

THESIS

PAYMENTS FOR ECOSYSTEM SERVICES AND INTERMEDIARIES:
INVESTIGATING POTENTIAL INVOLVEMENT AND PROGRAMMATIC ROLES IN
WESTERN PANAMA

Submitted by

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ABSTRACT

PAYMENTS FOR ECOSYSTEM SERVICES AND INTERMEDIARIES: INVESTIGATING POTENTIAL INVOLVEMENT AND PROGRAMMATIC ROLES IN WESTERN PANAMA

Payments for ecosystem services (PES) are a market-based conservation tool seeking to better align economic incentives with conservation by connecting beneficiaries of ecosystem services with providers of these services. A third actor group, known as intermediaries, often plays important roles in PES programs that facilitate transactions between beneficiaries and providers. Intermediaries can come from the public, civil, private, or academic sectors, and they can also operate at local up to national and international scales. As PES programs continue to expand globally, there is a window of opportunity to use lessons learned from existing PES programs to inform the development of new programs to streamline and improve their design and implementation. Examining the roles of program actors (beneficiaries, providers, and intermediaries) is a critical step in this process. My research explored the potential roles of intermediaries in PES schemes through an investigation in the Chiriquí province in western Panama where stakeholders are exploring the development of a regional PES program. I based my analysis upon information gathered from a review of relevant intermediaries literature, which identified four major intermediary roles: information exchange, administration and program implementation, networking, representation and mediation, and program design. I conducted semi-structured interviews with representatives of 34 intermediary organizations in my study region to gain an understanding of their organization's current intermediary roles and potential roles in a future PES program, their relative strengths and limitations in terms of organizational capacity, and how their organizations are connected to each other through networking and

collaborations. I performed qualitative analysis using coding and NVivo9 software. My results demonstrate that intermediary organizations are currently performing each of my identified intermediary roles, with information exchange and administration and project implementation being the most common roles. Most interviewees also identified their organization's potential roles in a regional PES scheme, and collectively these roles covered all of my identified intermediary role categories. I also found that interviewees identified challenges that could limit the activity and effectiveness of intermediaries. These challenges related to three general categories: challenges specific to an individual organization, challenges across the entire region, and challenges pertaining to an entire sector (e.g., public sector limitations). Finally, I found that organizational connections vary significantly, with the civil and public sectors, and local and regional scales exhibiting the strongest connections across the organization network, highlighting the value of connecting PES actors across sectors and scales. Overall, my results support previous findings that careful consideration of actors is critical to the appropriate design and implementation of PES programs.

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CHAPTER I

THESIS INTRODUCTION AND LITERATURE REVIEW

Introduction

Payments for ecosystem services (PES) represent a major new tool for achieving conservation outcomes on private and public lands, and PES experimentation is occurring throughout the world. PES schemes require the involvement of buyers (who are users and therefore beneficiaries of ecosystem services) and sellers (who are providers of ecosystem services), and in nearly all cases, also intermediary actors who serve a diverse set of roles that facilitate connections between buyers and sellers. The role of PES intermediaries, the focus of my thesis project, is important in informing the design of PES projects, as well as in successful PES operation. Intermediaries often perform a ‘balancing act’ between buyers and sellers of ecosystem services. They can represent a range of interest sets, and they can function as boundary organizations bridging biophysical, political, cultural, and administrative boundaries.

My thesis examines the potential roles of PES intermediaries in the context of Chiriquí province in western Panama where stakeholders are actively exploring the development of a regional PES program. Home to La Amistad National Park, a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage designated biosphere reserve, Chiriquí province is a biologically diverse and agriculturally important region of Panama facing mounting pressure from myriad environmental, economic and livelihood concerns. Determining PES program potential in this region requires a variety of information (e.g., biophysical quantification of ecosystem services flows, economic valuation) to determine whether conditions are right to link potential ecosystem services buyers and sellers. Also key to PES design are the organizations that play a direct role as intermediaries linking ecosystem services buyers and

sellers. My thesis work builds directly upon an earlier study by Duke (2010) that explored the potential involvement of landowners as ecosystem service sellers into a future PES scheme in the study region. Specifically, my research explores the potential for intermediary actors to facilitate linkages between ecosystem services buyers and sellers. Exploration of this linking piece will directly inform the region's PES feasibility analysis, while also contributing to a broader understanding of the role of intermediaries as investment in PES programs continues to expand globally.

Thesis Organization

My thesis begins with a literature review of relevant sources of information on ecosystem services, payments for ecosystem services, and intermediary actors. I discuss intermediaries as they pertain to PES and in a more general context. In Chapter II, I present my research in the context of a self-contained chapter being prepared for a peer-reviewed publication. In Chapter III, I provide a more in-depth discussion of the study limitations, recommendations and possible future research directions. The next section contain References, followed by Appendix I, which contains supplemental interview materials and Appendix II, which presents tables and figures.

