventions on the micro-level: the perspective of the local actors that 'live' the policy or program in their everyday lives. From this perspective, it is apparent that no intervention is a discrete 'project' in space and time, but rather that it is interrelated with many other aspects of actors' lives. Applying this approach shows that seeing the PES as the only (and new) incentive for *ejidatarios* to conserve the forest (and thus that the past absence of it was the cause of deforestation), is a great simplification. Indeed, how landowners work with the PES proves to be related to (among other things) their need for land to increase production, to the availability of agricultural subsidies, to their sons' aspirations for the future, to the contact they have with (the persuasive messages of) governmental and non-governmental organizations, to the norms of the *ejido* concerning land use, and to past experiences with CONAFOR or governmental bodies in general. I argue that any research approach that is not specifically actor-oriented is likely to miss out on these findings and will draw unwarranted conclusions.

Overall, this study contributes to the existing literature by presenting a process evaluation of the PES, that did not aim to label the PES a 'success' or 'failure', but rather investigated the local effects of this policy. The results (temporality and a lack of additionality) add to social scientific literature on the topic – and especially to those based on 'classic' types of policy evaluation (e.g. Alix-Garcia et al. 2012). The objective of this study – to present a thorough understanding of the effects of the PES in MdC – can be said to have been achieved by the conclusion that the main effect of the PES has been the increase in bureaucratic control over conservation efforts (rather than inciting conservation).

4.3 Policy recommendations

The conclusion of this study suggests that a sectoral and voluntary conservation program such as the PES will not do much more than officially registering what is being conserved, rather than actually instigating conservation. I therefore disagree with many of the above-mentioned authors that that PES can be improved with specific minor adjustments. Increasing payments or simplifying the application procedure may indeed increase participation numbers, but it is unlikely to incentivize *ejidatarios* to lastingly conserve additional forest cover. A small adjustment of the PES that *would* increase its effectiveness, I contend, is to allow the 50% of the PES benefits that *ejidatarios* are required to reinvest, to be spent on the sustainable intensification of livestock production. In that way, a first step can be made in tackling the cause of deforestation, rather than treating the symptoms.

However, full acknowledgement of the interrelatedness of forest conservation with land-based livelihood practices as well as with other aspects of the everyday life of *ejidatarios* suggests a somewhat more 'radical' policy recommendation. I propose that if the lasting conservation of the remaining forest cover of MdC is to be taken in earnest, conservation should become an important topic in the policies of different sectors, rather than the single topic of a separate program – such as the PES.

The most obvious link with nature conservation policy is that of agriculture- and livestock policy. Nature policy in Mexico is under the responsibility of the ministry SEMARNAT, while agricultural policy is governed by another ministry: SAGARPA. Practically, this means that while SEMARNAT provides landowners with

financial support to protect the forest cover, SAGARPA gives subsidies to productive farmers, cattle ranchers and oil palm cultivators. Not only are those incentives contradicting, choosing for either one of them, as an *ejidatario*, will lead to suboptimal outcomes for the *ejidatario's* income, the forest, or both.

As an alternative, an example may be taken from the strategy of Corredor Biológico, the government organization described in subchapters 3.1.1 and 3.1.2. Integrating both environmental and farmers' concerns, they offer conditional financial and practical support in sustainably intensifying agricultural and livestock production. One of the conditions to receive support is that farmers conserve the forest cover on their land. Through the silvo-pastoral system of production that Corredor Biológico promotes, forest conservation and livestock production become integrated, with the aim that ranchers are no longer reliant on the clear-cutting of plots to increase their production. This can be an economically and ecologically sustainable solution for MdC.

Besides, possibilities for the diversification of livelihood activities should be explored, so that the population of MdC is less directly land-dependent for its local economic development. Besides considering tourism or (unintentionally) promoting migration, there seems much to be gained in diversifying small-scale local industry. I recommend further investigation into the possibilities for diversifying employment in the region. Lastly, I argue that also adjustments in education policy are necessary for a comprehensive nature conservation strategy. Improving general education in the *ejidos* increases the number of the next generation's options for economic activities, and environmental education specifically can promote awareness of the global problems of declining biodiversity and climate change.

All in all, I argue that nature conservation is not a discrete sector or field that can be stimulated by paying landowners to 'do it'. Rather, it requires a change in the system of *ejidatarios*' livelihood practices; this involves many domains besides the actual conservation practices. Building artificial nests to stimulate the breeding of the endangered scarlet macaw, but at the same time clear-cutting a hectare of old-growth forest to keep one extra head of cattle, defeats the point of conservation, in my view. As this study shows that the PES in MdC does not instigate long-term additional forest conservation, I recommend the serious consideration of an integrated cross-sectoral policy that promotes the systematic change that is needed to avoid further land-use change in the Lacandon rainforest.

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Annex 1

Table of the point system for PES applicants. Copied and translated from: Comisión Nacional Forestal (2015: 24)

Criterion type	General priority criteria	Score
P-PREDIAL[2]	Approved P-PREDIAL.	10
Social	*Ejidos* and communities that have never received support from CONAFOR.	7
	Agrarian population or with indigenous population.	4
	The individual applicant is female or the group of applicants integrates women in its representative body.	4
	The individual applicant is young or the group of applicants integrates young people in its representative body. People in the age range between 18 and 25 years are considered young.	4
	Application located in a municipality of the 'Crusade against Hunger'[3].	7
	The applicant is or has been a beneficiary of the program OPORTUNIDADES or PROSPERA[4].	5
Forest Management	Current forest certification.	10
	Current certificate of adequate compliance to the Program of Forest Management for timber or non-timber forest products.	5
	Preventive technical audit or certification of good forest management in process.	2
	Awards or recognition in environmental and forestry matters.	2

[2] P-PREDIAL ('Programa predial de desarrollo integral de mediano plazo', or 'Property program for integral medium-term development') is the technical planning and monitoring document that identifies and describes the necessary steps to ensure the protection, conservation, restoration and sustainable use of forest resources and, where appropriate, the own actions of other sectors that are required to promote the development of the property, with the participation of the owners and/or holders of the forested land, thus contributing to the socioeconomic development of it, and at the same time allows CONAFOR to monitor and improve the efficiency and effectiveness of the implementation of the support it grants (Comisión Nacional Forestal 2015: 8)

[3] The '*Cruzada contra el Hambre*' ('Crusade against Hunger') is a government-sponsored program to fight hunger and poverty through social intervention.

[4] OPORTUNIDADES or PROSPERA are names for a social welfare program that makes payments to poor families in exchange for regular school attendance, health clinic visits, and nutrition support.