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Territory and authority of water fund payments for ecosystem services in Ecuador's Andes

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ABSTRACT

A 'water fund' is a model for watershed conservation that cities throughout Latin America are quickly adopting. Based upon the concept of Payments for Ecosystem Services, urban actors and international NGOs pay into a trust fund that finances conservation activities in rural communities existing in and around ecosystems important for water flowing downstream to cities. Ecosystems are inextricably tied to the landscape, so water funds seek to influence land use practices. However, the process of establishing control over land use activities within a targeted area is a challenge, particularly when these areas exist outside of the boundaries of state delineated protected areas and encompass diverse landscapes where people are living and working. Drawing upon an empirical case study from Ecuador, we use data from key informant interviews and archival documents to analyze how market actors and NGO alliances create authority and legitimacy for themselves to initiate the process of territorialization of a watershed premised on ecosystem services conservation. We demonstrate how urban market actors and NGO alliances create non-state authority for territorialization and bypass the political and economic instability of the state. However, we also show that the state itself may use this arrangement as a platform to exert power within territory

1. Introduction

Throughout the world, ecosystem services are increasingly a target for regulation and governance through multiplying arrangements of Payments for Ecosystem Services (PES). As ecosystem services and the people charged with maintaining and improving them are connected to land, PES arrangements are intimately tied to social and environmental processes located within places and spaces of intervention. Yet, literature examining territorializing aspects of governance within PES schemes remains relatively unexplored with a few exceptions (e.g. Rodriguez-de-Francisco and Boelens, 2016; Lansing et al., 2015).

In this article, we argue that PES intervention necessarily requires a new form of regionalization or territoriality – the control of land within a provision region of ecosystem services. Territorialization is an ongoing process of defining and re-defining space and involves territoriality, or a "form of behavior that binds, reifies, and controls space for some social ends" (Lövbrand and Stripple, 2006, 218). This article examines the process of territorialization for the production of ecosystem services, and particularly we address the process of constructing territory in which ecosystem services are made governable in a water fund PES model. We demonstrate how alliances between urban market actors and NGOs create non-state authority for territorialization that bypasses political and economic instability of the state. However, we also show that this arrangement exists in an ongoing process of change, and that the state itself may use this arrangement as a platform to exert power within territory.

While scholars have called for improving the science in order to more effectively target and efficiently implement PES arrangements (Naeem et al., 2015), others have called to examine the role of context and power relations within the creation and implementation of PES schemes (Kolinjivadi et al., 2017; Fletcher and Büscher, 2017). This paper responds to the latter by examining the creation of water fund PES in Latin America. A water fund PES scheme connects urban users of watershed ecosystem services (i.e. ecosystem service buyers) to upstream land managers (i.e. ecosystem service producers) via an extra-governmental intermediary organization. Urban users contribute to a trust fund whose interest goes towards incentivizing land managers to adopt conservation-oriented land management practices within ecosystems important to the quality and quantity of water flowing downstream to a city.

Our case study is the first and model water fund PES in Latin America, called *Fondo para la proteccion del Agua* (FONAG) launched

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through a partnership between The Nature Conservancy (TNC) and the municipal public water company in Quito, Ecuador (EPMAPS) in 2000. Water-users in Quito –a mixed assortment of public and private entities– voluntarily agree to pay into a trust fund whose interest finances an extra-governmental intermediary organization headquartered in the city of Quito, Ecuador. This intermediary organization is set to last 80 years by its contract and creates development projects that promote 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. In return, these projects require local labor inputs and the re-arrangement of land uses. TNC has declared a goal to replicate 32 other water funds in Latin America following FONAG's model (TNC, 2012). At least 18 cities have currently implemented the model, and several others are in the planning stages (LAWFP, 2016).

This case study underscores the political context of PES as a set of environmental governance practices. It demonstrates how broadly defined ecosystem services can facilitate alliances between non-nation-state actors to initiate a process of territorialization, and how the boundaries of territory are negotiated between actors with differing priorities. Furthermore, it demonstrates how the balance of power within a PES can be contested, authority reconfigured, and priorities redefined with territorial outcomes. We underscore how PES arrangements are dynamic and sensitive to changing stakeholder agendas. Therefore, this paper examines the process of constructing and claiming territory in a water fund arrangement of PES and contributes to broader scholarly discussion on power dynamics within PES through an empirical case study.

This article draws upon dissertation research involving a multi-sited ethnographic case study of FONAG to examine the socio-spatial processes involved in the construction of water fund PES. The majority of data collection informing this article occurred between 2012 and 2014 and was conducted by the lead author. Data consists of documentary materials and key actor interviews. Documentary materials include strategic plans, reports, promotional materials, procedural manuals, memos, contracts, websites, and newsletters produced by FONAG itself and its constituent members, donors, and other affiliated organizations. Semi-structured key actor interviews over multiple years also contributed data to this paper.

Interviewees contributing to this article included FONAG practitioners, current and former program coordinators and current and former organization leadership (n = 12), representatives of constituent member organizations (n = 5), donors and other affiliates (n = 4), as well as with a lead designer in FONAG's water fund model. The research was presented to all interviewees as dissertation work and all interviews were conducted in person with informed consent after the lead author initiated contact via telephone or email. Interviews focused on the purpose and objectives of FONAG, priorities of intervention for FONAG, a timeline of involvement and significant events of FONAG, and perceived future directions of FONAG. Interviews were recorded and transcribed with permission. The lead author organized documents and transcribed interviews with Atlas.ti software and coded them based on a grounded theory approach (Cloke et al., 2004; Cope, 2005). This was an iterative process that involved developing themes based on the aforementioned topics of inquiry.

