LABOR AND TERRITORY IN PAYMENTS FOR ECOSYSTEM SERVICES IN ECUADOR'S ANDES

A Dissertation

by

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ABSTRACT

This dissertation investigates how a market-based mechanism for water and biodiversity conservation generates value from ecosystem services, rendering them as a recognizable commodity to be exchanged in a market. Through a case study of a watershed payments for ecosystem services (PES) scheme in Ecuador called *Fondo del Agua* (FONAG), I examine the social constitution of value, and ask how changes in labor restructure socio-spatial relations, produce new territories, and modify how communities use their environment. This dissertation follows the interconnections FONAG has forged between the city and the countryside, particularly at the perceived sites of ecosystem service production. I employ participant observation, key informant interviews, walking tours of FONAG's intervention sites, and key document collection to analyze the function of FONAG and its project design, community enrollment, and project implementation. I demonstrate how FONAG targets local land use and labor arrangements to implement the PES scheme, and argue that PES arrangements necessarily invoke new forms of territorialization focused upon geographically grounded ecosystem services. The combination of labor and territorial processes co-produces value within PES programs by providing a proxy for an otherwise ficticious commodity. This dissertation advances literature in environmental governance and political ecology by addressing the existing gap on the labor processes entailed in producing value from newly defined commodities. It contributes to academic debates surrounding market-based and multi-partner governance through critical analysis of socio-spatial processes

attending labor reconfiguration, and it provides data on an increasingly popular model of environmental governance.

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NOMENCLATURE

CAMAREN	*Consorcio de Capacitación para el Manejo de los Recursos Naturales Renovables* (Consortium of Training for the Management of Renewable Resources)
COSUDE	The Swiss Agency for Development and Cooperation
DMQ	*Distrito Metropolitano de Quito* (Quito's Metropolitan District)
EEQ	*Empresa Eléctrica de Quito* (Electric Company of Quito)
EPMAPS	*Empresa Pública Metropolitana de Agua Potable y Saneamiento* (Metropolitan Public Company of Potable Water and Sanitation)
FONAG	*Fondo para la Protección del Agua* (Fund for the Protection of Water)
FFLA	*Fundación Futuro Latinoamericano* (Latin American Future Foundation)
GIS	Geographic Information Systems
IEDECA	*Instituto de Ecología y Desarrollo de las Comunidades Andinas* (Institute of Ecology and Development of Andean Communities)
IERAC	*Instituto Ecuatoriano de Reforma Agraria y Colonización* (Ecuadorian Institute of Land Reform and Colonization)
INEFAN	*Instituto Ecuatoriano Forestal y de Áreas Naturales y Vida Silvestre* (Ecuadorian Institute for Wildlife and Natural Areas)

MAE	*Ministerio del Ambiente del Ecuador* (Ecuador's Ministry of Environment)
NGO	Non-Governmental Organization
PES	Payments for Ecosystem Services
PiP	Parks in Peril
RECAY	*Reserva Ecológica de Cayambe-Coca* (Cayambe-Coca Ecological Reserve)
SUBIR	Sustainable Use of Biological Resources
TNC	The Nature Conservancy
USAID	United States Agency for International Development

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

1.1 ORIGINS

I began my search for dissertation topic with the intention of studying a biodiversity conservation intervention in Latin America. This decision was relatively easy, as I entered the doctoral program with Department of Geography at Texas A&M University as a trainee of the Applied Biodiversity Science program. My search for a project was further narrowed by my desire to study a topic that had strong ties to the United States. I therefore began looking for a project by perusing the United States Agency for International Development (USAID)'s website about their conservation programs.

I came across a short narrative describing USAID's biodiversity conservation initiative in a market-based watershed protection program in Ecuador. It described a scenario in which a rural woman had been given guinea pigs for her efforts in removing cattle from the fragile, highly biodiverse humid grassland ecosystem that was responsible for the bulk of Quito's water supply. The narrative portrayed the program, known as *Fondo para la Protección del Agua* (FONAG) as supporting rural culture and providing economic opportunity while simultaneously addressing the burden of conservation by providing a 'sustainable alternative' to agricultural activities that damaged the fragile, hydrologically important and ecosystem. This program translated into a direct impact on human lives as well as the environment.

I developed further interest when I found that FONAG's design was inspired by New York City's watershed conservation program. Furthermore, internationally influential organizations such as the United Nations Environmental Program (UNEP) had declared FONAG as a conservation success story for both biodiversity and water resources (UNEP 2011). The first of its kind in Latin America, FONAG set the precedent in the region as a model of market-based conservation called a 'water fund' (Goldman-Brenner et al. 2012). The Nature Conservancy (TNC), a large, international organization focused on biodiversity conservation, built a campaign to replicate the program throughout the region. In 2011, TNC spearheaded a partnership between the Inter-American Development Bank (IDB), FEMSA Foundation, the US$27 million with the purpose of replicating the fund throughout the region (FEMSA 2015). FONAG's reach has also extended outside of Latin America to inspire program proposals in countries such as South Africa and Madagascar (Wendland et al. 2010).

However, the more I read about the successes and influence of the program, the more I noted that only anecdotes existed about the impacts of the program, but there had been no research studies on what the programs were doing in rural communities. I then found an article by Diehn (2005) describing how one rural community rejected involvement with FONAG and preferred to continue managing the land without external involvement with the organization. With so many circulating narratives of FONAG that emphasized its benefits to rural communities, I was surprised to see an account of a community rejecting it. It occurred to me that the integrity of FONAG hinged on the communities agreement to frame their conservation practices as labor that was motivated

through an incentive mechanism. Thus began my research on FONAG. I wanted to further understand the 'work' involved in producing ecosystem services.

To more thoroughly introduce the organization, FONAG began in the year 2000 when Ecuador's growing capital city, Quito, partnered with The Nature Conservancy to initiate a market-based arrangement for watershed conservation. Water-users in Quito, a mixed assortment of NGOs and public and private companies, pay into a trust that funnels to an organization called *Fondo para la Protección del Agua* (FONAG). FONAG uses the interest on watershed conservation initiatives to protect the city's water supply. FONAG supports development projects, such as small animal husbandry or ecotourism, in the rural communities to reduce pressure upon and protect ecosystems of hydrologic importance. The projects are designed serve as an economic incentive for communities to engage in conservation practices that require the input of labor and the re-arrangement of land uses.

FONAG's arrangement, broadly known as a 'water fund,' is one in which downstream urban water-users (consumers) pay into a fund that is applied towards the conservation work of rural communities (producers) living in and around ecosystems responsible for the quality and quantity of water flowing to the city. Water funds are a form of Payments for Ecosystem Services (PES), a voluntary transaction in which payments from ecosystem service consumers are made to producers for compensation of their conservation activities in and around the sites of ecosystems generating the services, in an effort to secure those resources (Goldman-Brenner et al. 2012). PES projects provide financial incentives to land owners or resource managers for

implementing conservation actions that they would not have otherwise adopted (Sommerville, J.P.G., and Milner-Gulland 2009). Water funds, then, are aimed at directing human interaction with the land and natural resources, and thus an environmental governance mechanism for watershed conservation.

1.2 THEORETICAL UNDERPINNINGS

I have introduced FONAG as an arrangement of PES and I interrogate this mechanism within this dissertation. In this section, I present the theoretical underpinnings of PES and how its current definitions relate to FONAG's. Then, I examine critical literature on PES and indicate the contributions of my research.

PES is based upon neoclassical economic theory and usually presented by economists as a Cosean market solution to externalities (Engel, Pagiola, and Wunder 2008; Van Hecken and Bastiaensen 2010). In this framework, the problem of environmental degradation is a result of a lack of valuation. Ecosystem services are externalities; they are not taken into account in economic decisions because they provide benefits that are not economically valued. PES arrangements, then, are based on the premise that that adding capital value to previously ignored ecological elements will ultimately protect them (Vatn 2009). If environmental services are defined and given a discrete economic value, then they can be incorporated into the market-economy and thus correct the market failure that leads to environmental degradation.

FONAG's 2009 Strategic Plan explicitly identifies the arrangement as a PES, although the document does not give a formal definition of PES. A widely cited

definition of PES comes from Wunder (2005), stating that a true PES scheme must incorporate five components: 1) it is a voluntary transaction 2) there is at least one 'buyer,' 3) there is at least one 'provider,' 4) the environmental service (or land use contingent on securing that service) is well defined, and 5) there is conditionality in that the payments continue as long as the provider continues the provision of service. Very few arrangements labeled as PES meet all of the tenets in practice (Engel, Pagiola, and Wunder 2008; Wunder 2007). Southgate and Wunder (2009) specifically identify FONAG's scheme as a 'PES-like' arrangement by asserting that it lacks conditionality.

Goldman-Brenner et al. (2012) critique the equal weight given to all of Wunder (2005)'s tenets of PES, arguing that a definition of PES should emphasize the use of a financial incentive. Thus, the authors discuss FONAG and its water trust fund model as covered under the PES umbrella even though it does not meet a strict interpretation of Wunder (2005)'s tenets. Similarly, Kosoy and Corbera (2010) drift from Wunder (2005)'s definition to contend that PES schemes are fundamentally identified in through elements that include 1) a defined ecological function that is subject to trade, 2) a unit for exchange, and 3) the existence of demand and intermediation flows between ecosystem service buyers and sellers. Based upon the conceptualizations, FONAG's arrangement fits within PES.

According to the economic theory underlying PES, this market approach would be the most efficient means to moderate people's actions by eliminating transaction costs present in other types of governance systems. Wunder (2007) suggests that this system would be particularly beneficial in countries where systems of command-and-control

governance is not a functional option. Proponents of PES label it as a socially-just alternative to protected areas, in that it is a voluntary way to bring about conservation while compensating those who bear its costs, thus lessening the potential for social and political conflicts over resource allocation (Ferraro 2001; Frank and Muller 2003).

1.2.1 Neoliberal Environmental Governance

PES is ultimately an environmental governance configuration. Environmental governance is both a social arrangement for decision-making about the environment and a mechanism that produces a particular social order through environmental management (Liverman 2004; Ekers and Loftus 2008; Lemos and Agrawal 2006; Corson 2010; Himley 2008). All natural resource management models, including PES schemes, can be considered arrangements for environmental governance intended to direct human interactions with their environment. Because they operate within a political and social arena, they are infused with power relationships, thus making environmental governance arrangements a standard topic in political ecology literature (Sanderson and Bird 1998; Bates and Rudel 2000; Bridge and Perreault 2009).

Critical literature typically considers market-based environmental governance, including PES, as part of a larger shift towards directing people's interactions with nature and natural resources according to a neoliberal ideology (Igoe and Brockington 2007; Bakker 2010; McAfee and Shapiro 2010). This ideology asserts that the market is naturally efficient and impartial. Left to operate freely, markets will self-regulate at an

optimal level and consumers and producers will achieve Pareto optimality, or a harmonious situation that maximizes benefit to all.

Many authors criticize neoliberalism as having become apoliticized to the point of 'common sense' (Peck and Tickell 2002; Li 2007b; Prudham 2004). Neoliberalism has:

> "become a frame of mind, a cultural dynamic, an entrepreneurial personality type, and a rule of law that penetrates into the most intimate relations people have with each other, state apparatuses and their natural environments" Goldman (2005:8).

Some authors assert that neoliberalism is undoubtedly hegemonic (Perreault and Martin 2005; Perreault 2005; Goldman 2005; Corson 2010; Buscher 2012). Yet, others question the assertion of neoliberalism as a hegemonic force (Bakker 2010; Duffy and Moore 2010; Castree 2008; Shapiro-Garza 2013; McAfee and Shapiro 2010). Neoliberalism, it seems, can be challenged, hybridized, and reshaped in context specific processes (Shapiro-Garza 2013; Duffy and Moore 2010).

Neoliberalism is associated with practices of privatization, marketization, state deregulation, market-friendly reregulation, market-proxies within the state-sector, individualization, and the creation of voluntary 3rd party mechanisms that fill new gaps in state functions (Castree 2010). However, a key feature of neoliberal conservation, particularly to new environmental governance arrangements of PES, is the commoditization of nature (Kosoy and Corbera 2010; McAfee and Shapiro 2010; Robertson 2000, 2006). This commodification is based on the premise that nature can

only be saved if submitted to capital and revalued through capitalist terms (Buscher et al. 2012).

An object needs to become a commodity in order to be owned and exchanged and thus incorporated into a market. Castree (2003, 282) identifies six elements that are necessary to make a commodity: 1) privatization which enables control, 2) alienability (can be separated from the seller, 3) individuation (can be separated from its supporting context) 4) abstraction (its particularities are erased) 5) Valuation, (monetization) and 6) Displacement (appears as a 'thing' rather than a set of relations). Brockington (2011) asserts that ecosystem services are circulated as ficticious commodities, meaning that they are intangible. Ultimately, ecosystem services are "value-bearing abstractions of physical processes" (Robertson 2012, 387). Although one could hold water, for example, one cannot hold the invisible place-based ecological mechanisms that keep water flowing to the city of Quito.

Despite the ficticious nature of new commodities of PES, ecosystem services are geographically located and they have further implications in terms of territory. Peluso and Lund (2011) argue that the commodities created through PES environmental governance schemes are now objects for accumulation, and can thus be a mechanism to appropriate territory. As PES arrangements set up a new scheme of environmental governance, it necessarily requires a new form of territoriality – the control of land within a provision region of ecosystem services.

1.2.2 Territoriality

Neoliberal conservation literature, in which the PES arrangement is included, tends to focus on how conservation arrangements create spaces of reregulation and produce new types of values that are then captured by national and transnational elites (Igoe and Brockington 2007). This involves the processes of how environmental priorities are used to justify enclosure and appropriate land, resources, and 'new' commodities from nature. This system is called 'green grabbing', and includes "the restructuring of rules of authority over the access, use and management of resources, in related labor relations, and in human-ecological relationships" (Fairhead, Leach, and Scoones 2012, 239).

This restructuring of rules and authority does not necessarily include the complete alienation of land from prior claimants. Overall, it entails land control, of which territorialization, or the practice of claiming and managing space as it is carried out by states and other entities (Sack 1986; Vandergeest and Peluso 1995), is a central part. The claim to territory can be collaborative, including institutional alliances working to control space by claiming the power to govern over it (Vandergeest and Peluso 1995; Peluso and Lund 2011). The process of claiming therefore extends beyond land and resources to authority that demands recognition from competing claimants (Sikor and Lund 2009; Corson 2011).

Knowledge of how conservation territories are forged and maintained is largely founded in Vandergeest and Peluso (1995, 385)'s work on 'internal territorialization,' in which the state directs the process of gaining control over "natural resources and the

people that use them." The process includes delineating land boundaries, allocating rights, and designating the rules of resource use (Vandergeest and Peluso 1995). While authors have re-theorized internal territorialization many times since that seminal work, theory on the process of internal territorialization under neoliberal influences is only lightly addressed within the literature.

Corson (2011) adds to the theory of internal territorialization by addressing its process under the influence of neoliberalism. Asserting that the creation of protected areas always involves the process of territorialization, regardless of the degree to which local populations are included or excluded in park management, she demonstrates that the state can act as a vehicle for transnational actors to claim and manage land for conservation. In particular, she emphasizes that the process of territorialization extends to claims for authority to legitimate involvement in constructing policy regarding land and natural resource use. In her conceptualization, the entity of the state lends the authority needed for these organizations to engage themselves in the territorialization process. Corson's work expands theory on internal territorialization in the neoliberal era with a new conceptualization of the role of the state among transnational conservation organizations. Her focus suggests that the state must always play a visible and critical role in internal territorialization. Corson (2011)'s scope on neoliberal territorial processes, however, is limited to the establishment of a protected area.

Yet, conservation territories do not always come in the form of legalized protected areas. Particularly in Latin America, states have been weak in effectively territorializing protected areas. While conservation has a long history in a state-led

centralized form of territorial control, these trends began to change in the 1980s and 1990s during the neoliberal turn in which the international economic development community lost faith in states as effective managers of the economy and the international conservation community lost faith in states as nature's curators (Lemos and Agrawal 2006). With the decline of state power, environmental governance, along with other government functions, were decentralized and thus international conservation organizations shifted towards partnerships with market actors in their conservation pursuits (Lemos and Agrawal 2006).

The strategies of conservation, such as PES, then turned towards integrating nature into markets (Igoe and Brockington 2007; Büscher 2009). With new partnerships, the geographic boundaries of conservation changed. Targets shifted to inhabited landscapes, and new forms of conservation territories emerged that avoided political boundaries and sought natural ones, like watersheds, under the assumptions of better ecological management and increased opportunities for participation (e.g. Zimmerer 2000; Cohen 2012).

Regardless of whether a conservation territory was formed by the State or by a multi-partner alliance of market-based environmental governance, ecosystem services are tied to geographic space and entail territoriality. Therefore, controlling the behaviors of people and their resource use is critical for the transformation of ecosystem services into an object for exchange in a PES arrangement. Drawing from Vandergeest and Peluso (1995), a territorial claim needs to be enforced to achieve "control over natural resources and the people that use them" (385). Enforcement, they assert, is reached

through having the 'relevant audience' recognize the territorial claims that designate land for conservation. The creation of traditional, state-led conservation territories is not complete with the delineation of boundaries, but requires maintenance and vigilance of both conceptual and physical boundaries (Gabriel 2011). As such, borders need to be performed to imbue meaning and circulate narratives (Valdivia, Wolford, and Lu 2014).

More than strategy to control space, territoriality connects to "ways of being in the world" (Delaney 2005, 12). Territorialization therefore pursues remaking ways of experiencing space as informed by ways of knowing that are culturally and historically contingent and relies on being internalized within individual and collective identities (Delaney 2005). Territorialization within conservation arrangements therefore involves practices of making environmental subjects. Studies in environmental subjectivities typically examines why and how social identities change (Robbins 2011). This process entails the individual and collective internalization of environmental objectivities and rationalities (Bridge and Perreault 2009).

Foucault's work on governmentality has heavily influenced literature on the process and practices environmental subjectivity formation. Governmentality is described by Foucault as the "conduct of conduct" (Foucault 1991, 102). Literature has typically emphasized governmentality in a disciplinary sense, focusing on techniques for compelling individuals and communities to internalize values and self-regulate behavior (Fletcher 2010). In examination of governmentality and the creation of subjects as it relates to the environment, Agrawal (2005) popularized the term 'environmentality,' first coined by Luke (1999), with his empirical study on the state's practices to transform

individuals into self-disciplining environmental subjects. Environmental subject-making occurs primarily through practice, and frequently that includes direct performative labor between agents and subjects. O'Reilly (2011), for example, discusses the performative labor of development officials as they engage in the process of subject-making with clients.

While Agrawal's conception of governmentality and the environment is highly popular, there are other variations. Li (2007b), for example, employs governmentality in a sympathetic approach to subject-making for conservation and development by separately distinguishing it from discipline. Fletcher (2010), on the other hand, wages criticisms against a monolithic understanding of environmentality to address neoliberal conservation and offers a framework to categorize the elements of environmental subject-making within governmentality itself that allow for the emergence of multiple environmentalities.

Still others, however, move away from governmentality and towards a Marxist approach to analyze conservation work (e.g. Cepek 2011; Sodikoff 2009; Poppe 2012). Cepek (2011) particularly rejects the environmentality approach, arguing through empirical research that conservation project participants do not necessarily remake their beliefs, values and identities through conservation practice. Rather, he conceptualizes their participation as a form of 'alienated labor' in which "people maintain a critical consciousness of their activities… and they view their participation in relation to their political aspirations and background," instead of the goals and rationales advanced by the conservation organization (Cepek 2011, 502). Poppe (2012) extends this framework

to suggesting that multiple ambiguous positions must be taken into account when assessing local-level conservationists and that studies should stress agency within conservation labor.

Neoliberal conservation efforts not only look to convert members of local communities into environmental subjects, but neoliberal subjects that embrace market logics. Pervasive discourses in biodiversity conservation tend to label local communities as destructive, backwards, and a the primary threat to conservation arrangements (Adams 2004; Igoe and Brockington 2007). Within neoliberal conservation, this idea is amended so that local people have a "fundamentally flawed relationship with both nature and the market," yet can be reformed (Igoe and Brockington 2007, 442). Discourses of neoliberal conservation distinctly argue that local land users, disciplined in the values and logics of the market, can be remade into responsible 'green custodians' adept at caring for and repairing nature (Fairhead, Leach, and Scoones 2012; Leach, Fairhead, and Fraser 2012). In essence, this discourse focuses the labor of local resources users towards the production of nature, transformative act on nature that renders available to the market.

Most of the previous work on territorialization has been directed towards state-led protected areas. However, the emerging alliances surrounding payments for ecosystem services move beyond the paradigm of protected areas to claim authority to lands (and its associated ecosystem services) through flexible discourses of inclusion and participation. Yet, the process of territorialization necessarily requires labor. One gap

then, which I address in this dissertation, is the examination of territorialization (and accompanying labor processes) in to create commodities out of ecosystem services.

1.2.3 Labor

Although labor has been largely left out of the interrogation of PES, the arrangement is predicated upon the labor of individuals, households and communities to generate value out of ecosystem services. Ecosystem services are a ficticious commodity; they cannot be physically exchanged. Land-use, therefore, is frequently employed as a proxy for ecosystem services and thus the focus of exchange in a PES arrangement (Turpie, Marais, and Blignot 2008). People living in and around the sites of ecosystem services produce land uses with their labor, and therefore they are typically paid within a PES to pursue activities that reinforce the maintenance and restoration of ecosystem services.

Despite its importance to the mechanism of PES, the examination of labor within it is nearly absent in the literature. Shapiro-Garza (2013) is one exception to this trend, as she discusses how indigenous movements have used PES to reframe themselves as producers of value on the land to challenge the practices of the state, international financial institutions and conservation NGOs. Ultimately, this process led to the redefinition of programs that previously challenged their land tenure.

The practice of the PES exchange mechanism fits with Marx's labor theory of value, which states that a commodity's value is derived by the labor required to produce or obtain it (Marx 1990 [1867]). Although nature in itself can produce use value, Marx

indicated that only labor possessed capacity to produce exchange value (Marx 1990 [1867]). That is, the process of valuation that leads to commodification requires labor. Value is not simply inscribed on an ecosystem service through new market interventions that allow for the smooth transfer of capital. Rather, the environmental service requires labor to produce and maintain it to transform it into a commodity for market exchange.

Valuation of a commodity like environmental services, however, is not a straight forward process in which labor time measured equals value produced. In discussion of David Harvey's work, Henderson (2004) points out the multi-faceted ways by which value and the exchange of value go above and beyond hours worked to include abstractions in values and to satisfy capitalistic accumulation through value production. He argues that the creation of value ultimately puts the laborer, who is creating the new commodity, in a position of tension and urges the examination of the transformations of circuits of things, relations and ideas that result.

Drawing upon this discussion, Robertson (2012) asserts that the act of ascribing value is a social process central to building PES schemes. He points out that human beings are ultimately the bearers of value, and that the abstractions of commodities like ecosystem services come about through physical processes (Robertson 2012). He too invokes the labor theory of value to point out that labor is necessary to create exchange value, but then focuses on interrogating the processes of measurement and dividing abstractions.

Critically, however, Robertson (2012) points out that the social constitution of nature's value has been overlooked by political ecologists in their examination of PES

schemes as the creation of a 'new social world' and argues for studies of the labor process in which both humans and nature participate. My dissertation then addresses this gap and advances neoliberal environmental governance literature by interrogating the social constitution of nature's value. Furthermore, it adds to critical literature examining socio-spatial practices of environmental governance, and provides empirical data on a multi-partner governance regime.

1.2.4 Analytical Framework

The analytical framework for my dissertation draws upon Li's (2007a, 2007b) conceptualization of governance as an assemblage. Li (2007a, 2007b) defines assemblage as the interaction of diverse discursive and institutional practices among disparate groups of experts, agencies, and organizations, and promotes an explicit framework to consider the formation of assemblages in environmental governance that allows for historical contingencies and spatiality. Rather than a static formation, an assemblage is constituted from the continuous process of pulling disparate elements together in alignment. Groups are drawn together in an assemblage through will to improve, "or a desire to manage the conduct and social processes towards a particular end" (Li 2007a).

In this case, the environmental governance system that I examined can be considered an assemblage pulled together for the purpose of managing hydrological and biodiversity services through payments for environmental services. To achieve a critical, rather than prescriptive analysis, my research investigated the labor and territorialization

processes of PES environmental governance through Li's analytic of the assemblage. In doing so, this dissertation rejects the idea that this environmental governance scheme is somehow a grandly conspired plan, and simultaneously recognize the agency that situated subjects possess in their contributions to the assemblage (Li 2007a).

1.3 RESEARCH PROBLEM, QUESTIONS, AND OBJECTIVES

PES arrangements inscribe economic value to ecological processes as a means for conservation under the premise the market will enhance signals for resource-use efficiency and generate capital for reinvestment into conservation. More than simply inscribing a value on environmental services to be bought by consumers, PES schemes require individuals, households, and communities living in and around the targeted ecosystems to produce and maintain the ecological service with their own labor. This often involves changing agricultural practices or putting labor towards restoration processes, such as planting vegetation.

Recognizing the crucial role of labor in PES programs, I draw upon labor theory of value, which states that a commodity's value is derived by the labor required to produce or obtain it (Marx 1990 [1867]). That is, the process of valuation that leads to commodification requires labor. According to Marx, nature itself produces use value (Marx 1970 [1891]). However, he indicated that labor alone had the capacity to produce exchange value (Marx 1990 [1867]). Thus, when discussing the commoditization of ecosystem services, it is the human labor at the site of ecosystem services that ultimately becomes the target of market exchange in a PES scheme, rather than nature itself.

Through examining the PES water fund arrangement based out of Quito, Ecuador, this dissertation asks: how do changes in labor, required to produce value from ecosystem services, restructure socio-spatial relations in rural communities? To approach this broad question, my investigation focused on answering three specific questions: (1) How does FONAG develop these valuation interventions?; (2) How are PES schemes enrolling communities, and thus, workers?; and (3) How do labor requirements for PES schemes influence individual and community land-uses at the sites of ecosystem services production?

From these three questions, I developed three objectives that directed my research for this dissertation. The results of these objectives are worked into my examination of FONAG as I interrogate its process of moving from the urban institution and into rural communities. Objective 1 was to describe the discursive and material practices of assembling the PES scheme. I developed this objective following Tania Murray Li (Li 2007a, 2007b)'s framework that conceptualizes governance as comprised of a diverse set of discursive and institutional practices aligning disparate groups of experts, agencies, and organizations. Groups are drawn together in an assemblage through a 'will to improve,' or a desire to manage conduct and social processes towards a particular end (Li 2007a). This objective adapts from Li's (2007a, 2007b) framework and structured my investigation of the alignment of discourse and practices of FONAG. This objective most strongly informs Chapter III, in which I interrogate the process of FONAG's formation that, in turn, influence the interventions in the rural communities at the sites of FONAG's targeted ecosystem.

Objective 2 examined the avenues for community acceptance or rejection of PES environmental governance**.** This objective sought to understand the practices and processes through which FONAG enrolls communities in its interventions (and thus gains workers), rather than to identify predictive characteristics of community acceptance or rejection to form a model. Chapter IV addresses this objective by examining the labor and practice of FONAG's intermediaries with rural communities, as does Chapter V as it focuses on the negotiation of a community regarding its contract agreement with FONAG.

Chapter VI addresses Objective 3: to assess how the demands of FONAG's interventions restructure labor and land use within communities. Chapter VI interrogates the process and influence of FONAG's work within rural communities. In doing so, it puts forth an assessment framework to evaluate the impacts of FONAG's intervention projects.

1.4 ORGANIZATION OF THE DISSERTATION

The organization of the dissertation is informed by my conceptualization of the process of adding value to ecosystem services. To represent this process, I created a graphic depicting FONAG's extension through labor into the targeted ecosystem (Figure 1.1). This dissertation begins by examining the formation of the urban-based organization of FONAG, and follows its path into the rural Andean villages that are the target of the FONAG's agreements. With each segment of this dissertation, I interrogate

how FONAG extends its reach into the rural communities in an attempt to direct the labor of community members towards certain land uses.

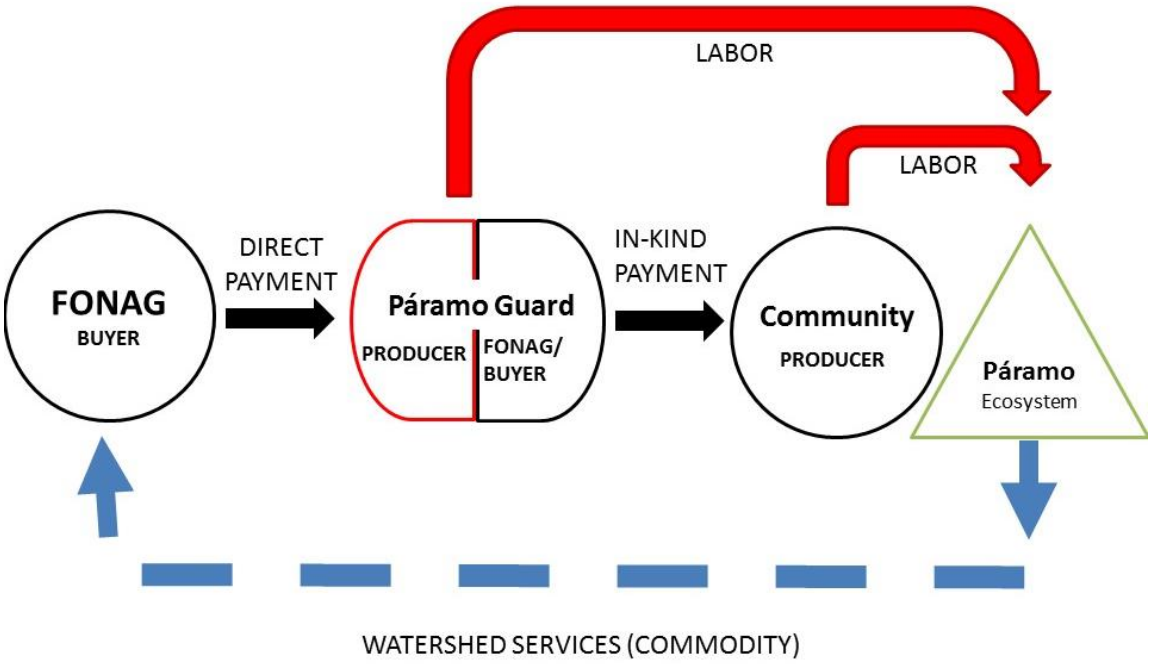

Figure 1.1 FONAG's extension into the targeted ecosystem

This graphic clarifies the process of ecosystem services value generation. The circles represent nodes of value creation within the PES exchange. The black circle represents a consumer/buyer of watershed ecosystem services, and the red circle indicates a producer of ecosystem services. The páramo guard is an intermediary between the consumer and producer, and thus is represented with a circle that is both black and red. The black arrows represent a form of payment, while the red arrows indicate a labor input intended to impact land use practices in the targeted ecosystem,

and thus ecosystem services. The ecosystem of interest in this dissertation, the páramo grassland, is represented with a green triangle. A key finding from this dissertation is that there is much uncertainty on the physical return of this market from a hydrological standpoint. Therefore, the ecosystem services as a commodity that returns to the city is comprised of a dotted line. It should also be recognized that this system does political work. The continuation of this mechanism generates both economic and political power to the two main founding partners of arrangement, as discussed at various points throughout this dissertation.

This dissertation is comprised of seven chapters. The current chapter presents an overview of the background, research questions, objectives, and the conceptual frameworks that contribute to the following chapters. In Chapter II, I outline the research design, describe the multiple study area sites, and situate the context of the field research. The next four chapters follow FONAG's connections from the city to the countryside, beginning with the urban institution and moving into rural communities located within the physical site of ecosystem service production.

In Chapter III, I examine the practices surrounding the construction of FONAG as an arrangement for environmental governance. I describe the emergence of FONAG out of the ashes of the failed protected area models of conservation. I then demonstrate how a PES is contingent upon processes of territorialization to create alliances for attracting economic resources to direct towards mobilizing labor for conservation. I also demonstrate how FONAG, as a non-state market-driven governance system effectively bypasses the state to create a conservation territory.

Chapter IV interrogates the work of FONAG's intermediaries, the páramo guard, within the communities. This chapter contextualizes páramo guard position as a part of FONAG, linking it to the earlier attempts by TNC and USAID to establish a landscape-scale conservation program within Ecuador. This reveals that the labor of FONAG's páramo guards generates value for the PES as they perform boundaries and work to mobilize local communities for conservation practices. This chapter also points out that the labor of the páramo guard is shaped by their existence within a blurred area of both agent and subject of the conservation arrangement.

Chapter V examines FONAG's efforts to mobilize community labor towards conservation practices. I examine the contracts for FONAG's interventions that discursively frame the productive projects as an incentive mechanism for communities to put their collective labor towards conservation. The discourses present within contracts represent a particular ordering of the landscape, and the rescripting of contracts can give insight into the negotiation surrounding the representation of labor between FONAG and communities. Labor plays an active role in exchange because the value of the fund is predicated on the activities at the site of ecosystem service production. Ultimately, communities can rework the narratives surrounding labor and the neoliberal narratives about water fund interventions to counter misrecognition of land uses as well as enabling the acceptance of needed economic resources without threatening their pre-existing land management institutions.

Chapter VI interrogates the process and action of FONAG's work within three case study communities. Offering an alternative framework to evaluate the projects, it

points out that many of the interventions support pre-existing land use and labor arrangements, rather than causing a rearrangement of land use and labor.

Finally, I summarize the key findings of this research in Chapter VII. I revisit the questions and objectives posed in my research

CHAPTER II

RESEARCH DESIGN

2.1 METHODOLOGY

I structured the research design of my dissertation to answer questions about the construction, practices and consequences of PES as a form of environmental governance that generates value from ecosystem services. The goals of my dissertation were not simply to answer a 'yes' or 'no' question. Rather, my interest lies in an in-depth understanding of a process, making an explanatory case study a suitable manner to focus my research (Yin 1998). A multi-sited case study design allows the analysis to follow people, connections, and relationships across space. In my study of the environmental governance and labor processes of Payments for Ecosystem Services (PES), I chose a case study program whose practices were enacted in multiple locations and spaces, it was therefore necessary to visit the multiple, within-case-study sites where this program was put into practice to examine the processes of PES.

This study takes an ethnographic approach that adds a richness of empirical data to academic literature examining the water fund model of PES that is thus far largely missing. Orienting research towards an ethnographic approach offers benefits in flexibility to collect multiple forms of data and allows for participant actions and accounts to be studied in every-day context (Atkinson and Hammersly 2007). There are currently no ethnographic studies examining FONAG's interaction within the rural communities. In general, very few critical studies of PES arrangements examine of the

dynamics between the downstream consumers or third-party users of ecosystem services and the providers (Francisco, Budds, and Boelens 2013). This study therefore works towards filling a crucial void in existing literature.

I approached my research with recognition that my position and the temporal and political context in which I was located would influence the data that I produced. Drawing from the concept of situated knowledges (Haraway 2001), I believe that it is important to the interpretive process of research to account for my position and how that may have influenced the process of data collection. I acknowledge that context and positionality created challenges in some aspects of my research and facilitated others. In the following sub-section, I reflect upon my context and positionality during the dissertation research process.

2.1.1 Context and Positionality in the Field

Inevitably, the context of my fieldwork presented various challenges. The change in leadership within FONAG during 2012 posed the most significant one. I began my dissertation fieldwork in January 2012. During April 2012, the technical secretary of FONAG was abruptly removed from his position at the request of Quito's water company (EPMAPS) for political reasons. The resignation of nearly the entire staff of FONAG followed this action, including the coordinator of the monitoring and surveillance program that oversaw community interventions. FONAG operations ground to a halt and the institutional knowledge was drained from FONAG within a span of six weeks. A new technical secretary started work in July 2012 and a new coordinator

for the monitoring and surveillance program started work in August 2012. FONAG suspended all projects for 2012, and so I was unable to conduct any participant observation of FONAG's intervention projects during that year. As a result, I returned to the field for six more months of fieldwork in 2013 to observe new community intervention projects.

Another challenge came the context of the rural communities that have been the subject of research for many NGOs that operate in the region. I had originally proposed to use a formal survey within communities. While testing my survey instrument, however, I found that many community members were reluctant to share detailed personal information on their household in the form of a survey. Reasons that the participants gave included a mistrust of people collecting kinds of data that could be used to determine taxes, and fatigue from NGO researchers who had performed surveys. While I had considered offering to monetarily compensate participants to complete the surveys, my contacts with the local NGO, *Instituto de Ecologia y Desarollo de las Comunidades Andinas* (IEDECA) directly requested that I did not do so. IEDECA facilitated introductions and consequently much of my access into rural communities. They were concerned that people would demand compensation the next time that the organization requested information. Because of participant resistance to formal surveys, I relied on collecting data about household labor and land use via key informant interviews with members of households, participant observation, and the land use walking tours.

Aside from these contextual complications, I also recognize that positionality had influence of the data that I was able to collect. As a female US citizen of Anglo-European decent, I do not have the appearance or accent of the typical Ecuadorian in the Andes region. I do not blend into a crowd easily, and I am clearly identifiable as a foreigner. My title as a researcher adds another layer to my identity and position, as it confers different meanings to different research participants. My various personal characteristics, including Spanish as my language, surely influenced how my research participants viewed me and our interactions to co-produce the data of this dissertation, particularly through key informant interviews.

My position and my appearance as the 'foreign researcher' seemed to differ between the urban and the rural spheres. Given the title of foreign researcher, it enabled access to buildings, information and people that were eager to have their perspective recorded. Interviewees would often repeat the points that they wanted me to record, to reinforce their perspective of their involvement. The political climate following the changes to FONAG's leadership definitely influenced the direction of many of the interviews in Quito. The representative for EPMAPS, for example, spent much of the interview justifying the actions of the company. I may have also been viewed by participants as a means to gain legitimacy or to gain support for their decisions within the FONAG.

My reception in the indigenous communities was different. First of all, the rural communities tend to view outsiders with a sense of caution. Outsiders, one key informant told me, simultaneously represent the possibility of resources and the risk of

exploitation. The communities in which I did my research are familiar with development organizations, but simultaneously have a long history of being exploited and marginalized. It was always necessary to gain access to a community with an intermediary to gain trust from potential research participants. Approaching homes without prior introduction to recruit research participants proved to be a futile method. The person that I spoke with would typically insist that they did not have knowledge to contribute or that I should contact the president of the community for information. For some of these communities, the páramo guards that worked with FONAG facilitated introductions and access. Despite my insistence that I was not working for FONAG, it became obvious that many of the people I interviewed saw me as a potential tool to gain resources for their community through FONAG. Interactions usually went smoother when I was introduced by members of a local NGO, IEDECA, into a community.

Finally, while I did not find gender to influence my interactions greatly in the urban sphere, it seemed to matter more in the rural communities. I recognize that my gender may have allowed me to experience more of the female sphere of labor while conversing with women while doing washing clothes, shucking corn or tending guinea pigs. These experiences and the data that I received may have not otherwise been available if I were male. On the other hand, I occasionally had to field unwanted jokes about my gender from male participants, and avoided situations in which might be dangerous or inappropriate based on gendered differences. I did not, for example, seek

to accompany páramo guards[1] on patrol, as the gendered difference would have make it inappropriate to do so.

2.2 CASE STUDY

FONAG's 2009 Strategic Plan explicitly identifies itself as a PES arrangement, stating that FONAG is "a mechanism of payments for ecosystem services directed towards protecting and regenerating water sources" (FONAG 2009a, 1). Practitioners of FONAG in Ecuador, however, typically refrain from referring to FONAG as a PES arrangement and outright disagree with the categorical label. FONAG, Ecuadorian practitioners claim, is a sustainable fund for conservation (various interviews, 2012-2014). FONAG's most recent version of the Strategic Plan, approved in 2014, self-distances from the PES label by omitting any mention of PES. Part of the reason for an organization to avoid the PES label could include a connotation with privatization (Kauffman 2014), or to avoid conflict with Article 74 of Ecuador's constitution prohibiting any entity other than the State to regulate the production, delivery or use of the ecosystem services. Despite the controversy, scholars routinely categorize FONAG as a PES or PES-like arrangement (e.g. Goldman-Brenner et al. 2012; Southgate and Wunder 2009; Martin-Ortega, Ojea, and Roux 2013). While FONAG does more than pursue intervention projects in rural communities, the PES or PES-like designation is

[1] Employees of FONAG that are hired from local communities

based upon FONAG's use of economic development projects to motivate conservation-oriented land-use practices.