Objective

The objectives of my research were to: (1) identify and engage entities in the study region that could serve as intermediary actors in a future PES scheme by connecting ecosystem services buyers and sellers; (2) explore the potential roles of PES intermediaries related to factors such as acting as bridgers, mediators, providers of information and technical support, and representatives of interests for ecosystem services buyers and sellers; and (3) provide guidance to stakeholders

about possible ways to design a PES program to effectively integrate intermediary actors. I explored this topic through semi-structured interviews with organizations working in Chiriquí province in western Panama where stakeholders are exploring the development of a regional PES program. The results of my research provide information to relevant stakeholders about PES feasibility in the study region, and my results also contribute to the broader scholarly and practitioner conversations related to using PES as a tool for achieving conservation and livelihood outcomes.

Literature Review

Ecosystem Services: Human dependence upon nature

Human societies depend upon nature for a diverse array of benefits that support human well-being. Humans have understood this dependence for a long time. For example, the ancient Greek philosopher Plato (estimated 428–348 BCE) recognized that problems of soil erosion and reduced water flows were linked to deforestation in the historical Greek region of Attica (Mooney & Ehrlich, 1997). In recent decades, the interdisciplinary field of ecosystem services focused on human-nature dependence has emerged and represents a major area of inquiry into understanding the current state of Earth's ecosystems and their ability to support human well-being (MA, 2005).

Broadly defined as benefits that humans derive from nature, *ecosystem services* represent a diverse array of benefits that support and fulfill human lives (Daily, 1997; MA, 2005). According to the Millennium Ecosystem Assessment (MA), a seminal report in this field published in 2005 based upon the work of over 1,300 international scientists, ecosystem services can be divided into four overarching categories (MA, 2005): (1) *provisioning services* (also

referred to by others as ecosystem goods) such as food, water, and timber; (2) *regulating services* such as processes by which ecosystems help to regulate the climate or purify water that passes through them; (3) *cultural services* such as recreational and educational activities and the aesthetic and spiritual fulfillment humans realize by connecting with nature; and (4) *supporting services*, which are needed to support the production of services in the preceding three categories. Examples include nutrient cycling, soil formation, and net primary production.

Across the MA's multiple major findings about the current state of ecosystems and their ability to support human well-being, a consistent theme that emerged is the notion that human actions are depleting Earth's natural capital and ecosystem services at a global scale. The extent and rate of depletion is placing increasing strain on the ability of Earth's ecosystems to support the basic needs of current and future generations. Based upon an analysis of trends between 1950 and 2000, the MA (2005) reported that 15 of 24 ecosystem services (approximately 62%) examined at a global scale were being degraded or used unsustainably; this includes 70% of regulating and cultural services. In contrast, provisioning services represent the major category where enhancements in service production were realized over this time frame. Specifically, increases were identified for crops, livestock, and aquaculture, as well as the regulating service of carbon sequestration (contributing to global climate regulation). As a note, supporting services were not included in this analysis since they are not directly used by people as are provisioning, regulating, and cultural services. This "balance sheet" of ecosystem services that were enhanced versus degraded motivates an important societal challenge: human societies at local to global scales are faced with a tension between providing for near-term human needs (e.g. through provisioning services such as food) while also supporting ecosystem services that provide for long-term sustainability (e.g. through regulating services such as water purification) (MA, 2005).

The MA states that addressing this tension and reversing ecosystem degradation over the next 50 years is possible, but that to do so will require substantial changes in policy and practice, most of which are not currently underway or are just in their infancy.

Building upon the MA and a growing range of related efforts, ecosystem service approaches are becoming an increasingly important focus of conservation efforts in diverse countries across the planet. With this new approach is coming a new set of methods for conservation that, at least partially, provide alternatives to conservation techniques used in recent decades. According to Goldman et al. (2008), “Where traditional approaches focus on setting land aside by purchasing property rights, ecosystem service approaches aim to engage a much wider range of places, people, policies and financial resources in conservation.” With the new ecosystem services approach has come new strategies and tools for advancing conservation efforts. The most prominent tool being explored is broadly termed *payments for ecosystem services* – a tool that seeks to better align economic incentives with conservation, and the tool that provides the focal point for my thesis project.

Payments for Ecosystem Services

Payments for ecosystem services (PES) are a relatively new incentive-based approach to natural resource management and ecosystem stewardship in which users of ecosystem services compensate landowners who protect, enhance, or restore ecosystem services through their land management and land use decisions (Engel, Pagiola, & Wunder, 2008). According to Jack et al. (2008), “The PES approach is based on a theoretically straightforward proposition: pay individuals or communities to undertake actions that increase levels of desired ecosystem services”. A widely cited formal definition of PES by Wunder (2005, p.3) is as follows: “(a) a

voluntary transaction where, (b) a well-defined environmental service (ES) (or a land-use likely to secure that service), (c) is being ‘bought’ by an (minimum one) ES buyer, (d) from an (minimum one) ES provider, (e) if and only if the ES provider secures ES provision (conditionality).” Note that the term *environmental service* used in this definition is synonymous with my use of the term *ecosystem service*; both are found in the broader literature.