We organize our discussion as follows: the next section examines water funds as neoliberal environmental governance arrangements that initiate processes of territorialization. We then describe FONAG's roots in the strategies of international conservation organizations and the shortcomings of state-led territories for biodiversity conservation. After elucidating on the restructuring of FONAG's territory around watershed services, we explain how FONAG's original movements to create its own authority as a non-state extra-governmental model of environmental governance opened an avenue for co-optation between actors. Finally, we assert that FONAG gives new insights on the exercise of power between actors within the formation of neoliberal conservation territories.

2. Water funds as environmental governance

A water fund seeks to influence land use behaviors within a targeted area. Therefore, it is a form of environmental governance, 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). The conceptual basis for water fund design is Payments for Ecosystem Services (PES) (Goldman-Benner et al., 2012). PES arrangements ascribe economic value to ecological processes for conservation under the idea the market will enhance signals for resource-use efficiency and generate capital for reinvestment into conservation. Scholars and practitioners often promote PES as a form of Market-based Instrument (MBI) that is a non-coercive, efficient way to incentivize conservation and address conservation funding gaps (Sandbrook et al., 2013; Pirard, 2012).

Depending on the context and mechanisms in a particular arrangement, PES schemes may or may not fall under the category of a MBI. A voluntary trade of specific goods or services defines a market, and may include a diversity of actors including states as well as individuals, private business or communities (Vatn, 2014). Several types of market exchanges exist for biodiversity and ecosystem services, and PES generally fits within a Coasean-type arrangement in which buyers of products of ecosystem services (i.e. water, carbon sequestration, or biodiversity) enter into contracts with landowners over land use practices (Pirard, 2012). The requirement of PES as strictly a pure market mechanism, however, is contested as very few programs exist with the conditions to perfectly meet it (Muradian et al., 2013; Vatn, 2014). While a popularized definition of PES from Wunder (2005) emphasizes a strict market-based mechanism, other scholars and practitioners have shifted to favor definitions of PES that focus on the presence of incentives to "align individual and/or collective land use decisions with the social interest in the management of natural resources" (Muradian et al., 2010, 1205). Water fund schemes tend to follow the definition of PES emphasizing the use of incentives to influence decision-making about land management (Goldman-Benner et al., 2012).

Underpinning PES arrangements, however, is an idealized vision of market-oriented environmental decision making that promotes individualized economic incentives (Fletcher and Breitling, 2012). While many particular practices are associated with neoliberalism, such as privatization, marketization, re-regulation and market facilitation, they may or may not be present within PES arrangement (Fletcher and Büscher, 2017; Bakker, 2005; McElwee, 2012; Shapiro-Garza, 2013). Yet neoliberal forms of environmental governance push forward a worldview and ways of organizing societies via market-oriented values and logic that is reflected in language and practices (Gomez-Baggethun and Muradian, 2015). The idea behind PES, that economic valuation is both the cause of and the solution to the destruction of nature, is therefore inherently neoliberal, regardless of specific practices that evolve as an outcome to this idea (Fletcher and Büscher, 2017).

New neoliberal conservation arrangements often reregulate spaces and incentivize new values that become the focus of management (Igoe and Brockington, 2007). This involves examining the processes of how environmental priorities are used to justify enclosure and appropriate land, resources, and commodities from nature (Fairhead et al., 2012). Although the extent to which ecosystem services are fully commoditized versus simply assigned new value is debated (Sandbrook et al., 2013), ecosystem services can be conceived of as "value-bearing abstractions of physical processes" through PES (Robertson, 2012, 387). We point out that PES programs necessarily incorporate the human component of maintaining or improving ecosystems to produce services, thus PES is more accurately described as assigning value to abstracted socio-environmental processes.

These sets of socio-environmental processes that comprise ecosystem services and result in a material product of interest (e.g. water, carbon, biodiversity) are geographically located. Water resources that a city uses for consumption, for example, tend to derive from surrounding or nearby watersheds (Wunder and Vargas, 2005). An urban area seeking to improve or maintain water resources flowing to the city will attempt to influence human activities on areas of land that specifically harbor the ecosystems providing those services.

Thus, territorialization –the practice of claiming and managing space as it is carried out by states and other entities (Sack, 1986; Vandergeest and Peluso, 1995)– comes into focus as ecosystem services become a recognized object for distinct management interventions. Territorialization includes delineating land boundaries, allocating rights, and designating the rules of resource use (Vandergeest and Peluso, 1995). The process of claiming, however, begins with establishing authority that is considered legitimate and demands recognition from competing claimants to land and resources (Sikor and Lund, 2009; Corson, 2011).

For environmental governance arrangements, the state traditionally lends authority for territorialization because it is broadly viewed as a legitimate power possessing the resources necessary to enforce territorial boundaries and the regulations within them (Vandergeest and Peluso, 1995; Karkkainen, 2004). However, literature on neoliberal environmental governance arrangements often emphasizes changing roles of the state that move away from a state-centric model of governance. In some cases, state functions may be directly transferred to private entities in a move towards privatization (Bakker, 2003; Swyngedouw, 2005). In other cases, boundaries between state and non-state entities may become blurred as non-state actors take regulation and policy goals (Bulkeley and Moser, 2007). The state may become a co-participant in a hybrid platform of environmental governance that includes partnership with private or non-governmental organizations (Lemos and Agrawal, 2006; Karkkainen, 2004). Or, the state may retain its management role, but engage in trading practices by offering incentives to land owners to pursue particular management activities (Vatn, 2014; Fletcher and Büscher, 2017).

Authority that underpins the processes of territorialization may be operationalized in through various mechanisms. Non-state actors may identify land for conservation, develop land management policy and then draw upon the legal authority of states to territorialize (Corson, 2011). In other scenarios where the state retains its management role, we see new scales of operation in which the sub-national hubs of state power focus on territorialization (Bulkeley, 2005; Rice, 2010).