There are two main justifications for why I chose *Fondo para la Protección del Agua* (FONAG) as a case study program in which to study the creation of value through territorial and labor processes within PES. The first justification is FONAG's status as having a well-established financial mechanism with active interventions. FONAG began officially in 2000, and already existed for ten years by the time I began developing my dissertation research in 2010. FONAG's interventions with rural communities in the watershed began in 2004, and FONAG is the longest-running PES water trust fund in Latin America (TNC 2012b). FONAG was a solid choice to study out of all of the existing water trust fund models because it was well-developed, had a track-record of stability, and had been running long enough for there to be an expectation of outcomes within the communities in which it has implemented interventions.

The second justification for choosing FONAG as a case study program was FONAG's influence on the design of similar programs throughout the developing world. The Nature Conservancy (TNC) originally designed FONAG as a model for replication since its inception. In its initial stages, TNC immediately began organizing campaigns and promoting the fund through publications and conferences (Kauffman 2011). This push to replicate FONAG as a model has been subsequently reinforced in the years following its initiation through various alliances with other international organizations. USAID, for example, stipulated that FONAG needed to replicate its water fund model in six daughter programs elsewhere in Ecuador as a condition for receiving donations

(Zavala 5/31/2012). Furthermore, the Latin American Water Fund Partnership between TNC, IDB, FEMSA and GEF seeks to establish the water trust fund model in at least 32 other locations throughout Latin America (TNC 2012b). Currently, TNC reports that it has launched a total of 17 water funds, including FONAG (TNC 2015). The majority of the funds are concentrated in the Andes region (Figure 2.1).

Figure 2.1 Locations of Latin American water fund arrangements (Source: TNC 2015)

FONAG is the most well established water fund PES in Latin America and has already proven itself to be influential within the region. FONAG's model also shows strong potential to gain influence in developing regions beyond Latin America. TNC has indicated that it is seeking to extend this model to developing countries in Africa and

Asia (ICCFoundation 2011), and the United Nations Environment Programme cites FONAG as inspiration for the creation of a water fund PES arrangement in South Africa (UNEP 2011). FONAG therefore represents a case study of a water fund PES arrangement, and merits a critical examination of the practices and processes that transform ecosystem services into a commodity for market exchange.

2.3 STUDY REGION

Broadly, the study region is constituted by the geographic area that FONAG deems a target for intervention. FONAG's vision statement as an organization specifically identifies the upper Guayllabamba watershed as the target of FONAG's conservation efforts. Approximately 2.5 million people reside in the watershed's urban and rural areas that cover roughly 471,000 ha (FONAG 2009a). The city of Quito's public water utility company (EPMAPS), however, derives only about 30% of its water supply from the upper Guayllabamba watershed (FONAG 2009a). The bulk of the water that Quito consumes comes from three sub-watersheds of Oyacachi, Antisana, and Papallacta adjacent to the eastern border of the upper Guayllabamba watershed. The three watersheds, populated by about 12,000 people, are included in FONAG's strategic plan identifies FONAG's target area of intervention but are not typically highlighted in FONAG's promotional materials (FONAG 2014f).

The three smaller watersheds are dominated by páramo, a high altitude humid grassland ecosystem that is crucial for capturing moisture and regulating watershed hydrological flows. The smaller watersheds extend across the borders of the Antisana

and Cayambe Coca protected areas, where the city of Quito's public water company has constructed major infrastructure projects to capture and transport water to the city. It is within these border areas that FONAG concentrates its on-the-ground interventions directed at influencing land uses. The watershed boundaries represent the connections between Quito and the rural communities, protected areas, and páramo ecosystem. Figure 2.2 shows the watersheds upon which FONAG focuses, Quito, the páramo ecosystem, the protected areas and the major infrastructure that carries water to Quito and dictates the main locations of FONAG's on-the-ground interventions.

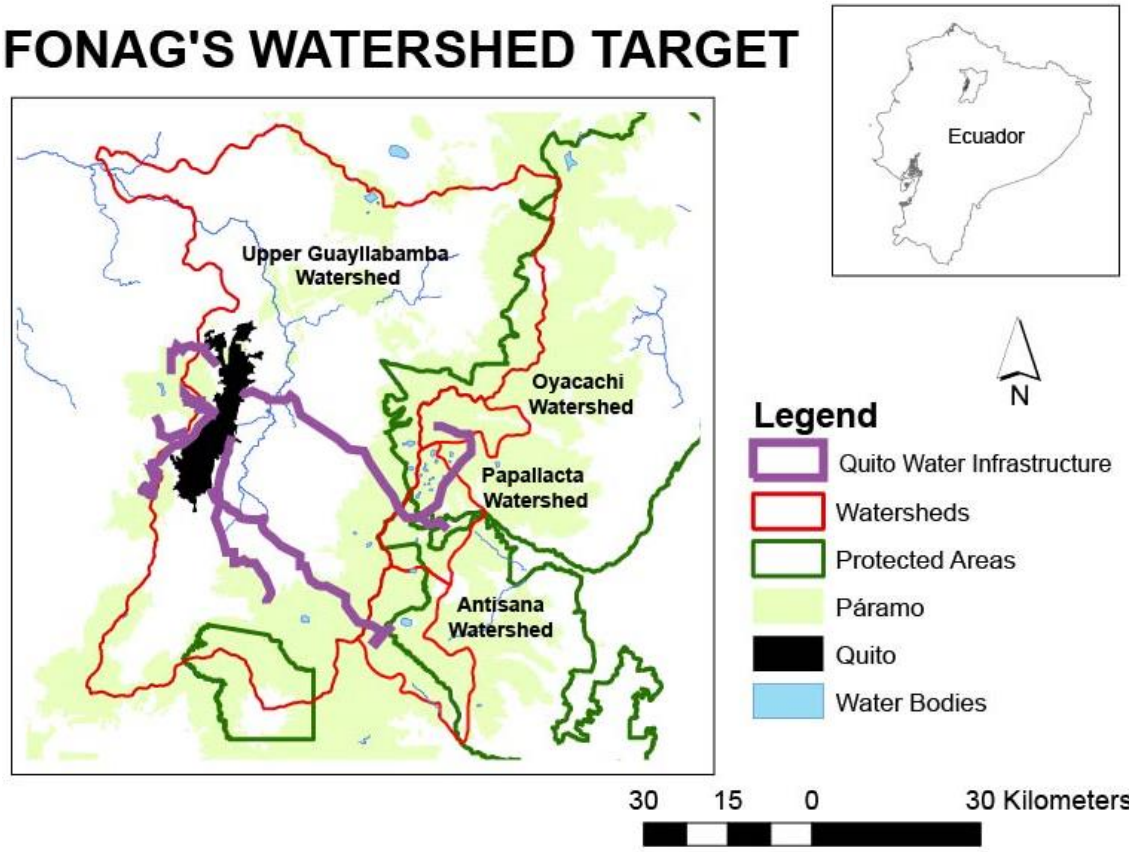

Figure 2.2 FONAG's target watersheds

The watershed's geographic space is an inhabited space with both physical and social variations across the landscape. Figure 2.3 is a graphic depicting FONAG's targeted area as the organization imagines it.

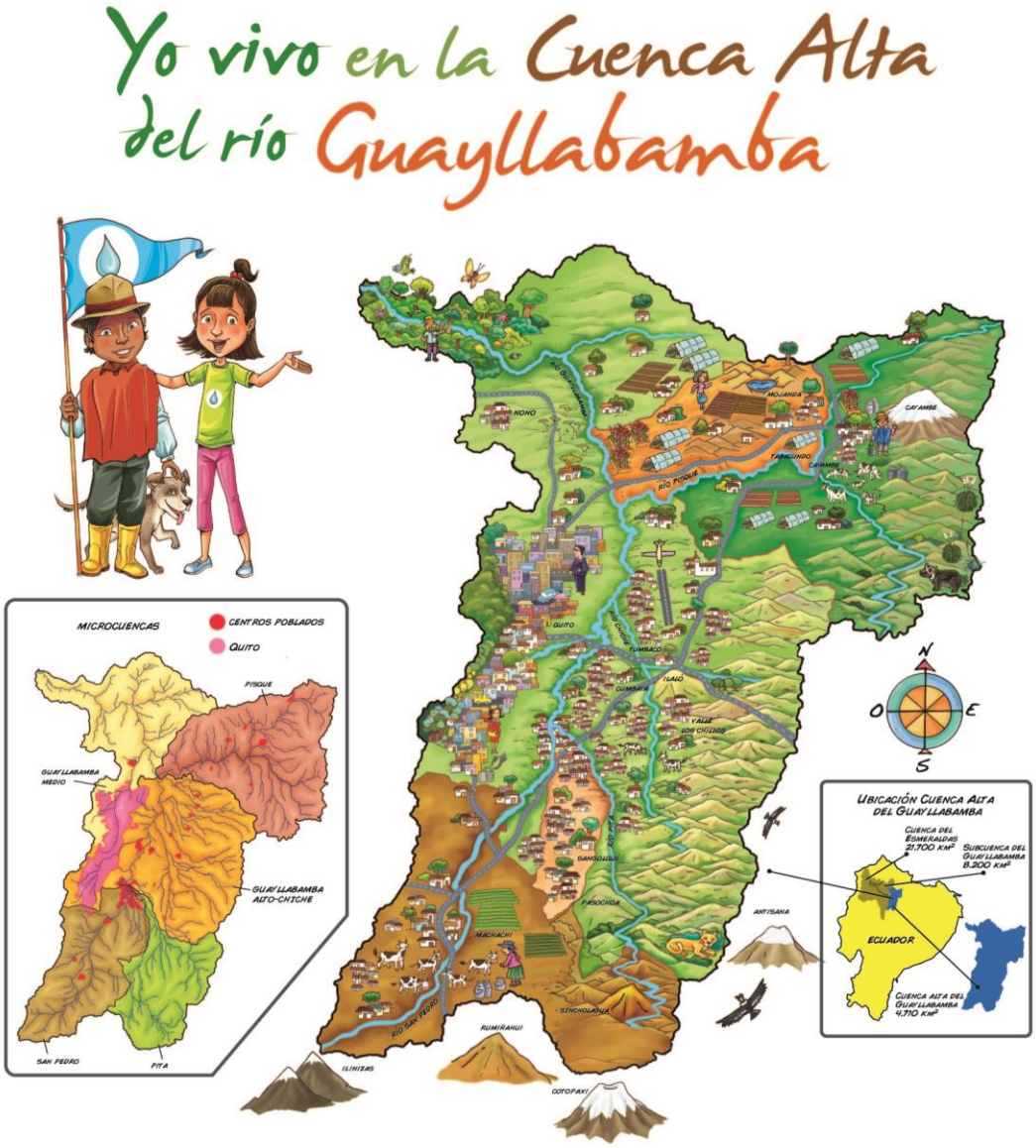

Figure 2.3 A representation of FONAG's watershed target (Source: FFLA 2012)

Fundación Futuro Latinoamerica (FFLA), an organization that partnered with FONAG to design a practical system for watershed governance, created the graphic. The caption on Figure 2.3 reads, "I live in the upper watershed of the Guayllabamba river" and shows two people, one indigenous and presumably rural and the other urban, physically touching each other and both bearing symbols of water. This graphic of the watershed conveys unity and connection across the diversity of landscapes and people, perhaps representing the vision of governance for FONAG. It shows Quito, rural communities, and agriculture activities stretching outwards and crisscrossed by rivers and roads. Symbols indicating the importance of biodiversity, such as the Spectacled Bear and the Andean Condor, are located at the eastern margins of the main map. The inset map on the left shows population centers outside of Quito and smaller divisions in the watershed.

The graphic offers a broad summary of elements present within the study area. My examination of these elements deepens within the following subsections. First, I begin with discussing the city of Quito, whose demand for water resources drives and sustains FONAG. Then, I discuss the biodiverse páramo ecosystem that is the source of water and the conservation focus of the PES scheme. Finally, I discuss rural context and the site selection of the four rural case study communities that are targets of FONAG due to their location within the páramo ecosystem.

2.3.1 Quito

FONAG's design focuses on protecting and maintaining the ecosystem services that provide water to the city of Quito, Ecuador's national capital. The city is located in Pichincha Province, just below the equator at 0.15°S and 78.35° W. It extends 12,000 km^2 through a valley in the Andes mountain range and rests at an elevation of roughly 2,800 masl, The population of Quito is roughly 1.6 million people, of which nearly 98% are connected to potable water through the Quito's public water utility company (EPMAPS) (EPMAPS 2014a).

Quito's population continues to grow at a rate of about 1.6% per year (Tallis et al. 2008), and the water demand keeps rising. To meet increasing demands, the city has focused on expanding its access to water through constructing new infrastructure, including reservoirs and systems from which to draw water (Vredeveld 2008; Proaño 2005; EPMAPS 2014e). The process of obtaining more water for Quito is one in which the city builds more infrastructure to draw water from locations further away. Table 2.1 lists Quito's major water infrastructure projects to date, which are also geographically represented on Figure 2.2. Quito has future plans to expand water capture in the east through a project titled *Rios Orientales*, which may draw water from as far as 110 km away (Zevallos Moreno 2010).

Year	System[2]	Discharge (l/sec)	Distance (km)
1957	El Placer	620	24
1974	Pita	1800	40
1990	Papallacta Bombeo	3000	51
1998	Mica Quito Sur	1500	45
2001	Papallacta Ramal Norte	1500	73

Table 2.1 Major water projects serving Quito (Zevallos Moreno 2010)

Because of the current difficulty and consequently prohibitive cost to access subterranean water sources, the city relies heavily on surface water that it collects in reservoirs in the watershed and transports to the city. Currently, about 96% of the water for Quito is captured from sources of surface water (FONAG 2014f). The páramo contributes greatly to this water supply, with Buytaert et al. (2006) estimating that 85% of the city's water is derived from the ecosystem. Furthermore, the importance of páramo to Quito has been underscored in studies from the Inter-American Development Bank indicating that the protection of the ecosystem is the key factor in future water security for the city (IDB 2014). As such, EPMAPS has recently increased its emphasis on conserving páramo land in the watershed, and measures to follow through with this effort have included becoming a constituent member of FONAG in 2000, and land purchases including 14,000 hectares of mainly ecosystem near the Antisana Ecological Reserve in 2013 (EPMAPS 2014a). The ecosystem is in close proximity to Quito, depicted in Figure 2.4 by view from the páramo overlooking the city.

[2] Major systems are complimented by many minor ones

Figure 2.4 Quito from the páramo (June 2010)

2.3.2 Target Ecosystem: Páramo

FONAG targets the páramo ecosystem for conservation within the watershed boundaries. Often referred to in both singular and plural form in literature, páramo consists of tropical high-altitude humid grasslands that form between approximately 3,000 and 4,800 meters of elevation. In addition to Ecuador, páramo ecosystems form predominately in Venezuela and Colombia, but also as far north as Costa Rica and as far south as northern Peru (Luteyn 1992). Ecuador's páramos range throughout the extent of the country's Andean region, covering 1,843,477 ha, or roughly 7% of the total national territory (Beltran et al. 2009).

Because of altitude, the environment is characteristically cold. The average temperature at 3,500m, for example, is about 7^{o}C (Buytaert 2004). Although a dry and

wet season annually take place, seasonality is muted due to its equatorial location. However, temperatures may fluctuate 20^{o}C or more in a single day (Luteyn, Cleef, and Rangel Ch. 1992; Beltran et al. 2009). The climate of the páramo is popularly described as summer during the day and winter during the night because of these extreme temperature changes (Leon-Yanez 2011).

Páramo heavily contributes towards maintaining regional hydrological flows within the Andes. Subterranean water is scarce and difficult to exploit in the region. Therefore, urban areas in the Andes, including Quito, Ecuador, depend heavily upon the functioning of the ecosystem (De Bievre, Iniguez, and Buytaert 2011). The soils of the páramo have a high rate of water retention of around 80-90% in saturation (Buytaert 2004) and retain humidity even through dry periods (Luteyn 1992). The páramo soils therefore convert irregular precipitation regimens into a continuous base flow into streams. These soils also have a high residence time for organic carbon, which continually accumulates from the roots systems of the grasses that cover the soils above (Farley, Kelly, and Hofstede 2004).

Páramo is particularly rich in the biodiversity of plant species. The diverse flora of the páramo is characterized by bunchgrasses, shrubs and ground-hugging plants, including lichens and mosses, and roughly 60% of the vascular plants are endemic to the ecosystem (Luteyn, Cleef, and Rangel Ch. 1992). At least 278 species are endemic out of the rough total of 1500 species that grow in Ecuador's páramos (Leon-Yanez 2011). In other words, 18% of the species in Ecuador's páramos are found nowhere else on Earth. Páramo is also included in the tropical alpine region that is a biodiversity

hotspot, or a region of conservation priority (Myers et al. 2000). Interested in protecting the rich biodiversity of the páramo, international organizations including The Nature Conservancy, a founding organization of FONAG, have been working on conservation projects in Ecuador's páramo since the 1980's (Lewis 2000). .

Despite the importance of the ecosystem to critical hydrological resources and biodiversity, very little detailed scientific knowledge exists on how the páramo ecosystem functions as a mechanism. The páramo ecosystem has been overlooked by biologists in comparison to neotropical lowland systems, contributing to a lack of comprehensive knowledge of páramo biodiversity (Luteyn 1992). Furthermore, the scarcity of hydrological and meteorlogical data on páramo ecosystems and a lack of studies regarding páramo soils have left many gaps within scientific knowledge of overall ecosystem processes and hydrology of páramo landscapes (Podwojewski and Poulenard 2011; De Bievre, Iniguez, and Buytaert 2011).

Without a firm knowledge of the hydrological cycle of the ecosystem, no general consensus exists on how the ecosystem responds to varying levels of human intervention. Some researchers assert that the páramo ecosystem is the direct result of human habitation and intervention that likely evolved along with the human populations present for thousands of years in the region (Luteyn 1992; Chepstow-Lusty et al. 1996). Pre-Colombian settlement, for example, was most densely situated within the Andean valleys, but the higher zones of elevation were subject to various uses. Pre-Colombian indigenous populations built military fortifications and sites for religious ceremonies,

constructed infrastructure to capture water for irrigation, and terraced the rich soils to cultivate crops such as potatoes in the páramo (Ramón 2009).

Current domestic animals and agricultural practices vary greatly from those during pre-Colombian times, however, and several studies emphasize the negative impact of human activities in the páramo ecosystem in terms of burning, grazing, cultivation or other interventions (e.g. Harden 2006; Buytaert et al. 2006). In contrast, other studies examining various impacts on páramo soils indicate that low intensity burning or grazing has may have very little impact on carbon storage or water retention capacities of páramo soils (Farley, Anderson, and Bremer 2011; Harden et al. 2013).

Although these studies challenge notions of no-use as best-use for the páramo ecosystem, the gaps in scientific knowledge about ecosystem processes support precautionary principle arguments for páramo management. FONAG takes this approach in designing interventions in páramo landscapes that particularly aim to reduce human through intensifying productive activities at lower elevations. Meanwhile, FONAG routinely collects data on climate, biodiversity, and human activities in areas of páramo and conducts its own research on various elements of ecosystem interaction to add to existing knowledge.

2.3.3 Case Study Communities

My research specifically examined four case study communities that FONAG targeted for intervention projects to promote páramo conservation. I chose three of the case study community sites in the spring of 2012. FONAG provided me with a list of 15

projects in rural communities that it had been involved with prior to 2012. This list of communities was categorized by the nearest protected areas. The list categorized eight community projects with the protected area of Cayambe-Coca National Park, three with the protected area of Antisana, two with the protected area of Illinizas, and one with the protected area of Cotopaxi. I chose to examine case studies in the buffer zone of the Cayambe-Coca National Park based on access to transportation. A reliable public bus transportation system connects most of the rural communities to the town of Cayambe.

I visited seven of the eight locations on the list of communities associated with Cayambe-Coca, and one community, Muertepungo, near Antisana. I selected three of case study communities Cariacu, Paquiestancia and Oyacachi based on the willingness of community members to participate in the study and my ability to obtain FONAG contracts describing the interventions in those sites. I obtained the contracts directly from the páramo guards because no employees remaining at FONAG's office during the turnover of the technical secretary appeared to know their location at this time. Although in 2012 I initially visited the fourth case study community, Quinchucajas, it did not officially became a case study site until fieldwork in 2013. It was one of two rural communities in which FONAG was actively initiating an intervention project during this year, and the only location in the Cayambe region. FONAG did not conduct intervention projects in 2012. Figure 2.5 shows the location of the four study communities.

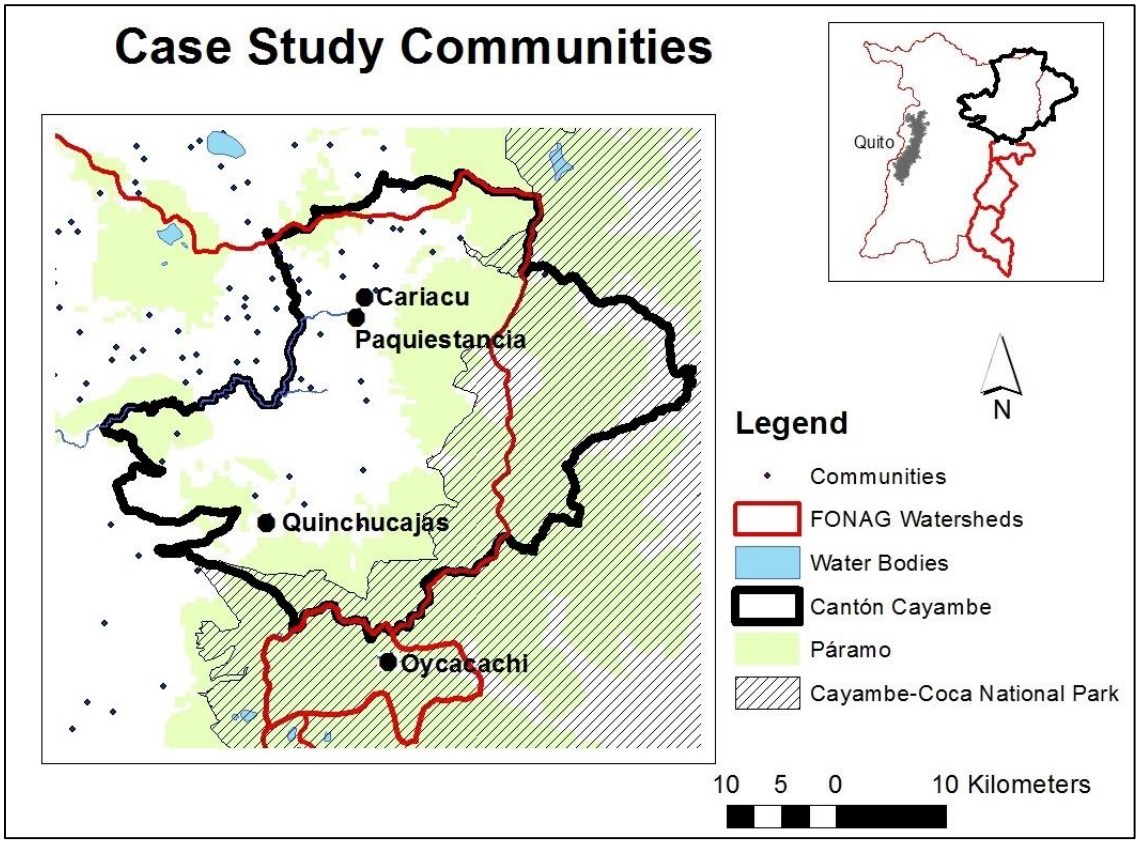

Figure 2.5 Location of case study communities

The case study communities of Paquiestancia, Cariacu and Quinchucajas are located in the Cayambe *cantón*[3] in the eastern portion of Pichincha province. Its government center is the town of Cayambe, located about 70 miles north of Quito on the paved Pan-American Highway. The fourth case study community, Oyacachi, is located in El Chaco cantón adjacent to Cayambe cantón. Despite existing in a different canton, Oyacachi is connected to the other case study communities culturally through a shared

[3] A cantón is a political subdivision akin to a county in the USA.

indigenous identity as well as economically through the one road that leads to the community (Field Notes 2012). Each of these communities claims areas of páramo as part of their territory. Cayambe cantón covers an area of roughly 1,800 km^2, with stone-paved roads connecting the smaller communities to the town of Cayambe, which is the area center for commerce, agro-industry and transportation. The canton's population is roughly 85,795 people, with an estimated 51,000 residing in the town of Cayambe (INEC 2010b). In the 2010 national census, about 34% of the total population in the cantón self-identified as indigenous[4], and 61% identified as mestizo (INEC 2010).

Agriculture is the predominant economic activity in the cantón, with small producers (less than 20 ha^2) accounting for 97% of all farms and 35% of the land (Chiriboga V. 2007). A typical parcel of agricultural land allocated to a household is 2-3 ha^2 within the case study communities (Field Notes, 2012). The arrangement of landholdings within the case study communities are reflective of trends in the region. Spanish colonialism initiated a long era in which powerful families owning expansive haciendas controlled the majority of the land (Recharte and Gearheard 2001). The haciendas relied upon the *huasipungo* system, a form of sharecropping in which the hacienda required indigenous peasants to work without monetary pay, typically the entire week, for the ability to remain on a small parcel of land within the hacienda and cultivate subsistence crops (Moates and Cambell 2005).

[4] Presumably of the Kayambi affiliation, but this information was not specified in the census data

Agrarian Reform laws in 1964 outlawed the huasipungo system and sparked the transfer ownership of many of these properties to the indigenous peasants that had worked on them. The state typically expropriated hacienda lands located in less arable areas at higher elevations, which were then redistributed to cooperatives made up of the former indigenous tenant farmers (Chiriboga V. 2007). The cooperative then allocated parcels of land to each family, which also had use rights of communal grazing lands, often including páramo (Chiriboga V. 2007). The Land Development Law eventually brought the process of agrarian reform to a close in the 1990s, and the cooperatives ceased to exist. The case study communities of Paquiestancia, Cariacu and Quinchucajas were all former haciendas that were converted into recognized communities during the close of agrarian reform (Field Notes, 2012; 2013).

Within Cayambe cantón, dairy contributes the most to economic output. Respectively, 42% of the gross value of production in the cantón comes from dairy and meat, 35% from the flower industry and 22% from annual crops, especially potatoes and onions (Chiriboga V. 2007). Cayambe cantón is the fourth largest dairy producer in Ecuador. Fitting with the broader regional trends, the agricultural sector dominates for employment within the four case study community members. This includes livestock and particularly dairy cattle which are ubiquitous in all four communities (field notes, 2012). Figure 2.6 depicts Holstein cattle grazing in a pasture by the road into Oyacachi.

Figure 2.6 Holstein cattle grazing with Oyacachi in the background (July 2012)

Other common agricultural crops include potatoes and onions. These crops grow well in the higher altitudes because of their resistance to freezing temperatures (Field notes, 2012). These crops are typically consumed by households as well as marketed in Cayambe (Field notes, 2012).

All four of the case study communities are affiliated with the Kayambi indigenous group. The population of this group is distributed within 168 communities, primarily within in Cayambe cantón (Becker 2015). Kayambi peoples traditionally speaks Kichwa and are descended from the Caranqui indigenous peoples that inhabited the area prior to their conquest by the Incans around 1515 (Becker and Tutillo 2009). The people of Oyacachi are widely believed to have fled the war with the Incans, and consequently settled where they are today. In 1534, following the death of the Incan

ruler Atahualpa, the Spanish fought to control the region. The Spanish seized and divided the land where Paquiestancia, Cariacu, and Quinchucajas are presently located. Oyacachi's territory was never seized by the Spanish. However, Oyacachi maintained connections and affiliations with other Kayambi communities (Becker and Tutillo 2009). As an indigenous group, the Kayambi maintain traditions of Inti Raymi[5] and San Pedro that involve common costumes and various ritual activities.

Although the communities share aspects of history and context, they also possess difference between them. Table 2.2 briefly summarizes individual characteristics of the case study communities.

Community	Oyacachi	Quinchucajas	Paquiestancia	Cariacu
Households	130	105	206	188
Avg elevation (masl)	3,253	3,700	2,860	3,043
Cultural Affiliation	Indigenous Kayambi	Indigenous Kayambi	Indigenous Kayambi	Indigenous Kayambi
Primary drinking water source	Public Utility 89%	River/Stream/Canal 100%	Public Utility 57%	Public Utility 92%
Primary Employment	Agriculture 57%	Agriculture 54%	Agriculture 56%	Agriculture 53%
Adult Literacy	87%	68%	93%	92%
FONAG Development project	Guinea Pigs and Pastures	Irrigation and Guinea Pigs	Guinea pigs and Gardens	Ecotourism

Table 2.2 Characteristics of the four case study communities (data source: INEC 2010a; FONAG 2011c, 2011d, 2013b, 2009b)

[5] Inti Raymi is a festival with pre-Columbian heritage that is annually celebrated during the time of the solstice throughout the Andes.

Levels of economic development vary between the four communities. Quichucajas, the community at the highest altitude, is the most materially poor and isolated. Unlike the other communities, buses do not run to Quinchucajas, and automobile ownership, for example, is very rare in comparison to the other communities (Field Notes, 2013). Adult literacy rates in Quinchucajas are the also the lowest of the four communities, at 68% (INEC 2010). Furthermore, it is the only community that does not have a public water supply. Instead, all households receive water from in streams or ditches (INEC 2010). This is then typically conveyed by buckets into the household. FONAG's 2013 project, while not a potable water project, constructed infrastructure to household properties for irrigation purposes.

Oyacachi, located in the Cayambi-Coca National Park, has a history of development organizations working within the community. These various organizations have sponsored a diversity of programs, including ecotourism, that impact the character and livelihoods of the community. Figure 2.7 depicts water slides in Oyacachi added to the hot springs tourist attraction in 2013.

Figure 2.7 Water slides in Oyacachi (November 2012)

In contrast to the other villages, Oyacachi houses were often multiple stories and made of wood, appearing to be much more expensive than housing in other communities that are often about half the size and constructed of adobe (Field Notes 2012). One of FONAG's early projects in Oyacachi focused on co-funding a center to sell crafts, and later FONAG pursued projects in guinea pigs and improving pastures for dairy cattle.

Of the four communities Paquistancia and Cariacu are located the closest to the market and transportation hub of the city of Cayambe. Therefore, many people from these areas seek employment within Cayambe businesses or in the rose farms located along the Panamerican highway near the town. Both communities are also working on ecotourism projects, with Cariacu's project funded by FONAG.

2.4 DATA

I collected data for this project during three fieldwork periods: January 2012 - December 2012, June 2013 - December 2013 and June - August 2014. I spent this time in the field employing a variety of ethnographic research techniques. This included semi-structured interviews with key informants, participant observation, analysis of documents collected from FONAG and its affiliates, and the spatial mapping of PES interventions within the rural case study communities. Texas A&M University's Human Subjects Protection Program Institutional Review Board approved all data collection protocol under study number IRB2012-0009.

2.4.1 Key Informant Interviews

Key informant interviews provide insight into the lived experience of a process and the construction and negotiation of meaning to interpret the experience (Cloke et al. 2004). For this study, I define key informants as persons whose perspective was valuable in understanding the practices of FONAG and its interaction with targeted rural communities in the watershed. As this research follows the process of translating PES into lives and landscapes, key informant interviews were a valuable source of data. Table 2.3 summarizes the categories of the key informants that I interviewed.

Category	**Informants**
FONAG employees	***11***
Representatives of FONAG Constituent Members	***7***
• The Nature Conservancy	3
• Quito's Water Company	1
• Consortium CAMAREN	1
FONAG Páramo guards (Intermediaries between FONAG and Communities)	*7*
Members of FONAG targeted Communities	***54***
• Quinchucajas	13
• Paquiestancia	11
• Cariacu	13
• Oyacachi	8
• Other communities	9
Other affiliates of FONAG	***8***
Total	***92***

Table 2.3 Number of research informants by category

I developed two sets of semi-structured, open-ended questions. The open-ended questions permitted interviewees to respond in their own words instead of with specific response options. After the initial response to the questions, I used free format follow-up questions to clarify responses (Montello and Sutton 2006). The first set addressed FONAG officials, representatives of constituent member organizations, and representatives of affiliate organizations that included donors and collaborators. These questions focused on the position of the firm rather than individual opinions. I conducted each of these interviews at the office of the interviewee, with prior notice.

I prepared another set of questions directed towards members of the community, and sought to gain insight on their perspective through focusing on community member

experience with FONAG projects. I interviewed the community president, the páramo guard for the project, and community members that had participated in the FONAG project for each of the four case study communities. Because páramo guards are simultaneously a part of the community and of FONAG, they received questions from both categories and they received questions specific to their work, such as how the páramo guard became involved with FONAG or what the process was for organizing a project within the community. While I conducted the majority of community member interviews on the interviewee's property, I maintained flexibility to conduct interviews in a variety of locations depending on the availability and preference of the interviewee. I conducted one interview, for example, on a bus travelling from Cayambe to Oyacachi because the interviewee found that to be the most convenient moment for an interview.

I recruited interviewees in various ways. I contacted FONAG for interviews with employees, and FONAG also provided me with a list of the representatives of its constituent members and affiliates. I attempted to contact the representatives of all six of the financially-contributing constituent organizations of FONAG, but unfortunately only three of the six organizations responded for interviews after multiple attempts to contact them. For data about the other three constituent organizations, I have relied primarily on document material to ascertain the extent of their involvement in FONAG.

To recruit members from the case study communities for interviews, I first contacted the community's páramo guard. The páramo guard subsequently introduced me to members of the community involved with FONAG for interviews. I then proceeded in a snow-ball sampling fashion in which the participant introduced me to

another potential participant for the study or gave me contact information of potential participants. The main target of my research was the small subset of community members, typically a group of less than 20 individuals, directly involved in FONAG projects within a case study community.

I also initiated a few random sample interviews in each case study community to include perspectives and experiences of FONAG's involvement in communities that might be passed over through the snow-ball sampling technique in my investigation. These interviews began with informal conversations that only occurred after I had made frequent visits to each community and had been present at public community events, such as summer festivals or community assembly meetings. This technique enabled me to initiate interviews with community residents that were not directly involved with FONAG projects as well as a few community members directly involved in the FONAG projects that did not appear in the snow-ball sampling technique. As a whole, the community interviews provided detail about individual and group experiences with FONAG projects that has thus far been absent in studies of FONAG. I analyzed the community interviews as a set to identify points of convergence and divergence in experiences and perceptions with FONAG projects. I also triangulated the interviews with other data, such as documentation and participant observation.

Conducting interviews without a formal introduction or prior recognition within a community was difficult. Four members from case study communities declined interviews and referred me to speak with members of the community governing council. This interaction usually started with me approaching the house, knocking on the door

and introducing myself. In each of these cases, the individuals offered me the phone number of the president of the community. One of them made a point to call the president of the community on her cell phone, and subsequently told me to contact him about my research project first before proceeding. Conducting interviews was therefore a time-intensive process because it involved building social relationships within a community in addition to administering the interview itself.

2.4.2 Participant Observation

I collected another significant portion of my data through participant observation. My venues for participant observation were varied and included a FONAG páramo guard training workshop (n=1), FONAG project meetings in which I accompanied FONAG employees on excursions to the field (n=6). This included field visits to see projects and meet páramo guards at their field sites, as well as one excursion to the various climate monitoring stations operated by FONAG. I also attended páramo management meetings by communities (n=3), and community labor events for a FONAG community development project in Quinchucajas that was focused upon building an irrigation canal (n=14). Furthermore, I participated in a water monitoring activity by a community páramo management organization (n=1), and attended FONAG's development project inauguration event in Quinchucajas (n=1). I gained permission at each of these events from either FONAG or rural community leaders to attend, and I took notes on them. During the events, I typically introduced myself at the gathering and freely asked questions. My field notes include observation on attendance

and the activities performed, but also include notes on verbal and nonverbal interactions between the FONAG officials, the páramo guards, and community members, as they presented their thoughts about the projects and the objectives they were pursuing through the projects.

The FONAG workshop on páramo guard training occurred during October 30-31, 2013. FONAG officials administered the workshop, which included two days of activities, presentations and discussion about the duties of the FONAG páramo guard. FONAG's coordinator for the páramo guard program introduced me as a student researcher at the beginning of the workshop, and I was involved in discussions as well as within small group activities focused on identifying the different facets of the páramo guard's work. Discussions ranged from the challenges faced by páramo guards in enforcement and reporting, the details of their working conditions, and their relationships with their communities.

The FONAG excursions are events when I accompanied FONAG officials from the office in Quito (frequently leaving before sunrise) and into rural field sites to meet with community páramo guards about the progress of community intervention projects. I accompanied FONAG on six of these excursions during the fieldwork periods of 2012 and 2013. Five of these excursions included a tour of the areas of intervention within the community, discussion of the challenges to the project, and discussions for improvement between the FONAG official and the páramo guard. One of the excursions with FONAG focused on collecting data from FONAG's various climate monitoring stations. During my last excursion with FONAG, in August 2014, the purpose of the excursion for

FONAG was to learn about land management and conservation initiatives of rural communities near Cayambe. The group toured three farms and visited a green house.

I attended three páramo management meetings that involved local communities. Two of them were with Ñukanchik Urku, the páramo management group established in January of 1997 that consists of seven communities, including the case study community of Quinchucajas. The first of these meetings occurred October 17, 2012 in the páramos of Ñukanchik Urku in which the group toured significant sites and periodically stopped for orations and discussion about land values and land use practices. The second meeting of Ñukanchik Urku was a business meeting in which they were discussing dues and activities for upcoming months, which occurred November 2013. The third meeting was Cangahua´s water management group. This is a water management group that involves the communities in the area south of Cayambe, many of which had been approached by FONAG. At each of the meetings, I was introduced as a student researcher by a respected member of the community. On one occasion, I also accompanied a small group including Urku Kamas (community equivalent to FONAG páramo guards) to monitor stream flow in the páramo of Nukanchik Urku.

A minga is a shared community work gathering common to Andean communities. In a minga, rural communities pool their labor to address larger projects for which they do not have the funds to hire machinery or workers. In this circumstance, I was able to participate and observe in the construction of an irrigation system as a FONAG community development project in the case study community of Quinchucajas. The process of the minga included digging the 1.5 km irrigation canal and the

construction of a cement holding tank that collects water from the nearby spring. I participated in 14 of such events.

Finally, I attended the inauguration event the irrigation FONAG community development project on October 9, 2013 in Quinchucajas. This event included signing papers to acknowledge the completion of the phase of the project, and speeches by community members, FONAG, and IEDECA, a non-governmental organization based out of Cayambe that was contracted to manage the project.

2.4.3 Land Use Walking Tour

Within Paquiestancia, Cariacu, and Oyacachi case study communities, I conducted a 'land-use walking tour.' I excluded Quinchucajas from the tour because the project was in process during the 2013 field season and so I was able to participate and observe the labor that went into that particular FONAG intervention in person. The purpose of the land-use walking tour is to describe the spatial pattern of interventions within the community and gain further insight into understanding how FONAG interventions impacted land use. These tours also allowed me to assess the type of work required for FONAG projects and land use changes within each of the case study communities.

The land-use walking tours were based upon the concept of counter mapping. Researchers have typically employed counter mapping techniques as a mechanism to contest representations by dominant power structures of property regimes and land use practices (e.g. Peluso 2005; Hodgson and Schroeder 2002; Harris and Hazen 2006;

Peluso 1995). A vital component of counter-mapping is that it captures the heterogeneity of space and the social relationships within in it that are typically obscured in top-down forms of landscape mapping (Peluso 2005). I did not seek to 'counter' another narrative about the landscape, however, I my intention was instead to make visible the labor process that went into the interventions of FONAG and the making of place. I adapted the method for the land-use walking tours from Rocheleau (1995)'s land mapping techniques. I did not focus on gendered difference of land use and value as Rocheleau (1995) did in her study. However, the exercise was useful to elaborate upon the hidden labor process behind the FONAG projects and the variegated outcomes that are otherwise not present in FONAG's reports.