From an economic perspective, PES provides a market-based approach for achieving environmental outcomes by providing a way to internalize economic externalities, a problem that has long been recognized and studied in the environmental economics (and broader economics) literature (Turner & Daily, 2008). Globally, PES schemes are primarily being deployed in relation to carbon sequestration, water-related services, and biodiversity (Carroll & Jenkins, 2010). By the early 2000s, over 280 PES-type programs were found to be operating or in development (Landell-Mills & Porras, 2002), and substantial growth has occurred in recent years.

The Ecosystem Marketplace, an internet-based information portal for PES, recently compiled information on major PES programs around the world. The market values identified through Ecosystem Marketplace reports provide a partial indication of the scale of markets. For biodiversity, 39 existing programs and an additional 25 programs in varying development stages were analyzed (the primary focus was North America rather than globally due to information limitations), all totaling a minimum annual market size of \$1.8-\$2.9 billion (Madsen, Carroll, & Moore, 2010). For carbon markets, a minimum of \$149.2 million has been transacted to-date for forest carbon offset credits (the primary source of carbon credits that relate directly to ecosystem stewardship), with the larger set of carbon markets (voluntary and regulatory) trading in the billions of dollars (Hamilton et al., 2010). For watershed markets, 216 payments for watershed programs were identified and analyzed, though only 113 were functioning with active

transactions. These active programs were estimated to have a market value of \$9.2 billion (Stanton et al., 2010). Furthermore, these programs contributed to the protection of 289 million hectares (ha) in 2008, divided as follows: China (270 million ha), the United States (16.4 million ha), Latin America (2.3 million ha), and Asia, Africa and Europe (<0.2 million ha) (Stanton et al., 2010). Across carbon, water, and biodiversity PES schemes, substantial growth is expected in the coming decade.

PES is being tested in regions around the world, from the pioneering national program in Costa Rica started in 1997 (Daniels et al., 2010), to water funds across Latin America (Stanton et al., 2010), steep-slope land conversion in China (Zhang, Tu, & Mol, 2008), and watershed health in the United States (Stanton et al., 2010), amongst many others. With the growing focus on PES has arisen an increasingly sophisticated and lively debate about the potential benefits and drawbacks of this market-based approach for achieving environmental outcomes. Below, I discuss the current state of knowledge and debate regarding PES. Beforehand, however, I note that most PES projects have only been implemented in the last decade, so long term results have not yet emerged. Furthermore, most existing programs have only been partially evaluated in the literature (Engel et al., 2008). As such, the discussion below should be considered up-to-date, but still preliminary and subject to change as PES application continues to evolve in the coming years.

PES Benefits

There are multiple recognized benefits that PES projects have been found to achieve for ecosystem stewardship and communities. PES can positively impact landowners' perceptions of environmental protection and increase participants' awareness of the linkages between

ecosystem services and human well-being. Many ecosystem services are considered externalities from the perspective of landowners, which gives landowners little incentive to produce these services (Goldman, Thompson, & Daily 2007; Pagiola et al., 2007). Accordingly, placing a monetary value on these services can demonstrate to PES participants the value of conserving such services (Pagiola et al., 2007; Engel et al., 2008). For landowners such as farmers, ranchers, and forest managers whose livelihoods depend on extractive activities or subsistence agriculture, the most suitable PES approaches may be those that provide incentives for implementing improved extraction and land-use practices that also result in enhancement of ecosystem services (Rosa, Kandel & Dimas, 2004). Key on-site environmental benefits of PES programs (e.g., reduced dependency on chemicals, water savings, increased soil fertility, and shade) are often initially overlooked by landowners, but these benefits can be quickly realized once a program is implemented on their land (Pagiola et al., 2004).

Numerous studies have demonstrated that PES can protect and restore ecosystem services more cost-effectively than alternative human-built, technological approaches (e.g., Ferraro 2001; Ferraro & Kiss, 2002; Ferraro & Simpson, 2002; Pattanayak, Wunder, & Ferraro, 2010). Related to this is the potential for PES to result in equal or greater net economic benefits than alternative approaches due to the opportunity for the PES program to protect ecosystem services (what is often termed *co-benefits*) on top of the targeted service (e.g., a payment for watershed services program may also enhance carbon sequestration and habitat for biodiversity) that result from changes in land use and land management practices (Goldman et al., 2007; Kroeger & Casey, 2007; Naidoo, Malcolm, & Tomasek, 2009).

PES programs can also be beneficial in facilitating increased communication amongst diverse stakeholders. PES can be useful for alleviating upstream and downstream stakeholder

tensions, indicating its potential as a conflict resolution tool (Kosoy, Martinez-Tuna, Muradian, & Martinez-Alier, 2007). Some PES program results have shown increased community self-policing, regulating, law enforcement, and landowner awareness, which highlight the important role of PES in community self-empowerment (Kosoy et al., 2007; Pagiola et al., 2007). This education of environmental and community awareness is an essential component to ensuring PES success and long-term sustainable development more broadly. Empowering local landowners with education and a monetary incentive to redefine their stewardship practices can be a sustainable investment in community self-sufficiency.