Bulkeley (2012) asserts that strategies to establish authority derived from outside of the state take on different forms and come from many different sources. So-called “private authority” (or non-state authority) in environmental governance may come from sources such as science, the market, morality, knowledge, reputation, issue-specific competence, and affiliation. Actors and institutions draw upon these sources to generate and perform authority as a set of different modalities of power. She distinguishes three ‘ideal type’ modalities of authority that may operate individually or in concert within a governance arrangement: consent, consensus, and concord. As consent, authority is practiced through enlistment in voluntary agreements designed to impel action that would otherwise not be taken. Legitimacy and recognition operate in terms of expertise, ethics, and even market potential. Rather than instrumentally “‘bending’ the will of others,” authority through consensus is “about the power to connect, to bring together but not to suppress the interests and differences that commonly divide” (Allen, 2003; quoted in Bulkeley, 2012, 123). Science employs consensus within the scientific community to establish authority, which in turn is frequently the means for establishing legitimacy and recognition in environmental governance regimes, whether climate or biodiversity conservation. Finally, authority through concord exists by the normalization of discursive and material practices associated with an environmental governance arrangement.

For PES, legitimacy and recognition of authority over resources explicitly operate in relation to modalities of consent and consensus with the objective of concord. Authority, in the case PES schemes, is linked to the production and reconstitution of territorial claims. This paper demonstrates how the production of territorial claims is a process tied to the ambiguousness of ecosystem services as a concept. The ambiguity opens space for different entities to form alliances attempting to manage the outcomes of ecosystems that may encompass an array of socio-environmental processes producing services like biodiversity, carbon or water (Suarez and Corson, 2013). This empirical case study of water fund PES in Latin America examines the early process and implications of claiming space for ecosystem services. We attend to how purpose, recognition, and compliance are all part of a spatial process, a territorialization of power.

3. A paper park legacy

Despite the name, Latin American water funds do not originate with concerns over water. Rather, water funds developed in response to ineffectual attempts to conserve biodiversity through protected areas. During the 1980s and 1990s, money shifted away from states, pushing them towards decentralization and reliance upon external financing, technology and expertise, and opening them 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 result was a boom in the creation of protected areas, particularly in developing countries (Brockington et al., 2008).

Yet, the legal establishment of a protected area is an incomplete form of territorialization if no further intervention to manage the conduct of people and their resource use occurs. Politically and economically volatile, and unable or unwilling to invest resources into fortifying protected areas, many Latin American states were known for housing paper parks, or parks delineated on maps that lack active management or control of territory (Brandon et al., 1998). Many of the same political conditions that facilitated the boom in protected areas contributed to widespread ineffectiveness in controlling protected area territory and directly resulted in the emergence of non-state and hybrid environmental governance mechanisms.

Declining state power sparked the decentralization of environmental governance, causing transnational conservation organizations to shift towards partnerships with market actors in their conservation pursuits. The strategies of conservation turned towards integrating nature into markets under the presupposition that imbuing it with economic value would shield it from destructive consumption, and economic growth could be harmoniously reconciled with environmental protection (Igoe and Brockington, 2007; Büscher, 2009). With new partnerships, conservation spaces changed. In neoliberal conservation, 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 (Zimmerer, 2000; Cohen, 2012).

Ecuador followed the global trajectory for conservation. By 2000, nearly one-quarter of Ecuador’s total land area was allocated to protected areas (World Bank, 2016). Transnational conservation non-governmental organizations (NGOs) were essential for Ecuador attaining this level. As one of those organizations, TNC arranged debt-for-nature swaps and funneled money to support Ecuadorian conservation NGOs such as Fundación Antisana, an organization created in 1991 for the sole purpose of forming a protected area around the Antisana volcano (Lewis, 2000). Lead by TNC, FONAG emerged as a part of these partnerships in the early 1990s.

As Ecuador politically and economically struggled in the decade preceding the crisis in 2000, its national government lacked funding to

regulate activities within protected areas (Lewis, 2000). TNC was particularly concerned with the funding deficiency for protected area boundary enforcement. Before TNC and Fundación Antisana facilitated the land acquisition, the area comprising Antisana Ecological Reserve had been a hacienda used extensively by members of neighboring communities for grazing, fishing and hunting. After the designation of the park, people continued these activities despite legal regulations prohibiting them (FONAG employee, personal communication, 2012). The Antisana Ecological Reserve was, in practice, another line on a map.

TNC and Fundación Antisana estimated that 80% of Quito's water supply originated from Antisana and Cayambe-Coca Ecological Reserves (Echavarria, 1997), and subsequently developed a plan for funding the protected areas through linking them to the water supply of the city. Finding new financial resources was particularly important because TNC's funding for its conservation interventions in Ecuador had been heavily supported by the United States Agency for International Development (USAID) through Parks in Peril (PiP), a program established in 1990 aimed at fortifying protected areas in Latin America and the Caribbean. USAID slated to end PiP within the next decade, and finding steady funding for conservation therefore concerned TNC (FONAG designer, personal communication, 2012).

While simultaneously working to fortify protected areas through PiP, TNC as a whole announced a move to embrace a landscape approach to conservation during the mid-1990s (Howard and Magretta, 1995). Informed by research warning about biodiversity loss due to habitat fragmentation, TNC shifted in its conservation approach (Birchard, 2005). This meant a new business model for TNC that 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).

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 functional landscape conservation approach, TNC partnered with USAID in 1997 to designate the Condor Bioreserve in Ecuador (TNC, 2007; Benitez, 2003). The Condor Bioreserve (Fig. 1) is not legally recognized, but rather is a 5.4 million acre conservation priority area for USAID and TNC that consists of a mixed-use landscape including portions of six protected areas and the farms, ranches and communities that occupy the space between them.

Proposing FONAG to Quito's Water Company during the same year that it designated the Condor Bioreserve (Arias et al., 2010; Echavarria, 2002), FONAG was TNC and USAID's solution to funding the on-the-ground interventions in the Condor Bioreserve after the expiration of PiP (Nyce, 2004).