In each of the walking tours, I asked participants to show me the spaces of FONAG intervention on their property or in the community and describe the work that went into the FONAG intervention for me. I asked about what kinds of work went into those spaces, what kind of time was spent on the project, who did the work, and what were the outcomes (e.g. was the project still functioning? had it been adapted?). I took geo-tagged photos of significant sites and wrote notes in my field book, from which I derived spatial patterns of the communities, the interpretation of those spaces and the labor that went into creating them. The walking tours were ultimately focused on the sites of material construction, as those were the sites that were accessible from the

Depending on the type of community development intervention, the walking tours took different forms. For example, Cariacu's walking tour was conducted with a group of 8 individuals from the community that had worked on the project. It was an

ecotourism program focused on building trails to provide access to waterfalls. The space of intervention was not on personal property, but communally held land. In contrast, Paquiestancia's community development project involved the production of guinea pigs, which took space on personal properties within walking distance of the home. Therefore, I conducted land use walking tours with individual participants as an extension of the key informant interview.

2.4.4 Document Collection and Secondary Data

Through the course of my fieldwork, I collected a large quantity of documents about FONAG. These included including reports, promotional materials, procedural manuals, the by-laws, the strategic plan, memos, and any other information that seemed relevant to the organization. Many of these documents came from FONAG itself, but many others were produced by constituent members, donors, and other affiliated organizations. I also collected copies of FONAG's bi-monthly newspaper, publication, Fondo-a-Agua, for the period of November 2007-January 2014, for a total of 30 issues. I have summarized the data I collected directly from the organizations during my fieldwork in Ecuador in Table 2.4.

Source	Type	Quantity
FONAG		
• Strategic Plans	digital	2
• Legal Statutes	digital	1
• Pamphlets	analog	7
• Reports	both	11
• Community Intervention Contracts	digital	1
• Newspapers	both	30
• Promotional materials	both	10
• Study area census maps	digital	N/A
IEDECA		
• FONAG project plan/supporting documents	analog	5
MAE		
• Cayambe-Coca National Park Management Plan 2009	analog	1
• Community Intervention Contracts	both	3
USAID		
• Memos	digital	1
• Reports	digital	6
• Procedure manuals	analog	3
• FONAG-USAID Agreement	digital	1
TNC		
• FONAG study data	digital	N/A
FFLA		
• Reports	digital	8

Table 2.4 Summary of documents

During 2014, I visited Ecuador's National Institute for Census and Statistics (INEC) and obtained census data about the blocks associated with the case study locations, including information on education, occupation, household material characteristics (building materials, access to utilities, etc). INEC also provided me with

GIS shape files of the Cayambe Area. This data was useful in making descriptive comparisons of the study sites.

2.4.5 Data Analysis

I recorded interviews only with explicit verbal permission of the interviewees, and then transcribed them. On several occasions, however, making an audio recording was not possible, or interviewees stated that they would prefer to not have their interview recorded. In these situations, I hand-wrote notes in my field notebook. I also included participant observation and data from the walking tours in my field notes and later digitally scanned them. I entered the transcripts from interviews, documents (newspapers, reports, memos, pamphlets, procedural manuals), into Atlas.ti software.

I coded the documents, interviews and my field notes to develop emergent themes (Cloke et al. 2004). I began this iterative process by assigning descriptive codes that break the data into categories to reflect obvious patterns or themes (Cope 2005). These codes included places, actors, interventions, topics. I identified emergent themes based on a grounded theory approach through the process of applying descriptive codes. I then applied analytic codes reflecting thematic connections within the data.

This chapter has described the research study area and methods. In the next chapter, I present FONAG's historical and structural foundations and examine the functioning of FONAG as a governance mechanism. Chapters IV, V and VI then follow FONAG's interventions from the city of Quito and into the rural countryside.

CHAPTER III

TERRITORY AND AUTHORITY IN NEOLIBERAL CONSERVATION

3.1 INTRODUCTION

Within this dissertation, I investigate the process through which ecosystem services are transformed into a commodity. I examine the social constitution of nature's value, which has been largely overlooked by political ecologists in their examination of neoliberal environmental governance. My analysis of how ecosystems services come into being as a commodity is accomplished through a case study of a model arrangement of Payments for Ecosystem Services (PES) in Ecuador called a water fund. I examine a water fund that is based out of Ecuador's capital city, Quito, and is known as *Fondo para la Protección del Agua* (FONAG).

Water-users in Quito, a mixed assortment of public and private companies, pay into a trust fund. This fund generates interest, which then goes towards creating development projects that promote the intensification of agricultural land-use in rural communities located in and around ecosystems of hydrologic importance within the watersheds serving Quito. With a purpose of reducing the total area of land altered by human activities in the targeted páramo ecosystem, these development projects also serve as payment to communities for their conservation practices that require the input of labor and the re-arrangement of land uses. The Nature Conservancy (TNC) has declared a goal to replicate at least 32 other water funds in Latin America following FONAG's

model (TNC 2012b). Currently, there are 17 cities implementing the model, and several others in the planning stages (LAWFP 2015).

Although organizations such as TNC promote FONAG as a straightforward mechanism for replication, FONAG's arrangement has implications that are more complex than a simple formula for financing conservation or a linear succession of events. FONAG is a mechanism for environmental governance comprised of a set of material and discursive practices intended to shape the conduct people towards their environment, facilitating the creation of a commodity known as "ecosystem services."

Ecosystem services are inextricably tied to the landscapes and space in which they are produced. Noting this relationship, Peluso and Lund (2011) argue that the commodities created through PES environmental governance schemes are now objects for accumulation, and can thus be a mechanism to appropriate territory. The process of commodification of ecosystem services therefore necessarily involves a process of territorialization, defined as the practice of claiming and managing space as it is carried out by states and other entities (Sack 1986; Vandergeest and Peluso 1995).

Investigations of the process of setting up neoliberal conservation territories are generally relegated to the examination of state-led protected areas, with the literature framing the state's role as a vehicle that lends legitimacy and authority for transnational and market actors to drive the process of constructing conservation territories (Corson 2011). I would like to redirect this argument, however, and propose that non-state actors can drive internal territorial processes with authority granted through a market arrangement. While the market mechanism lends legitimacy and authority, however,

this arrangement is vulnerable to power imbalances and can become 'hijacked' by the state or other entities to claim access to previously restricted territory.

This chapter examines the initiation of FONAG and how the water fund PES arrangement is able to enact a new process of territorialization. It clarifies how FONAG's history and ongoing influences have configured the organization's current arrangement, and examines the donors, NGO's, and public and private companies that contribute to FONAG. It points out how FONAG, a seemingly autonomous organization, is subject to power relations between the different contributors. My examination particularly identifies FONAG as both conduit and a restraint of power for Quito's water company (EPMAPS), the largest financial contributor to the fund.

First, I discuss the context and history of FONAG, to show how incomplete and uncooperative land control through the vehicle of the state led to the emergence of the PES water fund model and its accompanying process of (re)territorialization. Next, I draw on contemporary critical scholarship on water resources to help discuss the use of the watershed as a 'natural' territorial boundary that attracts financial investment and deflects political contestation. Third, I demonstrate how the concept of participation creates a platform for multiple alliances and lends legitimacy to the watershed territory. After examining the various partnerships that comprise the case study, I discuss how the assemblage of the water fund creates authority necessary configure the boundaries of the PES scheme. I argue that these alliances, formed through a watershed territory and effectively de-politicize the necessary process of territorialization. I also point out how the balance of power within FONAG itself is unstable, and argue that FONAG has

recently become a platform that lends legitimacy and authority to gain access to rural territory for the city of Quito, an extension of the state.

My analysis of FONAG draws upon Tania Li's Li (2007a) analytic of the assemblage. Li conceptualizes governance as a diverse set of practices aligning disparate groups of experts, agencies and organizations that are drawn together through a 'will to improve,' or a desire to manage conduct and social processes towards a particular end (Li 2007a). This approach rejects the idea that an environmental governance assemblage is somehow the product of an elaborately conspired plan of exploitation and recognizes the agency that situated subjects possess in their contributions to the assemblage (Li 2007a).

3.2 PAPER PARKS: INCOMPLETE AND UNCOOPERATIVE CONTROL

FONAG primarily emphasizes water conservation. However, its origins stem from a struggle over to enforce protected areas aimed at conserving biodiversity. FONAG emerged at the tail-end of the global boom in the establishment of protected areas. This movement, which peaked between 1985 and 1995, coincided with the international rise in neoliberal policies bent on restructuring the world to enable free-markets (Brockington, Duffy, and Igoe 2008). During the 1980s and 1990s, money shifted away from states, pushing them towards decentralization and reliance upon external financing, technology and expertise, and making them available to investments by external institutions. Multi-lateral funding imperatives pressured states to create protected areas and other conservation spaces premised upon assumed complementarity

of conservation and sustainability with economic growth (Igoe and Brockington 2007; Goldman 2001). The growth of protected areas for biodiversity conservation and the international investment in these areas can also be understood as an attempt at creating new spaces for capital expansion (Corson 2010; Igoe and Brockington 2007).

The presence of a protected area, however, does not necessarily mean full control over the land. The legal establishment of a protected area is an incomplete form of territorialization if there is no further intervention to manage the conduct of people and their resource use. Local people may simply not recognize new, competing claims to land and resources. Many of the same political conditions that facilitated the boom in protected areas may have also contributed to widespread ineffectiveness in controlling protected area territory and directly resulted in the emergence of other forms of non-state conservation mechanisms, such as FONAG.

Ecuador was situated within the neoliberal reforms that washed over Latin America during the 1980s and 1990s (Hey and Klak 1999). During this period, the country rapidly established state-controlled protected areas during this period. By 2000, nearly 40% of Ecuador's total area was allocated to protected areas, earning it recognition as the country with the highest percentage of land dedicated to protected areas in the world (Lewis 2000). Transnational conservation NGOs enormously assisted Ecuador in reaching this status. As one of those organizations, The Nature Conservancy (TNC) arranged debt-for-nature swaps and funneled money to support Ecuadorian conservation NGOs such as Fundación Antisana, an organization that was created in 1991 for the sole purpose of forming a protected area around the Antisana volcano

(Lewis 2000). Both TNC and Fundación Antisana became major advocates for FONAG in the latter portion of the 1990s.

The idea for FONAG originates with an individual, Juan Black. Black, a founder of Fundación Antisana and instrumental in setting up the Antisana Ecological Reserve, became the regional representative for TNC in 1992 (Echavarria 8/24/2012). Although Ecuador possessed expansive areas of land in protected areas, both political and financial instability saturated the country during the 1990s. In this period, economic inflation ballooned and the Ecuadorian presidential office functioned like a revolving door with most incumbents failing to serve even half of their terms. In 2000, the same year that FONAG launched, Ecuador faced an extreme national economic crisis involving the collapse of sixteen Ecuadorian banks, uncontainable inflation, spiking poverty rates, and the eventual dollarization of the economy (Jacome 2004).

Ecuador's government lacked resources to regulate human activities within protected areas as the country struggled in the decade leading up to the 2000 crisis (Lewis 2000; Echavarria 8/24/2012). The funding deficiency for protected area boundary enforcement became Black's preoccupation. Before Fundación Antisana facilitated the land acquisition, Antisana had been a hacienda extensively used by members of neighboring communities for grazing, fishing and hunting. After the designation of the park, people continued these activities, despite the new legal regulations prohibiting them (PG730 10/30/2012). The Antisana Ecological Reserve was, in practice, another polygon on a map.

Noting the proximity of both the Antisana and Cayambe-Coca Ecological reserves to the city of Quito and their ecological importance to the water supply to the urban area, Black supposed that funding for the reserves could somehow be raised if he linked the land to the city (Echavarria 8/24/2012). Although Black fell ill and passed away from cancer in 1996, his idea that the city of Quito could pay for the enforcement of protected areas as a compensation for the water originating within them passed to the succeeding director of TNC in Latin America, Roberto Troya (Kauffman 2011). TNC's efforts in the region had been supported by Parks in Peril (PiP), a joint program between TNC and USAID established in 1990 to fortify protected areas throughout Latin America and the Caribbean. However, USAID planned to end PiP within the next decade, and finding steady funding for conservation concerned TNC (various interviews with TNC affiliates, 2012).

TNC announced a move towards a landscape approach to conservation during the mid-1990's while simultaneously working to fortify protected areas through PiP (Howard and Magretta 1995). Informed by scientific studies warning about biodiversity loss due to habitat fragmentation, TNC shifted in its conservation approach (Birchard 2005). This meant a new business model for TNC. The organization moved away from real estate purchases to conserve land and towards institutional deal-making to conserve entire ecosystems comprised of mosaic arrangements of land ownership and use (Birchard 2005). In 1998, TNC´s new direction took hold after 13 years of development. The then-president, John Sawhill, officially declared that TNC would create 500 landscape-scale projects by 2008 as an goal for the organization (Birchard 2005). This

shift in business model also implied a shift in target: conservation areas were to be determined by the limits of ecosystems rather than political boundaries (Birchard 2005).

The transition of TNC's focus from protected areas to ecosystems and landscapes occurred simultaneously with the initial discussions about FONAG. As a part of its new landscape conservation approach, TNC partnered with the United States Agency for International Development (USAID) to designate the Condor Bioreserve in 1997 (TNC 2007). The Condor Bioreserve is a 5.4 million acre conservation priority area that consists of a mixed-use landscape that includes portions of six protected areas and the farms, ranches and indigenous communities that occupy the space in between them. This same area encompasses much of the watershed that is vital to Quito's water supply (TNC 2007).

The Condor Bioreserve itself is a management category created by TNC and its Ecuadorian partner organizations without legal recognition in Ecuadorian law (Clark and Padwe 2004). Practitioners began informally using the term for the territory in the midst of the Sustainable Use of Biological Resources (SUBIR) conservation initiatives spearheaded by TNC and USAID beginning in 1992, and later formalized the name within funding proposals (Nyce 2004). The focus of the SUBIR initiatives was to "test and develop economically, ecologically, and socially sustainable resource management models in three parks and their buffer zones" (Abramovitz 1994, 11).

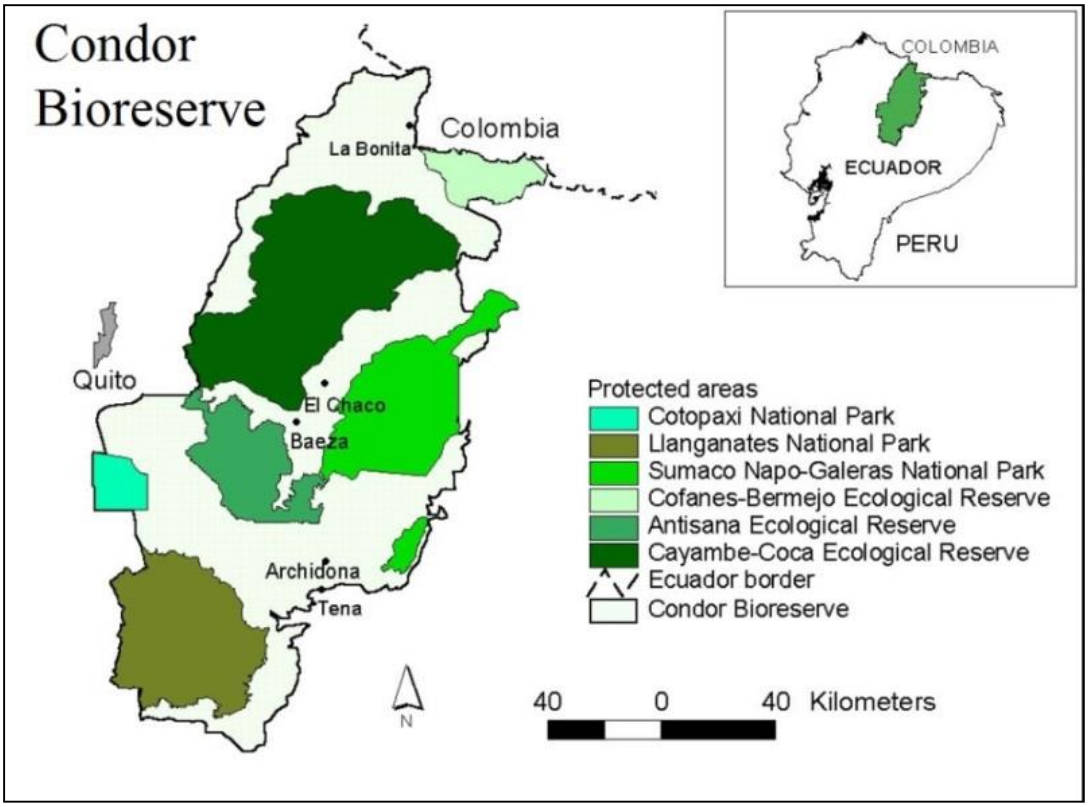

Figure 3.1 Map of the Condor Bioreserve and protected areas (Source: TNC 2008)

FONAG was TNC's solution to fund the on-the-ground interventions in the Condor Bioreserve after the expiration of PiP (Nyce 2004). A TNC-produced 2001 working paper titled, 'FONAG: The Water–based finance mechanism of the Condor Bioreserve in Ecuador' explicitly describes the goal of the fund "to collect a user fee from those who benefit from the water from the Bioreserve" (Echavarria 2001, 2). Likewise, a 2007 report from TNC alternatively called FONAG the 'Condor Bioreserve Watershed Valuation Project.' This report described FONAG as the mechanism for providing "long-term source of financing for the conservation of the Condor Biosphere

Reserve, particularly the Antisana and Cayambe-Coca Ecological Reserves, which are the primary source of drinking water for the city of Quito" (Krchnak 2007, 7).

However, the sprawling landscape boundaries drawn by TNC over Ecuador's protected areas did nothing to assist on-the-ground control of human resource use. While the state possessed authority to enforce conservation of protected areas, TNC and USAID delineated the Condor Bioreserve as a territory for conservation that lacked any kind of state-sanctioned authority that would authorize control of land use within the area. TNC and USAID continued to frame the problem of biodiversity conservation as a funding issue that could be solved through FONAG. TNC, however, would later report that FONAG was not the entire solution because the territory of interest to potential funding partners did not align with the boundaries of the Condor Bioreserve. This is acknowledged in a 2005 report from TNC, which states:

> "…[W]ater funds do not have the potential to become a primary source of funding for protected areas and biodiversity conservation. Protected areas of particular value for biodiversity conservation tend to be large areas that encompass many watersheds. Water users generally want to support management activities specifically in the watersheds that provide their water, not entire reserves or ecologically functional sites… [T]he early literature about FONAG presented the fund as a finance mechanism for the Antisana Ecological Reserve (120,000 hectares) and the Cayambe-Coca Ecological Reserve (400,000 hectares), or even potentially the entire Condor Bioreserve, which includes more than one million hectares. The watersheds of interest to FONAG member organizations, however, include a smaller area – the headwaters of several basins that supply drinking water and support hydropower generation and other economically productive activities that depend on water…" (Brown and Stem 2005, 9).

Based upon the report, TNC deemed that it was unreasonable to expect that the water fund would support an expansive area like the Condor Bioreserve. As a result, TNC

redefined the territory that it expected FONAG to finance, and ultimately reconceptualized FONAG as a governance mechanism in itself.

Attempts to build new conservation territories in Ecuador outside of state-led protected areas were both a product of, and response to, a political and economic context that enabled the creation of protected areas while the state was without ability to enforce them. TNC attempted to create a conservation territory that did not rely on the direct action of the state. However, the NGO lacked the authority and financial support succeed at the goal of meaningful conservation intervention through the Condor Bioreserve. The next section discusses the process of how TNC readjusted the boundaries for FONAG's new conservation territory to gain a partner that could alleviate the funding issue, the city of Quito's water company (*Empresa Pública Metropolitana de Agua Potable y Sanamiento* - EPMAPS).

3.3 POLITICAL CONTEXT FOR APOLITICAL BOUNDARIES

One of the first motions in the process of state-led territorialization is defining the territory to be re-regulated for conservation purposes (Vandergeest and Peluso 1995). In neoliberal configurations of internal territorialization in which transnational entities use the state as a vehicle, this is a highly contested process in which political boundaries are negotiated between competing claimants (Corson 2011). While international conservation organizations continue to pursue traditional parks under neoliberalism, neoliberal environmental governance arrangements are increasingly turning towards

hydrologic boundaries rather than political ones to delineate territory for environmental governance (Cohen and Davidson 2011; Molle 2009; Norman, Cook, and Cohen 2015).

Asserting to be more ecologically meaningful, and claiming objectivity, science provides a seemingly 'natural' scale of environmental governance that appears "normatively superior to the messy political boundaries" that usually guide environmental decision making (Cohen 2012, 2211). Framing the new boundaries in the apolitical language of science limits contestation and depoliticizes their construction. By extension, this also depoliticizes the process of territorialization and limits contestation. Despite its appearances as an apolitical boundary, however, the watershed partition is only one of many ways that a landscape can be bounded. Therefore, it is an inherently political act (Carse 2012).

TNC, supported by USAID, began the process of territorialization by delineating boundaries for FONAG's territory. The organization believed that tying biodiversity to water resources would facilitate an alliance with Quito's public water utility company (*Empresa Pública Metropolitana de Agua Potable y Sanamiento* - EPMAPS), which had access to capital. While TNC's primary interest is biodiversity conservation and EPMAPS is water, the sites of production for these two resources share the same physical space. The high-altitude humid páramo grasslands contain high rates of endemic species and are vital to the regulation and purification of water that supplies the city of Quito. Approximately 85% of the city's water supply exclusively comes from the páramo ecosystem (Buytaert et al. 2006).

Originally, TNC and Fundación Antisana intended FONAG as a financial mechanism with a constituent board of paying 'water users' that would identify 'problems' and make decisions on allocating money to support local organizations in their conservation work, rather than a new organization in itself. According to the primary designer of FONAG, Marta Echavarria:

> "Because there were foundations like Antisana… we didn't want to create more NGOs. …[W]e knew that the work wouldn't be done by only one [organization], it needed to be by all of them. So that's why we thought that there would be the *fidecomiso*[6], then there would be a technical secretary that would be impartial, and that technical secretary would be overseen by a board. And the board allowed participation of those that put resources into the fund, and the idea was that they would be users of water, water-users. And then the technical secretary would have a technical committee that would help maybe think about the problems. So that was the vision and that was the strategy that we followed" (Echavarria 8/24/2012).

In response to the paper parks failure that TNC had previously encountered, the key idea of FONAG was that it would be an endless source of funding for conserving lands simultaneously valuable for biodiversity and water resources. In a typical scenario with an NGO, donors could withdraw funding at any time and leave a project stranded (Echavarria 8/24/2012). However, the designers envisioned FONAG as a trust fund. It would have an endowment that would be left to grow untouched, and then only its interest would be applied towards conservation activities to create the financial stability that evades most small NGO's (Echavarria 8/24/2012). TNC envisioned EPMAPS' contribution as finances to seed an otherwise autonomous organization.

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[6] Trust fund

EPMAPS could be considered an extension of the state. The city of Quito is Ecuador's national capital and is typically privileged over rural areas because of its role as an economic driver. EPMAPS itself is a public company and an extension of the city, with the mayor being the head of the public company's governing board. However, the pivot point for TNC to seek partnership with EPMAPS wasn't authority. Rather, it was the financial resources that the city could provide (Echavarria, 8/24/2012). The fund itself would generate authority through the governance mechanism of the multi-stakeholder platform of a water council. As Echavarria stated, "the idea is that the water council should be the leading authority locally." However, the water fund designer insisted, this stops short of government "…because we are not a government, we are not" (Echavarria, 8/24/2012).

TNC drew upon EPMAPS' recent construction of new water projects and in the two protected areas to appeal for the company's partnership (Echavarria 8/24/2012). In 1998, EPMAPS completed the Salva Faccha dam, located in the Cayambe-Coca National Park above the town of Papallacta within the Papallacta and Oyacachi sub-watersheds. Figure 3.2 shows pipelines carrying water to Quito from the Cayambe-Coca National Park passing through the town of Papallacta.

Figure 3.2 Water pipeline to Quito passing through the town of Papallacta (November 2012)

EPMAPS designed the water project to augment the capacities of the original Papallacta water system that it completed in 1990. This water system collects dozens of small reservoirs within the Cayambe-Coca National Park, one of which is pictured in Figure 3.3 below. Including the Salva Faccha dam, this system serves the potable water needs of 50 percent of Quito's population (Proaño 2005; EPMAPS 2014d).

Figure 3.3 The Loreta Reservoir dam in the páramo, Cayambe-Coca National Park (November 2012)

As EPMAPS finished construction on the Salva Faccha dam to serve northern portion of the city, it initiated work on the Mica water project in the Antisana Reserve, located within the Antisana sub-watershed, to augment potable water supplies for the southern end of the city (Proaño 2005). The Inter-American Development Bank financed construction of a dam, a water transport system, and a hydroelectric station, which was completed between 1997 and 2001 (EPMAPS 2014b). EPMAPS initiated both of these major infrastructure projects within páramo ecosystems in protected areas, and both are dependent upon natural processes to fill the reservoirs with water that ultimately flows to Quito. FONAG encompassed these areas within its targeted watershed boundaries.

FONAG established its official area of operation (Figure 3.4) to cover 5,420km^2 including the upper Guayllabamba watershed, as well as the upper Oyacachi, Papallacta and Antisana sub-watersheds. The latter watershed divisions contain the reservoir systems that directly provide for the vast majority of the water supply to the Metropolitan District of Quito. These areas also contain extensive portions on the edges of three protected areas, including Antisana Ecological Reserve, Cayambe-Coca National Park and Cotopaxi National Park.

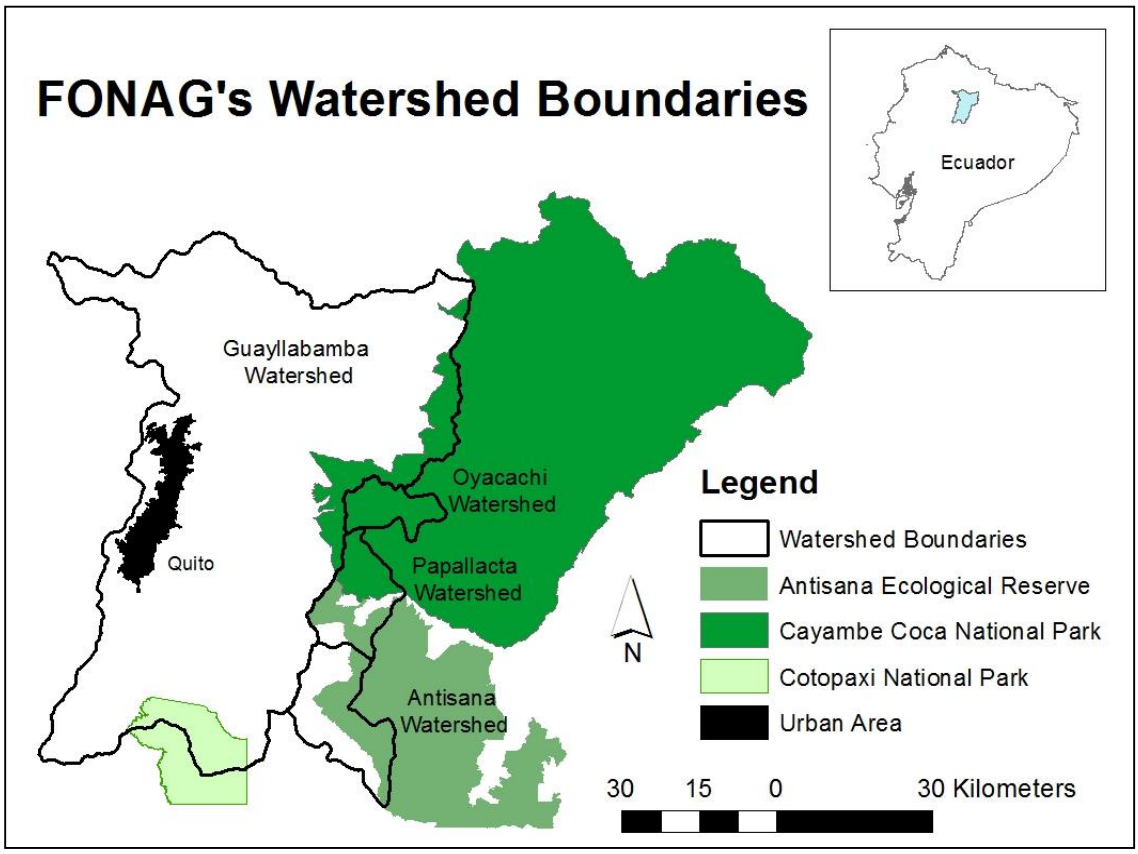

Figure 3.4 Map of FONAG's watershed boundaries and the protected areas

While trimmed to fit EPMAPS' hydrological areas of interest, the boundaries of FONAG's territories reflect consideration of the Condor Biorerserve boundaries. A vestige of this intent is demonstrated in FONAG's Strategic Plan 2009-2013 description of its geographic target area:

> "A special characteristic of this area is that the watershed divisions located in the south and east are inside of the protected areas… [Cayambe Coca and Antisana] form, together with five other protected areas, the Condor Bioreserve, a special area of interest for conservation because of their richness in biodiversity" (FONAG 2009a, 2).

The Condor Bioreserve's massive extent stretches from páramo ecosystems on its west side to Amazonian rainforests on the east. The western expanse of the Condor Bioreserve between the city of Quito and the protected areas, including vast areas of páramo, is one of the most densely populated areas in the country (FONAG 2009a), while the Amazon region is one of the least. Therefore, it follows that TNC prioritized efforts through FONAG to intervene the western edge of the Condor Bioreserve and focus on the Guayllabamba watershed that extends over a smaller area, but covers much of the boundary areas of the Cayambe-Coca and Antisana protected areas.

FONAG's finalized territorial boundaries, therefore, reflect TNC's goal to manage the landscapes for biodiversity in the highly populated areas radiating outwards from the city of Quito towards the protected areas and EPMAPS' goal to manage landscapes for hydrological resources. Although the boundaries are 'natural,' it is evident that they were carefully chosen and sub-divided to fit the goals of the two leading organizations. TNC was able to argue for the practical necessity of watershed

protection to EPMAPS because of the water utility infrastructure projects. However, the timing was also ripe for EPMAPS and TNC to form an alliance. This included an amicable legal framework to mix public and private money, transnational relationships with key conservation actors, and an example that could be replicated from abroad.

In 1999, Ecuador's national government passed a law, known as the Securities Market Act,[7] that allowed both public and private money to be managed together by private financial entities (Proaño 2005; Kauffman 2011). It provided a structure for financial resources to be controlled by banks and backed by legal framework. Public and private money could be mixed and put towards FONAG, so that the trust fund became a separate entity governed by a board of representatives from the contributors. This would theoretically make the financial resources 'autonomous,' or not susceptible to appropriation by any single entity (Echavarria, personal communication, 8/24/2012).

The mayor of Quito acts as the head of EPMAPS because the company is public. Roque Sevilla, a widely recognized environmental activist who had previously served as director of the World Wildlife Fund and the director of Fundación Natura, was mayor of Quito during the period of time in which FONAG launched (Kauffman 2011). Sevilla was likely persuaded to launching the water fund in partnership with TNC because of these connections.

Finally, TNC used New York City's watershed program in the Adirondacks as a selling point of a water fund to EPMAPS. TNC likened Quito's water supply situation

[7] Ley de Mercado de Valores

to New York City's because the majority of the water for the both cities originates within protected areas. New York financed a watershed protection program in the Adirondacks. TNC argued that EPMAPS could likewise finance a watershed protection program through financing FONAG in a partnership with TNC. As Marta Echavarria, a key consultant hired by TNC to design FONAG recalled, "We said, 'if New York City did it, then probably [there] could be a way to argue here [that] we can do the same'" (Echavarria 8/24/2012).

The New York City example solidified TNC's argument in favor of FONAG, and the mayor of Quito was persuaded to invest in watershed protection. EPMAPS invested the bulk of the funding, $20,000, while TNC contributed $1,000[8] to launch FONAG in 2000. The decision of EPMAPS to invest in FONAG can be boiled down to 1) the legal framework being right for the partnership, 2) the mayor's personal connections with international conservation non-governmental organizations, and 3) the feasibility of a watershed project modeled after one in the United States.

The circumstances under which the city of Quito agreed to align with FONAG appear to represent what Peck (2011, 2010) has called a 'fast' neoliberal environmental policy. Ecuador went through a period of economic reform. In the style of neoliberal policy supporting decentralization, financial institutions were altered to allow private entities to handle public money, therefore providing FONAG with the platform it needed

[8] Marta Echavarria (personal communication, 24 August 2012) and Siliva Benitez (personal communication, 3 July 2012) estimated the initial investment into FONAG to be around $50,000, but the fund lost a substantial amount of economic value during Ecuador's economic crisis in the year 2000.

to start its trust fund. Typical of other fast policy regimes in countries struggling with economic development, TNC looked towards 'policies that work,' or policies that had been tested and functioned in the setting of a developed country. The attempt to re-create the Adirondacks case therefore accelerated the adoption of FONAG in Quito.

TNC's intention of creating the watershed territory was to facilitate funding for conservation based on the fast policy design. Supported by favorable legal and political conditions, the 'natural' boundary of the watershed was not overtly political and circumvented the involvement of the tumultuous national government to make its uptake attractive to the city of Quito's water company. Furthermore, the operation of the water fund as a 3rd party gave FONAG an appearance as a neutral entity. The next section demonstrates how the watershed became a platform for other alliances in governing the territory.

3.4 THE WATERSHED AS A PLATFORM FOR PARTICIPATION

In addition to removing contestation over territorial boundaries, the shift towards governments and NGOs using watersheds as a boundary, portrayed widely in literatures as a move towards decentralization of environmental governance, opens opportunities for extra-governmental organizations in decision-making (Cohen 2012). The use of watersheds as boundaries also removes contestation over territorial boundaries. Literature in environmental governance represents decentralization as a move towards greater access to local knowledge, local empowerment, and increased participation (Lemos and Agrawal 2006). Although practice has demonstrated that a hydrologic

boundary does not inherently promote participation, rescaling to watersheds as a unit of environmental governance implies the concept of participation which serves to lend legitimacy to the arrangement (Cohen and Davidson 2011).

The concept of political legitimacy as participation stems from scholarship in the 1970s. Disenchanted with elite control that seemed to permeate arrangements in which only elected representatives possessed decision-making abilities, scholars argued that democracy "must include decisions made not by government officials or technical experts, but by the citizens affected by those decisions (i.e. the public)" (Cohen and Davidson 2011, 3). As a result, legitimacy came to be associated with decisions made by the people in a participatory process instead of those by elected officials in traditional forums (Cohen and Davidson 2011). With corruption permeating the legal systems of many developing countries, this concept of legitimacy particularly gained influence in Latin America. USAID, the largest donor to FONAG, justified its support with the hopes of promoting a democratic platform in a state otherwise characterized by corruption among elected officials (USAID Official, 5/31/2012). Thus, the watershed territory, which facilitated financial partnerships for conservation, also became a platform for alliances of environmental governance in the name of participation.

Participation based upon the watershed territory is reflected in FONAG's the mission and vision statements. Central to any organization, mission statements generally define the current purpose of the organization and inform the parameters of operation, while vision statements express the future of the organization and its relationship with the community that it serves (Collins and Porras 1998). The mission statement reads:

> "We are an alliance of persons and institutions committed to nature, and, together with local communities, protect, care for, and rehabilitate the environment, especially the watershed that supplies water to meet the needs of the Metropolitan District of Quito and its areas of influence, by means of a financial mechanism that co-finances environmental protection activities" (FONAG 2014c).

The mission statement broadly indicates FONAG as an 'alliance of persons and institutions' with 'environmental concerns.' By secondarily including 'local communities,' the term 'alliance' creates a distinctly urban focus, reinforced with the direct reference to the Metropolitan District of Quito. Moving on to the action of FONAG, the mission statement declares that this alliance is to "protect, care for, and rehabilitate the environment, especially the watershed…" The activities that constitute 'protect' or 'care for' are unspecified, but the geographic location is fixed with mention of the Guayllabamba watershed, laying a claim to the ecosystem services of the watershed. The mission statement indicates that the financial mechanism will act as a means to accomplish the activities. Specifically mentioning the Guayllabamba watershed, the vision statement of FONAG, reads:

> "To be a mobilizing instrument of all actors to practice a responsible and friendly civic duty in favor of nature, especially towards water resources in the upper Guayllabamba watershed" (FONAG 2014c).

The vision statement clarifies that the purpose of the constituent alliance is for directing human conduct regarding the environment within the watershed. It includes all actors in a call for collective action, subtly implying that this is also a governance arrangement.

The overwhelming scope of these statements have allowed for alignments between diverse constituents to congeal and for a plurality of interests to be incorporated into the alliance. FONAG's strategic plan also included a multi-scalar governance structure designed by *Fundación Futura Latinoamerica* (FFLA) that provided a representation mechanism for rural communities in the watersheds to participate in FONAG. However, FONAG shelved the idea in 2012. In the end, FONAG welcomed any type of organization as a constituent in the fund as long as it financially contributed to it, leading to a mixed partnership structure, or as Lemos and Agrawal (2006) have termed it, a platform of 'hybrid' environmental governance.

In its final formation, FONAG is a non-declining trust fund set by its contract to last 80 years, and is headquartered in the city of Quito, Ecuador to support the organization's interventions within its targeted watersheds. Constituent members serve on FONAG's board of directors, which oversees the Technical Secretariat, a liaison position between the constituents and the agency that involves supervising and managing the program coordinators of FONAG, and acting as an official spokesperson. Constituent members of FONAG, a group including two public municipal utility companies, two private beverage companies, and two transnational NGO's, contribute capital for the endowment. The funds themselves are managed by a private banking company called Enlace (Field Notes, October 2012).

After TNC and EPMAPS began the fund, more constituents gradually joined over the next seven years. In 2001, influenced by EPMAPS agreement to become a constituent, Quito's public electric company (*Empresa Electrica de Quito*-EEQ) also

joined FONAG. They were followed by the private brewery company, Cervecería Nacional S.A. in 2003, the Swiss Development Cooperation (through El CAMAREN) in 2005, and the private beverage company Tesalia in 2007. Reproduced from FONAG´s website, Figure 3.5 shows the logos of the constituents that financially feed FONAG.

Figure 3.5 Logos of the six constituent members of FONAG (source: FONAG 2012b)

Conspicuously, Fundación Antisana, one of the founding organizations, is not a constituent member of FONAG. In order to avoid a conflict of interest, constituent members needed to agree that the financial resources would not be re-directed back through any one of the constituent organizations. As a large international NGO, TNC decided that they were stable enough to not request funding support from FONAG. Fundación Antisana, however, lacked self-sufficiency and depended greatly on donors to

run its programs. To a large extent, they were dependent on the financial resources coming from TNC and USAID, which both have requirements to pass financial resources through local organizations. While Fundación Antisana wanted to join the board to make decisions about FONAG, ultimately they opted to remain off of the board in order to maintain eligibility to receive FONAG´s financial resources (Echavarria, personal communication, 24 August 2012).

Many international organizations have employed collaborations with local organizations as a means to buffer against criticisms of imperialistic practices (Neumann 1997). If the funding dries up, however, the local organizations are at risk of drying up as well. Rumicocha Foundation, for example, is an organization that grew off of Fundación Antisana. It focuses on the Cayambe-Coca Ecological Reserve and formerly based itself out of the town of Papallacta on the edge of the reserve. The organization received funding for Condor Bioreserve activities through TNC-USAID. Fundación Rumicocha formed because local interest existed in developing Ecotourism in Papallacta, but also largely because TNC and USAID made funding available to it. By 2010, however, the organization had stopped projects and entirely closed their office in Papallacta. They kept their office open in Quito because of the convenience it afforded to potential international donors to access. A representative of Rumicocha expressed much frustration with FONAG in a 2010 interview about not receiving FONAG resources.

TNC and Fundación Antisana found the process of getting water-users to join FONAG to be challenging. As such, many more water-users exist than are represented

on the board. TNC generated a list 1998 that identifies eight potential water-using partners for the fund (Troya and Curtis 1998), yet only two of the eight went on to be partners.

Echavarria directly worked in the process of trying to convince partners to become board members of the FONAG. She personally attended meetings ask solicited partnerships for FONAG. When asked why many potential partners ultimately decided to decline membership, she pointed to the lack of philanthropy in Ecuadorian culture, but also an unwillingness to work together. "They know the problems, they can say, 'OK, I'll do this,' right? But many of them want to do it on their own. So there is not the culture of working as a group" (Echavarria, personal communication, 8/24/2012).