PES Challenges

While there are many benefits to PES schemes, there are also several key challenges that will need to be addressed if PES is going to continue advancing as an effective conservation strategy and policy tool. Theoretical analysis and analysis of existing programs point towards potential programmatic inefficiencies, such as lack of additionality, leakage, and incorrect payments (Engel et al., 2008; Pattanayak et al., 2010). Lack of additionality refers to situations such as when payments are provided to landowners who were already going to conserve their land or supply targeted ecosystem services for another reason (e.g., for financial, legal, or environmental reasons) (Engel et al., 2008; Ferraro & Pattanayak, 2006; Pattanayak et al., 2010). Leakage or spillage occurs when activities that damage ecosystems (e.g., land clearing) occur outside the PES programmatic region due to market pressures and/or increased land demand (Engel et al., 2008; Robertson & Wunder, 2005; Pattanayak et al., 2010). As such, leakage can offset the positive environmental outcomes that may have been achieved within the project region. Incorrect payments can occur one of two ways. First, landowners could be paid an

insufficient amount for their land, thus keeping poor land use practices or degraded lands in production. Second, payment amounts could be too high, resulting in an inflated payment price for the services being produced (Engel et al., 2008). An additional concern regarding PES projects raised by Engel et al. (2008) is a lack of PES project permanence, meaning that project benefits will be realized for a sustained period of time (which is defined differently in different programs, but common time periods are, for example, 10 -20 years, 50-100 years, or in perpetuity). Permanence might be affected by external factors such as market or agricultural demands that compel landowners to reverse adopted land uses or land management practices resulting in negative impacts on ecosystem services. Lack of secure, long-term funding sources for a PES program can also jeopardize permanence (Engel et al., 2008; Swart, 2003).

For landowners, altering production practices to meet programmatic requirements to supply ecosystem services into a PES program can under certain circumstances result in an income loss to the producer (Pagiola et al., 2007; Swinton et al., 2007). This loss is often due to high upfront costs for activities such as planting trees (or other vegetation changes), or the need to diversify crops. While high upfront costs can be addressed within the program design (e.g., larger upfront payments to landowners to cover these upfront costs), it still remains a notable challenge for PES projects to address. This is a particular concern for poor populations who would face disproportionate financial challenges in covering upfront costs to participate in and benefit from a PES contract.

A 2009 report by Ecosystem Marketplace claims that a majority of schemes labeled as “PES” are similar to PES but do not actually fulfill the entire PES definition. They point out two major areas of where PES-type schemes fail to follow-through: (1) failure to cultivate buyers, and (2) avoiding the PES provision of conditionality (Wunder, 2009). Many PES projects have

failed to look elsewhere besides external donor assistance for funding options; they do not explore the potential for long-term funding among the actual ecosystem service beneficiaries. Second, many PES implementing teams are concerned about altering their carefully constructed relationship with the ecosystem providers, who are often poor landowners, by enforcing a formal business practice of conditionality which is to pay providers only when they deliver the service(s) they previously agreed to deliver (Wunder, 2009).

While there are diverse lessons learned from existing PES schemes and theoretical considerations, it is important to note that appropriate research and stakeholder engagement in project design and implementation could aid in enhancing the potential to deliver environmental and social benefits while minimizing problems. Indeed, this notion of identifying the “right” set of questions to answer to proactively inform the feasibility analysis for a PES project is the driving motivation for my thesis project, as described below.

PES and Livelihood Improvement

PES has the potential to play a critical role in sustainable development, especially in developing countries, by addressing environmental and social objectives (e.g., particularly related to rural livelihoods). PES schemes directed towards economically challenged communities could simultaneously improve livelihoods and ecosystem management (Rosa et al., 2004). The basic concept of PES is fairly straightforward (users of ecosystem services pay suppliers), however how a program is defined and administered can have substantial impacts on the degree to which the environmental goals of a PES project are achieved, while also providing either positive social outcomes or alternatively ensuring that no negative social impacts result (Pagiola, Arcenas, & Platais, 2005). My research focuses on the economically developing region

of western Panama, which makes the link between PES and livelihood improvement and other social objectives especially important.

Developing countries contain a large portion of the world's tropical forests, which are essential to providing ecosystem services (Pattanayak et al., 2010). Developing countries also contain a majority of the world's poor, which makes for an especially fascinating setting in which to employ poverty and ecosystem degradation reduction measures such as PES (Pattanayak et al., 2010). In their analysis, Pattanayak et al. (2010) synthesized a multitude of current PES literature and ascertained, "Whether or not poverty alleviation is an explicit side objective, the poverty impacts of PES are clearly relevant in developing nations... [A]lthough conceptual models suggest PES can alleviate poverty under some conditions (Kerr 2002; Pagiola et al., 2005; Wunder, 2008), the quantitative, empirical basis for attributing changes in poverty to PES remains limited (p. 261)."