Rather than a governance mechanism, TNC initially envisioned FONAG as a financial mechanism. Demonstrating this understanding of FONAG, TNC produced a 2001 working paper titled, 'FONAG: The water–based finance mechanism of the Condor Bioreserve in Ecuador' that explicitly describes the goal of the fund as "to collect a user fee from those who benefit from the water from the Bioreserve" (Echavarria, 2014, 2). Likewise, a 2007 report from TNC alternatively calls FONAG the 'Condor Bioreserve Watershed Valuation Project.' This report describes FONAG as the mechanism for providing a "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).

By broadening the target of protection to include water in addition to biodiversity, TNC shifted discussions of conservation to terms of ecosystem services and linked the urgency for protection to issues of water security with the adjacent urban area of Quito. Employing this framing, the 2001 TNC working paper states that, "… the lack of resources for the operation and protection of the reserves threatens the long-term conservation of these vital ecosystems and the water services they provide" (Echavarria, 2014, 1). FONAG's creation linked biodiversity to water and collectively reframed them as ecosystem services. The proposed financial mechanism became the solution to perceived threats to both biodiversity and human well-being. Securitization commonly frames justifications for PES arrangements (Pasgaard et al., 2017), and FONAG follows the trend.

The sprawling landscape boundaries drawn by TNC over Ecuador's protected areas, however, failed to assist on-the-ground control of human activities. While the state provided the authority needed to

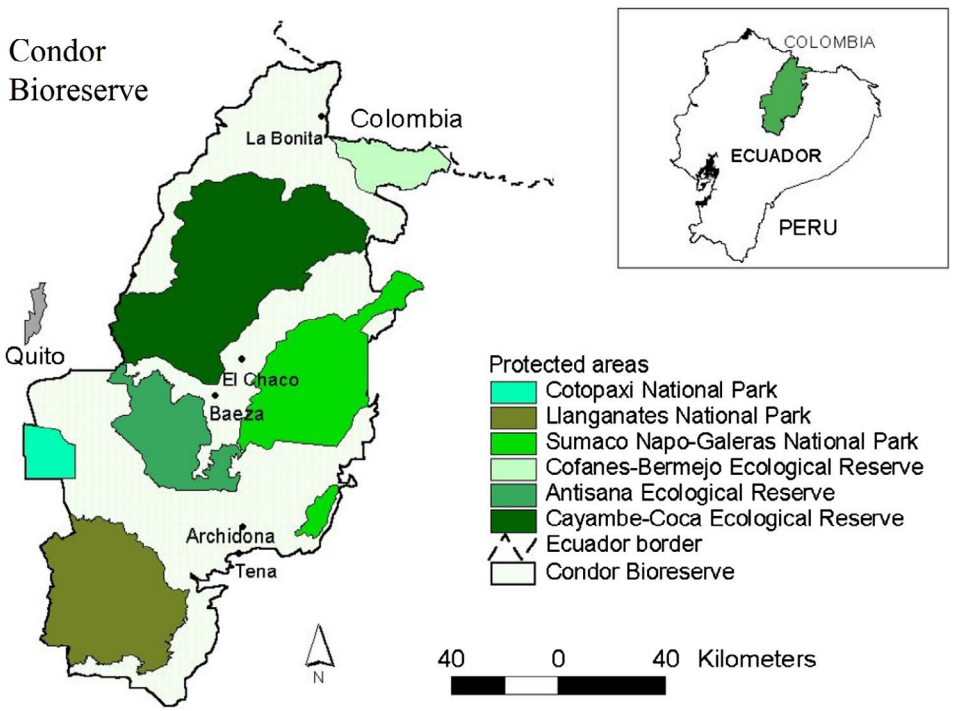

Fig. 1. Map of the Condor Bioreserve and Protected areas.
Source: TNC, 2008. Reproduced with permission from The Nature Conservancy.

territorialize spaces for conservation in the form of protected areas, TNC and USAID delineated the Condor Bioreserve as a territory for conservation that lacked any kind of authority that would lend control to the human activities within the area. TNC and USAID continued to frame the problem of biodiversity conservation as a funding issue with the financial mechanism of FONAG as the solution, but TNC later reported that FONAG had trouble launching because funding partners' interest in territory did not align with the boundaries of the Condor Bioreserve. This misalignment is acknowledged in a 2005 report from TNC:

> "…[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 ha) and the Cayambe-Coca Ecological Reserve (400,000 ha), 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

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.

The attempts to build new conservation territories in Ecuador outside of state-led protected areas were both a product of, and response to, a neoliberal context that facilitated the creation of protected areas while the state was unable to enforce them. While TNC attempted to create a conservation territory outside of the state purview, they lacked the authority to engage in any effective intervention through the Condor Bioreserve. That is, they had no power to influence collective or individual behaviors of environmental resource users within the reserve.

The next section discusses the process of how TNC readjusted the boundaries for FONAG's new territory to begin establishing territorial authority. We highlight how establishing territorial boundaries enabled an international NGO to initiate a governance mechanism for bypassing an instable and ineffectual national government. Furthermore, we demonstrate how the international NGO leveraged the economic resources of a subnational entity while attempting to limit its power.

4. Political context for uncontested boundaries

Defining boundaries is one of the first steps the state takes in internal territorialization, the process of re-regulating territory to assert control over "natural resources and the people that use them" (Vandergeest and Peluso, 1995, 385). Internal territorialization is employed to form protected areas for conservation and typically involves high levels of contestation as political boundaries are negotiated between competing claimants and stakeholders (Corson, 2011). Seeking alternative, apolitical processes of defining boundaries is a way to avoid contestation. Indeed, conservation arrangements led by non-state actors increasingly turn towards natural boundaries –particularly hydrologic ones– rather than state-sanctioned political ones to delineate territory for environmental governance (Cohen and Davidson, 2011; Cohen, 2012; Cohen and Bakker, 2014; Molle, 2009; Norman and Bakker, 2009; Warner et al., 2014). 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). It offers claims of objectivity, and for conservationists, it is ecologically meaningful. Focusing on science to inform the constitution of PES arrangements would presumably lead to better targeting of resources more efficiency and ultimately more desirable conservation outcomes (Naeem et al., 2015).