As I focused on the current alignments of FONAG, I did not interview representatives of the entities that had outright rejected constituent membership. However, other reasons could exist for declining to join FONAG. For example, perhaps the differences in goals between constituents outweighed the similarities, or perhaps the organizations did not fundamentally agree with the premises of PES. In this next subsection of the chapter, I examine the entities that agreed to become constituent members and discuss their points of alignment as well as fracture. Each constituent possesses a reason for involvement with the FONAG that includes priorities and perceived benefits that may not be shared with the others. I explore the formation of alliances and the diverse interests that comprise FONAG.

3.5 PAYING FOR POWER

FONAG would not exist if various companies and organizations did not come together to pool financial resources in what Tania Murray Li (2007b; 2007a:264) has called a 'will to improve', or "the attempt to direct conduct and intervene in social processes to produce desired outcomes and avert undesired ones." FONAG exists and persists through the ongoing practices of these disparate entities drawn together in an effort to direct conduct on the land within the upper Guayllabamba watershed. Drawing upon Li's (2007a: 268) analytic of assemblage, the term 'forging alignments' refers to the "will to govern as a point of convergence and fracture." The first of these alignments occurred with TNC and Quito's public water utility company who shared an interest in controlling the same spatial area. However, TNC, under the premise of participation in a watershed territory, envisioned the extension of membership to all those willing to pay for it. Table 3.1 demonstrates the breakdown of FONAG´s financial contributors.

Constituents (n=6)	Financial Investment ($US)	Percentage of capital	Type of Payment	Year Joined
EPMAPS-Quito	10,660,684	93.1%	Annual Percentage	2000
TNC	81,000	0.7%	Flat Annual Fee	2000
EEQ	585,000	5.1%	Flat Annual Fee	2001
Cervecería Nacional	55,000	0.5%	Flat Annual Fee	2003
El CAMAREN/ COSUDE	35,000	0.3%	Three Payments	2005
Tesalia Springs Company	21,000	0.2%	One Payment	2007
Total	**11,448,684**	**100%**		

Table 3.1 Constituents of FONAG (source: FONAG 2014d)

The total capital invested into FONAG's trust fund was nearly $11.5 million, and it generated interest equaled $6,333,813 at the end of 2013 (FONAG 2014d). The funds, managed by the private banking company Enlace, are invested in a variety of financial institutions, the largest being government bonds, which rendered approximately 66 percent of the interest. Other investments included CDs in the Pacific Bank, Central Hidroelectric ML, Infoods Corp secruities, and CF securities (FONAG 2014d). In 2010, the total operational costs were $2,203,687, with seven percent going to operating and administration costs.

By far, the largest contributor of capital has been EPMAPS, which alone accounts for slightly over 93 percent of the total funds invested into FONAG. The next largest contributor is EEQ, which has contributed about five percent of the total fund. Together, the two public utility companies account for roughly 97 percent of the total investment into FONAG. EPMAPS estimates that they are contributing nearly $100,000 per month into the fund, which means EPMAPS contributes a little more than $1.2 million dollars per year. The capital invested by EPMAPS dwarfs the contributions by other constituents, meaning that their total proportion of investment will increase over time.

Donations also contribute the growing water fund. Donors do not have a voting right like constituent members of FONAG's board possess. Yet, they carry influence within FONAG by sponsoring particular projects that forward their goals. The most significant donor of FONAG has been USAID. Donations were a helpful way to support activities, particularly in the early years while the fund capitalized. The acceptance of

donations has continued, however, into the present. In 2010, for every one dollar that came out of their own finances, FONAG attracted four dollars of outside donations (FONAG 2010). A majority of donor funds pay for interventions in rural communities.

3.5.1 The Nature Conservancy (TNC)

TNC is an environmental conservation organization that started in 1951 in the United States (TNC 2013). It launched programs in Latin America by the late 1970's, and by 2004 it achieved status as the largest environmental organization in the world (Birchard 2005). Currently, the organization boasts international work in thirty-five countries and has over 6 billion dollars in assets (TNC 2013). As an instigator of FONAG, TNC viewed FONAG as a means to procure sustainable funding for conservation projects around Quito. They noted the overlap of the watershed and many of the protected areas and pursued the water fund with biodiversity conservation as their focus.

In the past decade while FONAG has evolved, the vision of TNC has changed again and turned to focus on conservation for sustainability, rather than preservation. From TNC's official website, the vision "is to leave a sustainable world for future generations," while their mission is "to conserve the lands and waters on which all life depends" (TNC 2014). Located above both the vision and mission statements on TNC's website is a photo of a little boy in a field, with the caption "Protecting nature today for people and future generations." This represents a shift in TNC's interest and goals since the fund began, as noted by the TNC's conservation projects manager in Quito's office.

> "We say now that what is contributed [by being member of FONAG] includes more, in the sense that we are taking care of an area that is important for biodiversity, but also is important for supplying water to the city of Quito… The work in this type of scheme has solidified with a goal of ours that does not just include biodiversity, or conservation work in areas of biodiversity, but also to provide a service to human beings. So we say that [TNC's goals and FONAG's goals] are very related, in a direct relationship that totally contributes to our goals" (Benitez 7/3/2012).

Out of the constituent members, TNC stands alone in that its main interest is biodiversity conservation. While TNC's mission and vision statements currently emphasis the use value of nature to people, biodiversity conservation still maintains a focus of the organization's efforts, as demonstrated in the quotes from Benitez. The conservation projects manager of TNC underlines focus of FONAG as conservation mechanism, but also underlines the interest of TNC to be model for replication.

> "Our biggest interests are the benefits that we obtain from these zones, that they are kept in a good state of conservation, that the threats are reduced, that they are recuperated. That is our interest. There is another benefit, which is to say that FONAG is an example for other sites, that FONAG has been an example for other sites, and that it is an example that is replicated" (Benitez 7/3/2012)[9].

According to Kauffman (2011), TNC had envisioned FONAG as an example for replication since its inception. TNC immediately began organizing campaigns and promoting the fund through publications and conferences. Furthermore, USAID stipulated that as a condition for receiving donations, FONAG needed to replicate its water fund model in six daughter programs elsewhere in Ecuador (Zavala 5/31/2012).

[9] Translated from Spanish to English by author

3.5.2 Quito's Water Utility Company, (Empresa Pública Metropolitana de Agua Potable y Sanamiento, EPMAPS)

EPMAPS' interest with FONAG is that it directly requires water from the Guayllabamba watershed in order to meet the potable water needs of the approximately 2 million residents of Quito's metropolitan area. To EPMAPS, FONAG meant that future costs could be reduced for water treatment and supply through protection of the ecosystems that performed those services (Kettunen and ten Brink 2013).

EPMAPS is one of the original founders of FONAG, and the largest contributor to the fund. As stipulated by the Metropolitan Ordinance no. 129, Quito contributes 2% of what it receives from water utility bills per month to FONAG. The investment into the fund went up incrementally since 2000, when it started at 1%, but now remains capped at the current percentage. As such, EPMAPS is the largest investor into FONAG, and thus far its investments represent about 95% of the capital present in FONAG's trust fund.

EPMAP's focus is to maintain the quality and quantity of water that supplies the city of Quito (Romero 6/14/2012). This is reflected in its mission statement, "to provide sanitation and potable water services with efficiency as well as social and environmental responsibility," and its vision statement, "to be a company leader in sustainable management and innovator of public services in the region" (EPMAPS 2014c). EPMAPS has been heavily influential in directing FONAG's direction. In 2012, EPMAPS used its influence in FONAG's constituent board to remove Pablo Lloret from his position as technical secretary without the approval of the other constituent members.

The then-Environmental Manager of EPMAPS, Juan Carlos Romero, declared EPMAPS as "ultimately the owner of FONAG…despite the existence of the [other constituents]" (Romero 6/14/2012). In 2014, however, EPMAPS hired Pablo Lloret as its Environmental Manager and representative of FONAG. This act will likely change EPMAPS' decisions about the FONAG, and these changes demonstrate how EPMAPS' position and strategy with FONAG is dynamic.

3.5.3 Quito's Electric Company (Empresa Eléctrica de Quito, EEQ)

EEQ is the public electric utility company that serves the metropolitan area of Quito. For electricity generation, EEQ relies heavily on hydropower. When EEQ agreed to join FONAG in 2001, dams within the Guayllabamba watershed generated 22 percent of its power (Southgate and Wunder 2009). With nearly a quarter of its energy produced from waterways, EEQ requires continuous stream flow within the watershed to maintain a predictable level of electric output. Its interest is therefore situated in maintaining sufficient flow to generate hydroelectric power and maintain low levels of sediment in the reservoirs (Kettunen and ten Brink 2013). As a constituent member, EEQ contributes an annual flat fee of $45,000 (Consuelo 2005), thus far contributing approximately five percent to the total capital of FONAG's trust fund.

EEQ's vision statement is "to provide Quito the public service of electricity with quality, efficiency, solidarity, and socio-environmental responsibility, contributing to the

development of the electric sector and the construction of *buen vivir,*[10]" while its mission statement is "to be an example in the national and regional context for the quality and efficiency of rendering the electrical public service and for its support in sustainable community development" (EEQ 2014). The reliance on the watershed for power production for Quito and the collaborative and environmentally conscious language of the statements of EEQ align well with those of FONAG and appear to justify investment.

Aside from its involvement on FONAG's board as a constituent, EEQ has also been involved with FONAG by co-sponsoring multiple tree planting events in rural communities in the watershed (FONAG 2012a; Jumbo 2012). These tree-planting events typically last four to five days, rely on the labor of local communities in the watershed, and focus on foresting areas of around ten hectares (Jumbo 2012). These projects fit directly within EEQ's vision statement indicating socio-environmental responsibility through promoting sustainable management. Tree planting, according to a booklet produced jointly by EEQ and FONAG, addresses "the challenge to recuperate the watershed and mitigate greenhouse emissions released into the atmosphere" (Jumbo 2012: 4). Not only is EEQ looking to maintain the watershed, but these projects also serve to mitigate emissions produced by the electrical company when generating electricity through burning fuels.

As another public utility company, EEQ closely aligns with EPMAPS and is subject to the changing politics of Quito's city administration. After EPMAPS, it is the

[10] Buen vivir is a social philosophy in Ecuador that promotes an anti-capitalistic, community-oriented vision of development

largest provider of financial resources. Together, the two public utility companies contribute 97 percent of FONAG's finances.

3.5.4 Consortium of Training for the Management of Renewable Natural Resources (Consorcio de Capacitación para el Manejo de los Recursos Naturales Renovables, El CAMAREN)

El CAMAREN acts as a constituent member in place of The Swiss Agency for Development and Cooperation (COSUDE). El CAMAREN is the only constituent member of FONAG that cannot be classified directly as a water-user. Rather, it is an Ecuadorian consortium established in 1994 that brings together NGOs, universities, and government agencies for the purpose of discussion and collaboration on the theme of natural resource management. They contribute a flat fee of $US 3,500 to FONAG's trust fund, and their total share of contributions is roughly 0.3 percent (Gaybor 6/21/2012).

Although they do not have particular mission or vision statements, many of their activities involve water resource management and the facilitation of dialogue between natural resource users. For example, they annually organize the Water Resources Forum to discuss water resource issues affecting Ecuador (CAMAREN 2014). The setting of this forum provided a platform for many of the early discussions and about FONAG (Kauffman 2011).

While Echavarria had recruited the other board members of FONAG, Pablo Lloret, FONAG's then technical secretary, recruited COSUDE. Lloret had a history of

working with COSUDE on other projects. By 2005, COSUDE decided to close their office in Ecuador. Before they left, however, Lloret approached the director of COSUDE and invited the organization to join FONAG's board (Echavarria, 8/24/2012). COSUDE agreed, but turned their representation over to El CAMAREN in 2009. The two organizations had worked together since 1996, and so COSUDE left El CAMAREN with the position as inheritance (Gaybor, 6/21/2012).

The participation of El CAMAREN is interesting as it is, in a sense, reluctant. El CAMAREN' representative to FONAG, Antonio Gaybor, describes El Camaren's negative stance on water funds in general. During an interview, Gaybor stated,

> "Look, we definitely have distinct visions. I believe that these funds like FONAG were put together under a neoliberal policy, and absolutely have global policy themes. Ecuador entered a restructuration model of water policy to go along with the ends that the World Bank defined, a model that would privatize water services and rights" (Gaybor 6/21/2012).

Gaybor explained that the fund was an inheritance, and that maintaining a position on the board was a way to honor the relationship with COSUDE. In addition to that reason, El CAMAREN's involvement keeps the organization knowledgeable about FONAG's activities in the watershed, even if the organization seems powerless to influence those activities.

3.5.5 Cervecería Nacional S.A.

Cervecería Nacional S.A. is the private Ecuadorian brewery company that materialized after Cervecería Andina SA merged with Cervezas Nacionales in 2007.

Perceiving a benefit in safeguarding supplies of clean water that to use for production (Kettunen and ten Brink 2013), Cervecería Andina made its initial investment in FONAG in 2003, when its headquarters were located in Quito (Nacional 2014). While maintaining production in Quito, the headquarters of the merged company are now in the Ecuadorian coastal city of Guayaquil. Similar to the EEQ, Cervecería Nacional contributes a flat annual fee towards FONAG's trust fund. Their share is $6,000 (Consuelo 2005), which totals about 0.5 percent of FONAG's capital investment.

Similar to Tesalia, but unlike the other constituents, their mission and vision statements are brief do not reflect environmental or social concerns. Cervecería Nacional's vision statement is "to be the company most admired in Ecuador," and their mission statement is, "to possess and develop brands in the chosen drink segments that are the first choice of consumers and clients of Ecuador" (Nacional 2014). Although the company lacks a clear link to social and environmental concerns within their mission and vision statements, the official website of Cervecería Nacional includes information about other social and environmental investments. Cervecería Nacional does not list or discuss FONAG as one of these investments.

3.5.6 Tesalia Springs CBC

Tesalia Springs CBC is a private beverage bottling company that gets their water from springs in Machachi, Ecuador, within the Guayllabamba watershed. It bottles a wide variety of beverage brands, and is notable for being the oldest bottler of Pepsi products in South America (Tesalia 2014a). Joining FONAG in 2007, the company

became the most recent constituent member of FONAG. For its constituent membership, Tesalia paid a one-time fee of $21,000 into FONAG, making up two percent of the total capital investment to the fund.

Also focused on consumers and the creation of their products, the short mission statement for Tesalia is similar to that of Cervecería Nacional S.A. It reads: "We are competitive people that create solid relationships " (Tesalia 2014b). Likewise, the vision statement reads: "to be the innovative Ecuadorian organization and the leader in beverages, through socially responsible business that generates value to commercial partners, contributors, shareholders and the community" (Tesalia 2014b). The corporate social responsibility aspect of Tesalia connects it to FONAG.

An article about Tesalia's corporate responsibility states that the company's overall objective is to work towards making a 'Better Ecuador' through the themes of health, environment, water and education. Tesalia Springs directly ties its involvement with FONAG to its environment and water themes, claiming that it supports FONAG's objectives to strengthen the "prevention, protection and care of páramos, water sources, and forests" to avoid "the overexploitation of water sources in the upper watershed" (EKOS 2014:105). TNC is specifically named as another associate of the program, yet none of the other constituents are mentioned, indicating that the company was intending to call attention to its relationship to the internationally recognized conservation organization.

3.5.7 Donor: United States Agency for International Development (USAID)

The donor organization that exerts the most influence over FONAG is USAID, which helped establish FONAG and has subsequently contributed millions of dollars to it both in both financial and technical support. As discussed earlier, USAID has been linked to FONAG since it began. USAID and TNC originally envisioned FONAG as a means of funding the Condor Bioreserve, a PiP priority area. With this relationship, USAID, together with Fundación Antisana and TNC, contributed to the initial planning processes of FONAG. Through the years, USAID has given considerable financial support to FONAG, and as such, the logo of USAID has appeared on many of the pamphlets, signs, and other objects associated with FONAG. Until the most recent uniform in 2013, the jackets of FONAG's personnel featured USAID's embroidered logo. The Technical Secretariat from 2004-2012, Pablo Lloret, worked on getting donations from USAID as well as German international development organizations to run various programs, so as not to have to use money from the fund, particularly during the early years while the fund capitalized.

According to Paola Zavala, the Project Manager of USAID in Ecuador until 2014, USAID's interest lies with FONAG because of its multi-stakeholder platform of governance, which USAID believes to promote democratic arrangements in Latin America. As a donor, USAID does not have a representative on the constituent board. However, they are able to fund particular projects that they see as in their interest through the FONAG, and their influence is notable. The most recent cooperative agreement signed with USAID was in 2007, called "Protection of Water Sources for the

Conservation of Biodiversity: Financial Mechanisms for Watershed Protection in Ecuador" (USAID 2010a). The program had three main goals: 1) Strengthening the institutional capacity of FONAG, 2) furthering FONAG´s strategic programs, and 3) replicating the model of FONAG in five other locations around Ecuador that are high priority for watershed and biodiversity conservation (USAID 2010a). FONAG reports that they had received over $3 million from USAID in financial support of projects between 2007 and 2013, presumably as a part of this program (USAID 2014a).

Through this agreement, USAID contributed in many ways, including equipping and training rural employees of FONAG called páramo guards that work to influence local conservation practice. USAID's agreement with FONAG also funded a mobile education unit that travels to schools to teach about water conservation, a bi-monthly journal called 'Agua a Fondo,' and the development of a Water Resources Information System that provides information on water supply and demand, water concessions and climate change. They also set up hydrological monitoring stations to help collect data on rainfall and other climate conditions (USAID 2010a).

Furthermore, as a part of the initiative to strengthen the institutional capacity, USAID paid the salary of a full-time employee to work at FONAG with the title of Project Coordinator. Part of the Project Coordinator's job is to make sure that FONAG is structured to meet the organizational and financial reporting standards of USAID to continue receiving donations (Proaño 6/6/2012). Therefore, USAID heavily influences methodology of FONAG to determine what counts as the success of the fund. USAID typically defines success of its conservation programs as hectares effectively conserved,

thus orienting FONAG towards a territorial focus. By setting the parameters for interpretation of success, many of the decisions about projects and their outcomes have been directly influenced by USAID, despite the agency's status as a donor rather than a constituent member of FONAG. While USAID has been significantly involved with the conceptualization, development and ongoing practices of FONAG, the future reach of this influence is yet to be seen. USAID officially ceased working with FONAG in 2014, when the entire agency left Ecuador under the pressure of the national Ecuadorian government.

3.6 CONVERGENCE AND FRACTURE

Revisiting Li's (2007a: 268) definition, the alignments between diverse entities of an assemblage involve the "will to govern as a point of convergence and fracture." The point of convergence for all of these constituent members is with the FONAG and the desire to conserve the watershed surrounding Quito. There are natural alignments between some constituent members, such as Tesalia and Cervecería Nacional SA, which are both private companies dedicated towards manufacturing consumer products. These two companies, however, seem to be the least involved in the decisions of the board. One source reported that representatives of those constituents rarely appeared at board meetings.

Two of the constituents are focused on water resources as a means to achieve other goals. TNC´s main concern with biodiversity likely varies the most from those of the other constituents. However, TNC aligns with the other constituents through its

mission and vision statements that value of nature as a service to people, and that their means to protect biodiversity is focused on landscapes that include water resources. El CAMAREN is also focused on water resources, but views the management of water resources as a means to improve livelihoods and for development.

Another alignment in the group of constituents occurs between EPMAPS and EEQ as public utility companies. As both are public utilities, both are subject to the current politics of the city. Both have mission and vision statements that stress both social as well as environmental responsibility

The greatest fissure that occurs between the constituents is that power is directly related to financial resources invested in FONAG. Each constituent's vote is weighted in terms of how much capital they had contributed to the fund. Therefore, the most powerful member of FONAG is currently EPMAPS. In 2012, EPMAPS decided that FONAG was not doing enough to further its mission, and EPMAPS made unilateral decisions about the direction of FONAG based on its weight of investment. To the protest of TNC, USAID, and EEQ, EPMAPS declared themselves the owner of FONAG and dismissed Pablo Lloret as Technical Secretariat to steer operations of the FONAG more towards the goals of the company. Most of the employees of FONAG, unhappy with the way EPMAPS made changes, quit their jobs and FONAG activities halted for the year.

However, the desire to control the financial resources of the FONAG was not new at this time, as Echavarria reflected,

> "[EPMAPS] felt that these water funds, that this fund was kind of, you know, channeling resources that should be theirs, they did not understand why when you work in a watershed, it needs to be a multi-sectoral process, it needs to be a participatory decision making, it needs to be a body of organization" (Echavarria 8/24/2012).

The designers of FONAG intended the fund to be an autonomous entity that involved all stakeholders, regardless of the amount that they paid into the fund (Echevarria 8/24/2012). However, a major fissure in the system opened when votes were weighted by investment. This distribution of votes within the governing board of FONAG allowed for a power imbalance between the constituents regarding major decisions about FONAG. Although still supporting FONAG, a USAID representative called the situation with EPMAPS a "crisis." Representatives of TNC and El CAMAREN also voiced their concerns and frustrations with EPMAPS as now directing the priorities of FONAG.

The situation within FONAG is dynamic and in ongoing development. Two years after EPMAPS fired Lloret, the company hired him into the position of EPMAPS' Environmental Manager in 2014. This change will likely affect the relationships between constituents in the coming years. EPMAPS, however, still retains majority vote and consequently the most power within FONAG.

Li's (2007a) branch of the assemblage called, "managing failures and contradictions" that addresses the shortcomings within communities that are intervention targets. In this chapter, however, I look at FONAG as an assemblage before its interaction with the rural communities that it tries to govern, and how FONAG as an organization has dealt with criticism.

In the international arena, discussion of FONAG has been overwhelmingly positive. Academic literature rarely criticizes FONAG, instead it highlights FONAG's financial successes and potential for ecological and social benefits as a system of Payments for Ecosystem Services (PES) (see Benitez et al. 2010; Tallis et al. 2008; Echavarria 2002). Articles found on websites and internet media also maintain support for FONAG and PES (see UNEP 2011; Kenny 2012; Baillie 2013), and FONAG vigorously promotes itself through Twitter and Facebook social media accounts, and a bi-monthly newspaper it produces called *Agua a Fondo*. While literature stresses the uniting of common interests between constituents of water funds, there is a lack of literature addressing the complications that arise because of uneven power relationships between constituents

Within Ecuador, however, FONAG has received criticism for being a system of Payments for Ecosystem Services. Indigenous communities in Ecuador have resisted the concept of Payments for Ecosystem services because it implies privatization and the usurpation of traditional, non-monetary values and relationships with economic values (Boelens 2006). FONAG has faced scrutiny by indigenous communities who regard FONAG as a PES mechanism and who have managed páramos without outside financial support (Diehn 2005).

The changing national political framework in Ecuador addressed fears of privatization of ecosystem services. In 2008, eight years after TNC and EPMAPS started FONAG, Ecuador adopted a new constitution. Article 74 of Ecuador's constitution reads: "Environmental services will not be susceptible to appropriation;

their production, benefits, usage and exploitation will be regulated by the State." The constitution therefore implies that systems for PES are not a legal because it requires making ecosystem services a form of private property (Herrera 2011).

A culture of resistance or distrust of Payments for Ecosystem Services in Latin America was noted in an editorial by the prominent economist Sven Wunder, and co-authored by Maria Teresa Vargas, a former president of Fundación Antisana who was involved in the initial design process of FONAG. The authors suggest that PES be called by different terminology to improve local acceptance of such arrangements (Wunder and Vargas 2005). In view of the constitution, but perhaps to also avoid issues stemming from fears of ecosystem services appropriation, employees of FONAG will not refer to it as a PES mechanism, despite the international promotion of the arrangement as PES and the direct reference to FONAG as a PES in FONAG´s Strategic Plan 2009-2013. The former technical secretary of FONAG Pablo Lloret (3/15/2012) described it, "it is not a PES; it is simply a fund that generates money for conservation projects." While not referencing the constitution, distancing FONAG from the concept of PES helps deflect accusations of privatization that are prevalent throughout Latin America.

The previous sections elaborate upon the production of territorial boundaries of the water fund within a neoliberal political context. Despite differences in priorities and ideas about natural resource use and allocation, the watershed boundary appears logical and legitimate and attracts alliances between market actors and transnational organizations the formation of territory. While the alliances are legitimized through the

watershed platform, this next sections describes how the market mechanism itself legitimizes the claim to authority for governing the territory.

3.7 DISCUSSION: AUTHORITY IN THE WATERSHED

Corson (2011) demonstrates how transnational organizations in a neoliberal paradigm leverage partnerships with the state to use it as a vehicle of authority to territorialize areas for conservation in Madagascar. I propose that neoliberal regimes that territorialize areas for conservation can do so without using the authority of the state to delineate territory, allocate rights, and designate rules of resource use. As a case study, FONAG generates its authority for rule-making through its market-based mechanism.

I have demonstrated within this chapter that FONAG emerged as an arrangement for biodiversity conservation from neoliberal reforms that emphasized decentralization and a 'market' approach to governance. The designers of FONAG, employed by TNC, developed a conservation model that derived authority to delineate territory, allocate rights and designate rules of resource use from the market mechanism and the participatory platform rather than rely upon the authority of the politically and financially volatile state.

Cashore (2002)'s framework for a Non-State Market-Driven (NSMD) governance system offers insight into FONAG's arrangement. With the NSMD framework, governing authority is granted through the institutional setting of the market and supply chain rather than the state exercising its sovereign decision-making authority and enforcing compliance. The role of the market, the state, and stakeholders along with

broader civil society take on particular characteristics. Table 3.2 summarizes conditions of an NSMD.

Condition	Characteristics
Role of the Market	Product being regulated is demanded by purchasers further down the supply chain
Role of the State	State does not use its sovereign authority to directly require adherence to the rules
Role of stakeholders and broader civil society	Authority is granted through an internal evaluative process

Table 3.2 Conditions of NSMD governance (adapted from Cashore 2002).

This arrangement requires that a market exists in which to regulate a product. This is formed through the demand of that product from purchasers down the supply chain. In this case, ecosystem services become a product that can be purchased through the existence of FONAG. Furthermore, the role of the state is limited in the governance arrangement. Nobody is incarcerated for failing to comply with regulations and representatives are not popularly elected to the governing body. This does not mean that government is completely absent. Rules governing contract law or property rights play an important background role, as markets typically operate in parameters with governmental policies. The role of the state is limited to an interest group that may attempt to influence policy, but does not have the ultimate power to make decisions (Cashore 2002). Likewise, FONAG operates within the parameters of pre-existing state

regulations, yet the state does not have the ultimate authority on how interventions are pursued nor does it have any power in enforcing compliance.

Stakeholders and broader civil society hold a crucial role because they ultimately grant authority for the NMSD to intervene in a territory. Typically, this authority is granted because of the perceived economic material benefits and because it has become an accepted, 'understandable' practice (Cashore 2002, 511). FONAG pursues authority through offering incentives to gain agreement from rural communities, and seeks public approval in Ecuador through education and media outreach campaigns that justify and reinforce the logic of the watershed program as common sense.

Another indicator of the NMSD system is that the arrangement between rural land users and FONAG does not draw upon government authority for enforcement. Rather, program compliance overseen by *páramo guards*, or individuals hired from local communities to observe and report upon human activities in the páramo ecosystem. Communities risk losing the possibility of future contracts with FONAG if they poorly comply with requests.

FONAG appears as an NMSD, and indeed seemed to operate as one for the first decade of its existence. The arrangement was to be an autonomous entity immune to the whims of a single funding partner, as envisioned by the water fund's principle designer. This worked for a while and this was evident from the geographic locations in which FONAG targeted for intervention. Prior to 2012, FONAG's rural interventions targeted any communities open to working with FONAG in the Guyallabamba watershed that contained areas of páramo within their territory. These locations typically bordered

protected areas, but did not necessarily include geographic locations from where EPMAPS was drawing water.

Twelve years after the initiation of FONAG, EPMAPS began to assert itself through FONAG. Although five other constituent partners of the water fund existed, EPMAPS consistently contributed the most money to the fund, amounting to more than US$10.5 million of the nearly US$12 million from 2000 to 2013. This proportion accounts for nearly 95% of the capital invested into FONAG's (FONAG 2014e). While EPMAPS could not pull money out of FONAG, it could leverage its weight as a contributing constituent member to direct the fund towards its particular interest. FONAG became a conduit for the city assert influence and gain access to territory not under its jurisdiction.

Ecosystem services are a form of infrastructure (Carse 2012), and EPMAPS envisioned FONAG as a part of the water infrastructure for the city. As such, EPMAPS justified its efforts to redirect the water fund's focus towards working only in locations where EPMAPS directly drew its water. In 2012, EPMAPS fired the technical secretary, Pablo Lloret, and the majority of FONAG's employees quit their positions. All of FONAG's rural agreements within rural communities ground to a halt during that year while EPMAPS directed the process of hiring new employees. This move was noted by those involved in setting up other water funds. In the process of constructing a water fund with the city of Lima, Peru, an original designer of FONAG asserted that FONAG's process had brought a valuable lesson and that future water funds. The Lima water fund would be set up without any one of the constituents exceeding a 50% of the

base contributions to avoid the possibility of hijacking in the future (Echavarria, personal communication, 2012).

In FONAG's scenario, extra-governmental entities including NGOs and companies are not using the state as a vehicle to gain authority to set up territories for conservation. Rather, they are able to set up their own mechanisms of authority through market processes. This case also demonstrates the state as using the participatory platform and association with extra-governmental entities that are focused on conservation as a conduit for legitimacy and authority in a process of territorialization aimed at drawing water resources to the city. FONAG, aimed at watershed conservation, lends non-state authority so that the state can assert itself under the guise of an NSMD.

3.8 SUMMARY AND CONCLUSION

This chapter demonstrates the water fund PES conservation arrangement of FONAG as developing through the ineffective territorialization and enclosure of land through the traditional protected areas model. Throughout the Latin America, the creation of protected areas exploded in the 1990s under neoliberal re-regulatory policies. Yet, the protected areas model was widely met with local resistance and funding problems, resulting in both an uncooperative and incomplete form of land control. The shortcomings of the protected areas system inspired new arrangements for conservation, including a redefinition of territory and the authority in the case study water fund.

By constructing a conservation territory based upon a watershed, transnational organizations focused on biodiversity conservation were able to circumvent a tumultuous state and secure local partners for financing through a watershed boundary. More than simply a financing mechanism, however, the watershed territory fostered legitimacy through its association with a democratic model of participation. This opened FONAG to further partnerships with other actors willing to pay for that participation.

As an arrangement of non-state market driven governance, FONAG then established rule-making authority over decisions about natural resource practices within the watershed territory by seeking approval not only from the market mechanism that sought to integrate rural landholders into FONAG's mechanism, but also seeking approval from external audiences, such as the international conservation community and other residents of the watershed that are not represented in FONAG. However, this chapter also points out how the city of Quito's public water company, an extension of the state, was able to use FONAG to gain authority and legitimacy to extend its influence into areas that were otherwise outside of its legal reach. This chapter adds to debates about the process of creating conservation territories and green grabbing in the neoliberal era. It argues that the state use extra-governmental organizations concerned with biodiversity conservation as a vehicle further territorialization. .

While the processes by which the state constructs traditional conservation territories in has been well examined, there is a lack of literature focusing on the territorialization process of these new kinds of market oriented conservation territories. I advance theory on the topic through my examination of the Ecuadorian water fund to

suggest that the state, as a structure for authority, can be sidelined by market and transnational actors to set up conservation territories. Yet, the state can then draw upon that authority conferred by the market system. In other words, non-state actors can create and claim authority through the process of territorialization predicated on a market-based conservation mechanism. This claim to legitimacy, however, can be used by entities such as the city of Quito to gain influence in rural locations that were once restricted. This process becomes important because it sets a framework for conservation interventions that determine resource access and affect livelihoods on a local level.

CHAPTER IV

BORDERING ABOVE AND BELOW: FONAG'S BROKERS

4.1 INTRODUCTION

This dissertation examines the production of ecosystem services as a commodity. It examines the labor necessary to create a commodity and the attending socio-spatial transformations that accompany commodification. I investigate the practices and processes of a well-established arrangement of payments for ecosystem services (PES) in the Ecuadorian Andes that transfers payments from the urban sphere of Quito to those living in and around the targeted ecosystem of the páramo to do conservation activities. I envision this system in the form of a commodity chain, and this dissertation sequentially examines the practices and processes that constitute connecting nodes in the chain. The previous chapter examined the urban sphere and the creation of Quito's water fund, *Fondo para la Protección del Agua* (FONAG). It introduces the water trust fund as a novel configuration of neoliberal environmental governance contingent upon the establishment of a new conservation territory, and particularly focuses on the process in which FONAG initiates a new claim to territory through bypassing a state plagued with political and economic instability.

This chapter examines the next input of labor, or node, in the fictitious commodity chain (Figure 4.1): the labor of FONAG's *guarda páramos*, or páramo guards. Residing in targeted communities, páramo guards are local residents that FONAG directly hires as full employees. Their labor goes towards 1) conserving the

páramo ecosystem and 2) recruiting the collective labor of their neighbors to do conservation work. The páramo guard's labor is an extension of FONAG's influence into the rural sphere. As such, it directly contributes to enforcing FONAG's territorial claim on the land, necessary to pursue the commodification of ecosystem services that are derived from it. I conceptualize conservation work, tied to ongoing process of territorialization, as productive work that generates value from ecosystem services.

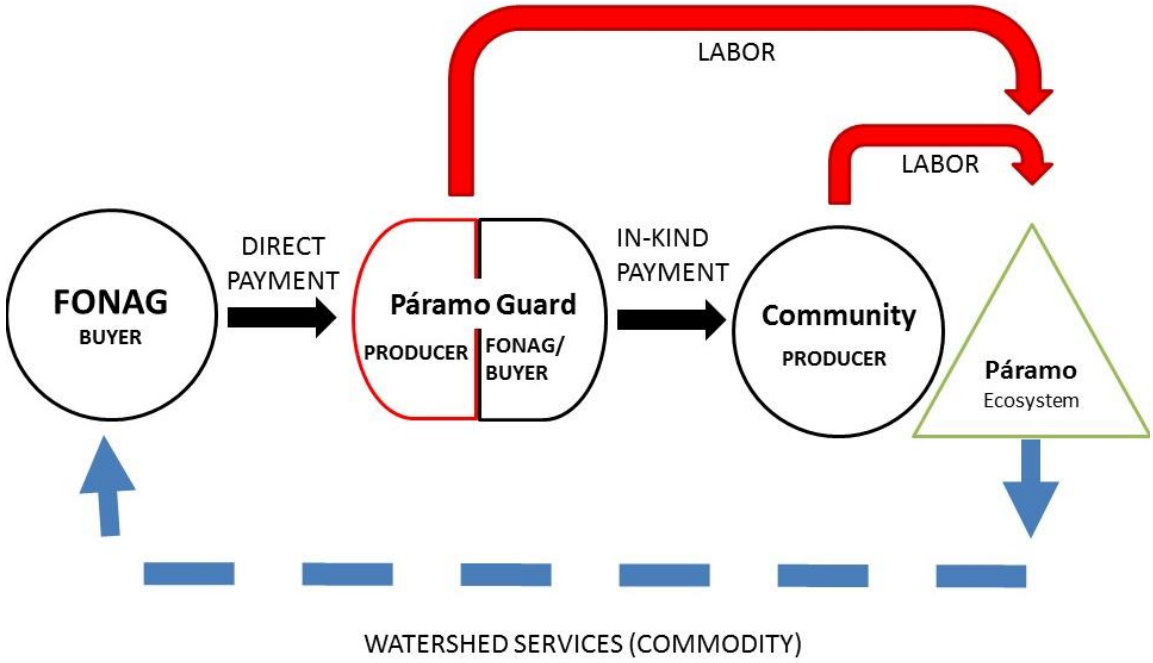

Figure 4.1 The páramo guard as a 'node' in ecosystem services production

The páramo guard is a laborer whose work includes practices of bordering that contribute to FONAG's process of territorialization. The páramo guard, however, is a paid member of the local community and therefore simultaneously occupies a position of

an implementer and target of FONAG's conservation interventions. In other words, the páramo guard is both a subject and an agent of the PES arrangement. Through their work as essentially brokers between FONAG and rural communities, they occupy multiple positions that result in a subjectivity that produces value for the PES arrangement.

After placing the role and work of the páramo guard within the broader context of the literature on territorialization and environmental governance, I examine the origins of FONAG's páramo guard. Then, I delve into the practices of bordering that constitute the labor of the páramo guard that connects FONAG to ecosystem services. This chapter examines the practices of these intermediaries as simultaneously laborers and environmental subjects in the process of ordering on the landscape through the water fund conservation arrangement. It demonstrates how the páramo guard's labor is necessary for FONAG to render the páramo ecosystem as quantifiable and thus exchangeable, and it highlights how territorial claiming through market based environmental governance is a strategic, performative and incomplete process.

4.2 GUARDS AS BROKERS

The creation of traditional, state-led conservation territories is not complete with the delineation of boundaries, but requires maintenance and vigilance of both conceptual and physical boundaries (Gabriel 2011). As such, borders need to be performed to imbue meaning and circulate narratives (Valdivia, Wolford, and Lu 2014). The work of establishing and maintaining borders in state-led conservation territories is traditionally

undertaken by guards that are employed as a technology to facilitate the process of ordering and disciplining (Gabriel 2011; Valdivia, Wolford, and Lu 2014). Although not necessarily produced through state authority, the boundaries of a non-state market driven conservation territory likewise need to be maintained. It therefore follows that guards are employed in PES arrangements to produce environmental subjects and maintain territory.

The expenses of negotiating contracts, performing scientific baseline studies, and monitoring and enforcement of contracts are all transaction costs present within a PES. The páramo guard's labor not only goes towards enforcing contracts between the PES and producers, but towards mobilizing the labor of the people living in and around the sites of ecosystem services production to turn them into 'producers.' In the water fund PES arrangement, then, guards are extensions of the urban-based governance mechanism. In other words, they are agents charged with making environmental subjects out of their neighbors.

However, páramo guards are not only agents of the water fund PES arrangement. Rather, they hold a dual role as a subject and a 'producer' of ecosystem services. In the PES water fund arrangement, guards are typically from local communities and are trained and directly paid by the program to be the constant, on-the-ground presence of the organization. Guards, then, themselves are also environmental subjects to be regulated and governed, but through wages. According to Wunder (2005), the payment of guards, particularly local ones, is called a potential criteria to qualify a conservation arrangement as a PES because the financial exchange for conservation

activities in the targeted ecosystem satisfies PES definition requirements. In this way, páramo guards are environmental subjects and a direct 'producer' of ecosystem services through their labor and the financial exchange.

As guards in the PES are themselves simultaneously part of the targeted community, they hold a dual role as both agents and subjects (Valdivia, Wolford, and Lu 2014). In other words, guards are the extension of territorializing power into a target area, but are also local community members and the focus of neoliberal transformation themselves. They are the "blur between implementer and target" of conservation interventions (Sodikoff 2009, 444). Ideally fitting the role of mediators between the PES organization and the community, the position of the 'guard' is subject to demands stemming from both their local community and the PES organization. Thus, as intermediaries, páramo guards can also be conceptualized as brokers of FONAG's contract agreements with rural communities that offer productive projects in return for conservation practices.

Although the definition of PES can be applied to a wide variety of arrangements that may or may not employ guards, literatures about PES frequently mention the topic of guards. The case study of FONAG is therefore not unique in its employment of guards. Goldman et al. (2008) note the substantial presence of guards in their study involving 34 cases in the Americas of which 19% included hiring guards as a conservation effort. Of The Nature Conservancy's seventeen water fund projects modeled directly after FONAG, nearly half (n=7) employ a form of an intermediary

position such as a guard, although sometimes bearing an alternative title such as ‘environmental promotor.’

Yet, treatment of the role guards in PES is chiefly limited to counting them as a group of beneficiaries (e.g. Tallis et al. 2008; Corbera, Kosoy, and Martinez-Tuna 2007) or agents for monitoring and control (e.g. Farley, Anderson, and Bremer 2011; Agrawal 2005). Recent work in has discussed labor of guards in bordering activities such as forming city parks (e.g.Gabriel 2011), or protected areas (e.g.Valdivia, Wolford, and Lu 2014). Others place the labor of local guards into a role clouding insider–outsider categories that generally muddle the visions of state planners or NGO representatives (Agrawal 2005; Robbins 2000). My work in this chapter, however, interrogates the positions inhabited by the guards as brokers and the role of the value generated in maintaining the PES arrangement.