The potential effects of PES programs on poor populations vary from case to case. Pagiola et al. (2005) identify that poor populations will be best able to participate in PES projects if they meet three criteria: (1) 'eligible' (in the correct location), (2) 'disposed' (the payments they will receive are greater than the cost of them providing the service), and (3) 'able' (e.g. they own land rights or title). Authors such as Zilberman et al. (2008) conclude that the impact PES will have on poor populations depends on the size of their farm, their diversity of wealth sources (where their money is located or invested) and other effects such as a change in the price of food or land (since PES participation may reduce land available for agricultural production) (Pattanayak et al., 2010). Poor landowners have also been found to be highly risk-averse; they are often reluctant to switch to new land-use practices, especially if they do not consider the payment to be sufficiently high (Jack et al., 2008).

It is possible that PES schemes will only be able to make a marked contribution to poverty reduction if they pay program participants significantly higher prices than what they normally would earn from their land or than the ecosystem services are actually worth (Jack et al., 2008). This raises concerns regarding incorrect payments (described previously) and possible tradeoffs between poverty alleviation goals and PES program efficiency.

Another important consideration in PES schemes in developing countries is consideration of social equity concerns. A large portion of ecosystem services originates from natural landscapes and rural areas where people are closely linked and directly dependent on their natural environment (Carroll & Jenkins, 2009; Rosa et al., 2004). PES schemes will need to secure participation opportunities for people and communities directly dependent on the land and small-scale subsistence farmers (Carroll & Jenkins, 2009).

The potential benefits of PES in developing countries and the need to modify programs to fit the context-specific region is evident (Carroll & Jenkins, 2009). Due to the political, social, and geographic context of each situation, appropriate policy design and program goal achievement will be essential for successful program implementation (Jack, et al., 2008). “The importance of context in achieving policy goals emphasizes that no single policy is right for every scenario. Previous experience with incentive-based approaches suggests that it is unlikely a PES approach will always be able to simultaneously improve livelihoods, increase ecosystem services and reduce costs (Jack et al., 2008, p. 9469).” The potential trade-offs involved in making these decisions need to be carefully considered on a context-specific basis.

PES Considerations

The previous sections highlighting benefits and challenges to PES demonstrate that there is no one ‘right’ way to develop a PES project. It is apparent that development of PES projects should be carefully and thoroughly researched to determine if it is the most appropriate conservation tool for the specific situation, and if so, which contextual factors could influence its appropriate design and implementation. “PES in other words is not a single tool, but an entire toolbox with different instruments for different circumstances. To achieve the sustainable management of ecosystem services, PES schemes must be designed and implemented carefully, intelligently, and adaptively (Carroll & Jenkins, 2009, p 3).” Motivated by this important recognition, my thesis research was designed to investigate the potential involvement of intermediary actors in a PES scheme and the potential roles of these actors in program design and implementation. To help set the stage for this focus, the next section discusses the general types of actors involved in PES schemes.

Actors in Payments for Ecosystem Services

Designing, implementing, and maintaining a PES scheme requires the involvement of a set of key principle actors. As Wunder’s (2005) PES definition indicates (as stated in full above), PES is a transaction that involves at minimum one ecosystem service buyer and one ecosystem service provider. While providers (or sellers) and users (or buyers) are the two main actor categories, a third group – generally called *intermediaries* (described further in the next subsection) – is often needed to connect these two. Figure 1 illustrates the principle actor groups in a