Supported by USAID, TNC began the territorialization process by delineating boundaries for FONAG's territory in terms of a watershed. The main conservation target, however, was high-altitude humid páramo grasslands. This ecosystem contains high rates of endemic species, but is also vital to the regulation and purification of water supplying the city of Quito. An estimated 85% of the city's water exclusively derives from páramo ecosystems (Buytaert et al., 2006). Yet, detailed scientific knowledge on how the ecosystem functions as a mechanism is limited. The scarcity of hydrological and meteorological data on páramo ecosystems and a lack of studies regarding páramo soils have left many gaps within scientific knowledge of overall ecosystem processes of páramo landscapes (Podwojewski and Poulenard, 2011; De Bievre et al., 2011). The difficulty and ambiguity in measuring and defining ecosystem services often leads to the use of proxies to represent them, including types of land cover (McElwee, 2017). Páramo became a proxy for ecosystem services generation of biodiversity and water. In comparison to a watershed boundary, the ecosystem is conceptually messy with disputable limits and fragmented over space.

TNC consistently framed the problem of conservation as a financial one. EPMAPS had access to capital, and TNC believed that tying geographic areas important for biodiversity and water resources would form a basis for an alliance. Part of the legal reforms initiated during Ecuador's economic crisis included the Securities Market Act[1] that enabled private financial entities to manage public and private money together (Proaño, 2005; Echavarria, 2002; Kauffman, 2017). Financial contributions from various water users could be put towards FONAG, so that the trust fund became a separate entity overseen 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 (FONAG designer, personal communication, 2012).

In response to the paper parks failure that TNC had previously encountered, FONAG's structural design as a trust fund would support the operations in perpetuity. In a typical scenario with an NGO, donors could withdraw funding at any time and leave a project stranded (FONAG designer, personal communication, 2012). However, the designers envisioned FONAG as a trust fund. The endowment could grow untouched, and then only its interest would be applied towards conservation activities to create the financial stability that evades most small NGO's (FONAG designer, personal communication, 2012). TNC envisioned EPMAPS's contribution as money to seed an otherwise autonomous organization.

Cities play an important role in building national economies and coordinating state power (Bulkeley, 2005). As EPMAPS is an agency of the city of Quito, it could be considered an extension of the state. The city of Quito is Ecuador's national capital and holds privilege 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 heading the public company's governing board. However, the pivot point for TNC to seek partnership with EPMAPS was not state authority. Rather, it was to leverage the power of the economic resources that the city could provide (FONAG designer, personal communication, 2012).

To approach EPMAPS for partnership, TNC utilized the recent construction of new water projects within the two protected areas as a selling point (FONAG designer, personal communication 2012). In 1998, EPMAPS completed the Salve Faccha dam located in the Cayambe-Coca National Park within the Papallacta and Oyacachi sub-

[1] *Ley de Mercado de Valores*, passed by Ecuador's national government in 1999.

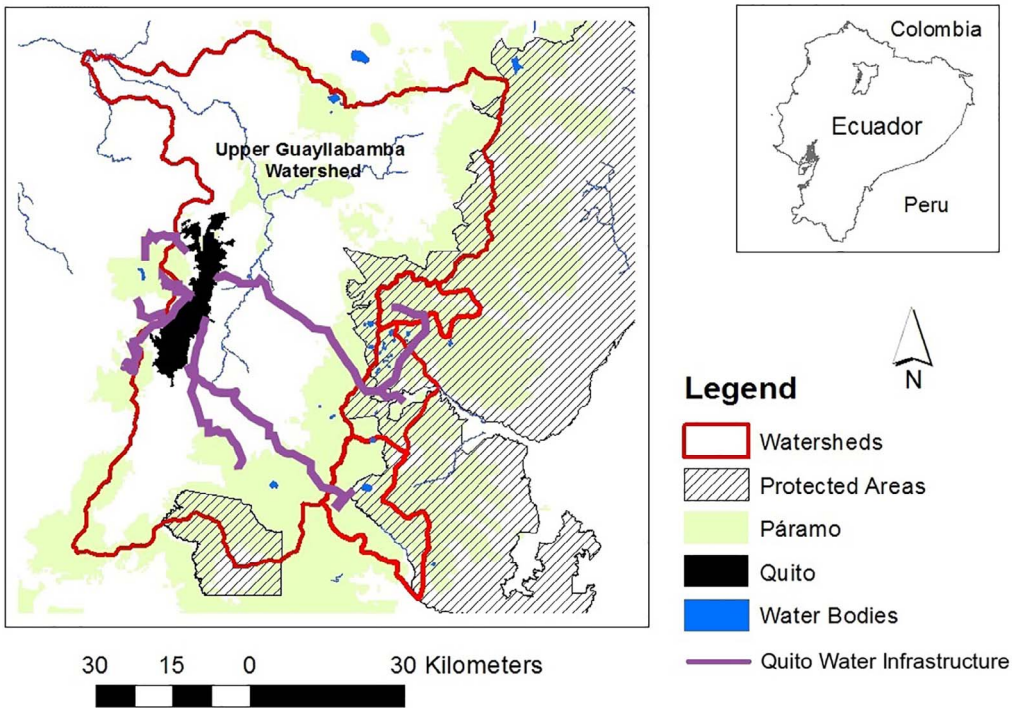

Fig. 2. 2012 FONAG's Watershed Boundaries and Protected Areas. The majority of the water for Quito comes from outside of the Guayllabamba watershed and is drawn to the city via pipelines and canals.
Source: Author.

watersheds. The Papallacta water system, to which the Salve Faccha dam contributes, collects water from dozens of small reservoirs within the Cayambe-Coca National Park and serves the potable water needs of 50% of Quito's population (Proaño, 2005; EPMAPS, 2014b). As EPMAPS finished construction on the Salve Faccha dam for the northern portion of the city, it initiated the Mica water infrastructure project in the Antisana Reserve, located within the Antisana sub-watershed, to augment potable water supplies for Quito's southern end (Proaño, 2005). Constructed between 1997 and 2001, it consists of a dam, a water transport system, and a hydroelectric station (EPMAPS, 2014a). EPMAPS initiated both of these major projects within páramo ecosystems in protected areas, and both are dependent upon ecosystem processes to fill the reservoirs with water that ultimately flows to Quito.