Sodikoff (2009) points out that the discussion of the labor and the production of value within the dual roles of local conservation guards is nearly absent within broader literature. In examination of an Integrated Conservation and Development Project (ICDP) in Madagascar, Sodikoff (2009) that value from the labor of the guard is directly derived from the act of protecting the forest while degrading it through continued subsistence agricultural work. Adding to this discussion through a study in Burkina Faso, Poppe (2012) expands on the discussion of guard labor to point out that guards occupy a multitude of ‘ambiguous’ positions that simultaneously puts them at advantage and disadvantage, depending the context and with whom they are interacting. On a global-scale, for example, guards are located in a position of low-wage earners, but also

occupy a position of privileged high-wage earners in their position on a local level (Poppe 2012). The broader literature lacks discussion, however, of the guards as agents and subjects in producing value, which I elaborate upon in this chapter. The following sections will shed light on the work of the guards as they perform borders to create territory as well as mobilize labor for a PES environmental governance system to facilitate exchange value out of ecosystem services.

4.3 ORIGINS OF FONAG'S PÁRAMO GUARD

Chapter III discussed how FONAG, as an environmental governance arrangement, grew from a landscape-scale conservation program called SUBIR. SUBIR catalyzed the idea for FONAG as a funding mechanism for conservation activities within the Condor Bioreserve (Nyce 2004), and also gave rise to a strategy for establishing territorial control that FONAG eventually inherited. This section examines the historical origins of FONAG's intermediaries and the transition of guards as a technology of the state to a technology of a neoliberal environmental governance arrangement, reflecting tendencies towards decentralization, personal responsibility, and territorial boundaries for conservation drawn by actors outside of the state.

Like other countries throughout the world, Ecuador employs guards, overseen by Ecuador's Ministry of the Environment (*Ministerio del Ambiente del Ecuador*-MAE) to enforce the boundaries of national protected areas. MAE's traditional park guards have legal authority and carry the responsibility to prohibit land uses inside the boundaries of protected areas, with the exception of tourism and scientific research. A traditional park

guard typically hired by MAE holds at least a high school diploma and comes from a region far from where MAE assigns them to work. As a consequence, a traditional park guard has a technical knowledge, but poor knowledge of local customs and little credibility and influence with local populations (FONAG employee, 2012).

Ecuador has historically excluded local residents from participating in protected area management activities altogether (Ufelder 1998). With few interactions with park guards, some local communities were never informed or failed to acknowledge the territory of the protected areas when the state designated them (Ford 2004). For example, the state neglected to inform residents of the community of Oyacachi that their ancestral territory had been incorporated into the Cayambe-Coca protected area until 12 years after its lawful establishment (DIVA 1997). Because of aloof nature of interaction with local communities that were the focus of control, the state was largely ineffectual in territorializing its protected areas.

When TNC and its partners shifted its conservation focus to incorporate the spaces between protected areas, their strategy for territorial control likewise shifted. Part of TNC's strategy was to change the duties of protected area guards to extend their presence outside of the protected areas and into the adjacent communities, which they deemed as producing the majority of threats to the protected areas (Ford 2004). As a result, TNC and partners propelled the Community Park Guard Program that into existence in 1993 through SUBIR with support from TNC, USAID, the Cooperative for American Relief Everywhere (CARE) and MAE, known at that time as the Ecuadorian

Institute for Wildlife and Natural Areas (*Instituto Ecuatoriano Forestal y de Áreas Naturales y Vida Silvestre*-INEFAN) (Ufelder 1998).

At this time, the work of the guard shifted away from relying upon the authority of the state in a command-and-control form of disciplinary enforcement, and began to focus upon processes environmental subject making. According to the proceedings of a 1995 training session of community park guards, the goal of the community park guards was to "be the facilitators of a medium and long term process of community transformation, with support and coordination of the public and private sectors, toward self-sufficiency through collective initiative and work" (as cited in Ufelder 1998). This quote reflects the decentralized emphasis of neoliberal environmental governance, where rural people are to be transformed into self-regulating green custodians. The training session therefore established the community park guard's position as a mediator for this process of transformation.

Like the traditional park guard, the community park guard's duty is to influence the community from the inside to discourage undesirable activities in the páramo within or adjacent to the protected areas, such as burning, hunting, dumping trash, cutting trees, and grazing cattle (Martinez 2011). Furthermore, they serve as a resource to inform communities of state regulations regarding land use practices (Martinez 2011; Ford 2004). In addition to these practices that resemble traditional park guard duties, the community park guard's duties involve managing small scale development projects. In the early years, these were funded by the SUBIR initiatives to cultivate positive relations between protected area management and local communities, and to involve the

communities with the management of the protected areas (FONAG 2010b; Ufelder 1998; Ford 2004). NGOs and protected area managers believed that the projects had the potential to offset some of the needs of the communities which they believed drove them to use resources from the protected area (Ufelder 1998).

Focused on protecting the newly created Antisana Reserve, Fundación Antisana, a local NGO supported by TNC and USAID, designed the community park guard position and the training program, eventually writing a handbook for the for the process (Jervis 7/15/2014). Fundación Antisana and its daughter program, Fundación Rumicocha, then handled the training activities, which MAE approved (Ford 2004). For several years, the remuneration of community park guards varied. Some were employed by the state, but many were appointed in unpaid volunteer positions (Gonzalez and Martin 2007). Funding to pay community park guards was an issue, and TNC, USAID and their partners envisioned FONAG as a partial solution. FONAG was a part of a larger plan to support the Condor Bioreserve, and part of that support was to pay for park guards to ramp up enforcement of the territorial boundaries of the state-designated protected areas (Nyce 2004).

4.3.1 FONAG Inherits the Community Park Guard Program

TNC eventually shelved the idea of financially supporting conservation for the entire Condor Bioreserve through FONAG after observing that potential urban partners for financing watershed protection were not necessarily interested in having their funds applied to areas without hydrological importance for Quito (Brown and Stem 2005). As

a result, FONAG itself became the focus of TNC and partners. It expanded from a simple mechanism for financing conservation into an environmental governance arrangement on its own, with a distinct conservation territory that was reworked into watersheds. Early FONAG guards were therefore a continuation of the SUBIR community park guard program that supported MAE's ability to manage protected area boundaries. This is reflected in the first title of the FONAG's guard program: Surveillance and Monitoring of Protected Areas.

FONAG hired the first community park guard in 2004 from the indigenous community of Oyacachi located within the Cayambe-Coca National Park (Escandón and Rojas 2008). This occurred after a four-year period during which FONAG built its administrative structure and left its trust fund to capitalize (Escandón 6/6/2012). The guard already worked for MAE prior to his appointment by FONAG, and his primary duties were to assist in diminishing local conflicts with the spectacled bear (páramo guard 11/10/2012). FONAG lacked a coordinator for its guard program during its first two years of implementation. The early community park guards were supervised and trained by MAE, who considered them to be employees that were paid through FONAG funds (Martinez 2011).

In 2006, FONAG hired a full-time coordinator for the program, Susana Escandón, who forged an official agreement with MAE (Escandón and Rojas 2008). In the following years, FONAG began hiring guards to work not only in the protected areas, but also properties held in common by communities near national park buffer zones and lands owned by Quito's water company. Accordingly, FONAG changed the

title of the program managing the guards to Control and Surveillance of Priority Areas. During 2011, MAE and FONAG did not renew agreements and the guard title of FONAG employees was changed to páramo guard to distinguish them from employees of MAE (Martinez 11/22/12). In 2014, however, MAE and FONAG resumed coordination and training activities (Dominguez 2014), although they remain separate in terms of which organization supervises and pays them.

The origins of the páramo guards are therefore rooted in the task of controlling land uses for state-delineated protected areas. The Ecuadorian state lacked control of protected areas. Therefore international agencies and NGO's concerned with biodiversity conservation spearheaded the efforts to support the state in establishing control over the territory. They targeted the land use activities of the communities neighboring protected areas through the SUBIR program, which they believed contributed the most threats to the páramo ecosystem (FONAG employee, 2012), and proposed and developed a program to fit their vision of a conservation territory that extended beyond the legal borders of the park. Guards were redefined to being an intermediary between the state and the community.

FONAG, which is a representative organization of market actors and international NGOs, easily adapted the use of community guard in its efforts to establish and control their new territory encompassing landscapes that include a variety of property arrangements. The community guard became an intermediary, a broker of sorts, between the community and FONAG as the state was sidelined from FONAG's conservation arrangement. Consistent with neoliberal ideas about conservation, the

involvement of FONAG in the community park guard program has consequently redefined the role of communities to become 'green custodians' to be transformed into both neoliberal and environmental subjects.

The FONAG's support offered to communities in the form of productive projects ultimately transforms them into the position of producers of ecosystem services and consequently facilitates the commodification of ecosystem services from the landscape. In essence, FONAG took over a process of territorialization that began with the designation of the Condor Bioreserve. In the following sections, I will focus on the labor that FONAG expects to make that transformation.

4.4 FONAG'S PÁRAMO GUARD

The páramo guards pertain to the Control and Surveillance of Priority Areas Program, one of five core programs run by FONAG and the only one that directly intervenes to change land use activities in rural communities located in priority areas. As such, it is also the material link between FONAG and the páramo ecosystem. FONAG's mission statement designates its priority areas as the locations important for maintaining the quality and quantity of the water supply to Quito's Metropolitan District (DMQ) (FONAG 2009a). With the mission statement as guidance, FONAG's Control and Surveillance of Priority Areas Program strategically targets its interventions in locations along the borders of protected areas that supply the bulk of the water that Quito consumes (Field Notes 8/12/2013). It operates through five teams of páramo guards based within the general locations identified in Figure 4.2.

Aptly named, the Control and Surveillance of Priority Areas Program is responsible for control and surveillance of the land that FONAG deems important to its mission and within its territory. Its priority areas therefore consist of the páramo ecosystem within the Guayllabamba and other targeted watersheds, particularly in the in the buffer zone abutting Cayambe-Coca, Antisana or Cotopaxi national parks (FONAG 2010b). The sum total of land that FONAG's páramo guards are responsible for include 38,316.53 hectares (FONAG 2014e). This area is consists of a mosaic of properties that can be divided into three types: that of Ecuador's Ministry of Environment with 13,890.64 hectares, Quito's water company (EPMAPS) with 13,382.87 hectares, and collective property of rural communities with 11.042.83 (FONAG 2014e). Community lands therefore account for slightly less than 30% of the properties directly targeted by FONAG.

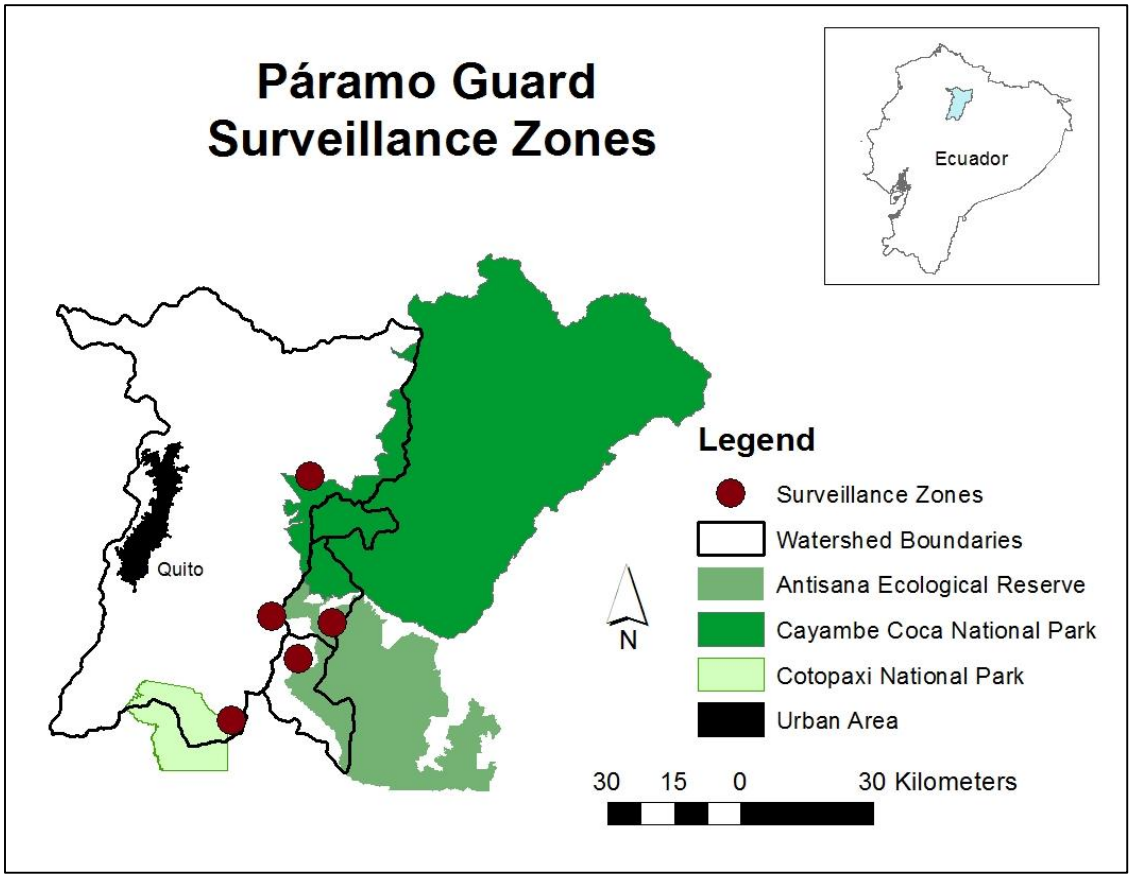

Figure 4.2 Generalized locations of FONAG's surveillance zones (locations derived from USAID 2012)

As of 2014, FONAG employs a total of 12 páramo guards that are paid about US$800/month for their position (Field Notes 2012). This amount is up to three times the monthly cash income of typical adults in these rural communities (Field Notes 2012). The coordinator of the Control and Surveillance of Priority Areas and her[11] assistant supervise to the páramo guards. The coordinator's position includes receiving

[11] Both the current and former coordinators are female.

monitoring reports from páramo guards, setting patrol routes, maintaining equipment supplies, and developing rural productive projects in coordination with the páramo guards. She reports directly to FONAG's technical secretary and conducts training of páramo guards up to three times per year (FONAG 2011a).

Described by FONAG as its "visible face," the páramo guards are the representatives of FONAG that are most in contact with communities whose land use practices FONAG is trying to influence (FONAG 2014a). Consistent with pervasive neoliberal discourses placing local communities as the most proximate threat to nature (Igoe and Brockington 2007), FONAG is concerned about local community interaction with ecosystem services because "[the people] live inside of the protected areas, buffer zones, and their actions cause immediate damage [to the páramo ecosystem]" (Escandón 6/6/2012).

FONAG gains access to communities and forms interventions directly through the páramo guards that are hired from the community. FONAG does not generally appoint páramo guards without the agreement of the community general assembly, a practice originating from MAE's original community park guard program (Martinez 2011). In places that FONAG has hired páramo guards, the program coordinator typically approaches the community to hold a series of meetings in the communal house, a community-owned building that is utilized for public meetings and functions (Susana Escandon 6/12/2012). In the general assembly, a meeting open to all community members, the FONAG describes the position of the páramo guard and the opportunity for productive projects that the position would also bring to the community. Then, an

election would be held in another assembly and community members would vote between three or four people that were interested in taking the position (páramo guard 11/25/2012).

Officially, there are 11 criteria for hiring a páramo guard:

1) Be a man or woman of legal adult age.
2) Live in a community inside of the surveillance area or in buffer zones that have influence on the area.
3) To have communal leadership capacity that permits him to be an adequate link between FONAG and the community.
4) To have abilities to communicate with the community and other actors, to enable promotion of collective action for the conservation of the surveillance area.
5) To know the biodiversity of the surveillance area, its water resources, and sites under the most pressure.
6) It is preferable, but not necessary, to have a high school degree. This always has less weight that points 3, 4, and 5.
7) To be a healthy person, with physical capacity and desire to live and work in areas that have extreme climates.
8) To have initiative, interest, and drive for improving his activities.
9) Ability to work in a team in a responsible and cooperative way.
10) To be available to travel away from the community for training and exchange.
11) To not have previous legal violations (USAID 2012, 15).

As a whole, the eleven criteria give insight as to the importance of the community focus for this position. While knowledge of biodiversity and water resources is one criterion, there are three criteria that stress the importance of the páramo guard's link to the community to do his work. One of those three states that the position will be a direct link between FONAG and the community. Another stresses the importance of promoting 'collective action,' or of mobilizing labor towards conservation purposes. As such, páramo guards are directly positioned as the intermediaries between FONAG and

communities that are the target of intervention. They are hired to straddle the position of community member and FONAG employee, and are simultaneously subjects and agents of the territorialization process.

While the hiring criteria well reflects the duality of the community member/FONAG employee position of the páramo guard, the specific objectives of the Control and Surveillance of Priority Areas Program determine the form of the páramo guard's labor. FONAG distinguishes three objectives of the program that determine the work of the páramo guards:

1) Maintain control and surveillance of hydrologic areas of interest to comply with current laws and norms
2) Monitor flora and fauna
3) Train local communities on environmental themes and implement productive projects to lessen human impacts on the ecosystem (FONAG 2014b).

The work included in these objectives manifests itself in a verticality that exists within rural Andean communities. Verticality is a concept developed by J.V. Murra in the 1960's to refer to the zonal production strategies of the Incans based on elevation (Stanish 2014). The concept has subsequently been employed to understand contemporary divisions in land use based on elevation zones in Andean communities (Maxwell 2011). I use the term here to simply refer to the perceived division of the landscape by FONAG's páramo guards. Páramo guards frequently used the relative terms 'above' and 'below' to describe their work. In a community, lower elevations are typically divided into individual parcels dedicated to homes and farming. The upper elevations, characterized by a colder, harsher climate, are typically designated as

collective land and dominated by the páramo. These landscapes are connected through irrigation canals that carry water from the upper elevations to the lower elevations.

Objective 2, "Monitor flora and fauna," addresses work 'above' as páramo guards record indicators of the health of the ecosystem (FONAG 2014b). Objective 3, "Train local communities on environmental themes and implement productive projects to lessen human impacts on the ecosystem," identifies with the work 'below,' or the work in the local communities of creating and supervising FONAG's productive projects (FONAG 2014b). Finally, Objective 1, "Maintain control and surveillance of hydrologic areas of interest to comply with current laws and norms," is work that is done in both realms as páramo guards are charged with observing, recording, and influencing their neighbor's natural resource use in both realms.

Depicting the two spaces of intervention, Figure 4.3 is a photo from a community that FONAG has initiated several projects. The upper elevations are communally held páramo that is adjacent to the Cayambe-Coca National Park, and the site of FONAG conservation efforts that include a native planting project and community efforts to remove cattle. The lower elevations of the community are the sites of FONAG's productive projects, including a guinea pig husbandry program. In both of the realms of above and below, páramo guard work contributes to the process of territorialization, which requires performance to establish meaning. The following two sections examine this performance.

Figure 4.3 An example of the landscape ‘above’ and ‘below’ (Image 1: October 2012); (Image 2: FONAG 2011b)

4.5 THE WORK 'ABOVE': WITHIN THE PÁRAMO

Páramo guards patrol 'above,' the páramo ecosystem that FONAG targets for conservation. These patrols are performed on routes within the five surveillance zones, and the experience of the patrol is highly variable depending on the conditions of terrain and the extent of area to be covered in the patrol zone. In remote areas, for example, páramo guards stay in guard houses for up to five days at a time. In other zones, there are no guard houses and the páramo guards return home the same day of the patrol. Conditions also determine if the patrol is conducted solo or in pairs, and via horseback, motorcycle or foot (Field Notes, 2012). Ultimately, the performance of these patrols is labor that contributes to the production of conservation space and the legibility of ecosystem services.

There are two main components to the work above in patrols as described by FONAG: surveillance and control (Field Notes, October 2012). Surveillance work does not require direct contact with local people, but rather it is a practice of recording "all of the internal processes of the páramo" (FONAG employee, 10/31/2012). With cameras, GPS units, and notebooks, this part of the job requires recording and reporting everything that occurs in relationship to the páramo. This includes information about natural phenomenon, such as animal sightings, climate conditions and changes in vegetation, as well as human activities like agriculture, hunting, grazing, burning, or tourism. This is reported to FONAG's program coordinator who uses this information to make decisions about páramo guard activities.

This work requires learning new skills. It requires páramo guards to undergo training to operate the technologies, such as GPS units and wildlife camera traps. They must learn to translate their patrols into standardized reports, employing scientific names of plants and animals so that they can translate the ecosystem to those in FONAG's office, researchers, and others not familiar with the ecosystem (Field Notes, páramo guard training, October 2012).

As a FONAG employee told the guards during training, páramo guards "walk with the eyes of FONAG above in the páramos" (FONAG employee, páramo guard training, October 2012). This work is crucial to the process of territorialization, as keeping records holds power to convert space into an object for governance, rendering an area as 'legible.' This is reflective in a comment by another FONAG office employee, who asserted that the páramo guard's "…job is to observe to help [FONAG] make decisions about what you all have seen. If you do not tell us [in Quito's office], how are we supposed to make decisions?" (FONAG employee, páramo guard training, October 2012). In other words, FONAG's administration claims to make decisions about the páramo guard program based on the information in the reports.

While data from the patrols creates an object for governance and opens the space for FONAG to make decisions about it, the data also serves as evidence to reinforce and legitimize interventions in the páramo ecosystem. The reports serve as a "base line" to determine improvement or regression of the condition of the páramo ecosystem (Field Notes, páramo guard training, October 2012). This would always work out to favorably legitimize the presence of FONAG. De facto improvement in the health of the

ecosystem would be positively attributed to the interventions FONAG, while decline would serve of evidence for the need for FONAG's interventions in the ecosystem. Consequently, the reports are necessary not only to create the páramo as an object for governance, but to legitimize and strengthen FONAG's claim the ecosystem.

The second part of the páramo guard's work above in patrols is 'control.' For the páramo guard, 'control' relates to intervention in the conduct of people in the páramo. This means deterring activities FONAG deems to be environmentally damaging to the páramo. As the former program coordinator of FONAG explained,

> "…Basically, the guard has to convey the norms and rules of behavior regarding environment: no hunting, no burning, no cutting trees, and no letting cattle out [to graze the páramo]" (Escandón 6/6/2012).

Charged with maintaining order, FONAG páramo guards are agents of the market-based conservation mechanism of the water fund and not the state, and therefore do not have legal authority. Whether they are patrolling community land, a national protected area, or property owned by Quito's public water utility company, they cannot give or deny permission to any individual to be on the property. There is nothing that páramo guards can do to directly intervene in an individual's actions during a patrol aside from talking with that individual and telling that individual that their actions negatively impact the ecosystem (FONAG employee, páramo guard training, October 2012).

The control work of the páramo guard begins with his appearance. In a patrol, páramo guards therefore rely on their appearance to convey a symbol of representation. They are marked bodies wearing a FONAG issued jacket. Having the symbols on the

jackets or other uniform clothing conveys that they are a representative of the entities whose symbols they carry. FONAG's symbol is always found on the front of the garment, although the jackets, through 2013, are marked also with patches on the sleeves from the two largest contributors to the fund, including donor USAID on the right sleeve and constituent Quito's water company (EPMAPS) on the left sleeve (Figure 4.4).

Figure 4.4 Páramo guard in uniform coat (October 2013)

The importance of this visual cue was underscored during the páramo guard training sessions I attended in October 2013. FONAG's program coordinator said that it may be difficult to have logos put onto all of the cold weather clothing that the guards

needed for their patrols. The guards raised concern about not having the visible logo on articles of uniform clothing, to which an office employee suggested that the guards carry business cards for identification. This suggestion was met with reluctance from the guards.

A major issue with just using a business card is that uniforms visually convey that páramo guards are representatives of FONAG, and can do so at a distance. This is important to avoid conflict and possible danger to the páramo guard. Direct interaction with people that are personally unknown to the páramo guard on a patrol may pose a threatening circumstance, especially if stumbling upon illegal hunters that may be armed. On the converse, having a páramo guard without a uniform approach an unknown person may unnecessarily draw a response of fear and alarm from that person if there is no visual communication through a uniform that the páramo guard is a representative of FONAG, rather than someone potentially harmful (Field Notes, páramo guard training, October 2012).

When páramo guards directly interact with an individual that is behaving contrary to FONAG's norms, the strategy for control is to influence the individual through explanation. A FONAG employee stated that the process of controlling negative behaviors is "having problems and giving solutions" with the experience and confidence that the páramo guard possesses (FONAG employee, páramo guard training, October 2012). In other words, the páramo guard is to project authority to compel local resource users into comply with FONAG's norms of use.

The position of the guard as a local member of the community comes to the focus of these exchanges, and the relationship to other sources of authority is distanced. Rather telling individuals that they are harming the ecosystem which provides water services to Quito, the guards regularly invoked the local relationship of the lands to local communities to change behaviors of people in the páramo. One páramo guard discussed how he approached people that were fishing or hunting by explaining to the offenders that respecting the environment:

> "is not for the Ministry [of the Environment], is not for me, but instead is for the future of the grandchildren, of the children. The resources are [for us] to consume, but in an equitable form so that hopefully they will never run out" (Páramo guard, páramo guard training, October 2012).

This quote demonstrates how one páramo guard directly distances himself from the known authority of the state in an exchange of 'control.' Furthermore, the páramo guard does not mention the city of Quito or FONAG's claim to the resources. Rather, the páramo guard focuses upon local relationships to dissuade behaviors, demonstrating this mixed identity between employee for FONAG and local community member. Along with this mixed position of identity, the quote also demonstrates the performance of subject-making by the páramo guard. FONAG pays for the performance of páramo guards to carry the message of water conservation into the space of the páramo. They draw upon a specific narrative of water conservation that, in turn, frames their interactions with local residents. I now turn to the work 'below.'

4.6 THE WORK 'BELOW': WITHIN THE COMMUNITY

The work of the páramo guard shifts when it is focused 'below,' or in the lower elevations that constitute the working landscape of the community. FONAG calls this part of the páramo guard position the "community management component," framing páramo guards as environmental managers within their communities (FONAG 2010b). In this position, páramo guards are responsible for developing and supervising productive projects funded through FONAG and its donors. Harkening back to its roots in the SUBIR Community Park Guard program, the main objective of the FONAG páramo guard's work inside of the community is to transform the community's perception of the guards from "prohibitionists" to "managers" (Escandón and Rojas 2008, 18). These titles imply that rather than simply restraining certain land use activities, a páramo guard as a manager directs land use activities and the labor behind them.

As such, páramo guards are envisioned by FONAG to take a leadership role in the community, to be respected, and to disseminate their environmental knowledge to other community members (Escandón 6/6/2012). The central means to gain support for the páramo guard within the community are the productive projects, which are formalized agreements between FONAG and the community requiring the collective labor of the community to be dedicated towards conservation activities as a condition to receive the productive project. FONAG financially supports the projects by purchasing the materials and supplies necessary to complete the project. The community is then responsible for the component of manual labor (Escandón, 6/6/2012). FONAG

stipulates that a minimum of 40% of the funding for a productive project must be put forth as a counterpart contribution by the community, valued through collective labor, use of facilities and tools, among other things (USAID 2012).

Since 2004, productive projects have included the support for ecotourism, raising small animals such as guinea pigs, creating organic gardens, improving pastures at lower elevations, and developing a small-scale irrigation (see Appendix A for comprehensive list). Each productive project is designed to promote intensification at lower elevations to relieve land use pressure on the páramos at higher elevations (Saenz 11/11/2013). They have also to be environmentally friendly. Project proposals for trout farming, for example, have been rejected by FONAG because trout are an exotic species that could contaminate streams (Escandón 6/6/2012).

The communities in which páramo guards develop productive projects may be the guard's home community, or it may be a nearby community in his surveillance region. After consulting with people from the community, the páramo guard will bring ideas to the program Coordinator. If she decides that they project fits with the goals of FONAG, she will present a proposal in an assembly meetings in which the entire community gathers (Field Notes, October 2012). Overseen by the páramo guard, the people interested in the project form a small group to directly work with the project. From the productive projects FONAG implemented between 2007 and 2012, the groups on average consisted of approximately 29.2 households (USAID 2012, 2011, 2010b, 2009, 2008).

To receive financial support for a project, a community as a whole must agree to put its labor towards 1) the productive project itself and 2) conservation activities. Both of these draw on the collective orientation of Andean indigenous communities. The páramo, which is the focus of conservation within FONAG's agreements, is typically held in common by the community. Many of Ecuador's modern Andean land use arrangements date back to the agrarian reform movement during the 1960s, when mostly unproductive land at higher elevations was redistributed to landless indigenous peasants (Hess 1990). Since páramo was such marginal land for production, communities often designated it as the communal grazing lands, with private parcels for homes and agriculture at lower elevations (Ramón 2009). Because páramo land was held in common, it follows that FONAG's conservation agreements are oriented towards the collective.

Tangible conservation activities within the páramo are an important focus of the agreements. As stated by the former program coordinator,

> "Their agreements always have been focused on more than the themes of labor and community work, but on concrete environmental agreements, like reducing the livestock load, reducing hunting, reducing fires, and in some cases, planting trees and restoration including collecting garbage from the river. They are environmental agreements that you can see" (Escandon 6/6/2012).

These contracts discursively separate land into zones of production and conservation. The contract also includes a map depicting the zones, and quantifying the area that will be 'conserved' through the conservation agreement. This metric then, is

used as evidence of success by FONAG. The labor of the páramo guard, as broker of the agreement and patroller of the páramo, is necessary to represent an exchange.

The program coordinator, assisted by the páramo guard, writes a contract and description of the project. These contracts draws upon the same culture of collective labor that allows infrastructure projects like irrigation canals and road systems to be built to pursue these conservation and development projects. Although the contracts do not include repercussions for failing to satisfy the agreement, they do require a signature from the community's president agreeing to uphold the contract.

The páramo guard becomes the broker of an in-kind exchange between the FONAG with its urban constituents and the rural communities whose labor processes go towards producing ecosystem services through the productive projects that require the collective labor of the community. In other words, the work of the páramo guard allows access to the community labor in this PES arrangement. The páramo guard and his simultaneous performances as FONAG employee and community member, however, create tensions that are not easily reconciled.

4.7 PÁRAMO GUARDS AS SUBJECTS

Sodikoff (2009, 444) points out that locally hired guards in conservation arrangements are a "blur between implementer and target" of conservation interventions. That is, they typically engage in subsistence agriculture and local natural resource use, while being hired to control those same activities. This creates somewhat of a paradox within production, in which a guard's job exists because of his activities in another role.

The work of FONAG's páramo guards similarly fall into that position, however, this labor also requires a lot of negotiation between competing demands of the community and FONAG.

Although FONAG officially defines the work of the páramo guard, pays them, and holds them accountable, the process of hiring a páramo guard is typically dependent upon the local community. FONAG considers the páramo guard to be a link that allows them access to the community, but the community elects a páramo guard with the perspective that the person in that position leverage benefits for the community. The position therefore conveys accountability to the community upon the páramo guard. This is evidenced in a publication of FONAG on their guard program, describing concerns of the guards whose "reputation was at stake, in case of not obtaining financing for the [productive] projects (Escandón and Rojas 2008, 18). Rather than having accountability to only FONAG and motivation of the salary, the páramo guard also has accountability to the community and non-monetary motivations.

These tensions also became evident when páramo guards struggled to reconcile their lived experience as a páramo guard with the expectations of the FONAG office. As a neoliberal subject, the páramo guard is paid for a number of hours per week that there are responsible for recording and reporting to FONAG's office. Páramo guards are required to record their hours of work, but what may appear to FONAG office workers as a simple and straight forward task is often daunting to the páramo guards. Marking proper hours is particularly difficult for them. One páramo guard commented that the work never gives exactly eight hours in the field because there are always unexpected

circumstances that call their attention. Among guards, there seemed to be a consensus that they were working more hours than they were required, but there was a division in opinion between páramo guards on whether they were being adequately compensated.

Most of the complaints poor compensation for hours came from the páramo guards that spent up to five days in a row working out of the guard shack in the Antisana location. The guards pointed out that the conditions were difficult in that there was no telephone in the shack to keep in contact with their family, and there was only enough electricity from the portable generator to run it for two hours a day. Entertainment options were extremely limited, as there was not enough power to run a television and there were generally only two people staying at the guard house at any given period of time. One of the guards requested that FONAG look into hiring a staff psychologist to help them deal with the isolation that is a part of their work when in the field for long periods of time.

Multiple páramo guards who did not stay for periods of days in the field, however, commented on the excess of hours but claimed it was not a major concern. One guard, for example, commented that faithful schedule of eight hours meant he wouldn't be able to fully perform his work.

> "If I leave after exactly eight hours, then I would probably pass the hunters on the road. So, I stay a little longer, but this does not cause a problem for me because while I stay longer, for me it is just a little bit longer because I know that I am caring for the land. I know that it is important to have results with the flora and fauna and water. So, for me it is a source of pride. I do not know if the other [páramo guards] feel the same way?" (Páramo guard, páramo guard training, 2012).

In response to that comment, the FONAG office employee replied that it was great that the páramo guard took pride in his job, but that he needed to adhere to the hours to be properly compensated (Field Notes, October 2012). Many of the guards had been writing down the hours that they were supposed to be working, rather than the actual hours that they had been working, causing a source of frustration to the FONAG office employees. None of the páramo guards indicated that it would be an easy matter to write down the true hours. FONAG demonstrated desire to fairly compensate the guards for their work, but the lived experience of the job required more hours than could be compensated. Yet, driven by values other than monetary compensation, páramo guards continued their work. At this point, the guards' own environmental subjectivity could be considered a subsidy the mechanism of FONAG because their labor ultimately contributes value for FONAG to function.

Much of the tension within the practices of the páramo guard could be from an expectation of professionalization of the páramo guard's labor by FONAG. Without full recognition of the dual role of páramo guards and local community members, FONAG may expect labor processes and interactions to be de-personalized in the way of interactive service workers (Leidner 1993). Yet, FONAG's páramo guards are largely autonomous in their work. They very rarely receive direct visits from managers and their interactions are not very closely managed.

This section illustrates the complexities that constitute the role of a páramo guard between both implementer and target of a conservation arrangement. The separation of these two identities are not sharply defined or easily captured in the timesheets of

FONAG. Páramo guards may justify potential exploitation of labor as work in their 'other' role as concerned community member attempting to protect resources for their community.

4.8 DISCUSSION

As examined in previous sections, the role of the páramo guard is to act as a broker between the community and FONAG. The páramo guard enables FONAG to function as a market by building a connection between FONAG and communities in which economic value can circulate. On a material level, the guards enable FONAG access to páramo lands collectively held by communities and then negotiate agreements in which FONAG agrees to finance productive projects if the community agrees to collectively put their labor towards conservation practices directed at maintaining or restoring ecosystem services. This exchange between urban 'consumers' and rural 'producers' is what enables FONAG to exist as a PES arrangement requiring capital circulation.

The role of conservation intermediaries is poorly interrogated within existing literatures, and virtually absent regarding PES arrangements. While the mixed category of the role of the guards has been recognized (e.g. Agrawal 2005; Robbins 2000; Valdivia, Wolford, and Lu 2014), very few have chosen to specifically examine it. Sodikoff (2009) and Poppe (2012) are exceptions, noting the multiple and sometimes contradictory positions that guards as intermediaries of conservation possess and the value that is produced from their labor for conservation. I add to this discussion here as

by examining subjectivity of the páramo guards in FONAG and the value that is produced from this subjectivity.

Agrawal (2005)'s work with environmentality stresses that environmental subject-making occurs through practice. In Agrawal (2005)'s case study, an individual's conservation work in monitoring resource use, enforcing community regulations and participating in forest council activities imbues beliefs, desires and values within and individual that are subsumed into identity. While the desire to care for the páramo ecosystem expressed by páramo guards certainly overlapped with the priorities of FONAG, the páramo guards also seemed to lack some qualities that would be expected out of environmental subjects of FONAG.

The narratives of FONAG, for example, stress the importance of water for the city of Quito. In contrast to what would be expected of environmental subjects, páramo routinely verbally expressed the importance of the páramo lands for serving the needs of their own communities within the páramo guard training sessions at the headquarters of FONAG. This goal and desire to serve the city of Quito appeared to be internally rejected by páramo guards or actively ignored. These incongruences with the desires of FONAG and the páramo guards frequently appeared in the training. Disagreements on the logic of record keeping or areas of most importance for monitoring, for example, frequently arose in the meetings, showing that the páramo guards regularly applied a logic and judgement to situations that differed from FONAG's. It would appear then, that the process of subject-making was, at best, incomplete.

Cepek (2011), an ethnographer who has conducted long-term research with an indigenous group involved with conservation organizations in Ecuador's Amazon, criticizes environmentality. He asserts that the participants in conservation work maintained a critical consciousness of their practice and view their action "in terms of their political agendas and their cultural perspectives rather than the rationales of [conservation organization] agents" (Cepek 2011, 505). While participants in that case did not internalize the rationale of the practice, they performed it anyway because it would further other goals and desires.

Cepek (2011)'s work resonates with the páramo guard scenario of FONAG. The páramo guards are workers for FONAG, but they are simultaneously a member of their community and are specifically chosen by FONAG because of that characteristic. Paramo guards maintain a logic and values inherent to their home community and thus can negotiate between the two. According to Poppe (2012), the local guard intermediary maintains that ambiguity to the advantage of the conservation organization that would otherwise be actively resisted.

Rather than reject environmentality altogether, I suggest that the incomplete environmental subject and the incomplete process of environmental subject-making serve to subsidize the production of value within FONAG's water fund PES arrangement. While FONAG acknowledges and has expressed desire to compensate páramo guards for the problem of practical working conditions and their hours of labor, the expectations of the job do not line up with the physical requirements of the position. All of the páramo guards agreed that it was not possible to do what was asked of them in

the time that was expected of them. The willingness of páramo guards to continue the practices of FONAG, despite the inability of FONAG to compensate them ultimately subsidizes FONAG as they derive an extra value from the páramo guards to complete their job.

4.9 SUMMARY AND CONCLUSION

This chapter examines the second 'node' in the fictitious commodity chain of FONAG: the labor of the páramo guards and their role in implementing a neoliberal environmental governance arrangement that transforms ecosystem services into a commodity. Páramo guards are employees hired by FONAG from local communities to act as brokers between FONAG and rural communities, and their position constitutes a material connection from the urban-based organization of FONAG to the rural communities. Páramo guards are charged with the responsibilities of 1) patrolling the páramo ecosystem to record and report on the ecosystem and to dissuade any human activities that FONAG deems inappropriate, and 2) recruiting the collective labor of local communities to do conservation land use practices in exchange for small-scale productive projects. The páramo guard's labor directly contributes to enforcing FONAG's territorial claim on the land, necessary to pursue the commodification of ecosystem services that are derived from it.

Guards are common technology for enforcing territorial claims and boundaries, but studies of the productive nature of their labor is lacking in the broader literature (Sodikoff 2009). As both the target and implementer of PES environmental

governance, páramo guards are both subjects and agents. Neoliberal conservation discourses typically portray local people at conservation sites as having an inappropriate relationship with both the market and the ecosystem, but can be reformed (Igoe and Brockington 2007) . The páramo guards and their labor are therefore incorporated into an effort to create 'green custodians,' or disciplined neoliberal environmental subjects that embrace the logics of the market (Fairhead, Leach, and Scoones 2012).

The position of the páramo guard was born out of the context of Ecuador's political and economic instability during the 1990's and early 2000's. During this period, international organizations TNC and USAID sought to build a mechanism to expand biodiversity conservation outside of the limits of unenforced state-designated protected areas and into the larger landscape within a territory they called the Condor Bioreserve. The organizations developed a Community Park Guard position in which they trained local people to inform their communities of conservation regulations and influence local land-use activities. This model was later adopted by FONAG as the funding mechanism began to drive the borders of the conservation territory.

FONAG's páramo guards, working through FONAG's Control and Surveillance of Priority Areas program, are charged with recording and influencing land use activities on three types of property: protected areas, land owned by Quito's water company, and land collectively held by communities. The páramo guard surveillance zones are therefore strategically located on the borders of protected areas that contain reservoirs directly supplying water to the city of Quito. FONAG targets the páramo ecosystem for

conservation on all three types of property, but their labor can be divided into two realms divided by relative elevation: above in the páramo and below in rural communities.