Principle Actors in PES

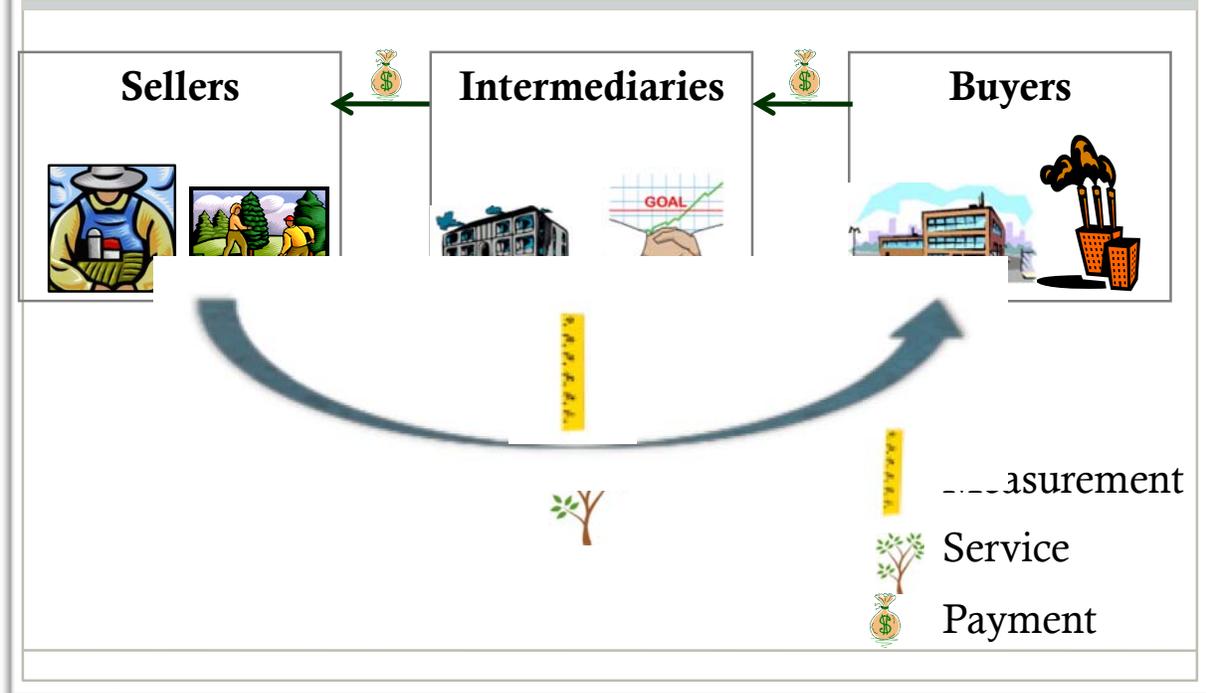


Figure 1. Principle Actor Groups in Payments for Ecosystem Services.

PES scheme, with providers and users on opposite ends connected by intermediary organizations who are performing tasks such as measuring ecosystem services and administering payments (among many other possible roles).

Users of ecosystem services are actors benefiting directly or indirectly from ecosystem service provision. Users generally are identified as being in the private sector (e.g. hydropower producers who benefit from land management practices and land uses that reduce sediment erosion affecting hydropower production) or government agencies acting on behalf of the public good (e.g., supporting reforestation or forest conservation to protect wildlife habitat). Actors on the provider side are “those organizations and individuals who govern the land and therefore can

influence the level of ecosystem service flow” (Koellner et al., 2008, p. 747). Engel et al. also describes providers as “those actors who are in a position to safeguard the delivery of the ecosystem services (2008, p. 667).” Providers can include the private sector (e.g. agricultural producers, forest companies), government organizations (e.g. a national park administration), or non-governmental organizations (NGOs) (e.g. land conservation group) (Koellner et al., 2008).

Effectively linking users and providers through a PES scheme is challenging given the complex environmental, geographic, political, economic and social contexts in which PES operates. This reality motivates the potentially important roles of intermediary actors in PES design and successful operation (Moss, Medd, Guy, & Marvin, 2009). Intermediaries can “possess the ability to work across the often impermeable boundaries between different actor groups, arenas of actions, or geographical scales which have characterized the governance of these infrastructure systems in the past” (Moss, 2009, p. 1481).

Intermediaries is a term used to describe actors operating between other groups, but formal definitions vary. A recent literature review of intermediaries found that the term is used in a multitude of ways across disciplines, to describe individuals as well as groups (Medd & Marvin, 2008; Moss et al., 2009). The literature review concluded, “What is clear is that the definition of an organization as an intermediary refers to the character of work they do rather than the characteristics of the organization itself. It is the work that an actor, of whatever form, performs that constitutes it as an intermediary” (Moss et al., 2009, p. 21).

For the purposes of my research, I define PES intermediary actors (or intermediaries) as those actors who play a connecting role between users (or buyers) and providers (or sellers) in a PES scheme. This definition does not limit the type of actors involved, but rather follows in Moss et al.'s (2009) footsteps in defining intermediaries by the work they perform instead of their

organizational characteristics. These intermediaries could be actors from government agencies, NGOs, local organizations, municipal offices, private consulting groups, regional or transnational foundations, as well as other organizations.

The Role of Intermediaries in Payments for Ecosystem Services

Intermediary actors are seen as a go-between, a source of resources providing trustworthy information to all involved actors. “The conflicting interests of stakeholders who nevertheless have to work together have created a role for ‘honest brokers’ who can stimulate and facilitate PES” (Pham, Campbell, Garnett, Aslin, & Hoang, 2010, p. 64). Intermediary actors have been shown to fill this role of a trustworthy agent, brokering information, negotiations, and representing interests for all involved actors (Howells, 2006; Moss, 2009; Moss et al., 2009; Pham et al., 2010; van Noordwijk et al., 2007). An information gap often exists between providers and users; both are interested in understanding how they will be affected by a PES scheme but are cautious of their information source(s). Intermediaries serving in a role as honest brokers have the potential to be key to the proper design of a PES program; true representation of actor interest, provision of comprehensive information, and helping to bridge gaps between actors can all motivate proper PES design. Particularly in developing countries, it has been found that PES is not well understood by ecosystem services providers, users, and others such as decision makers and the general public (Pham et al., 2010). It has been found that in order for PES projects to succeed, recognition of competing viewpoints from diverse actors involved in environmental decisions must be acknowledged to promote legitimate decision-making (Corbera, Brown & Adger, 2007). Legitimate decision-making also requires that the ‘mediating

organization’, or intermediary establishing the market scheme is trusted by those in the community (Corbera et al., 2007).