The partnership offered benefits to both parties. Because the production sites for biodiversity and water resources share the same physical space, the fund would simultaneously support TNC's efforts in biodiversity conservation and EPMAPS' efforts in maintaining the urban water supply. FONAG established its boundaries of intervention to cover 5420 km^2 including the upper Guayllabamba watershed, as well as the upper Oyacachi, Papallacta and Antisana sub-watersheds (Fig. 2). 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 cover extensive portions within the buffer zones of three protected areas, including Antisana Ecological Reserve, Cayambe-Coca National Park and Cotopaxi National Park.

While trimmed to fit hydrological areas, FONAG's territorial boundaries reflect consideration of the Condor Bioreserve boundaries. FONAG's Strategic Plan 2009–2013 demonstrates a vestige of this intent in the 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, 2009, 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, 2009), 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 territorial boundaries 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, as well as the goal of EPMAPS to manage landscapes for water resources. Although the boundaries are 'natural,' evidence indicates 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. The argument was further strengthened through referencing New York City's successful implementation of user-fee funded watershed conservation program in the Catskill Mountains as a model (Arias et al., 2010). Solidifying FONAG's launch in 2000, EPMAPS invested US$20,000, and TNC contributed US$1000 into the fund.

As articulated in TNC reports and other textual materials generated during FONAG's implementation, TNC's interest in creating the watershed territory was for facilitating biodiversity conservation. Within a favorable context, 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. Thus, an environmental governance arrangement focused on biodiversity conservation shifted to connect to territories to govern water.

Critical scholars have pointed out that scientific approaches are not

politically neutral and cannot be separated from the context in which they are produced, however. PES programs are therefore susceptible of falling into an epistemological trap of assumptions that overlooks the socio-political context within which PES programs form (Kolinjivadi et al., 2017). Framing boundaries in the apolitical language of hydrological science limits contestation and depoliticizes their construction. By extension, this frame also depoliticizes the process of territorialization, thus, mitigating contestation. The choice of the watershed boundary ultimately legitimized participation for water users in supporting an ecosystem services governance mechanism, and as the next section demonstrates, the watershed became a platform to attract alliances in governing the territory.

5. The watershed as a platform for alliances

The use of watersheds as an environmental governance boundary affected other political dynamics of resource decision-making. Frequently portrayed as a move towards decentralization of environmental governance, the deployment of watershed as political boundary opens opportunities for extra-governmental organizations in decision-making (Cohen, 2012). 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 demonstrates 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; Karkkainen, 2004). Government actors may still be present in a participatory platform, but do not provide the source of legitimacy. Rather, they are placed in a role of co-participant alongside business interests and NGOs and authority held by the hybrid arrangement rather than the state (Karkkainen, 2004).

With corruption permeating the legal systems of many developing countries, this particular concept of legitimacy as attached to decentralization gained influence in Latin America (Wilder and Lankao, 2006; Abers, 2007; Abers and Keck, 2006). USAID, a major 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-FONAG Project Coordinator, personal communication, 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.

It follows that the concept of participation based upon the watershed territory is reflected in FONAG's mission and vision statements. Central to any organization, mission statements 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, 2014a

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 an 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 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, 2014a

The vision statement clarifies that this 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. This representation of the watershed appears in other materials that FONAG has produced for the public, such as cartoon maps emphasizing connections between rural and urban watershed residents and signs calling for shared responsibility in watershed protection.

The overwhelming scope of these statements allowed for alignments between diverse constituents to congeal and the incorporation of a plurality of interests into the alliance. FONAG's strategic plan also included a multi-scalar governance structure designed by the NGO *Fundación Futura Latinoamerica* (FFLA) that provided a representation mechanism for rural communities in the watersheds to participate in FONAG, however FONAG shelved this idea in 2012. In the end, FONAG welcomed any type of organization that financially contributed to the fund, leading to a mixed partnership structure, or following Lemos and Agrawal (2006), a platform of 'hybrid' environmental governance. While giving the appearance of openness, the platform of participation is contingent to the ability or willingness to pay for representation.

After the initial agreement between TNC and EPMAPS in 2000, TNC actively recruited other businesses and organization to join FONAG. Concerned about maintaining rivers of the watershed feeding hydroelectric dams, Quito's public electric utility company joined FONAG in 2001. The brewing company Cerveceria Nacional joined in 2003, followed by the Swiss Agency for Development and Cooperation (COSUDE) in 2005[2], and finally the Tesalia beverage company in 2007. The constituent members meet quarterly to discuss matters of FONAG, and ultimately their objectives influence the course of FONAG's action as an extra-governmental organization in its targeted watersheds.

The previous two sections demonstrate that the territorial boundaries of the water fund are produced through 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, the next section describes how this extra-governmental organization claims authority for governing the territory.

6. Constructing authority

Because FONAG is an extra-governmental organization and does not function as a state entity, it does not exercise sovereign decision-making authority to enforce compliance. While it has lines on a map designating its area of intervention, it holds no legal claims to those lands. FONAG tries to influence land use in the region by offering development projects to rural communities in exchange for conservation land-use practices. The agreements made for conservation practices between rural land users and FONAG do not draw upon government authority for enforcement. Rather, program compliance overseen by *páramo guards*, or individuals hired by FONAG from local communities to facilitate contracts with FONAG and to observe and report upon human

[2] COSUDE discontinued projects in Ecuador and transferred its constituent participation to El CAMAREN, an Ecuadorian agricultural consortium, in 2010.

activities in the páramo ecosystem. Communities risk losing the possibility of future contracts with FONAG if they poorly comply with requests.