The labor above in the páramo is conducted through patrols that incorporate recording and reporting information on flora, fauna, and human activities, as well as dissuading human activities such as burning, hunting and grazing. Throughout these activities, they do not possess any legal authority because they are agents of FONAG and not of the state. They cannot approve or deny access to anyone on any kind of property, and they cannot impose punishments for any rule infraction. The work requires páramo guards to learn new technologies, mark themselves as representatives of FONAG through uniform, interact with local people, and translate their experiences into reports to FONAG. Through these activities, the páramo guards are performing borders and rendering the territory as legible (Scott 1998) to FONAG for governance.

The labor below in the rural communities involves recruiting communities to form an agreement with FONAG in which they receive a small development project for work towards conservation goals. The guard helps develop and supervise the implementation of both the conservation and development work, and the terms of exchange. In effect, the labor process frames only the páramo guard, but the community members as 'green custodians,' who put labor towards conservation activities to restore and maintain ecosystem services in a valued exchange with FONAG.

The dual position of the páramo guard as target and implementer of the PES arrangement blurs within the labor practices of the páramo guard. As a member of their communities, páramo guards are obligated to work in the interests of their communities,

yet are also expected to work in the interests of FONAG. They struggle with FONAG in their difficulties in fitting the job requirements, working more hours than they receive compensation and committing their own money to supplies and equipment to complete their work. They often justify the conservation practices as benefitting the greater community, and thus also obscure boundaries between community member and the agent of FONAG. The transformation into a neoliberal subject is therefore incomplete.

Overall, the páramo guard's labor is a strategic, performative, but also incomplete process. It demonstrates how the páramo guard's labor is necessary for FONAG to render the páramo ecosystem as legible for governance, but also quantifiable and thus exchangeable. Ultimately, the work of bordering that the páramo guard performs is recorded by FONAG and used to determine success. The zones of surveillance in conjunction with a productive project, for example, are translated into hectares conserved that are then reported as action on the landscape and justification for FONAG's continued existence.

CHAPTER V

REWORKING COMMUNITY LABOR AND IDENTITY THROUGH CONTRACTS

5.1 INTRODUCTION

This dissertation focuses on the creation of tradable commodities out of ecosystem system services, as constituted from labor and territorial processes. The first chapter examines the formation of the market-based environmental governance arrangement called FONAG, a water fund payments for ecosystem services (PES) program based out of the city of Quito, Ecuador. The previous chapter of this dissertation examined the labor of the páramo guard as an intermediary of FONAG to mobilize the collective labor of rural communities for conservation work. This chapter examines collective rural labor as another node in the fictitious commodity chain of a water fund PES arrangement (Figure 5.1). It examines the process of how FONAG mobilizes labor in the communities towards conservation objectives and how that process is co-constituted by the community's need for recognition of work that they already do within the páramo.

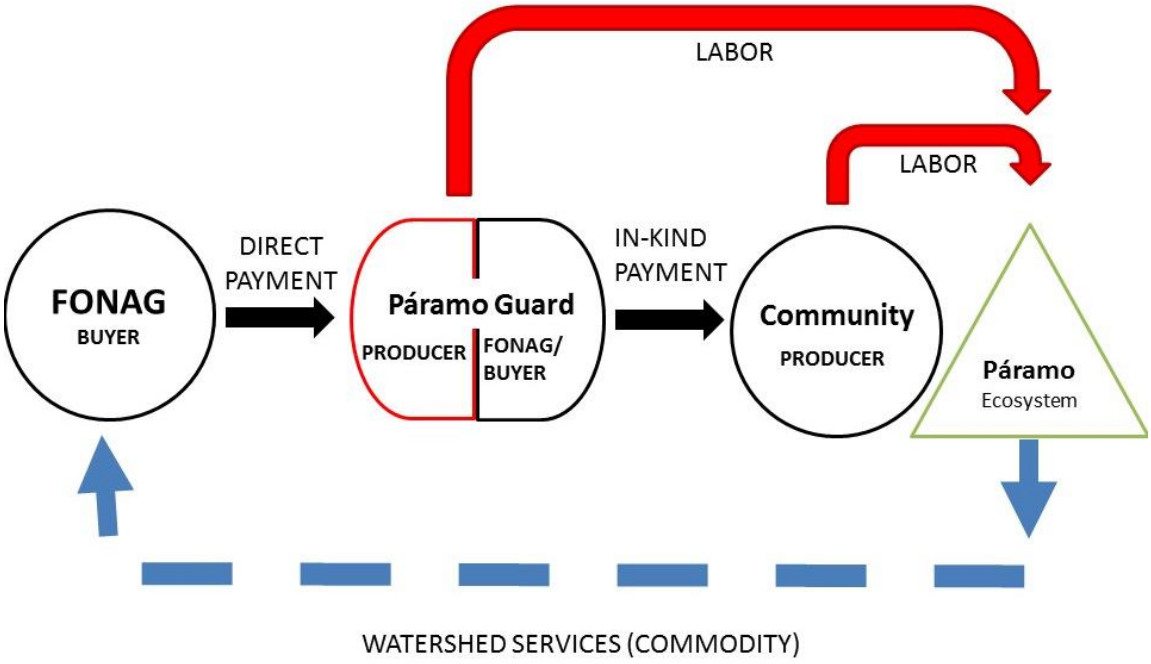

Figure 5.1 The community as a 'node' in ecosystem services production

I conceptualize the process of mobilizing labor as a realignment of the FONAG's contract agreements and local labor institutions. I examine FONAG's contracts because iterations of the document offer evidence on the evolution of agreements, including critical points of disjuncture that illuminate the process of labor mobilization. Ultimately, it is the collective mobilization of labor for conservation that forms the basis of FONAG's to be framed as a PES mechanism.

This chapter engages critical literature framing PES arrangements as a manifestation of broader hegemonic forces of neoliberal movements. These literatures typically present PES as a neoliberal force for capitalist accumulation through the abstraction ecosystem services into commodities (e.g. Fairhead, Leach, and Scoones

2012; Peluso and Lund 2011; Büscher and Fletcher 2015). One exception is Shapiro-Garza (2013), who broadly analyzes discourses surrounding the implementation of a long-running PES program in Mexico.

Furthermore, very few studies address the on-the-ground process of PES interventions between downstream users and the ecosystem service providers that enact these projects (Francisco, Budds, and Boelens 2013). This chapter therefore adds to literature examining the application of PES and challenges the narrative of PES as a hegemonic neoliberal force. I also contextualize communities and emphasize that the communities have long, complex histories of development that have been in process before FONAG arrived, and that rural communities have their own agendas that can be achieved through contracts.

The first section of this chapter examines importance of rural labor mobilization and the exchange mechanism to FONAG's arrangement, and how this mechanism is co-constituted by the local labor institution of the minga and FONAG's contract. Next, I analyze the complex process of initiating a FONAG project within the case study community of Quinchucajas. After examining the distribution of economic valuation and material practice of FONAG's project, I discuss how the recognition of labor becomes a critical role within negotiations within the Quinchucajas case.

5.2 MOBILIZING LABOR FOR CONSERVATION

Payments for Ecosystem Services (PES) is a solution for a particular definition of the problem of environmental degradation- one that can be addressed through the

mobilization of rural laborers for conservation work. This section describes the process of enacting this concept through the water fund arrangement of FONAG. It identifies FONAG's choice in defining the primary threat to the páramo ecosystem as rural residents that can be transformed into laborers for conservation. Furthermore, this section describes the institutions of the local *minga* labor arrangement and of FONAG's contract agreements that serve to mobilize collective rural labor towards conservation work in the páramo.

In a 2007 report on water funds, The Nature Conservancy (TNC) identified two main sources of threats to the integrity of the páramo ecosystem: rural residents pushing the limits of the agricultural frontier with inappropriate land use practices, and companies and municipalities that initiate infrastructure projects that ignore the full environmental impacts of "roads, dams, water distribution systems, oil and gas pipelines and other infrastructure projects" (Krchnak 2007, 6). TNC recognized these projects as promoting soil erosion, compaction, and consequently reducing flows from the páramo (Krchnak 2007). In subsequent years, however, TNC and partners have discursively reframed the watershed of Quito as 'green' infrastructure (TNC 2012a). Materials produced by FONAG have subsequently minimized the role of the city and of companies as contributing to the degradation of the páramo through construction projects.

FONAG typically identifies poverty and the lack of economic alternatives in rural communities as the primary cause for páramo ecosystem degradation. The narrative of poverty in rural communities appears in several publications, pamphlets and other printed materials from FONAG and its supporting organizations. An example

comes from issue 2 of *Fondo-A-Agua*, FONAG's newspaper publication targeting the general public on water issues. An article reviewing the importance of the ecosystem describes the páramo as:

> "…the home of historically poor and marginalized rural communities. Human intervention, for lack of alternatives or for the advancement of industry, impacted the ecosystem. Practices like burning or the introduction of animals affect its environmental services." (Mena Vasconez 2008, 3)

Although FONAG portrays rural Andean communities as the primary threat to the páramo ecosystem, FONAG aligns with the pervasive discourses of PES to assert that rural people can be transformed from threats to guardians of the páramo. After describing the hardships of the local communities, for example, another article from the same issue of *Fondo-A-Agua* declares "…it is in these communities that we are basing the hope of the care and management of the páramo" (Lloret 2008, 2). The identification of rural communities as caretakers and managers of the ecosystem also frames them as laborers.

FONAG's narrative of local people as having a flawed relationship with their environment, which can be corrected through valuation of ecosystem services, is a common discourse in market-based conservation (Fairhead, Leach, and Scoones 2012). This discourse is a powerful justification for intervention in rural areas, as it carries positive connotations of assistance. However, it is also important to note that the broader discourses of improvement within 'backwards' local populations has been circulated long before market-based conservation programs (e.g. Li 2007b).

The combined poverty narrative and the identification of rural communities as potential laborers for conservation informs FONAG's intervention strategy. FONAG offers what it terms 'productive projects' as a point of exchange to direct community activities towards ecosystem conservation and restoration. Productive projects are a form of economic development intended to be ecologically compatible with the ecosystem. Productive projects pursued by FONAG within communities have frequently included raising guinea pigs, constructing organic gardens, or developing community-based ecotourism. FONAG intends for the productive projects themselves to contribute to the overall conservation of the páramo by reducing poverty and thus reducing the pressure on the ecosystem through generating alternative sources of income. At the same time, they require the exchange of community labor directly towards conservation work. They therefore also function as an in-kind economic incentive to mobilize the labor of communities to directly contribute to specific conservation goals.

The direct conservation labor that is required from communities to receive productive projects typically includes the work of cattle removal from communal páramo lands, but has also included garbage clean-up and planting native vegetation. Each productive project of FONAG is articulated by a written contract agreement that specifies the required commitment from a community to directly engage in labor for conservation. FONAG pays for the materials and technical assistance for the productive project, while the communities as a collective must agree to provide the manual labor for both the productive and conservation and productive components of the agreement. The communities are expected to bear no less than 40% of the expense for enacting a project

agreement (USAID 2012). FONAG calculates this expense through estimating manual labor necessary to complete the project and assigning it a value. FONAG typically designs the projects to last a year, but occasionally communities have renewed contracts in different 'phases' that may include additional themes if FONAG deems the community have done well with the first project.

The productive projects can thus be understood as an in-kind exchange. A mechanism of exchange and remuneration is a key component of a PES arrangement, even though various terms can be employed (Wunder 2005). The remuneration language of FONAG's productive project contracts are representative of the political context of Latin America. For example, FONAG rejects the term 'incentive,' to describe the role of the productive projects. According to an article in the first issue of *Fondo-a-Agua*,

> "These productive alternatives are not 'incentives,' [rather] they are proposals based on the social, economic, cultural and environmental reality that will bring a better quality of life to the communities involved…" (FONAG 2007, 7).

The term 'incentive' harkens to a marketization of watershed services, which has been strongly resisted in Ecuador and other Latin American countries. Based on historical context in Ecuador's Andes, Kauffman (2014, 43) identifies the phrase 'payments for environmental services' as "toxic" to indigenous communities, who view it as linked with privatization. Despite the alternative terminology that FONAG employs to describe its arrangements, this concept of remuneration within PES remains intact as FONAG

describes its productive projects as helping communities recover the costs of conservation practices.

Water fund PES arrangements may obscure the identification of the commodification process through employing terminology that avoids words like 'payments' or 'incentives.' However, PES and PES-like arrangements involve the process of rendering ecosystem services into an object for exchange that is premised upon linking producers of ecosystem services to consumers that pay for the ecosystem services (Kosoy and Corbera 2010). The labor of rural communities, mobilized by FONAG, adds value to ecosystem services as a commodity. The labor (physical action) at the site of important ecosystems in turn brings ecosystem services into being, into an object that has an exchange value. The mobilization of community labor, therefore, is critical to ecosystem service production. FONAG's successful creation of an exchange is dependent on two institutions: the *minga* and the contract.

5.2.1 The Minga

FONAG leverages a local institution of collective labor in Ecuador's Andes called a minga. The minga has pre-colonial origins and serves mobilize labor through systems of reciprocity (Orlove 1977). It emerged from subsistence agricultural practices requiring seasonal labor investments that exceed the capacity of households. A household receiving aid from others is expected to return a labor contribution to others when needed. Therefore, a minga can be understood as an institution of a cycle of delayed reciprocal mutual aid (Faas 2015).

This institution is important within each of the four case study communities of Quinchucajas, Cariacu, Paquiestancia, and Oyacachi. The rural communities typically pool their labor to address larger projects for which they do not have the funds to hire machinery or workers to enact projects. The tradition of minga labor contributes to the continuity of the community as a whole. Mingas are formally discussed in community assemblies and arranged by community leaders. They are typically obligatory, requiring each household to contribute a member over the age of 18 to work on community-organized projects. The expectation of household contributions, however, are not rigid and based upon their abilities to contribute (Field Notes, 12/13/2012). While a minga can focus on any type of project, the results are frequently demonstrated in the infrastructure of hand-constructed irrigation canals and roads that crisscross the Andean landscape.

FONAG develops the productive project in conjunction with a small subgroup within the larger community. About 10% to 15% of households within an entire community will directly participate as beneficiaries in the productive project part of a FONAG agreement (Field Notes, 2012). However, FONAG requires the community as a collective to put their labor towards the conservation component of the project contract as a condition of the exchange.

The reasons for community members to contribute labor to the FONAG projects that do not directly benefit them align with the minga institution focusing upon delayed reciprocity of aid. A community member explained to me why she contributed labor she put her labor towards a FONAG project without receiving a direct benefit from it. “I do not [directly benefit from this project], but maybe I will on the next one, and I will

need my neighbor's help," she commented (KIQ3 9/15/2013). This quote expresses an individual's perspective of the labor institution and how the minga institution facilitates FONAG's project. An individual not directly benefitting from the productive project will do so because of the unknown possibility that they might benefit from a future project requiring minga labor. FONAG therefore depends upon the institution of minga to mobilize labor within a community for conservation.

5.2.2 Productive Project Contracts

The contract agreement is the other institution that FONAG utilizes to initiate conservation interventions within rural communities. A community must agree to receive a FONAG project via a formal written agreement, or contract that is signed at a minimum by the technical secretary of FONAG, the president of the community and the páramo guard (Field Notes, 8/10/2013). Occasionally FONAG will also require the subgroup to sign the document, with illiterate members placing a thumbprint as their signature next to their typed name. This agreement is brought to the community assembly for discussion before signing. If the community agrees with the terms, then the community's president will sign the project contract. If not, then the president of the community will reject the contract and the community will not put their labor towards it.

While representing an agreement, the contracts are not legally binding. The only repercussion for non-compliance to the contract is the risk that FONAG may not offer another project. As Goldman-Brenner et al. (2012, 60) assert, "[r]ipping up the organic garden or taking back the guinea pigs surely would not be morally defensible sanctions

for contract violations." On FONAG's part, there is no legal obligation to offer further projects to the community or to fulfill contracts that were signed (Field Notes, 9/9/12). Although formalized, the contracts are solely bound by trust between the communities and FONAG.

Contracts embody a set of neoliberal ideas, based upon my examination of five of FONAG's contracts for rural community interventions. First, revenue generating activities are prioritized. This makes sense, given that the projects are largely meant to generate 'alternatives' to the income that would otherwise be generated from *ganado bravo,* or semi-wild beef cattle, in the páramo. The revenue thus becomes the vehicle exchange for the work to rearrange land-uses for conservation purposes.

Next, the contracts serve to compartmentalize the landscape in the name of efficient use, dividing it into human production and ecosystem services production, or the 'people' and the 'páramo' to quote from a contract, "optimize the landscape" (FONAG 2013a, 2). This discourse is demonstrated in several of FONAG's publications, such as descriptions of the productive projects as having a purpose "…to reduce the exploitation or inadequate uses of [community] natural and productive spaces" (Escandón 2010, 10). Thus, there is a strong emphasis on dividing the landscape into spaces for production or conservation.

Finally, the contracts attempt to create isolated labor regimes. The community as a scale of focus for contracts appears to contradict this characteristic. However, the contracts present an assumption that the community makes decisions about land use autonomously, rather than considering communities as a part of a larger network with

their neighbors. The contracts reveal FONAG's assumption that there is no mechanism to manage communal lands and that intact páramo are somehow overlooked by the people in the living in the area, and that poverty will drive rural communities to destroy the ecosystem as they seek to consume resources. In this way, they embody a criticism of Boelens, Hoogesteger, and Rodriguez de Francisco (2014, 85) that "generic PES strategies fail to recognize the cultural and cohesive function of Andean communities' land and water institutions, their complex rights, and their management relationships."

Contrasting these neoliberal characteristics is an emerging trend towards FONAG's use of the word 'reciprocity' to frame its exchanges with rural communities and has turned to describe productive projects "…as co-mechanisms of reciprocity for the protection and conservation of the zones of hydrologic interest" (Dominguez 2014, 10). Kauffman (2014) suggests that water funds offer a positive form of collaboration and inclusivity, asserting that water fund members appeal to the norms of reciprocity and exchange among Ecuador's "poor and popular sectors" to implement community *mingas* for conservation and restoration projects. This, he claims, combined with the in-kind nature of the exchange that promotes a sense of public benefit from the projects, has "overcome concerns about privatization and commodification," leading to community adoption of water fund projects whereas individual payment PES would likely be rejected (Kauffman 2014, 47).

The description of FONAG's productive projects as reciprocal agreements is likely recent in origin. None of FONAG's annual reports prior to 2013 use reciprocity in descriptions of productive projects. A reference to reciprocity is also absent within

discussion of FONAG's productive projects in the 29 issues of *Agua-a-Fondo* published by FONAG prior to the Quinchucajas irrigation project. Furthermore, none of the four contract agreements between FONAG and communities prior to the Quinchucajas case study refer to reciprocity in any way. This includes the Cuyuja project that FONAG approved May 23, 2013, roughly two months before FONAG finalized Quinchucajas' project contract. The evolution of discourses indicates that the water fund PES in Ecuador did not seamlessly align the local institutions of the minga. In the following sections, I discuss the realigning of the institutions of the contract and the minga in order for FONAG to mobilize community labor towards conservation.

5.3 QUINCHUCAJAS CASE STUDY

The community of Quinchucajas provides a case study for examining how minga labor institutions are critical the negotiations between FONAG and the communities. My analysis examines the iterations of FONAG's contracts and is based upon Jepson (2012)'s use of archival documents examining the rescripting of narratives about local water governance. Contracts offer insight into the evolution of agreements and the points of disjuncture and negotiation that develop in the process. Through examining contracts and the surrounding context that led to changes, I illuminate the process of how FONAG's contracts and local labor institutions went through realignment in order to mobilize labor.

Quinchucajas is a rural agricultural community consisting of 105 families and encompasses an area totaling about 600 hectares located in just north of Quito (FONAG

2013a). The community exists on a perceptible incline, with an average elevation of 3,700 meters above sea level. Adobe homes are scattered through the extent of the community, with the school and the *casa communal*, a public building used for community functions, located in the lower portion of the community. In the upper elevations of the community, agriculture is predominately limited to below-ground crops such as potatoes and onions that can survive light frost, whereas a greater variety of crops are grown at lower elevations (Field Notes, 08/22/2013). The people in the community primarily speak Kichwa, and are linked to the Kayambi indigenous group. The community borders a large area of intact area of páramo consisting of approximately 4300 hectares[12], of which approximately 60% is disputed territory with the Cayambe-Coca National Park (FONAG 2013a). Furthermore, the community is adjacent to an area called Cerro Puntas, which Quito's water company (EPMAPS) has identified as critical to water resources for the city (Metropolitano 2014). Thus, the area became a conservation target for FONAG.

Two men work as páramo guards from Quinchucajas for monitoring and surveillance of the zone FONAG identifies as Cerro Puntas. One of the men also serves as the president of Quinchucajas (Field Notes, 9/19/2013). They patrol the páramo to report on ecosystem changes and dissuade people from activities such as burning, grazing cattle, and hunting. In addition, they organize and manage FONAG interventions

[12] FONAG reports area as 4,300 ha while Committee Nukanchik Urku claims the area to be 4,700 ha, as cited in the contract (FONAG 2013b). The discrepancy in area is likely caused from an ongoing territorial border dispute with Cayambe-Coca National Park.

in the rural communities of the surveillance zone. Chapter IV details the roles of páramo guards and their duties.

Facilitated by a women's organization consisting of 22 members, FONAG has implemented two productive projects in Quinchucajas (Field Notes 9/19/2013). FONAG implemented the first productive project in 2009 on the production of guinea pigs (USAID 2009). FONAG pursued an irrigation system as the second productive project in 2013. My focus for this analysis centers upon the irrigation project because possess contracts and documents that were developed by FONAG at the various stages of the project. Furthermore, I was present to conduct participant observation through the development, implementation and completion of the project.

FONAG's irrigation project began as a proposal for a smallholder farming project focusing on organic vegetable gardens within the lower elevations of the community. FONAG developed this project to directly engage members of a women's organization within the community. The same organization had also engaged with FONAG's previous guinea pig project. FONAG identified 'unused' land in the lower parts of the community as having potential for the gardens when presenting the project to the members of the organization. The members, however, indicated to FONAG that the reason that they were not already practicing agricultural work in those spaces was because there were periodic droughts that made reliable cultivation a challenge. Therefore, they requested an irrigation project (Field Notes, 2013).

The irrigation system that the woman's organization proposed had been discussed by the community years prior to the arrival of FONAG. Community members

in the lower portion of Quinchucajas identified a small spring near one of the roads into the community as an unused and available water source (Figure 5.2). However, the community lacked the financial resources to purchase the materials for the project (KIQ3 9/15/2013).

Figure 5.2 A spring flowing into a ditch near the road into Quinchucajas (August 2013)

The irrigation system fit with FONAG's criteria of projects to reduce use pressure on the upper elevations by intensifying agriculture at lower elevations, so FONAG decided to pursue a project (Dominguez 10/9/2013). FONAG drafted a proposal for the irrigation project to directly serve 9 hectares of land, and subsequently 9 families, in the lower portion of Quinchucajas. FONAG lacks the technical expertise to design and implement an irrigation system, and therefore it contacted the Institute for Ecology and Development of Andean Communities (*Instituto de Ecologia y Desarollo*

de las Comunidades Andinas – IEDECA), an NGO with expertise in irrigation systems, to direct the project (Field Notes 10/8/2012).

Employing several people that belong to various Kayambi communities, IEDECA was formed in the town of Cayambe in 1988 and focuses on assisting local communities. When the organization began, it focused on the improvement and development of irrigation systems, a topic that other NGOs avoided because of its inherently political nature (IEDECA Employee, 9/13/2013). The organization is regularly involved in mediating natural resource management issues between local communities. FONAG presented a proposal for the Quinchucajas project in May 2013 in a community assembly attended by representatives of IEDECA (Field Notes, 7/31/2013).

The productive project, however, was stopped from going forward by an environmental governance regime of which FONAG was previously unaware. IEDECA pointed out that the páramo FONAG targeted for conservation did not pertain solely to Quinchucajas. Instead, the lands are collectively owned and under active, intentional management of an organization called Committee *Ñukanchik Urku*, translating to simply 'Our Páramo' in Kichwa. This organization consists of seven communities to which the páramo pertains, including Los Andes, Comuna Izacata, Izacata Grande, Cochapamba, La Compañía Lote 2, La Compañía Lote 3, and Quinchucajas. Two more communities, Cuarto Lote and Santa Rosa del Pacha, also participate in the organization because they benefit from irrigation water that comes from the páramo (Field Notes, 10/22/2013).

Meeting at least once a month[13], this organization has a set of institutions in place regarding grazing, fire and other uses of the páramo. The FONAG representative from the office in Quito had been unaware that the páramo they had proposed to conserve was the common responsibility of Committee Ñukanchik Urku, and IEDECA refused to agree to the project without consent from the group (IEDECA employee 8/12/13).

The proposal was brought to the attention of Committee Ñukanchik Urku, and the group complained that there was no recognition of the shared labor that went into managing the páramo. Officially formed in January of 1997, Committee Ñukanchik Urku carried more than 20 years of existence cooperatively managing the páramo to maintain the hydrologic processes that were critical for their supply of water for irrigation and consumption within their communities (FONAG 2013a; Field Notes 8/14/2013). Working through them are 16 individuals elected by communities and in charge of monitoring the mutually agreed upon rules for páramo use, such as observing that people were not running cattle, burning or planting over limits demarcated with small stands of planted trees. They report violations up publicly at the community assemblies, which also decide consequences. This position, called *urku kama* in Kichwa, literally translates to páramo guardian. The position is not paid, but rather is considered an honor (KIQ5 11/25/2013). The people in the *urku kama* positions take daily turns in monitoring in approximately two-week rotations (Field Notes 8/14/2013).

[13] There is an exception during the summer festivals and the organization may not meet during this period.

The Committee also demarcated the areas of road access into the páramos with signs. Figures 5.3 and 5.4 are two signs that communicate the communal claim on the territory. The sign shown in Figure 5.3 reads: "The Committee of Ñukanchik Urku, burning the grass ends the life of the páramos and dries up the water." In Figure 5.4, the sign reads, "With much strength we have recovered the vegetation to maintain the sources of water, achievements reached through community organization."

Figure 5.3 Committee Ñukanchik Urku sign with map captioned: "Fires in the grassland end the life of the páramo and dries up the water" (September 2013)

Figure 5.4 Committee Ñukanchik Urku sign captioned: "With much strength we have recuperated the vegetation to maintain the water sources, achievements reached by community organization" (September 2013)

The signs communicate a claim to the páramo lands and represent an explicit attempt to render visible the intentional and active management of the landscape to outsiders. It was also Committee Ñukanchik Urku that challenged the narrative of FONAG's first project proposal.

Despite the visual cues such as the signs located along access points to the Committee Ñukanchik Urku's páramo, FONAG failed to recognize the collective labor arrangements and pre-existing páramo land management practices. Walker (2011) identifies recognition is a crucial component to justice because an unequal exercise of power is inherent within in acts of non-recognition. Therefore, it follows that the

committee of Ñukanchik Urku found recognition as an important condition for agreeing to FONAG's contract.

Resonating with justifications of the minga system that calls upon all community members to work towards the benefit of some of the community, Committee Ñukanchik Urku found it agreeable for Quinchucajas to accept the benefits of the project as long as the work of the collective was recognized. The leaders of Quinchucajas supported these changes, and moved to reframe the project as recognition of the ongoing efforts of the communities to manage the páramo land to maintain hydrologic processes that also served their own needs for water consumption. As a condition of acceptance, then, between the community of Quinchucajas and FONAG, the first contract agreement for irrigation went through a process of negotiation and revision specifically over the representation of labor and the environmental effects of that labor on the landscape.

This evolution of the contracts become apparent through directly comparing them. The practical outcome of the two versions of the contract agreement are the same: Quinchucajas would accept responsibility for the manual labor for the productive project and conservation components of the contract, and would receive financial support from FONAG and technical support from IEDECA to construct an irrigation system for 9 hectares of land and the community. However, the two contracts significantly differed in the way in which they discursively framed labor within FONAG's project. The first contract constructs the agreement with Quinchucajas as a mechanism for impelling the community put their labor towards conserving and restoring the páramo. The language of the second contract, in contrast, supports and recognizes the continuing actions of the

larger network of communities in their labor to actively manage the páramo. It recognizes the larger social context in which these practices exist.

The first agreement lacked any acknowledgement of the position of Quinchucajas as one community in a larger organization of communities with an established history of strategically managing the páramo. In contrast, the introduction to the second contract states, "The present project initiates a process recognizing one of the member communities of Committee [Ñukanchik Urku], in this case Quinchucajas, in their great efforts towards following through with its objectives of conservation of the páramo under the principle of reciprocity of which we benefit from the environmental functions of Ñukanchik Urku" (FONAG 2013b). The objectives, strategy, and goals continue with the alternative framing.

The most notable areas of change between the documents included the objectives and the purpose of the project. As demonstrated in Table 5.1 the general objective transforms from "to launch the recovery and conservation…" (FONAG 2013a, 4) into "to support the continuation of recovery and conservation..." (FONAG 2013b, 5). Rather than adopting new practices, the project was to support the continuation of the responsible practices that were already in place. This subtle change continues to frame the rest of the terms of the agreement. While not mentioned anywhere in the first contract, the second contract also invokes the word 'reciprocity' multiple times, harkening to the relationship that Quinchucajas has with Committee Ñukanchik Urku and the system of benefit sharing through labor.

	Rejected Contract, May 2013 (FONAG 2013a, 4)	Final Contract, July 2013 (FONAG 2013b, 5)
General Objective	"To **launch**[14] the recovery and conservation of the areas of hydrologic interest through the improvement of productive practices and strengthening the technical skills of production in the Community of Quinchucajas."	"To **support the continuation** of recovery and conservation of the areas of hydrologic interest in the páramo of *Ñukanchik Urku* through improving productive practices and strengthening the technical skills of production in the Community of Quinchucajas, **under the principals of Reciprocity from the communities responsible for the management of páramo**"
Specific Objectives	a. "To **optimize** the management of natural resources through zoning productive territories in a way that the areas of hydrologic interest **will be conserved and restored** while the areas that are apt for agro-productive activities will be managed according to their calling."	a. "To **implement mechanisms of reciprocity for the community of Quinchucajas,** member of *Ñukanchik Urku*, for the management of natural resources; through zoning productive territories, **supporting the continuation** of conservation of the areas of hydrologic interest and improving its level of agricultural productivity to assure food sovereignty."
Sustainable Use Strategy	"This strategy creates a structure of action to diminish the pressures upon Quinchucaja's páramo ecosystem derived from the production and consumption of natural resources by improving the productive system of the community"	"This strategy creates a structure of action to improve the community productive system in the lower parts (areas of production) and to lessen the pressures that exist above in the páramo."

Table 5.1 Comparison of 2013 Quinchucajas irrigation project contracts

[14] Bolded words indicate emphasis by author.

	Rejected Contract, May 2013 (FONAG 2013a, 4)	**Final Contract, July 2013 (FONAG 2013b, 5)**
Goals	"a. 2000 hectares of páramo **to be** managed in an adequate form for conserving and improving ecosystem services b. Improving systems of production as a demonstrative scenario… c. A training process to improve the capacity for agricultural production of the families of Quinchucajas as a part of the process of organizational strength."	"a. 1945 hectares of community páramo of the Ñukanchik Urku Committee **that will continue to be** adequately **managed** to conserve and improve the functions of the páramo ecosystem. b. Improving the production systems in 9 hectares as a demonstrative scenario… c. A training process to improve the capacity for agricultural production of the families of Quinchucajas as a part of the process of organizational strength."

Table 5.1 Continued

Despite this change, both of the contracts retain an emphasis on compartmentalizing the landscape into productive areas and areas of conservation. The first specific objective of both contracts remains to create zones for productive areas to therefore lessen the impact on páramo conservation area, although they are worded slightly differently to recognize work that is already being done in the area. The Committee of Ñukanchik Urku discusses the páramo as though it is a place of active management, a lived space that serves a function to their community. While the Committee usually meets in the casa communal or school building, occasionally they will hold *recorridos*, or hiking tours in which members are allowed to share their thoughts on the páramo, and to reflect on the history of it and efforts to manage to gain insight on future goals. Figure 5.5 depicts one such occasion on October 17, 2012.

Figure 5.5 Members of Ñukanchik Urku gathering in the páramo (October 2012)

The Committee of Ñukanchik Urku is not an anomaly of management in the region, as there at least six other collectively held páramo that co-managed by multiple Kayambi communities on the edges of the Cayambe-Coca National Park (IEDECA employee, 10/10/2013). As water that the communities depend upon comes directly from the páramo, this is an area that is actively managed by communities.

The revised contract never used the word 'compensation' or any language that indicated exchange other than references to 'reciprocity' regarding Quinchucajas' position within a larger network of communities that manage Ñukanchik Urku. Instead,

the project employs the word 'recognition' in regards to the conservation efforts, thus removing the invisibility of prior collective land management practices. However, one explicit 'expected result' of the project remained that reaffirmed the exchange and the PES framework. This expected result recognized the labor of the community to be "maintaining the functions of the páramo ecosystem," for the duration of the 24 months of the project. The contract gave the work an explicit value of $700 (FONAG 2013b, 8).

5.4 ECONOMIC VALUE, LABOR AND THE IRRIGATION SYSTEM

The physical inputs to the material construction of the irrigation system also merits examination because it gives insight on the distribution of economic value towards the project and the contributions of community members. After the formal contract agreement with FONAG was signed by the community of Quinchucajas on July 26, 2013, IEDECA and the community's irrigation water committee, constructed the technical plans to build the irrigation system.

According to FONAG's contract, the total value of the intervention project was set at US$29,554.74. Purchasing materials was budgeted for $11,454.74, while the collective labor of the community in constructing the project was estimated at the value of $13,200.00. The total also included a $5 donation from each family for the women's group to purchase seeds or materials to improve their gardens at an estimated $500.00, $3,000 for the work of IEDECA, and another $700 valued for further meetings or community mingas associated with conservation. Extra payment for the páramo guards from FONAG was valued at $700 over the course of the project (FONAG 2013b).

From this, the value that the community generated solely from labor, according to FONAG, totals $13,900.00. The division of estimated economic value, then puts the communities expense at 17,400.00 (58.8% of the total project expense) and FONAG's cash burden at 12,154.74 (41.2% of the total project expense).

Excavation of the project began with a community-wide minga on August 12, 2013 and lasted for the next several days. The length of the irrigation canal totaled 1200 meters, all of which was dug by hand by both men and women of Quinchucajas. In the initial excavation project, each family was expected to contribute at least one worker to the project, so there were roughly 100 people working at any given time (Field Notes, 08/14/2013). Figure 5.6 depicts community members in Quinchucajas digging the irrigation ditch.

Figure 5.6 Digging the irrigation canal in Quinchucajas (August 2013)

After the initial community-wide mingas to complete excavate the irrigation ditch, several smaller mingas were organized to construct the holding tank. In contrast to community-wide mingas, the laborers in were members of the households directly benefitting from the irrigation project, and typically 12 to 15 people gathered at a time to contribute to the project. Figure 5.7 depicts the minga working on the holding tank construction. These gatherings lasted for a much shorter duration, typically half a day one or two days per week. As such, the work to construct the reservoir and the remaining part off the irrigation system lasted until October 8, 2013. The inauguration of the project, then, was October 9, 2013 at the community house of Quinchucajas. Representatives of FONAG, IEDECA, and the Quinchucajas gathered to sign an agreement of completion (Field Notes, 10/09/2013). These community members were expected to put their labor towards a larger irrigation project serving the higher elevations and coordinated by IEDECA the following month in November. The relationship to this other project that was not a part of FONAG underscores how the collective labor agreement with FONAG was also embedded in other reciprocal labor relationships within the community.

Furthermore, the idea of exchange or the frame of exchange for community members not involved the leadership of the community seemed to be missing. From conversations with six of the members of Quinchucajas while digging the ditch for the irrigation system, none of them thought of the project as an exchange, since they were already actively managing the land (Field Notes, 8/14/2013) Two of the participants

offered opinions that they understood FONAG's project to be no different from any other development project offered by an NGO (Field Notes 8/14/2013).

Figure 5.7 Minga to construct the water holding tank in Quinchucajas (September 2013)

5.5 DISCUSSION: LEVERAGING LABOR

The application of a PES arrangement as a solution to environmental degradation is predicated on an assumption that an exchange mechanism will serve to mobilize to 'destructive' rural inhabitants of an ecosystem into land managers—laborers that

maintain and restore an ecosystem that produces services. The rural inhabitants of an ecosystem thus become 'producers' of ecosystem services. I interrogate the process of implementing the arrangement through examining FONAG's intervention within the case study community of Quinchucajas. FONAG draws upon both pre-existing labor institutions and contract agreements in order to mobilize community members as conservation laborers and thus ecosystem services 'producers.'

The case study of Quinchucajas demonstrates the complexity within the application of the PES arrangement and the process of labor mobilization. The neoliberal discourses that drove the creation of FONAG's PES arrangement as a solution to environmental degradation render the pre-existing environmental governance regime and the labor of land management at the site of ecosystem service production invisible. Through analyzing the process of aligning the institutions of the minga and the contracts, the Quinchucajas case study reveals how rural communities can actively challenge seemingly hegemonic neoliberal discourses that misrepresent labor and land use relationships to gain recognition of pre-existing collective institutions for ecosystem management. The case study also demonstrates how targets of PES can actively challenge and reform narratives of their identity.

My examination of the labor process itself and the value that is exchanged between FONAG and the rural community also reveals a disjuncture on how FONAG's productive project is perceived between the rural community and practitioners of FONAG. The people of Quinchucajas and for example, received FONAG as any other form of a development project. While FONAG kept records of the value of the

exchange between labor and materials, members of Quinchucajas, for the most part, did not take this value exchange into consideration. Instead, much of the value of the FONAG project resided within its value to fulfill a social obligation with another irrigation project in the community distinct from FONAG.

This case study of Quinchucajas complicates Kauffman (2014)'s notion that PES is a positive form of inclusivity that simply overcomes fears of privatization and commodification. Kauffman fails to recognize that these projects are also a form of strategy and a negotiating tool within and between communities. A representation of PES as fitting in with local institutions without complication minimizes valid questions about site-specific pre-existing labor and land use institutions.

The case study supports the assertion by Boelens, Hoogesteger, and Rodriguez de Francisco (2014) that the PES projects in the Andes fail to fully grasp the cultural and cohesive function of Andean communities' land and water institutions. Inadequate recognition by PES practitioners of the pre-existing relations regarding ecosystem and water management may provoke instability in the minga system. If communities or individuals in communities were to behave as the rational economic actors that neoliberal conservation assumes, the collective land management arrangement likely wouldn't work. Issues of jealousy with no guarantee payment may even jeopardize ecosystem management arrangements like the one of Ñukanchik Urku. At the time of the study, Ñukanchik Urku has no rules about how to deal with PES schemes within their organization (Field Notes, 10/23/13).

5.6 SUMMARY AND CONCLUSION

This chapter examines the mobilization of collective labor at the site of ecosystem services production. PES functions as an exchange mechanism in which the people living in and around sites of ecosystem service production are conceptualized as 'producers' whose labor goes towards the constitution of ecosystem services. I therefore analyze the process of how the labor of producers is mobilized within a water fund PES arrangement using a case study FONAG's work in the rural Andean community of Quinchucajas.

I begin my examination of the labor mobilization process with FONAG's narrative of the problem of páramo degradation. Early descriptions of páramo ecosystem degradation by TNC, the organization that instigated FONAG, identified two main contributions to the problem: agricultural practices of rural communities within the páramo and infrastructure construction by municipalities and companies. While infrastructure construction as a problem is minimized in subsequent years, FONAG focuses on the agricultural practices by rural populations. As such, the solution becomes to transform rural populations from threats and into conservation workers.

FONAG uses productive projects as a point of exchange to incentivize local communities to put their labor towards conservation. I, however, point out that the agreement is not a process devoid of social context. FONAG draws upon two crucial institutions to mobilize the collective labor of communities that manage páramo: the minga and FONAG's written contract agreement. The minga institution is embedded in local cultures as a delayed form of mutual reciprocal aid that calls upon shared labor

even if direct benefits go to a minority of a community. The contract agreements, which define the exchange in writing, tend to exemplify a set of neoliberal ideas by prioritizing revenue generating activities, compartmentalizing the landscape in the name of efficient use, and assuming isolated labor regimes.