Intermediaries often try to balance needs between users and providers of ecosystem services, in order to represent both sets of interests as well as to establish trust with both sets of actors (van Noordwijk et al., 2007). Intermediaries are often the go-between actors, facilitating transactions between buyers and sellers in PES schemes. The literature identifies a multitude of roles that an intermediary could play, particularly in a PES scheme (Table 1).

Table 1. Potential roles for PES intermediaries synthesized from PES and other relevant intermediaries literature (Corbera et al., 2007; Howells, 2006; Khurana, 2002; Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008; Milder, Scherr & Bracer, 2010; Mike & Simon, 2008; Moss, 2009; Moss et al., 2009; Pagiola et al., 2005; Peskett, Schreckenberg, Brown, 2011; Pham et al., 2010; Swallow et al., 2009; van Noordwijk et al., 2007; Vatn, 2010; Wertz-Kanounnikoff & Kong-Apirak).

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| Information Exchange | <ul style="list-style-type: none"> -Providing accessible information about the PES concept to stakeholders and public -Providing information to potential participants about how the program works. -Assisting with information sharing between buyers, sellers, and other groups involved in the PES program. |
| Administration & Program Implementation | <ul style="list-style-type: none"> -Promoting and publicizing information about the PES program. -Project administration, managing contracts, and administering program funds. -Monitoring and evaluation -Providing assistance with paperwork, and program eligibility requirements |
| Networking, Representation & Mediation | <ul style="list-style-type: none"> - Convening stakeholders to for input into program design and contract negotiation -Representing interests and concerns related to program participants. -Where appropriate, acting as a neutral third party. -Serving as honest brokers of information and resources across program participants. -Helping to establish trust between program participants. -Facilitating connections among organizations. |
| Program Design | <ul style="list-style-type: none"> -Informing program design (e.g. target ecosystem services, landowner eligibility, payment structure, geographic boundaries). -Developing program standards and guidelines, including a protocol for monitoring & evaluating the program. |

Van Noordwijk et al. (2007) describe three major roles of PES intermediaries in bridging the relationship between buyers and sellers:

First intermediaries are considered as ES [ecosystem service] supporters who can clarify the 'real' interests of potential buyers and sellers in scoping and stakeholder analysis stage and facilitate negotiations to speed up arguments. Second, intermediaries can act as public advisors who give opinions to influence regulatory frameworks or the decisions or actions of other stakeholders in the process. Third, intermediaries can be involved as certifiers who (formally) confirm and guarantee the robustness of contracts.

The major roles of intermediaries in voluntary ecosystem services agreements are listed by van Noordwijk et al. (2007) as the stages of (1) scoping, (2) stakeholder analysis, (3) negotiations, and (4) implementation and monitoring of agreements.

Intermediaries can be a variety of actors, from individuals to organizations to a collection of collaborative groups that are connected in some way to different PES stakeholders. These intermediary actors span scales including local, regional, national, and transnational.

Intermediaries perform a variety of tasks, depending on their strengths or abilities, the context in which they are working locally and regulatory measures (van Noordwijk et al., 2007; Pham et al., 2010; Pagiola et al., 2005; Mike & Simon, 2008; Moss et al., 2009). Intermediaries can perform a range of institutional tasks, including: promotion of programs, administration of paperwork, funds and support, supervision, payment distribution and monitoring (measurement) of ecosystem services (Pagiola et al., 2005).

They [intermediaries] also transfer knowledge and resources between groups, increase market competition, and exert political influence. This provides both ecosystem services sellers and buyers with filtered and interpreted information, which can in turn reduce their exposure to risks and transaction costs and help local institutions develop (Pham et al., 2010, p. 64; see also Khurana, 2002; Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008).

In many PES schemes, the intermediary is found to be the “...dominant agent-whether the state, firms, or NGOs of various kinds. The intermediary defines the good, establishes the group of ‘sellers’ and ‘buyers’ and even often set a predefined price” (Vatn, 2010, p. 1247).

Intermediaries can provide significant nonmonetary benefits and compensation to involved stakeholders, such as training courses, negotiations between upstream and downstream individuals and communities, and improved internal organization (Wunder, 2006).

Intermediaries can also be useful when working with multiple providers in order to reduce costs and streamline the process (Jack et al., 2008).

There is a limited amount of data available specifically on the role of intermediaries in PES, especially on the services that are provided through intermediaries and the financial costs that exist for involving an intermediary actor (intervention costs) (Bracer et al., 2007; Moss et al., 2009, Pham et al., 2010). What information does exist is mainly theoretical in nature and does not provide practical examples of cases (Bracer et al., 2005; Pham, et al., 2010).