Yet, authority moves beyond simple compliance (Okereke et al., 2009). Examining non-state market-driven governance programs, Cashore (2002) asserts stakeholders and broader civil society hold a crucial role because they ultimately grant authority 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). While FONAG gains authority through consent by offering incentives to gain agreement from rural communities, it also seeks public approval in Ecuador through education and media outreach campaigns that justify and reinforce the logic of the program as common sense. In this way, FONAG additionally seeks authority through concord – or the normalization of discursive and material practices as associated with an environmental governance arrangement (Bulkeley, 2012).

Making territory governable also includes building authority through the generation and management of knowledge. Knowledge and power are co-constituted and leverage actors, policies and practices that ultimately privilege a particular rationality in the governance of social order (Okereke et al., 2009). The process of making activities and space legible is important because governing territory requires knowing territory and becoming a source of expertise (Rice, 2010; Murdoch and Ward, 1997). After a governing entity identifies a problem that justifies extending the reach of governance into the lives of those living within its desired territory, building and managing knowledge is essential to claiming authority necessary for interventions (Murdoch and Ward, 1997).

The security narrative in PES requires expertise for generating and delivering data to inform and justify interventions (Pasgaard et al., 2017). The general gap in knowledge on páramo ecosystem processes leaves ample room for FONAG to generate expertise that would also strengthen its authority within the territory. Collecting data is therefore one major facet of FONAG as an extra-governmental entity. Several of its programs include developing and collecting data about the hydrology, climate, biodiversity and human activities within the páramo ecosystem. Part of the páramo guard program, for example, involves regularly recording notes on human activities and landscape changes as they make their rounds through targeted areas. FONAG has also set up a network of climate monitoring stations throughout the watershed that continuously collects data on precipitation, humidity, and temperature. Furthermore, its Vegetation Restoration program works extensively to develop knowledge of páramo vegetation, particularly the impacts of different kinds of vegetation on soil moisture or carbon sequestration. FONAG is generating bountiful data and expertise about the páramo surrounding Quito, which it can then use to justify the authority of its influence on action within its territory.

Literature of PES as an environmental governance mechanism tends to stress the role of incentives on driving land use decisions by ecosystem services producers. However, FONAG's PES water fund arrangement constructs territory that requires a set of processes for that move beyond the transactions between buyers and sellers of ecosystem services and monitoring for compliance. Rather, the environmental governance process includes territorialization that involves the construction of authority in order to claim space and justify governing the actions within it. In addition to focusing on deal-making and compliance, FONAG gains authority by promoting itself both inside and outside its targeted territory for approval, and actively creates expertise on the ecological and social processes within its boundaries to justify intervention. FONAG uses many practices beyond the buyer-seller transaction to generate authority for territorialization. However, as seen with FONAG, power dynamics between the buyers of ecosystem services can have substantial impacts of the trajectory of territorialization.

7. The autonomy factor: the watershed as a platform for co-optation

The early designers of FONAG envisioned the arrangement was to be an autonomous entity immune to the whims of a single funding partner (FONAG designer, personal communication, 2012). Hybrid, multi-partner arrangements are often discussed as a partnership that places the state as a co-participant (Karkkainen, 2004; Lemos and Agrawal, 2006). However, questions about power and influence within these relationships between partners often goes unaddressed (Kolinjivadi et al., 2017), nor are PES arrangements discussed as dynamic entities whose practices and focus shift over time.

USAID was of the greatest early influences on the construction of FONAG as a governance mechanism. It not only supported the initial studies to establish FONAG, but also actively shaped the early development of its structure and priorities. For the first four years of the fund, FONAG did not run any intervention programs, rather allowed the trust fund to capitalize. FONAG developed its interventions following this period, including agreements with communities in the watershed. To maximize the trust fund's capitalization, FONAG's leadership sought donations to finance its early activities.

In 2007, USAID made an agreement with FONAG called "Protection of Water Sources for the Conservation of Biodiversity: Financial Mechanisms for Watershed Protection in Ecuador" (USAID, 2010). The agreement revisited the origins of FONAG as a mechanism for biodiversity conservation, and therefore prioritized interventions that focused on biodiversity conservation. The agreement required FONAG to structure itself to meet the organizational and financial reporting standards of USAID (USAID-FONAG Project Coordinator, personal interview 2012). In addition to supporting the development of materials for the education and communication programs of FONAG, USAID donated funds that went to equip and train páramo guards, and influenced the choice of targeted communities. During this period, FONAG aimed to fortify existing protected areas. The Cayambe Coca Ecological Reserve, for example, had only two park guards hired by Ecuador's Ministry of the Environment to manage roughly 4000 km^2 of land. Funds provided by USAID facilitated FONAG to hire seven páramo guards to promote conservation in the buffer zone of the protected area (FONAG Paramo Guard Coordinator, personal communication, 2012). FONAG's rural interventions targeted communities that contained areas of páramo within their territory adjacent to protected areas, but did not necessarily include geographic locations from where EPMAPS was drawing water. Although contributing financial resources, EPMAPS was largely a complacent member of FONAG.

Twelve years after the initiation of FONAG, however, EPMAPS began to assert power through FONAG. Critical of FONAG for its lack of focus on water resources and heavy focus on biodiversity monitoring, EPMAPS prompted a re-organization of FONAG that involved replacing the Technical Secretary and redefining priorities for intervention (EPMAPS Environmental Programs Manager, personal interview 2012). Although five other constituent partners of the water fund exist, EPMAPS consistently contributes 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 over 93% of the capital invested into FONAG's trust fund (FONAG, 2014b). While EPMAPS could not remove money from 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 legal jurisdiction. All work with USAID officially ended in 2014, and FONAG severed its ties with most of the other donors as well.