The Quinchucajas case study, then, focuses on the context and process that surrounded the construction of a local community's agreement with FONAG regarding labor practices, which can be traced through examining the process of finalizing contracts. The case study demonstrates how communities are embedded in socio-ecological relationships that are largely invisible to FONAG. Committee Ñukanchik Urku challenged misrepresentation of labor and land use relationships to gain recognition of pre-existing collective institutions for ecosystem management. Rather than hegemonic neoliberal practice, my research shows contingency and co-production on a local scale.

The context of the practical labor of the Quinchucajas case study also bears importance. FONAG tracks contributions between FONAG and the community by assigning the labor of the community a monetary value that is then compared to FONAG's own monetary valuation of material contributions. The community of Quinchucajas however, does not maintain a formal accounting system for labor value. Rather, the community incorporates the project into its own minga labor system. The collective labor of the community would subsequently work on an irrigation system in a different part of the community funded by a different NGO for other beneficiaries. From a practical standpoint, community members of Quinchucajas widely perceived the

FONAG project as no different from any other development project that may be enacted in the community. Thus, there is a disjuncture on how FONAG's productive project is perceived between the rural community and practitioners of FONAG.

Very few studies address the on-the-ground process of PES interventions between downstream users and the ecosystem service providers that enact these projects (Francisco, Budds, and Boelens 2013). This chapter therefore adds to literature examining the application of PES by contextualizing communities and demonstrating that rural communities have their own agendas that can be achieved through negotiations with PES. Thus, this chapter advances theory by challenging the narrative of PES as a hegemonic neoliberal force. Not only can rural communities challenge neoliberal narratives, but they can also co-opt it serve their broader need for legitimacy and recognition.

CHAPTER VI

"IT IS LIKE PROVING THE EXISTENCE OF GOD": DETERMINING OUTCOMES OF PES

6.1 INTRODUCTION

This dissertation examines the construction of ecosystem services as a commodity in a watershed arrangement of Payments for Ecosystem Services (PES). This process includes attempts to create new territory by non-state market actors and transnational non-governmental organizations (NGOs), and is contingent upon mobilizing the labor of communities towards conservation and restoration practices at the site of targeted ecosystems. This process is interrogated through examining a water fund PES arrangement in Ecuador called *Fondo para la protección del agua* (FONAG) by following it from its urban-based institution and into the rural communities and ecosystems from which it generates value through four substantive chapters.

Chapter III focused upon the formation of alignments to create the conservation arrangement and the accompanying territorial processes, Chapter IV examined the labor of the intermediaries that connects rural communities to FONAG as they perform territorial boundaries and add value to the market mechanism. Chapter V elaborates on mobilization of collective labor from rural communities for conservation work. This final substantive chapter represents the last node of the fictitious commodity chain and examines how FONAG's intervention projects impact rural communities at the site of ecosystem service production (Figure 6.1).

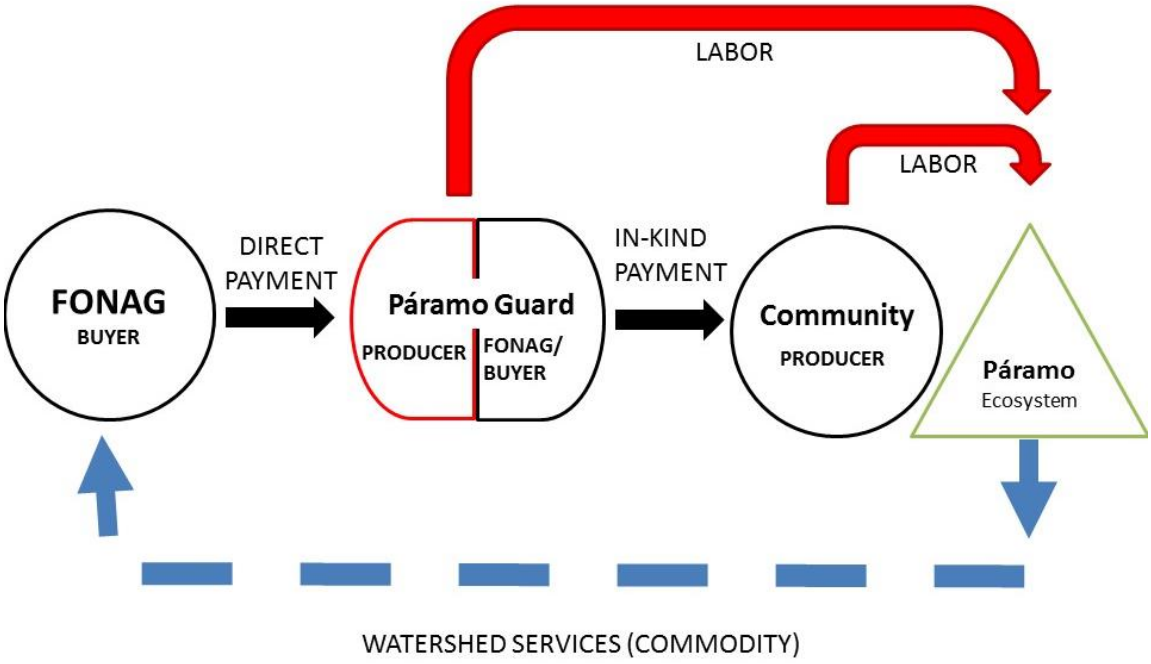

Figure 6.1 The ficticious commodity chain of ecosystem services production

I begin this chapter by discussing how PES interventions are typically assessed by land change outcomes, and how that relates to FONAG's assessment of its interventions. Then, I introduce my analysis framework for evaluating directionality of influence and relative outcome of intervention projects in three case study communities that FONAG has targeted for interventions. After describing the FONAG interventions within communities, I then examine the process and outcomes within each case study community. Finally, I discuss and summarize my contributions from this analysis. I point out that typical approaches to understanding outcomes tend to conflate action with influence.

6.2 ELUSIVE OUTCOMES OF PES

The objective of maintaining or improving the provision of an ecosystem service or bundle of services is a core justification for implementing PES projects. The typical goal of a PES arrangement, then, is to halt the conversion of ecosystems on the basis that intact ecosystems provide an array of services that maximize the benefit to society (De Groot, Wilson, and Boumans 2002; Costanza et al. 1997; Daily 1997). PES arrangements are built upon the premise that land change occurs because ecosystems are not properly economically valued. Environmentally benign land use activities, such as conservation, are typically conceptualized by PES scholars as offering fewer benefits to upstream land users than what could be generated from alternative uses. Keeping land covered in forest, for example, would typically offer less of a financial return than converting that land into pasture or a field for agriculture. Rational upstream land managers would then convert land to forward their individual interests, even though it comes at a cost to downstream ecosystem service users (Pagiola, Arcenas, and Platais 2005). PES offers a means for downstream users to halt upstream land conversion through offering economic compensation to upstream land managers for alternative land uses.

Studies broadly assert that many areas generating key ecosystem services are inhabited by impoverished people in developing countries (Pagiola, Zhang, and Colom 2009; Nelson and Chomitz 2007). Poverty alleviation, then, inserts itself into PES schemes in many developing countries throughout the world. Despite criticisms that PES regularly fails to live up to its purported benefits, PES is attractive to both

conservation and development practitioners because it theoretically offers a 'win-win' scenario that promises economic development with conservation (Muradian et al. 2013). Many PES projects consequently target changing the land use practices of the rural poor dependent upon agriculture (Gauvin et al. 2009).

Land cover and land use becomes a critical focus of PES programs from this starting point. A recent review of studies on PES outcomes found that 98% cited land use and vegetative cover conversion as a driver for PES program implementation (Hejnowicz et al. 2014). This trend is also evident in PES watershed programs in Latin America, in which a study found that 77% of PES watershed programs in the region including, but not limited to the water fund model, explicitly indicated concerns over land cover change (particularly deforestation) as a reason for their implementation (Martin-Ortega, Ojea, and Roux 2013). Land change frequently extends, then, into a proxy for the provision of ecosystem services in PES programs. Hejnowicz et al. (2014)'s study of PES assessments found that about 84% of PES program evaluations used land use change as a proxy for aspects of environmental services.

Measuring the outcomes of PES as land change, however, is complicated by presence of multiple drivers, including political-economic factors operating at national and global scales such as land-use legislation and market prices for agricultural and natural products (Sánchez-Azofeifa et al. 2007). Identifying PES outcomes is further complicated by the presence of multiple NGOs simultaneously implementing conservation and development projects that spatially target the same communities and ecosystems. Despite this ambiguity in evaluating environmental outcomes directly

related to PES schemes, land-change continues to be a standard focus for assessing the environmental impacts of ecosystem services projects (Daniels et al. 2010; Hejnowicz et al. 2014).

There are criticisms of land cover as being the primary focus of PES programs to indicate the successful provision of ecosystem services. However, the action of FONAG follows this broader trend that links purpose and success into land use practice. The United States Agency for International Development (USAID) evaluates the success of its environmental programs through hectares of conserved land and has directly shaped process of evaluation of FONAG's intervention projects as a major donor to FONAG. In 2007, FONAG and USAID made a US$940,000 agreement called "Protecting Water Sources to Conserve Biodiversity: Financial Mechanisms for Watershed Protection in Ecuador" (USAID 2007). The agreement was subsequently renewed in 2009 and continued through 2014, when USAID formally ended its 53-year relationship with Ecuador. USAID donated a total of US$3.6 million to FONAG and its daughter programs over the course of the agreement (USAID 2014a).

Part of the original agreement between USAID and FONAG included adapting FONAG's actions to fit USAID reporting metrics. An employee of FONAG described the process of adapting FONAG's actions to USAID's indicator metrics for outcomes:

> "What are the indicators of [US]AID? It is hectares effectively conserved, a number about an area. [FONAG] has advanced a methodology that has been accepted by USAID. So we have adapted, that is to say, if we are doing a monitoring program, if we are working with páramo guards, if we are doing productive projects, if we are making an environmental education program, if we are working with teachers, with children, we adapt [these activities] to transform

> them into a number of hectares effectively conserved or improved" (FONAG employee June 2012).

The quote demonstrates how FONAG's disparate activities are translated to USAID as hectares of effectively conserved land. Fully developed in 2010, the method for determining effectively conserved land is based upon a GIS analysis that ranks land area by accounting for non-transformed vegetation cover within the areas that FONAG has actively pursued projects of intervention (FONAG 2010a). This form of analysis reflects an assumption that the area of land that has been the focus of intervention has been effectively conserved. While this is useful to determine where FONAG has been working and what areas could be potential targets for FONAG interventions, it speaks very little to the improvement or maintenance of ecosystem services through the programs.

FONAG and its supporters have also used hectares of tree planting as a demonstration of its success. FONAG has directly caused tree planting in about 3,600 ha since the organization began in 2005 (Soto 2014). If unattached to the incentive of a development project, FONAG typically pays individuals directly for labor to plant trees at a rate of about $8/day in which a person can plant about 150 trees/day (Cannon, Hill, and McCarthy 2010). FONAG then erects a sign following the completion of a project at the site of the plantation indicating the community, the area of the plantation, the species, altitude and year(s) (Figure 6.2).

Figure 6.2 FONAG tree planting project sign (November 2013)

Nearly every report I found presented the number of trees or number of hectares that FONAG had planted as an indicator of success, despite the páramo's designation as primarily a grassland ecosystem. FONAG, with USAID funds, hired the United States Forestry Service as a consultant to evaluate their planting project in a community near Cotopaxi National Park during 2010. The evaluators indicated FONAG's plantations had been well established, but that "there is almost nothing known about how changes in land use activities might affect any of their respective water budgets" (Cannon, Hill, and McCarthy 2010).

The ambiguous outcomes of FONAG have been fuel for controversy. In the beginning in April 2012, FONAG underwent massive change in its management that was pushed forward by Quito's water company (EPMAPS), the largest contributing constituent member of FONAG. While there were several issues that contributed to the change in FONAG, one facet of the conflict was over identifying outcomes and the changes brought about by FONAG. Expressing frustration over the lack of evidence for on-the-ground outcomes of FONAG, the current environmental director of EPMAPS, Juan Carlos Romero, exclaimed,

> "It's like believing in God. You believe in God because you feel God, but it is easier to demonstrate that God does not exist than God does exist. Something like that happens with FONAG" (Romero 6/14/2012).

Romero likens proving the impacts of FONAG to proving the existence of God in this quote. The lack of evidence creates a gap in knowledge about the on-the-ground outcomes of FONAG and the water fund conservation arrangement in general, particularly as to what the program accomplishes in the communities that it targets through its conservation and productive alternatives interventions. The Nature Conservancy (TNC) attempted to address the issue of outcomes within communities within a study that was initiated in 2011. The study asked, "Does it benefit water quality, help protect the ecology of the watersheds, and provide benefits to the upstream communities to offset the costs of local land-management changes?" (TNC 2012c, 5). The report summarizes the response to this question as "probably," explaining that local

people perceived ecological and socioeconomic benefits, but TNC was unable to measure them (TNC 2012c, 5).

Working with the local communities proved to be especially difficult for TNC, which suffered from two related problems. Multiple conservation and development projects were underway in the study communities, which meant that participants had trouble isolating outcomes that could be attributed from only FONAG (TNC 2012c). Furthermore, residents were reluctant to participate in the study due to research fatigue from studies conducted from other organizations. In the end, the socio-economic impact study reported inconclusive results, although the report did note that it had acquired baseline data that could be applied towards future comparison (TNC 2012c).

6.3 FRAMEWORK FOR INVESTIGATING FONAG'S OUTCOMES

A major shortcoming of many studies of PES outcomes is that they fail to take into account for the multiple interactions occurring within a context of a community. Land use and land cover change literature is typically quick to point out that land use rarely boils down to a single variable (e.g. Geist and Lambin 2002). PES programs exist within a rich context that of multiple historical, political, economic and social influences. I investigated the local, on-the-ground outcomes within three case study communities in the case of FONAG. As discussed throughout this dissertation, there are two main components to FONAG exchange agreements within communities: productive projects that promote economic development and conservation projects that focus on maintaining or restoring páramo lands and require collective labor.

The rural communities in the case studies have been undergoing processes of development and change for decades. One community, Oyacachi, at one time had roughly 20 different development agencies working within the community (various interviews, 2012). These programs and the various other political, economic and social influences are layered onto a place, which then the PES program is added. The goal of PES programs is to cause action that will lead to an improvement in the delivery of ecosystem services. Because the understanding of the ecosystem and changes in land use is so poor, success is then equated with action in FONAG. Action itself is a complicated measurement.

Economists have criticized PES programs for a lack of attention to the concept of additionality, defined as the change that would occur as a result of the intervention from the PES arrangement (Pattanayak, Wunder, and Ferraro 2010; Goldman-Brenner et al. 2012; Engel, Pagiola, and Wunder 2008). In PES arrangements that target deforestation, this has been done in a variety of ways that usually involve remotely sensed land-cover change analyses. Sánchez-Azofeifa et al. (2007) tested to see if the involvement of PES programs as a variable is a significant predictor in deforestation through farm-level surveys, and others have employed statistical analyses comparing sites enrolled in PES. Morse et al. (2009) employs interviews to assess deforestation impacts, but studies in additionality typically skip questions of temporal context that would also speak to involvement in the projects. Studies are also lacking in the area investigating PES interventions that target land under communal management, which is FONAG's case.

FONAG determines success in terms of action, and therefore before asking questions of land change outcomes, I found it important to ask 'would this action have been done without the intervention of FONAG?' I have created a framework to answer this question, based on the data from the walking tours and key informant interviews. I suggest that the activities should be recognized as heavily influenced by context, and so I created three categories as attributed to the community action in relationship to FONAG conservation and development interventions: Causal, Enabled and Coincident. Table 6.1 defines these categories.

Term	**Definition**
Causal	Practice did not exist before arrival of FONAG. Was created, funded and done directly because of FONAG.
Enabled	Practice was conceived of by community, and FONAG provided the financial catalyst to mobilize practice.
Coincident	Practice was in the process of implementation by the community or already in implementation when FONAG arrived. FONAG funding not critical to implementation of activity.

Table 6.1 Categorical definitions of directionality for land use practice assessment

As discussed in Chapter V, FONAG typically frames its productive projects as 'alternatives' to livestock that will, in turn, help relieve pressure on the páramo. In contract agreements with communities, FONAG represents these projects as a means to offset costs of conservation practices. Therefore, I examine the productive projects both

in terms of economic benefit and as a mechanism to promote cattle removal from the páramo.

I use a relative scale of improvement adapted from Kusters et al. (2006) that ranks impacts as positive (+), negative (–) or neutral (0) to evaluate these outcomes. Kusters et al. (2006) examines the outcomes of PES projects as impacts on various forms of capital. However, I have simplified this approach to examine the relative financial impact. The questions from my interviews and walking tours with community members were open ended, but can be assessed in terms of proxies for relative economic benefit. I reviewed interviews to answer three questions: is the member still involved in the project activity? Does participant have positive things to say about the project? Does participant sell project products? Using data from the walking tour or key informant interviews from each location, I then ascertain the relative economic outcome of FONAG's productive project(s). A summary of the categorical definitions are represented in Table 6.2.

Relative Impact	**Definition**
+	At a minimum, some people benefited and there were no reports of financial harm to others involved in the project.
-	At a minimum, some people perceived financial harm and there were no indications of positive impacts in the interviews.
0	Participants did not perceive financial harm, but that did not find the financial benefit large enough to merit continued participation.

Table 6.2 Categorical definitions of relative impact of FONAG's productive projects

A (+) rating means that, at a minimum, some people benefited and there were no reports of financial harm to others involved in the project. A (-) rating means that, at a minimum, some people perceived financial harm and there were no indications of positive impacts in the interviews. A (0) rating signifies that no harm was perceived, but that participants did not find the financial benefit large enough to merit continued participation. I limited the relative impact analysis to the direct beneficiaries of the projects, the member of the subgroups that worked directly with FONAG, because it would be expected that they would be most likely to recognize a form of impact. The tables list the proxy questions, the number of affirmative interpretations for each proxy question, and the overall relative impact category.

In the following section, I analyze FONAG interventions in each of the three case study communities. I first describe the context of FONAG's presence and the process of initiating conservation and development agreements with rural communities. Then, I examine FONAG's conservation and development actions within each individual case study community. I interrogate FONAG's actions to determine if they were directly causal of activity within the communities for the conservation component of FONAG's interventions and assess the relative impact of the development projects.

6.4 ASSESSMENT OF THREE COMMUNITIES

The following section is focused upon the understanding the outcomes and experiences of three communities, Paquiestancia, Cariacu and Oyacachi with FONAG interventions. I draw upon multiple case studies to demonstrate the diversity in

experiences that exist between communities. I collected most of the data in 2012, but made subsequent visits back to all three communities in 2013 and 2014 to verify and clarify the initial findings. Table 6.3 provides a brief summary of the characteristics evaluation and evaluation of the community projects that I examine in this chapter.

Community	Paquiestancia	Cariacu	Oyacachi
Households (N)	206	288	130
Subgroup[15] (N)	23, 23	16	18
Interviews/walking tours (N)	5	8	6
Productive Project	(A) Gardens (B) Guinea Pigs (C) Pasture Improvement	Tourism	Guinea Pigs
Conservation Project	(1) Livestock Removal; (2) Vegetation planting; (3) Anti-litter campaign	Livestock Removal	Livestock Removal
Year Initiated	2007	2011	2009
Conservation Influence Type	(1) Coincident; (2) Causal; (3) Enabled/Causal	Coincident	Coincident
Productive Project Relative Impact	(A) + (B) + (C) 0	0	-

Table 6.3 Evaluation and characteristics summary of case study communities (FONAG 2008b, 2011c, 2009b, 2011d)

[15] Subgroup refers to the subset of community members that were directly involved in the agreement with FONAG. Paquiestancia has two numbers because it made two project agreements.

I examined each of the communities that hosted a FONAG intervention that included a productive project agreement for this analysis. As Chapter V discusses in-depth, FONAG requires communities to agree to conservation practices in order to receive productive projects, and thus they are an exchange mechanism between communities and FONAG. The entire community must agree to support the contract, a process that is done in a community-wide assembly meeting and requires the signature of the president of the community.

There is always a subgroup within a community that takes management responsibility for the project and directly receives the benefits of FONAG's productive project. In each case, the members of this subgroup are self-selected by their interest in the project. The members of this subgroup typically represent a small proportion of the overall number of households within a given community, representing less than 15% of the total number of households in each given community. This is typical of FONAG productive projects, as outlined section 2.

In Paquiestancia and Oyacachi, FONAG's productive projects focused on setting up members of the subgroup to raise guinea pigs. In Cariacu, FONAG supported the construction of infrastructure for an ecotourism project. Paquiestancia had three project phases, also included the support of organic gardens. In each of the agreements, FONAG focused on the removal of cattle from the communal páramo. Additionally, Paquiestancia involved another conservation agreement involving planting native plants in the páramo.

While I made various site visits to other communities FONAG had implemented productive projects in previous years, including Chumillos, Muertepungo, La Chimba, a group of small communities near the town of Cangahua called Nurukta. I focus upon Paquiestancia, Oyacachi and Cariacu because I have data from sources from these communities. I elaborate upon the methods of case study site selection in Chapter 2. This includes a copy of FONAG's productive project contract agreement document with the community, at least one interview with the president of the community from the time that the FONAG project was initiated, at least five interviews with members of the organization directly working with FONAG for the project, at least three interviews with people from the same community outside of the main group that works with FONAG, at least one interview with the páramo guard in charge of the productive project for the community, and at least one walking tour of the physical spaces in which FONAG has intervened for each community.

6.4.1 Paquiestancia

FONAG began working in Paquiestancia in 2007, and the community was among the first in which FONAG enacted interventions (Field Notes 2012). FONAG targeted Paquiestancia because of its proximity to the Cayambe-Coca National Park, a protected area that constitutes the eastern border of the community (páramo guard 10/10/12). This border area primarily consists of páramo lands collectively held by Paquiestancia (FONAG 2011c). As such, the Ministry of the Environment (MAE) targets the region for conservation and employs a community park guard to work in

Paquiestancia. This position originated from The Nature Conservancy (TNC) and USAID's SUBIR program discussed Chapter 3. Paquiestancia's community park guard, therefore, began working with FONAG to develop and implement FONAG's interventions within the community. The projects in Paquiestancia were subsequently used as a model communities in the region, and FONAG brought subgroups from other communities to view Paquiestancia's productive projects as an example (various interviews, 2012).

The final report of USAID's projects in Ecuador specifically names Paquiestancia as an example of a success story. The report asserts that Paquiestancia removed cattle from the páramo within the buffer zones of the Cayambe-Coca National Park in conjunction with FONAG productive projects and environmental education workshops, stating that the project benefited 115 people and the interventions resulted in increased water protection and improved livelihoods for the community (USAID 2014b). Yet, this assessment of FONAG's work within Paquiestancia only scratches the surface of the outcomes of FONAG's interaction with the community. As a case study community, I discovered that the interaction between FONAG and the community is much more complex than this description implies.

Flor Andina[16] is the sub-group of the community that worked with FONAG for the projects. The group organized itself as much as 20 years prior to FONAG's arrival in the community (KIP4 10/23/2012). The group is composed mainly of women and is

[16] The term means Andean Flower. It is a name was chosen by the group and refers to the rose industry, for which the Cayambe region is well-known.

referred to by both key actors and FONAG as a "women's organization," although key actors indicated that the group was not gender exclusive and had three male members, including a male president, during interviews in 2012. The group became connected to the community park guard in 2007 because his wife was the acting president of the organization during that period (various interviews, 2012). Before approaching the community assembly about working within the community, FONAG connected directly to the subgroup to develop the set of interventions for the community involving projects of productive alternatives and conservation. These projects were decided by a vote within the subgroup itself, and then later brought to the community assembly for approval (various interviews, 2012). Per the policy of FONAG, the contracts required the signature of the president of the community as a representation of community support for FONAG's interventions. However, this agreement between the subgroup and community became a source of tension and conflict between the community and Flor Andina. FONAG was never officially accepted by the community.

Flor Andina was able to operate and accept projects, but almost exclusively through accepting the entire conservation responsibility of the projects, with which FONAG intended to be shared with the greater community. While FONAG was able to mobilize the subgroup, its ability to mobilize the larger community was extremely limited, and even resented by the rest of the community. In the next subsections, I will summarize these efforts.

6.4.1.1 Productive Alternatives in Paquiestancia

FONAG implemented three phases of interventions within Paquiestancia between 2007 and 2011 called the *Vida Andina*[17] project. The productive projects of Vida Andina included a small animal husbandry project focused on guinea pigs, a project for household gardens, and a pasture improvement project (FONAG 2011c). According to Paquiestancia's contracts, the purpose of the productive alternatives were to give an economic benefit that would reduce the pressure on the community páramo (FONAG 2008b, 2011c).

The guinea pig project and the home garden project were combined into one phase in Paquiestancia. Locally known as *cuyes*, guinea pigs are a common domesticated animal used as a food source throughout the Andes region. FONAG paid for the materials to build outbuildings for guinea pigs, including cement, wire, plastics, nails, cinder blocks as well as the guinea pigs themselves. The guinea pig project included 20 women and 3 men that were direct beneficiaries of the project (FONAG 2008b). FONAG provided each member of Flor Andina with 11 guinea pigs, including 10 females and 1 male (various interviews, 2012), with the intention that they would begin selling the guinea pigs within 7 months (FONAG 2008b). For the household gardens, FONAG provided funding to Flor Andina to purchase the materials, such as wire, as well as vegetable seeds for the gardens including cabbage, lettuce, cauliflower,

[17] Meaning Andean Life and a reference that FONAG and Flor Andina chose in reference to the (KIP4 10/23/2012).

beets, carrots, chard, celery, and radishes (FONAG 2008b). The range in areas of the home gardens ran from .2 ha to .5 ha (Field Notes, 2012).

Beneficiaries were responsible for providing the labor to construct the outbuildings for the guinea pigs, as well as building the pens to house the animals (Figures 6.3 and 6.4). Four of the five beneficiaries of the program that I interviewed indicated that they had personally paid someone to do this work for them, rather than doing it themselves or soliciting the help of neighbors (Field Notes, 2012). This suggests that the broader community did not perceive benefit from the project. FONAG awarded the project US$5,000 for materials, and FONAG estimated the cost to the community to be $9,600.00 (FONAG 2008b). This estimate included the labor costs for the productive projects, the conservation project, and the environmental education workshops (FONAG 2008b).

The purpose of the pasture improvement project was to create better pastures at lower elevations that would, in turn, improve the production of milk from dairy cattle to positively affect the household economy, as well as to provide food for guinea pigs (various interviews, 2012). The total cost of the project was $7,000, with about $5000 going directly to each of the 36 individuals to plant 0.5 ha (FONAG 2011c). Each participant was individually responsible for planting their pastures (various interviews 2012).

Figure 6.3 Guinea pig outbuilding constructed from FONAG funds adjacent to a home garden (October 2012)

Figure 6.4 Guinea pigs and pens in outbuilding constructed through FONAG (October 2012)

FONAG undertook productive projects in Paquiestancia that Flor Andina requested. FONAG uses them as a mechanism for mobilization to target the conservation activities within a community. I classify the productive projects under the category of 'enabled' through my evaluation framework because the members of the group already wanted the project but did not have the resources to pursue without FONAG's intervention. However, it is important to note that two of the interviews indicated that they would have still planted gardens and raised guinea pigs without the assistance of FONAG. The advantage to funding from FONAG was that they did not have to make purchases on credit with other institutions. As one stated, "Before, we would indebt ourselves to purchase wire to make the fence for the gardens… we had gardens before [FONAG], and this was debt" (KIP2 10/23/12).

Overall, the members of Flor Andina seemed to have a relatively positive benefit from the guinea pig and vegetable garden projects.

Subgroup Activity (N=5)	**Sustained Involvement**	**Positive perception**	**Consistent Market involvement**	**Impact**
Vegetable Gardens	5	5	2	+
Guinea Pigs	4	5	1	+
Improved Pastures	1	1	N/A	0

Table 6.4 Summary of FONAG's economic impact in Paquiestancia

All members of the subgroup I interviewed were still involved in the project, and a two of them sold produce fairly regularly at the weekly Wednesday market in

Cayambe. While many of the participants still had guinea pigs, they primarily consumed them in the household. Only one participant claimed to regularly sell guinea pigs. Other participants claimed that they would sell them only on occasion. The pasture improvement project was a bit flawed in that it appeared that several of the households with pasture could not sustain the grasses. Reasons included bad seed and poor knowledge of pasture management. Most agreed that that the pasture management project was not largely successful.

One of the most striking outcomes of FONAG's efforts in Paquiestancia was how it seemed to create conflict in the community with the subgroup. Every participant involved in FONAG brought up conflict when they began describing the projects. Much of this conflict stemmed from the benefits that members of Flor Andina received for an agreement that was supposed to be with the entire community. When the guinea pig project was brought to a vote in the general assembly, the vast majority of the community members would not vote for it, and therefore the president did not approve of it (various interviews, 2012). This happened multiple times through three different presidents of the community, as the presidents only serve a 2 year term (KIP9 11/22/12). When Flor Andina proposed to do the project work themselves, the community agreed to let them go ahead and do it.

Another point of contention related to the alternative productive projects was over Flor Andina's the attempt to build their own market. Paquiestancia has a weekly market in which the entire community is welcome to sell their produce. Backed by FONAG, Flor Andina attempted to create a market that was exclusively for the group to

sell their products, causing resentment within the community. Eventually, another organization, CEDAL, intervened and eventually the community resolved that Flor Andina would sell their products at the same market event as the rest of the community (KIP9 10/27/2012).

6.4.1.2 Conservation Projects in Paquiestancia

The conservation component of FONAG's projects in Paquiestancia included environmental education workshops as well as labor activities within the community and the community páramo. These projects included an anti-litter campaign, planting native vegetation in the páramo, removing livestock from the páramo, and feeding Andean condors (FONAG 2011c, 2008b). I do not have any interview data on the Andean condor feeding project, so I omit this from my assessment in Paquiestancia. The expectation of these projects is that the entire community would offer support of them. In the budgets, for example, show the costs divided between FONAG and the community, rather than FONAG and the Flor Andina group (FONAG 2008b).

Flor Andina hosted conservation workshops on fires, livestock in the páramos, and water protection, as well as the labor costs of preparing the gardens (FONAG 2008b, 2011c). These workshops were open to the entire community, and key informants estimated that the attendance was typically around 20-30 individuals and most in attendance were members of Flor Andina (various interviews, 2012).

One of the first conservation projects in Paquiestancia was to clean up the garbage in the village. According to various interviews, trash was a major issue both

along the streets within the community as well as within a collectively owned forest on the edge of the community. One community member explained that Flor Andina had come to the community assembly requesting a community minga to clean up litter and a fine for dumping garbage in the village, including the forest. Flor Andina also requested to place four signs in the community, purchased through FONAG's funding, stating that the community would issue a US$100 fine to any person found dumping garbage in the community (Figure 6.5).

Figure 6.5 Sign in Paquiestancia: "Littering Prohibited, Surveilled Zone, $100 fine by the community" (November 2013)

The signs all identified with FONAG and Flor Andina written on them. In Figure 6.5, for example, FONAG is painted on the sign in green, and a pink flower bears the

initials FA, for Flor Andina, in the center. These signs were placed along the main routes within the community. However, the $100 fine is never actually enforced. Instead, it is used as a visual reminder and threat to curb infractions (various interviews, 2012). Although all of the interviewees report the litter problem as being improved, there are still infractions within the community. One of the interviewees complained about the youth of the community, claiming they would regularly "throw [trash] on the ground, and we have to go get it to keep the community clean" (KIP4 10/23/2012).

Contrasting the garbage project, the native tree planting conservation project in the collectively held páramo invoked major contention within the community. The páramo itself cover an area of about 800 ha, and FONAG requested that an area on the road leading into the páramo be planted with native plants. When representatives of Flor Andina brought this to the community assembly, the request as firmly rejected by the community (KIP9 11/11/2012). The president of the community indicated that it was an issue of labor that would go into planting the 10,000 plants that FONAG requested to be placed in the páramo at the time of the request. Describing the work, she stated, "The truth is that this is very hard, to even plant 50 plants (KIP9 11/11/12). Furthermore, there had been a previously unsuccessful attempt to plant within the same area. Community members of Paquiestancia had done páramo vegetation planting in that area through the *Consejo Provincial*[18] a few years prior to FONAG's proposal. The entire region is geologically active, and a landslide occurred within months after planting that area and

[18] Provincial Board, a state institution.

the plantings were lost (KIP9 11/11/12). Flor Andina, then, undertook the FONAG planting effort over a period of two days without a compulsory community minga approved by the assembly (various interviews, 2012).

Livestock removal from the community páramo was another conservation condition of agreement with Flor Andina. FONAG indicated that the community had reduced grazing by 60% as a result of FONAG's projects (FONAG 2008a). However, the interpretation of this result is more complicated than how it was represented. Two of the interviewees indicated that the process of cattle removal from Paquiestancia had been ongoing for a number of years prior to FONAG's involvement. Specifically, livestock removal in Paquiestancia's páramo had been ongoing since at least 2001, when the community began working on an ecotourism project that focused on a horseback tour of the páramo to view condors. The cattle removal project was also supported by the community as a larger regional movement dating back to at least the 1990s to improve water quality and quantity in among rural communities. The community periodically organized to round up ownerless cattle, and therefore few cattle remained in the páramos when FONAG proposed the project. Flor Andina's proposal, then, was to remove horses from the páramo. Because it fit with the ongoing practices of the community, the community agreed and held a minga to round up horses. The community returned the horses to their owners if they could be identified, and sold the others.

FONAG assumes that the environmental actions are caused by its intervention. Only one of the three projects, however, could be considered to be directly caused from FONAG's actions: the páramo vegetation planting. As demonstrated by the lack of

interest in the project in the assembly, the community did not support putting their collective labor towards this conservation project after previous complications with planting that area with another program. As a result, Flor Andina planted the area themselves.

The other two projects, however, were supported by the community. Based on interviews with both members of Flor Andina as well as other community members, I categorized the livestock removal as coincident because it had been ongoing in Paquiestancia and would likely have continued with or without the funds from FONAG. The anti-litter campaign was conceived as an issue in the community assembly, but the FONAG seemed to be a catalyst for Flor Andina to address the issue. Therefore, I categorized it as enabled because it key informant interviews indicated that the community was aware of the litter problem before FONAG and Flor Andina, and therefore may have addressed the issue without outside intervention, but it didn't seem like it had been planned beforehand. Table 6.5 is summarizes my categorization of conservation actions within Paquiestancia.

Intervention	**Influence**
Livestock Removal from Páramo	Coincident
Anti-garbage campaign	Enabled
Páramo vegetation planting	Causal

Table 6.5 Categorization of FONAG's conservation action in Paquiestancia

On the question of land use there did not seem to be indication that FONAG's interventions caused changes. While the vegetation planting was causal, it occurred in a collectively owned area of páramo in which the community did not permit grazing or agricultural uses. The anti-garbage campaign, while perceived as a beneficial practice to the community, did not change land uses.

An unexpected outcome of the environmental projects was discussed by one community not involved in Flor Andina. She expressed extreme distrust in the motives of FONAG, which emerged after attending a FONAG workshops on water protection. Within the workshop, FONAG emphasized the benefits of their actions to the city of Quito. According to the key informant, others in the community shared this distrust, and it also contributed to a rejection of FONAG projects by the community Executive Board. One community member described the her viewpoint,

> "Look, right now we are going to go caring for [and] protecting the páramo, and later what's going to happen? [FONAG is] going to say, 'Look, we invested US$10,000, and now you have to give us your water.' What is going to happen then? How are we going to defend ourselves when this happens?" (KIP6 10/12/12).

The above quote alludes that one of the outcomes of the format of the project could also be distrust, an element that would make a similar project much more difficult to enact in the future.

6.4.2 Cariacu

FONAG's involvement with Cariacu began in 2011. Unlike Paquiestancia, however, this project had the support of the community assembly. Cariacu is located about 6 km north of Paquiestancia, and shares similar socio-economic characteristics with the other communities in the region. Like Paquiestancia, FONAG targeted Cariacu because part of their community contains páramos that border Cayambe-Coca National Park. Likewise, Cariacu had a community park guard from the prior SUBIR program that worked for MAE and played a significant role in the project. After attending workshops help by FONAG, the community park guard of Cariacu connected the group within Cariacu to FONAG because of the group's interest in conservation. The guard then facilitated discussion with the group of different productive project options (KIPG4 2012).

The group identifies itself as targeted towards *jovenes*, or young men, but there are also four female members of the group (Various Interviews, 2012). One reason for initiating the project was the potential to address the lack of economic opportunities for the youth of the community and deter them from leaving the community to find work elsewhere (FONAG 2011d). The group also viewed the ecotourism project as having the potential to benefit the broader community, as demonstrated in the quote below.

> "The boys decided that they liked [the ecotourism project] the best because… the income it generates is for them, but it is also communal. Stores can be benefitted, for example. If it is a group, only 20 people of the project [working] in guinea pigs, only those 20 people are going to benefit. If it is tourism, however, [the project is] a little bit bigger and benefits the entire community" (KICPG4 2012).

After gaining support from the tourism group, the community park guard proposed the project to FONAG, and FONAG subsequently agreed to fund it. The project was then quickly approved within the community's assembly in Cariacu. The community accepted the project mainly because of the possible benefits to local businesses including restaurants and stores (KIC2, 11/17/2012).

6.4.2.1 Productive Alternatives in Cariacu

FONAG's contract with Cariacu was officially titled, 'The waterfall route Pakchapi Pakari' and its official objective is to "manage and care for the community páramos for their best use through a sustainable activity like community ecotourism" (FONAG 2011d, 2). Per the strategy of FONAG, the subgroup within the community had thought about the productive project prior to FONAG's arrival and wanted to implement. In this case, then FONAG's funding enabled the group to pursue the ecotourism project.

FONAG funded the materials for the infrastructure to create a touristic trail through Andean forest that would provide access to two waterfalls out of Cariacu's system of 11 waterfalls (FONAG 2011d). The waterfalls exist within a forest dominated by native *polylepis* species, known locally as yagual trees. The terrain is steep, and the dense vegetation make it difficult to navigate (Field Notes 11/17/2012). The area is located on the far southern edge of the community, about 5 km from its center and 2 km down the main road that public buses traverse.

The contract listed the total cost of the project at US$13,190.00, of which FONAG invested a total of $US8,700 (FONAG 2011d). This sum included the material and estimated labor costs for building and placing signs, a picnic table shelter, wooden railing and steps on the path, a shelter with a bathroom at the entrance of the trail system and a footbridge that crossed one of the streams. The process of constructing was very labor intensive, with the work lasted for six months. Members of the group were obligated to work in minga every weekend. The broader community also contributed labor to the project in minga, as it was expected to benefit the larger community both directly and indirectly (Field Notes 2012, KIC6 11/10/2013).

Figure 6.6 A portion of the waterfall trail through the Andean forest (November 2012)

To build the path on the terrain, the work included manually removing trees and vegetation and moving earth to create a somewhat even surface for walking. They built railings and stairs where the terrain sloped (Figure 6.6). The group also created wooden signs with water conservation slogans and placed them at various places along the trail (Figures 6.7, 6.8, 6.9). A flash flood had washed the footbridge away in by the time I conducted the walking tour in 2012. This was distressing to the participants on the walking tour, as a large proportion of the financial investment of FONAG had gone to finance the bridge. The tourism group signed another agreement with FONAG in February 2012, but FONAG restructured soon after the agreement was signed. FONAG deemed Cariacu as outside of its target area after restructuring, and consequently did not uphold its agreement with the community (Various Interviews, 2012).

Figure 6.7 FONAG sign at the trailhead reading: “Only nature does great work without expecting some reward; Respect Nature” (November 2012)

Figure 6.8 Sign indicating Kuchikama Waterfall reading: “Nobody can drink water from a mirage, Do not waste water, FONAG USAID” (November 2012)

Figure 6.9 Sign on waterfall trail stating: “Neither rewards nor punishments exist in nature, just consequences. Do not waste water. All of us need it. - FONAG” (November 2012)

In 2012, the charge for a tour of the paths was $1/nationals and $5/foreigners. The tours were organized by the president of the tourism group (Field Notes, 2012). The members of the group took turns by order of a list, working in pairs typically on the weekends. One person would watch the entrance, and the other would take the visitors on the tour. The tour was intended to last for an approximate time of 1.5 hours and included the trails, two or three waterfalls, and the forest. The tourism group agreed to share revenue with the larger community at 15%, to be paid to the community's treasurer (Field Notes, 2012). One interviewee estimated that there were roughly 100 visitors per month, but the number was inconsistent because people tended to arrive during holidays (KIC3 11/17/12).

Over various site visits to Cariacu's ecotourism project in 2012, 2013, and 2014, I determined that the ecotourism project was not generating much economic activity. During the walking tour in 2012, I asked about the amount of revenue that was generated from the project, and if the project was creating employment for the group members. I was told that any revenue from the project was invested back into the project, so that there was no profit. Consequently, various members of the tourism group saw it as having no immediate impact on employment (various interviews 2012). The following year when I returned to Cariacu on a Saturday, I could not find anyone from the tourism group, and the gated entrance to the trails was left ajar. When I went into the community to learn more about the situation, a community member told me that the tourism group had been in conflict with the larger community over the profits, and that the tourism

project had been abandoned. In a return visit in 2014, I was told that the tourism group typically only organized for school groups.

While the potential still exists for economic benefits of the project, overall there appears to have been no positive economic impact for either the subgroup working with FONAG, or the greater community itself via the involvement in the project.

Subgroup Activity (N=8)	**Sustained Involvement**	**Economic Impact Perception**	**Consistent Market involvement**	**Impact**
Tourism	0	0	0	0

Table 6.6 Summary of FONAG's economic impact in Cariacu

The land occupied for this project was in a collectively-held forested area on the skirts of the communal páramo. Because of the streams running from this area that provided for the water needs of the community, grazing and agriculture was prohibited in this space before arrival of FONAG. While the forested area was transformed into an area of production via ecotourism, it did not significantly re-arrange land uses within the community.

6.4.2.2 Conservation Projects in Cariacu

Like Paquiestancia, Cariacu agreed to host environmental education workshops on fires, water protection, and páramo management. Typically, around 30 people attended these events (KIC3 11/17/2012). FONAG also required Cariacu to remove

livestock from the páramo. The community Executive Board approved the agreement without conflict (various interviews 2012).

Examining the conservation action, the people of Cariacu claimed to have a strong conservation ethic before FONAG arrived. According the páramo guard for the project,

> "One of the reasons that FONAG chose to work in Cariacu is because Cariacu has always conserved its páramo. When there have been fires, for example, the people collaborate to put them out. When [FONAG] came to look, they saw that [the community] almost never burns [the páramo]. In this site we do not burn, it would be bad luck, right? That's the first thing FONAG does, is to see if [the community] is in agreement with what FONAG suggests: to conserve to care for, and to make good use of natural resources. These are the conditions that FONAG has always set out. This isn't just in one páramo, it is in all of the páramos. In all of the páramos this is the case for FONAG to be able to work in conservation" (páramo guard 11/12/2012).

The páramo guard pointed towards the prior existence of an intact ecosystem to make a case that Cariacu had been practicing good land management prior to FONAG's arrival. Specifically regarding the removal of livestock from the páramo, it appeared the Cariacu had been in the process of removing cattle before FONAG arrived. When FONAG arrived, about 120 cattle were in the páramo, described by the páramo guard as "not many" (páramo guard, 11/12/2012). The community did a minga to remove the cattle. Specifically they targeted the old ones and left about 40 or 50 of the younger ones to grow larger (páramo guard, 11/12/2012).

> "…what happened is that there, in the páramo of ours, the people realized that they cannot have a lot of livestock in the páramo. On top of that, the other communities are the same in that they are also are regulating the load [of

> animals]. From here there will come a time when there are no animals in the páramo" (páramo guard, 11/12/2012).

Various interviews indicated that part of the reason for removing cattle, in addition to maintaining the flow of irrigation water that comes from the páramo, is that the cattle in the páramo are not very lucrative. Instead, most families in Cariacu tend to make income on dairy cattle, which are not adapted to the harsh climates of the páramo and need daily attention. As a consequence, the dairy cattle are kept at much lower elevations and within walking distance of the household (various interviews, 2012). As one community member commented, "Here, we live off of milk, and that's about it" (KIC4, 11/12/2012).

The process of cattle removal in Cariacu was ongoing, and there is little economic incentive to maintain cattle in that area. Therefore, I have determined that the livestock removal from Cariacu's páramo was likely coincident (Table 6.7), meaning that community would have likely done it without FONAG's intervention.

Intervention	**Influence**
Livestock Removal from Páramo	Coincident

Table 6.7 Categorization of FONAG's conservation action in Cariacu

6.4.3 Oyacachi

Instead of bordering the Cayambe-Coca National Park like Paquiestancia and Cariacu, Oyacachi is located directly within the park. Furthermore, Oyacachi's territory

includes the Salvafacha reservoir and dam, meaning that much of the water for the city of Quito comes from Oyacachi's territory. The total territory of Oyacachi is 62,630ha, with about 20,000 ha classified as páramo (FONAG 2009b). According to interviews, most of the 120 families in Oyacachi have dairy cattle, and many people also earn income from involvement in tourism or handicrafts (various interviews, 2012).

The process for choosing a project in Oyacachi began with the páramo guard. At the time, the páramo guard did a survey of community members to find a project that people wanted (páramo guard 11/22/2012). When several people indicated interest in a guinea pig project, he approached FONAG to see if they would be open to funding it. Then, the páramo guard brought the project to the community assembly for a vote and it was approved. The páramo guard indicated that this was the typical process that followed through for each FONAG project, and that each time more people in the community wanted to participate in FONAG's projects (páramo guard, 11/22/2012).

6.4.3.1 Productive Alternatives in Oyacachi

FONAG has implemented several productive projects in Oyacachi. Frequently, these projects have been in conjunction with other organizations working within the community. For example, FONAG contributed to a project in the community that involved organizing a group of artisans and financially contributing to the construction of a building to sell the crafts of community members (páramo guard, 11/25/2012). This building bears a white plaque with FONAG's logo, along with the logos of three other supporting entities, including Ecuador's Ministry of Environment, a development

organization called Samiri, and a small grants program operating through the United Nations Development Program (Figure 6.10).

Figure 6.10 Shop selling wooden handicrafts in Oyacachi (November 2012)

Another project that FONAG jointly implemented involved a project focused on genetically improving dairy cattle and improving pasture management (páramo guard, 11/25/2012). While I took notes on all of FONAG's projects, I focused my research upon the guinea pig project FONAG implemented in 2009 because I obtained a copy of the productive project contract agreement and because FONAG was the sole source of funding for the project.

The official objective of the guinea pig project in Oycacachi was "to optimize the adequate use of natural resources, such as flora, fauna and water, inside of the páramo of

Oyacachi with sustainable, environmentally healthy production of small animals" (FONAG 2009b, 1). The contract indicated that 16 community members were involved in the project, and that total amount of the award from FONAG to Oyacachi was $5,000. About 20% of this funding from FONAG was budgeted for workshop or meeting expenses including a tour of Flor Andina's project in Paquiestancia. FONAG allocated the rest towards funding materials including plastic, nails, and wiring to make guinea pig pens. The rest of the cost of construction was the responsibility of the member of the group. For example, the members of the subgroup in Oyacachi harvested the wood to construct the pens from the forest. They then accomplished built the pens themselves and with the help of relatives or friends (various interviews, 2012).

The guinea pig project itself fell short of the expectation of generating much household income. Nobody I interviewed was actively selling guinea pigs. A major hope among participants of the project was that they could sell them to tourists, but tourists ate very few. Many people bring their lunch to the hot springs, and the tourists that purchase food items tend to prefer items such as trout over guinea pigs (KIO3 11/19/12). Furthermore, the transportation costs were deemed too high by community members to pursue selling the guinea pigs in other villages (various interviews 2012).

Within the interviews, several people indicated that they wanted more funding from FONAG. They were dissatisfied with the amount of funding of the previous projects, claiming it wasn't enough to make a significant impact in the community. One community member commented,

> "It's a shame that the projects have been done with, how should I say, not a large amount of capital. Just small things. In other words, a benefit has not been achieved throughout the community" (KIO6 11/19/2012).

Expressing a similar sentiment another participant of the guinea pig project stated,

> "Yes, yes, they gave us [financial] support, but it was very small support and therefore the results [of FONAG] didn't meet the expectation of the community. This year we were hoping to get maybe $15,000, because in [FONAG] has always supported us with [amounts of] $5,000, $7,000, $10,000 every year. Because we are 700 inhabitants, that is almost nothing" (KIO2 11/19/2012).

These two quotes indicate that beneficiaries of FONAG considered FONAG's funding to be beneficial, but not far-reaching. While reviews like the ones above do not convey complete satisfaction with FONAG, a key point is that the people interviewed were open to FONAG working again in the community. This was significant because of the current situation in Oyacachi in which the community decided to avoid working with NGOs for a while.

At one point, as many as 20 different organizations had worked in Oyacachi (Escandón 10/152012). When I did the interviews in 2012, I was informed by the former páramo guard that there were no NGOs working in Oyacachi at the moment. The reason he gave was that people were tired of training workshops and wanted to see material outcomes.

> "About the rest of the NGO's that we've had here, they've come saying that they are going to do projects, so they have trained a lot of people, but the people [of the community] only have been in workshops, workshops, workshops…the people wanted results from the projects, that big projects arrive and [the NGOs] implement these, but that never happened. So the community thought that [the

> NGOs] are just capturing the money, and just they are taking the money, and nothing stays with us. So now NGOs are prohibited" (KIO2 11/19/2012).

Furthermore, interviews revealed that some residents of Oyacachi may be conflating the work of FONAG and EPMAPS. One person claimed that FONAG owed the community projects on behalf of the interventions of EPMAPS within the territory of Oyacachi.

> "It was since Quito's Water Company started doing work here in the territory. The community, complained through its legal representative that [EPMAPS] should do remediation and that they should pay for the environmental impacts to the community. And OK, after so many negotiations and meetings, they firmed up something, and as FONAG is part of the fund for the protection of water, it is EPMAPS that gave FONAG the responsibility for doing projects. So it is from there FONAG has been doing things with the community" (KI07 11/22/2012).

Rather than simply wanting more projects, this resident that provided the quote claimed that the water company owed them more projects. He also complained that the páramo guard position was presently vacant in Oyacachi, meaning that there was nobody to facilitate funding for the community at that time. While EPMAPS is a constituent member of FONAG, I did not find any further evidence to support the claim that FONAG was officially a part of EPMAPS' agreement with Oyacachi. However, this claim also demonstrates some confusion among community members about the purpose of FONAG.

On the whole, the people of Oyacachi wanted more projects. The economic impact of the project fell short of expectations, since the commercialization aspect of the guinea pigs failed. However, a few of the residents continued with the project for

household consumption. Therefore, I ranked the relative impact as positive, although likely a mild positive.

Subgroup Activity (N=6)	Sustained Involvement	Economic Impact Perception	Consistent Market involvement	Impact
Guinea Pigs	3	0	0	+

Table 6.8 Summary of FONAG's economic impact in Oyacachi

6.4.3.2 Conservation Projects in Oyacachi

The reduction of livestock has been the major conservation component associated all of FONAG's productive projects. Reducing ranching activities in the páramo is a specific objective of Oyacachi's guinea pig project contract, along with designating a community park guard to work with FONAG from Oyacachi (FONAG 2009b). While several interviewees claimed that FONAG's productive projects were beneficial, none of them claimed that they had helped with reducing the number of animals in the páramo. For example, when I asked a community member if FONAG's projects had helped reduce the amount of animals, she responded,

> "No. [The project] gave too little to ask that [community members] reduce their animals. [FONAG's productive projects] went every year getting bigger and bigger and it was thought that at the end there would be a really big project, so people would reduce their animals. If there was a really good project, then we would remove the animals without needing to be asked" (KIO2 11/19/12).

This community member asserted that the projects would need to be much larger in order to make an impact on the way that Oyacachi managed its land, and several other

community members of Oyacachi I interviewed iterated similar sentiments (various interviews, 2012). When I asked a community member if there had been any kind of improved land management due to FONAG, he insisted that the good state of Oyacachi's páramo was a long-term effort on the part of the community of Oyacachi.

> "OK, sustainable management is to not put an overload of animals. [We do] this whether FONAG is there or not. Of this we ourselves are conscious and we have already been managing [land] this way since times past because we are an indigenous community and have lived [in Oyacachi] since pre-Colombian times there. In other words, we are not colonists who've been there some 20, 30 or 50 years. History says 500 years, but we ourselves do not know… In the Cayambe Coca National Park, inside the territory of the community, is where the wetlands are, those that produce the most water in the zone of Cayambe Coca National Park. That says that is the result of the community. In other words, indigenous people we have been taught since ancient times that we live in nature, so you have to manage it well… In other words, a human population has been [in Oyacachi] for a long time, but they have been knowledgeable to [keep] it in a good state" (KIO8 12/2/2012).

To this participant, the good quality of the páramo lands were evidence that the community was taking care of them long before the arrival of FONAG.

Various other key informants indicated that there was a period of time in which the number of animals was high, and that the community was going through a process of reducing them. A former páramo guard of Oyacachi, for example, estimated that up to 1500 head of cattle had been in the páramo at one time, and now there were maybe 200 (páramo guard 11/25/2012). He attributed it to changing regulations about the practice of burning grass within the community for pasture rejuvenation, rather than to FONAG's productive project activity.

> "[Removing cattle] was something that [FONAG] tried but didn't work. However, the people of the community are now automatically reducing the cattle in the páramo. Why? Because now we do not use fire. There isn't food for cattle and since they cannot eat anything up there, there's fewer. There's a few cattle now lower by the road and that's it. In the highlands, no."

Two others commented that the overall number of cattle in the páramo started dropping before FONAG arrived because of ongoing conflict with the Andean bear, *Tremarctos ornatus* (Field Notes 2012). Years prior to FONAG's arrival, USAID, in conjunction with Ecuadorian NGO EcoDecision, initiated a project to mediate bear-cattle conflict, focusing on removing livestock from bear territories in the páramo (Field Notes 2010). Whether attributing the reduction to bears or to community burning policies, nobody I interviewed credited FONAG's productive projects for individual or community decisions to remove cattle from Oyacachi's páramo. I determined the influence of FONAG on the removal of cattle to be 'coincident' in Oyacachi because of the lack of evidence for a causal link between cattle reduction in the páramo to FONAG and because of evidence that cattle reduction had been an ongoing process before FONAG intervened. Table 6.9 summarizes the action of conservation intervention in Oyacachi.

Activity	**Influence**
Livestock Removal from Páramo	Coincident

Table 6.9 Categorization of FONAG's conservation action in Oyacachi

6.5 RESULTS AND DISCUSSION

The ultimate goal of a PES arrangement is to affect the land use outcomes in the sites of ecosystem services production. FONAG addresses that challenge by using alternative productive projects as incentives for communities to perform conservation practices, primarily to reduce livestock grazing in the páramo. To evaluate the outcomes of these projects, I use empirical data from three case study communities in which FONAG has implemented conservation agreements for productive projects. I assert that questions of influence must be raised before assessing outcomes, and that assessing the directionality of impacts may be beneficial to implement before a quantitative assessment. Therefore, I developed a framework to assess directionality of outcomes that FONAG claims as the result of its interventions. Walking tours and key informant interviews provided a contextually rich data set upon which I based my analysis.

My analysis highlights the differences and similarities between how FONAG rolled out its projects and how they intervened within the communities. FONAG used the first community, Paquiestancia, as an example of success with interventions. Although a women's organization, Flor Andina, took responsibility for the various phases of the project, the community never gave full support to FONAG's work. Community members outside of the subgroup remained skeptical of the benefits of the project, even though the productive project had a relatively beneficial economic impact for the members of the subgroup participating in the project. My analysis shows that the removal of livestock from the páramo was likely a coincident action with ongoing páramo management efforts in the community, and not an outcome of FONAG. The

vegetation planting project in the páramo, however, was directly caused by FONAG because greater community was not supportive of the effort. The anti-litter work was likely an activity enabled by FONAG, since the community was supportive but had not yet taken direct action on the matter.

In Cariacu, FONAG supported the construction of an ecotourism project in exchange for removing cattle. A subgroup comprised of mostly young men took responsibility for the project, but the larger community also contributed labor to the construction of the trail system. During the time of data collection, the tourism project was not generating income for the individuals involved with the project and was a source of conflict for the community. Here too, the community had an ongoing effort to remove cattle from the páramos, which was likely coincident with FONAG project and did not cause cattle removal.

FONAG also implemented several intervention projects in Oyacachi. The subgroups consisted of community members that were interested by the project, rather than an official organization within the community. Community members did not find the guinea pig project useful for generating extra income, but they still sought additional support from FONAG. Community members discussed several reasons for a downward trend in livestock numbers in Oyacachi's páramos, but all concluded that it was not due to the incentive of FONAG's projects.

One of my initial hypotheses was that PES projects would re-arrange household labor and land use regimes. However, rather than rearrange household labor and land-use, FONAG works with pre-existing household labor and land use arrangements. For

example, when I asked about whether taking care of guinea pigs was gendered work, a community member in Oyacachi commented that many women chose to do the guinea pig project because they could raise them near to the household, and therefore guinea pigs required very little extra time to maintain. In other words, the project did not require an overt change in pre-existing labor routines and activities. Similarly in Cariacu, all of the members of the tourism project held other jobs and primarily only worked in ecotourism on the weekends or when they had availability. FONAG's productive project only generated a negligible amount of income, if any, for the tourism group members, and therefore they treated it as a secondary priority to any other activities. The conservation component of the agreement likewise followed the same trend as in the other study communities. The case study communities were already managing the páramo for cattle reduction when FONAG arrived, so accepting FONAG's conditions for conservation did not create an additional burden. This trend is also present in the case study of Quinchucajas in Chapter V.

My assessments of these three community case studies indicate that there is no evidence that FONAG is directly changing land uses through its actions. Furthermore, the productive projects, while either benign or offering a modest benefit to those involved, are not alleviating poverty or shifting household land uses. This evidence leads to another question: why are these projects being enacted? In a broader picture, what work does FONAG do? To answer this question, I begin by looking back at the roots of FONAG with the partnership that initiated it. FONAG exists because of the combined will of multiple constituents that put funds toward the work of the organization. It is

therefore imperative to reflect upon the constituents because they enable FONAG to continue.

The Nature Conservancy (TNC) initiated its efforts with FONAG to support its concerns with biodiversity conservation. However, it is also important to recognize that TNC did so while trying to frame FONAG as an exportable model of conservation from its initiation. TNC's early emphasis on a replicable model suggests that TNC was also looking for a way to generate rent and self-perpetuate by having a model that would attract donations and could be exported to other locations. TNC has thus far successfully promoted the creation of a multi-million dollar Latin American Water Funds Partnership based on FONAG's model, which was launched in 2011. The efforts to replicate the model and the money involved in this effort is evident at a 2010 fundraising event where the TNC representative ends the story of FONAG with:

> "[FONAG]'s been so successful that now we've taken it out and want to expand it to 20+ funds across Latin America. And there's a major commitment that we're making at the Clinton Global Initiative of $20 million; $5 million coming from GEF and the Inter-America Development Bank, and the rest we are going to have to fundraise, so do not run away after this" (Merchant, video recording, 2010).

As a narrative to 'sell' this model to the potential donors in the audience, the representative of TNC at the fund-raising event stressed how FONAG was an incentive to push rural communities into action for watershed protection.

> "The Conservancy started that with just $1,000, and now it [has] grown to capitalize about $8 million, spitting out about $800,000 per year for the communities in the upper Andes, Kichwa Indian communities, that then use it for various activities, various economic activities that they do. It's an amazing

> model to get people who use the water to essentially pay for it. But not just pay it to a central coffer, but actually pay it to the people who are in the front lines actually protecting that water supply... [T]hat's the kind of model, I think, that is going to turn conservation on is head. Asking, 'what do people want, and how do we give them a real incentive in protecting nature?' Because I could go on and tell them great stories about saving [the páramo] for the Condors or the Andean bear, and it might resonate with a few of [the audience] in this room here, but for the communities that I deal with in those upper watersheds, that's really not going to motivate them to act" (Merchant, video recording, 2010).

While it is true that FONAG generated about $800,000 per year in interest in 2010, only a small fraction of that money was put towards community productive projects. I would like to push aside focus on that financial misrepresentation of FONAG, however, to examine the quote further.

TNC justifies replicating the water fund model on the concept that it causes rural communities to take conservation action that it otherwise would not be taken. As applied to the case study communities, TNC, then, claims the 'coincident' conservation labor of rural communities as their own and uses those claims as evidence of success to attract more financial resources. By 2010, TNC had largely loosened its direct involvement with FONAG and focused its efforts on implementing the other water funds (TNC employee, 2012). Yet, the organization continues to grasp the narrative of causing conservation practices through FONAG. In a 2011 address of TNC to the International Conservation Caucus Foundation on the success of the water fund model, the story of FONAG began again with a rural community, and the slide behind the speaker quickly switched to show and image of rural indigenous people with caption of simply 'producers' (ICCFoundation 2011).

TNC, of course, is not the only beneficiary of FONAG. The other founding partner of FONAG, Quito's public water company (EPMAPS), has more to directly gain from the presence of FONAG and accordingly provides most of the financing. The obvious reason for EPMAPS participation is that it participates to avoid the degradation of its existing water supply. However, FONAG does more than this. First of all, as discussed in Chapter V, FONAG tends to minimize the impact of infrastructure projects from EPMAPS and other companies upon the páramo, and instead emphasizes rural communities as a threat to the ecosystem. Furthermore, EPMAPS has a historically poor relationship with many of the rural communities in the watershed over the water projects (Field Notes, 2012). FONAG enables access to both biophysical and social data about rural communities through the páramo guard. This data would otherwise be very difficult to obtain through an official of EPMAPS (Field Notes, 2012). EPMAPS intends to expand its water capture in the coming years through a project called *Rios Orientales*, and thus FONAG's data could be used to assess feasibility of access to various future water sources.

These goals are not articulated within FONAG itself. The former páramo guard coordinator argued that FONAG contributes to building environmental consciousness within communities, rather than making a direct, physical change to the landscape,

> "I can tell you that a lot of the [productive] projects function, and that many of the families have left the projects because they have other things to do, other work. But many families keep doing the projects. More than anything the message of water conservation, the message of using fewer agro-chemicals, are maintained within the knowledge of the people. So this was also the objective, that the people could have this [knowledge] after the projects, and that FONAG

> could integrate itself into the community again and carry this message of water conservation" (Escandón 10/15/2012).

While supporting the notion that FONAG's productive projects are contingent on convenience, the above quote emphasizes FONAG projects as making social change within the communities. Based on the preoccupation of communities about maintaining their water supply for irrigation and household consumption, it also does not appear that FONAG has done that in the case study communities. At best, FONAG supports existing concerns and existing practices focused on watershed protection to maintaining a status quo within the case study communities.

In addition to these insights on the specific water fund PES arrangement of FONAG, this chapter offers broader contributions to understanding outcomes within communities that are the target of in-kind PES projects. First, I offer an alternative framework examining the outcomes of PES. Much of the existing work on evaluating PES arrangements focus on land use change and economic outcomes, but I demonstrate that these outcomes are contingent to contextual conditions within each location that PES interventions are enacted. I question the narrative of PES as a type of mechanism that actively mobilizes entire communities to embrace certain conservation practices in return for an economic incentive.

Furthermore, I offer a simple framework to gauge relative economic impacts from in-kind productive projects. One of the major issues with evaluating the outcomes of PES projects is a lack of baseline data to compare before and after. However, these types of analyses also fail to account for other conservation and development programs

that are concurrent within communities. In my method, I developed indicators of success that directly address the projects in question.

Finally, this chapter points out that the direct outcomes of PES interventions should be considered in a broader sense than just economic and conservation outcomes. My analysis here demonstrates that FONAG has the potential to generate social conflict within communities, particularly when the benefits of the project are perceived by the larger community as going to a subgroup while the greater community shares the burden of responsibility for enacting these projects. Both positive and negative social outcomes need to be examined within PES because ultimately it will affect the ability for these programs to work in the locations in the future.

6.6 SUMMARY AND CONCLUSION

This chapter examined the practical outcomes of FONAG's water fund PES arrangement within the rural communities it targets. I begin this chapter by examining the practice of assessing PES arrangements and their impacts. The ultimate purpose of PES arrangements is to influence local land managers to undertake land use practices of that maintain or enhance ecosystem service production. Conversion to other land uses from forest cover is a primary driver leading to the development and implementation of PES programs. It therefore follows that land change, particularly of forest cover, is the most common proxy measurement for ecosystem services.

FONAG follows this broader trend in its assessment, and relies heavily upon the quantity of hectares designated as 'effectively conserved' as a metric of success. This

metric comes directly from USAID, the largest donor of FONAG until 2014. Yet, the actual evidence of a direct impact on land uses remains scarce. Success, in the case of FONAG, is often conflated with the presence of practices without regard to directionality. Questions of influence, I argue, should be raised before attempting to quantitatively assess outcomes.

I therefore introduce a framework to assess the directionality of land use actions in conjunction with intervention projects in the following section of this chapter. I developed three categories of action: causal, enabled and coincident. If actions are not a result of a project intervention, I assert that assessment to 'quantify' land area conserved is rendered irrelevant. In the case of a causal relationship, however, I also adapted a scale of improvement to assess the relative impact of project initiatives. I employ these frameworks in the next section as I examine the process of and outcomes of FONAG's interventions three case study communities of Cariacu, Paquiestancia, and Oyacachi.

I find that nearly all of the conservation practices that are intended to be compelled through FONAG agreements were coincident in nature. I typically assessed the productive project component of FONAG agreements as enabled, but I also find that the conservation agreements and productive projects do not induce long term change in land use nor labor routines within communities and participants. The projects tend to be accepted out of convenience. With this information, I discuss why FONAG's interventions in the rural communities continue to be promoted as a success. I point out that TNC attracts funding and further donor support with this narrative, and subsequently claims the pre-existing land management labor of communities as a direct result of its

interventions. TNC uses this misrepresentation of labor to self-perpetuate and generate rents. EPMAPS, on the other hand, gains access to data through FONAG about communities and their lands. This data has the possibility of being used for future decisions on water capture.

This chapter contributes to a literature on water fund PES and in-kind PES arrangements that target ecosystems under collective management. Contributing insight on an empirical case study of a model water fund PES, it raises questions about the narrative of PES as a type of mechanism that actively mobilizes entire communities to embrace certain conservation practices in return for an economic incentive. As such, it reveals a gap in the evaluation process of PES arrangements, and puts forward a framework that can be applied to assess the directionality of PES agreements' influence on community conservation practices.

CHAPTER VII

CONCLUSION

7.1 CHAPTER OVERVIEW

This chapter summarizes the four core chapters of this dissertation (III, IV, V, VI) and presents an overview of each chapter's investigation, findings, and theoretical advancements. This chapter concludes with discussion of implications for water fund programs with recommendations for future research.

7.2 DISSERTATION SUMMARY

This dissertation investigates the process in which ecosystem services are transformed into a commodity within a market-based arrangement for environmental governance called Payments for Ecosystem Services (PES). It particularly examines the social constitution of nature's value, which has been largely overlooked by political ecologists in their examination of neoliberal environmental governance. Because ecosystem services are inextricably tied to the landscapes and space in which they are produced, the commodification of ecosystem services necessarily involves land control and therefore a process of territorialization. Therefore, this dissertation examines the production of value for a PES environmental governance arrangement through the practices of labor and territorialization.

The dissertation focuses upon a case study analysis of a model water fund PES arrangement in Ecuador called the *Fondo para la Protección del Agua* (FONAG). It

follows the water fund from the urban-based institution and into rural communities that are located in the páramo ecosystem, the site of hydrological service production for the city of Quito. I conceptualize the production of value through ecosystem services as a ficticious commodity chain. I use the term 'ficticious' in reference to ecosystem services as a collection of abstracted physical processes. Each substantive chapter, then, represents a node in the ficticious commodity chain.

The framework of analysis in this dissertation draws loosely upon Li's (2007a, 2007b) conceptualization of governance as an assemblage. Li (2007a, 2007b) defines assemblage as the interaction of diverse discursive and institutional practices among disparate groups of experts, agencies, and organizations, and promotes an explicit framework that allows for historical contingencies and spatiality. Rather than a static formation, an assemblage is constituted from the continuous process of pulling disparate elements together in alignment.

Chapter III is the first substantive chapter and it examines the urban consumers, or 'buyers,' of watershed ecosystem services. This chapter directly addresses the research objective: describe the discursive and material practices of assembling the PES scheme. It does so by examining the practices surrounding the process of how FONAG formed. It follows FONAG's transformation from a concept to generate revenue for conservation and into its conversion to an environmental governance regime unto itself, or a social arrangement for decision-making about the environment and a mechanism that produces a particular social order through environmental management (Liverman 2004; Ekers and Loftus 2008; Lemos and Agrawal 2006; Bridge and Perreault 2009;

Corson 2010; Himley 2008). The chapter situates the water fund PES in the literature as a part of a broader neoliberal shift promoting the reregulation of space in order to create new commodities for accumulation (Peluso and Lund 2011; Igoe and Brockington 2007). As such, the construction of the PES water fund arrangement necessarily initiates new processes of territorialization. After contextualizing the emergence of FONAG from the failures of the traditional state-led protected area model of development, the chapter demonstrates how the environmental governance regime is contingent upon processes of territorialization to create alliances centered on a financial mechanism. Those alliances in combination with the financial mechanism are able imbue FONAG with authority and legitimacy to create a market-based conservation territory. This differs from previous literature on the process of territorialization in neoliberal conservation in which the State lends authority as a 'vehicle' for transnational organizations to undertake territorialization (Corson 2011). This chapter expands upon theory on the process of neoliberal territorialization by demonstrating that PES conservation territories can be constructed without state authority.

Chapter IV examines the next node in the ficticious commodity chain, the work of locally hired employees of FONAG called páramo guards. This chapter addresses Objective 2: to examine the avenues for community acceptance or rejection of PES environmental governance, and does so by examining the labor and practice of FONAG's intermediaries with rural communities**.** The páramo guard's position constitutes a material connection between FONAG and rural communities. It represents FONAG's reach to influence site of ecosystem service production. This chapter

examines the labor of the páramo guard situated as both a target and an implementer of the environmental governance arrangement. The páramo guard's labor particularly involves 1) patrolling lands of conservation interest to FONAG, and 2) negotiating and facilitating productive projects in rural communities. The work of patrolling contributes to enforcing FONAG's territorial claim on the land, and the facilitation of productive projects is an act that mobilizes labor towards conservation practices. While generating value by directly performing conservation labor, the páramo guard also acts as broker of an exchange mechanism that produces value for the PES arrangement. This chapter demonstrated how the páramo guard's labor was necessary for FONAG to render the páramo ecosystem as legible for governance, but also quantifiable and thus exchangeable. Furthermore, the chapter demonstrates that the labor of the páramo guard is an incomplete form of subject-making that also subsidizes water fund PES arrangement.

Chapter V examines the contribution of community labor to the creation of value within the water fund PES arrangement. This chapter also addresses Objective 2: to examine the avenues of acceptance or rejection of PES programs. Specifically, the chapter interrogates the mobilization of community labor through the contractual mechanism that specifies the exchange of conservation labor for in-kind development projects. It conceptualizes the process of mobilizing labor as a realignment of the FONAG's contract agreements and local labor institutions. The chapter begins by examining the concept of 'green custodians,' a pervasive narrative of local people whose labor is considered available to care for nature as long as they can be converted to a

proper relationship with the market (Fairhead, Leach, and Scoones 2012). I demonstrate that the narratives that FONAG uses surrounding rural communities and their relationships are informed by assumptions and are a form of misrepresentation. In particular, I examine the process of creating a contract agreement with the community case study of Quinchucajas. The case study demonstrates how communities are embedded in socio-ecological relationships that are largely invisible to FONAG. A local organization that co-managed the páramo challenged misrepresentation of labor and land use relationships to gain recognition of pre-existing collective institutions for ecosystem management. Rather than hegemonic neoliberal practice, my research shows contingency and co-production on a local scale.

Finally, Chapter VI interrogates the process and action of FONAG's work within three case study communities. It specifically addresses Objective 3: to assess how the demands of FONAG's interventions restructure labor and land use within communities. This chapter begins by broadly interrogating the concept of outcomes within PES and points out the ambiguity that exists in determining the influence of PES within targeted ecosystems. Then, it examines how FONAG has determined outcomes and metrics of success. Next, it interrogates the influence of FONAG's actions in three case study communities which FONAG has completed contractual agreements using empirical data of land-use walking tours and key informant interviews. It offers a framework to assess FONAG's influence on conservation practices and evaluate relative economic impacts within the case study communities. It found that FONAG's agreements for conservation interventions fell within the existing labor and land use regimes, and that most of the

conservation land uses within communities were coincident, rather than caused by the actions of FONAG. It then discusses other possibilities for the perpetuation of FONAG's interventions in rural communities.

7.3 CONTRIBUTIONS

This dissertation contributes to theory in political ecology, in particular neoliberal environmental governance literature, by responding to Robertson (2012)'s call to examine the social constitution of nature's value. It accomplishes that task through looking at the processes of labor that are required within the water fund PES arrangement of FONAG. In doing so, it also adds to critical literature examining socio-spatial practices of environmental governance, and provides empirical data on a multi-partner governance regime. Three themes have emerged through the dissertation process that substantively contribute to understandings of market-based conservation. These themes include identity, political economy, and labor and territoriality.

7.3.1 Identity and PES

The first theme is the role of identity in PES. This dissertation demonstrates that the negotiation of identity is key within the internal processes of a PES arrangement. The PES arrangement creates new roles that people and their labor must inhabit, as it broadly frames urban-based companies and organizations as consumers that can 'buy' ecosystem services from people living in rural communities that are now framed as 'producers.' Thrust into this new conceptual role, people living in rural communities are

now subject to having their labor formally recruited through agreements for conservation work. They must also negotiate the identities that they assume when engaging in the program.

Chapter IV illuminates how FONAG recruits páramo guards based on their identity as members of local communities. While FONAG attempts to, in essence, 'remake' this identity so that they are now agents of FONAG, they are only partially successful. While páramo guards engage in the practices that FONAG pays them to do, they maintain their identity as a community member and thus fail to internalize all the rationales and logics of FONAG. Although this may frustrate practitioners of FONAG, this dual identity is what enables FONAG to work within the communities, and furthermore subsidizes value creation for FONAG. Chapter V directly addresses the process of remaking identities, as the community of Quinchucajas and the Committee of Ñukanchik Urku negotiate their identity within contracts for productive projects that require conservation labor. The Committee of Ñukanchik Urku challenged misrepresentation of labor and land use relationships to gain recognition of pre-existing collective institutions for ecosystem management that were otherwise rendered invisible to FONAG.

Finally, while not directly addressed within this dissertation, there is a need for future work to explore the role of gender identity in PES arrangements. Many of the projects of FONAG are intentionally targeted at women or men, and are based upon assumptions about gendered labor in rural communities. It would be valuable to examine how project participants negotiate those positions.

7.3.2 The Political Economy of PES

The political economy of Payments for Ecosystem Services also rises to the surface as a key theme in this dissertation. This dissertation demonstrates that the water fund PES arrangement not only mobilizes labor for conservation work that imbues ecosystem services with and exchangeable value, but also does political work that generates value for the constituent members of the water fund PES. These members pay into the fund, and can be considered 'investors' that receive returns not only in the water services, but in financial gains and political power. This is particularly the case for the two founding partner organizations, The Nature Conservancy and Quito's water company (EPMAPS).

Chapter III examines the origins of the water fund PES, and locates them in TNC's efforts to expand conservation territories to include landscapes rather than follow protected area boundaries. TNC's initial efforts are also focused on building an exportable model for replication, one that gain influence for the organization and further its perpetuation. EPMAPS, on the other hand, was presented with an opportunity to gain access and influence within territory that it did not directly control. Faced with the possibility of water shortages and a history of tense relationships with rural communities over water, EPMAPS was able to flex its power by firing many of the employees of FONAG and discursively reframing it as an extension of itself after the water fund had capitalized to millions of dollars.

This extension of influence also appears in Chapter IV through examination of the páramo guard labor and the practices of boundary-making through FONAG. The

labor of the páramo guard renders data about the territory that is transferred to FONAG for possible use in governance decisions. That labor also includes brokering productive project agreements with fellow community members and generally creating good will between communities and FONAG. However, the páramo guards patrol and surveil multiple forms of properties, including those of EPMAPS, rural communities and the protected areas. The labor of the páramo guards therefore both directly and indirectly reinforces territory claims by EPMAPS.

After investigating the outcomes of FONAG's project, VI explores the question, if there are no causal conservation impacts of FONAG, then why pursue the interventions? Discussion returns to TNC and their efforts to attract donor money for program replication, and also points out that TNC uses the claims of directly causing conservation practices in rural communities to do so. In a way, TNC claims the labor of these conservation 'successes' as their own. Likewise, it points out that EPMAPS gains a great deal of influence through the resources of the fund. Through the complexities of these relationships, this dissertation demonstrates that there is much more to be gained from the water fund PES than 'conservation.' While many studies in PES evaluate the directly intended outcomes of PES, particularly the halting of deforestation or other conservation goals, there is space for work examining the work of PES in generating value for the unstated objectives of PES.

7.3.3 Labor and Territoriality

This dissertation also demonstrates that labor arrangements in and around the sites of ecosystem service production are essential to the creation of value within PES programs, and that PES arrangements necessarily invoke new forms of territorialization in order to form a new environmental governance arrangement. The creation of a new commodity through a PES arrangement is a process of co-production of labor and territory. This aspect of PES has been largely ignored within existing literatures, and therefore became the focus of this dissertation.

I point out, through the ficticious commodity chain framework, the multi-faceted ways in which the water fund PES regime generates value. The value generating mechanism of the water fund PES arrangement requires intentional conservation practices within ecosystems be motivated through an economic exchange. These processes are therefore tied to territory within my interrogation of the mechanism. Chapter IV demonstrates how the páramo guard demonstrates value through labor as an employee of FONAG. The páramo guard, simultaneously an employee of FONAG and a member of the community, generates value for the fund by representing intervention, and therefore a conservation outcome, through the physical lands that he patrols. I point out that the páramo guard's labor tasks cannot be physically completed in time allowed for compensation, leading the páramo guard's labor to subsidize the arrangement.

Chapter V examines the creation of value through the mobilization of rural community labor itself. It shows the importance of the complexity of labor mobilization, but also demonstrates a poor knowledge of the socio-ecological relationships with the

ecosystem that FONAG has designated for conservation. It also reveals efforts to discursive efforts to compartmentalize a landscape into conservation and productive zones that can be quantified into territory conserved, and how communities can renegotiate those conceptualization of land use and labor. This dissertation shows that there is an inextricable link between territorial processes and labor to generate value for PES environmental governance systems. The labor of 'producers' is needed to justify the system, and without it, the market-based mechanism cannot persist. Future work examining PES in political ecology should therefore take into account co-production of labor and territory in value.

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APPENDIX

Summary of FONAG's Projects

Protected Area	Community Name	Productive Project (# participants)	Conservation Project
Cayambe-Coca National Park	Ñurukta Organization	Pasture Management; Guinea Pig Husbandry (36; 40)	Livestock reduction in páramo
	Paquiestancia	Guinea Pig Husbandry (23; 23)	Livestock reduction in páramo and cattle census
	Quinchucajas	Guinea Pig Husbandry & Pasture Management; Irrigation (22; 22)	Páramo surveillance and fire reduction
	Oyacachi	Guinea Pig Husbandry & Smallholder Farming (27); Pasture Management (43)	Páramo surveillance and fire reduction
	La Chimba	Smallholder Farming (28)	Páramo surveillance and fire reduction
	Cariacu	Ecotourism (21)	Páramo surveillance and fire reduction;
Antisana Ecological Reserve	Cuyuja	Smallholder farming (23; 40; 48)	Livestock reduction in páramo
	Muertepungo	Ecotourism (21; 23)	Livestock reduction in páramo
	El Tambo	Smallholder farming (26; 30)	Páramo surveillance and fire reduction
	Nueva Esperanza	Medicinal Plants (30)	Tree planting
Ilinizas Ecological Reserve	Pucará	Guinea Pig Husbandry (20)	Livestock reduction in páramo
	El Chaupi	Medicinal Plants & Smallholder Farming (15; 20)	Garbage clean-up
Cotopaxi National Park	Santa Ana de Pedragal	Ecotourism (21); Pasture Management (70)	Garbage clean-up; Livestock reduction in páramo

Summary of FONAG's projects by protected area. More than one number listed for participants means that FONAG undertook more than one phase of the project in the community (Compiled from: USAID 2008, 2009, 2010b, 2011, 2012)