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. All of FONAG's rural agreements within rural communities

halted during that year while EPMAPS directed the process of hiring new employees. Those involved in setting up other water funds noted this move. Then in the process of setting up a water fund with the city of Lima, Peru, a key designer in FONAG's mechanism stated that FONAG's process taught a valuable lesson: future water funds would be built without any single constituent exceeding 50% of the base contributions to avoid the concentration of power within one primary constituent member in the future.

Since the reorganization, FONAG's constituent organization appointed yet another Technical Secretary, and the office of FONAG was relocated the EPMAPS' property. FONAG now currently coordinates its activities very closely with the priorities of EPMAPS. FONAG has also expanded its targeted territory to include larger areas of EPMAPS infrastructure development to the west of Quito, and has expanded its strategy to include direct land acquisition from private landholders deemed to be important to Quito's water supply in the original zone of the Condor Bioreserve (FONAG Technical Secretary, personal communication, 2017).

TNC has donated one parcel of land to FONAG, while both Quito's electric and water utility companies gave extra financial resources for FONAG to purchase two large private haciendas to the south of the city. While FONAG still principally engages in deal-making with communities and landowners, the privatization and direct accumulation of land sparks a new chapter in how FONAG aims to govern ecosystem services in the watershed. It also demonstrates that mechanisms like water fund PES can change over time.

As the lead contributor of funds, EPMAPS has the most influence within FONAG. Representatives of the private businesses rarely attend the constituent member meetings (FONAG Technical Secretary, personal communication 2017). Yet, both the current EPMAPS representative and FONAG's technical secretary maintain that private business participation is imperative for the sake of credibility and to maintain FONAG's status as a separate entity rather than having it officially subsumed into the water utility company. While EPMAPS is working to lessen its contributions to the water fund, it now interacts with FONAG as a tool for achieving its watershed management objectives (EPMAPS Representative, personal communication, 2017). A representative of FONAG, however, described FONAG as a separate mechanism for mediation between the water company and rural communities (FONAG employee, personal communication, 2017).

Ultimately, this section demonstrates how the balance of power can be contested and ecosystem services priorities can be redefined within a water fund PES arrangement. As an mechanism aimed at managing lands for ecosystem services, FONAG has shifted over time in which ecosystem services it prioritizes. The initial focus of FONAG's interventions aligned with TNC and USAID's objectives of biodiversity conservation and fortifying protected areas. However, FONAG currently focuses upon water resources consumed by the city of Quito after EPMAPS exerted its power. While lumped into one group, buyers of ecosystem services are uneven in power and hold diverging perspectives on what constitutes land management.

8. Conclusion

This paper examines the process of how the environmental governance mechanism of water fund PES in Latin America formed, and particularly how its formation initiated the process of creating a new territory focused on managing ecosystem services. Initiating territorialization for water fund PES includes claiming space and building authority that is not dependent on the state. FONAG as an extra-governmental arrangement does not use the state as a vehicle to gain authority to set up territories for conservation. Rather, it is able to set up its own non-state mechanisms for gaining authority. Yet, this paper also demonstrates a sub-national entity of the state—a city—as co-opting non-state generated authority to expand its territorial claims to ecosystem infrastructure.

FONAG's scenario demonstrates how an international NGO can drive the formation of a hybrid arrangement for environmental governance that evades the instability of the national-level state and generates its own authority to initiate the creation of new territories based on ecosystem service management. It also demonstrates how the governance of broadly defined ecosystem services opens a common space for otherwise unlikely alliances in a process of territorialization. The boundaries, however, are subject to negotiation between priorities of ecosystem services. Furthermore, the balance of power can be contested and ecosystem service priorities can be re-defined. Thus, changing power dynamics within the Water Fund PES can influence territory. This case demonstrates a subnational entity of the state using the participatory platform and association with NGOs and private business as a conduit for legitimacy 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 city can assert itself in a relatively apolitical manner.

The case of FONAG, as demonstrated in this paper, originated in the ineffective territorialization and enclosure of land in the state's traditional protected areas model. Throughout the world, 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 an incomplete form of land control. The shortcomings of the protected areas system inspired new arrangements for conservation, including a redefinition of territory actualized through various modalities of authority.

By constructing a conservation territory based upon a watershed, transnational organizations with a conservation interest were able to circumvent a tumultuous state and secure local partners for financing. 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 environmental governance arrangement, FONAG was able to establish rule-making authority over decisions about natural resource practices within the watershed territory. We demonstrated how FONAG partly accomplished this through mediating deal-making and compliance between urban water users and rural landholders. However, FONAG also established authority through the normalization of the environmental governance arrangement. It accomplished this through seeking approval from external audiences, such as the international conservation community and other residents of the watershed not represented in FONAG's governing structure. FONAG also constructed authority by actively generating expertise about the social and physical processes with its territory.

Adding to debates about power and social process in PES, this paper argues that extra-governmental entities can generate their own authority in setting up conservation territories and new environmental governance arrangements, and the state may use that non-state authority to strengthen its own position. As shown in this case study, the process is ongoing and dynamic, and subject to the internal power dynamics of the participatory platform. EPMAPS, with its claims on the finances of the mechanism, but limited claims on rural lands outside of the city, appears to use FONAG as a conduit to assert and exercise power.

There is scarce literature focusing on power and the territorialization process of PES schemes. We advance this line of analysis using the Ecuadorian water fund to suggest that the state, as a structure for authority, can be sidelined by business and transnational actors to set up conservation territories. In other words, non-state actors can create and claim authority through the process of territorialization predicated on a market-based conservation mechanism. However, this claim to legitimacy can be used by entities such as the city of Quito to gain influence in rural locations that were once restricted. As such, this process is critical to understanding the underlying dynamics of a particular form of environmental governance because it sets a framework for

conservation interventions that determine resource access and affect livelihoods on a local level.

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