Intermediaries can assist in informing PES design, which is particularly important when considering a program design focused on enhancing livelihoods, as is the goal in my proposed research. Case studies of PES projects in Vietnam have indicated that in order to “make PES conditional and pro-poor, the intermediaries acted as bridge builders, mediators, arbitrators, equalizers, developers of standards, representatives, and watchdogs in all four PES cases” (Pham et al., 2010, p. 64). The poorest part of the population is often found to have limited knowledge of PES and a limited voice in the decision making process (Hovland, 2003; Huang & Upadhyaya, 2007), which increases the risk of other actors with more power exploiting those with limited power and voice (Pham et al., 2010). Intermediaries can act as agents for underrepresented

populations, and often assert influence and power in order to make the economically and/or socially disadvantaged population's opinions heard with greater weight.

The case studies also demonstrated that intermediaries aided in bridging the knowledge gap between policy makers, organizations and others with differing expectations and terminology through conversation and by editing prepared presentations appropriately for the target audience (e.g., ES buyers) (Pham et al., 2010). Other case studies have demonstrated the need for intermediaries operating at different scales to contribute to 'research, training, certification, funds management, market access, etc.' (Rosa et al., 2004, p. 194).

Intermediaries have the potential to play very effective roles within a PES project. However, it is important to remember that the complexity, diversity, and diverging interests among intermediaries and their associated relationships can result in negative impacts of intermediary involvement, particularly on the poorest populations (Rosa et al., 2004; Pham et al., 2010; van Noordwijk et al., 2007). Intermediaries can reduce the amount of benefits that producers and communities receive, might be influenced by the potential to increase their profit margin with the transaction, or might negatively impact local culture or customs (Campbell & Shackleton, 2001; Mike & Simon, 2008; Pollard & Court, 2004; Rosa et al., 2004; Pham et al., 2010; van Noordwijk et al., 2007).

Intermediaries are often allocated a substantial amount of power in PES schemes (Vatn, 2010), which can have unintended results. Intermediaries are supposed to provide information to buyers and sellers about provision costs, funding options, actual uses for the collected funds, how programs should be conducted and details on the level of ES provision (e.g. through monitoring and verification). However, intermediaries have not always been forthcoming or

honest with this information, especially when they are collecting a disproportionately high amount of incoming funds for themselves as transaction costs (Corbera, 2009; Vatn, 2010).

The complex potential of intermediaries within a PES program is evident. This potential highlights the need for sound research about which organizations are operating in the study area, and how they could best contribute to (or not contribute or even impede) the design, implementation and effective management of a PES project.

PES Intermediaries as Boundary-Spanning Actors

The characteristics of PES intermediaries described above suggest the need to consider these actors as boundary-spanning actors. The characteristics of boundary-spanning actors are similar to those of intermediaries in that they serve the function of crossing and building bridges over social, political, geographic, environmental, and economic boundaries. The boundary-spanning literature provides insight into the value and influence of intermediary organizations and their boundary-spanning work.

For the purposes of this research, boundary spanning, or boundary work, is best described by Kristjason et al. (2009) as “collaborative work requiring brokering that spans the boundaries between partners.” Although there is a lack of specific literature available on the concept of PES intermediaries functioning to some degree as boundary organizations, many similarities can be drawn from the work of boundary organizations and intermediaries, which have been addressed in recent literature (see Klerkx & Leeuwis, 2008; Moss, 2009; Pham et al., 2010). It is important to note I am not proposing that PES intermediaries are in fact boundary organizations but that PES intermediaries function and contain characteristics similar to boundary organizations in the manner in which they work as brokers of information and go-

between. Identification of boundary work highlights the similar roles that both intermediaries and boundary organizations play.

Boundary spanning can indicate information transferring across a variety of geographic, political, spatial, environmental, and administrative boundaries (Cash et al., 2002). Boundary spanning work with regard to a research project entails contacting a user community, gaining access to their area, and then gaining their trust (Kristjason et al., 2009). One well-cited definition of boundary organizations is provided by Cash et al. (2003) as “organizations mandated to act as intermediaries between the arenas of science and policy.” This definition has been recently expanded since some authors critique that focusing on one boundary (in this definition the science and policy boundary) is too narrow, and the diversity of boundaries should be considered (Klerkx & Leeuwis, 2008; Waterton, 2005).

Boundary organizations conduct work at a variety of boundaries, and also collectively create boundary objects. The distinction between boundary work and boundary objects is best clarified by Kristjason et al., (2009):

Boundary work takes place between 2 or more groups that work to different standards and objectives (e.g. basic scientists evaluated by peers versus action people who are validated by political processes). Boundary objects are joint creations at the interface of communities (e.g. models, maps, assessments, contracts, posters) (p. 5049).

Boundary-spanning organizations perform many of the same roles and oversight of institutional tasks as do intermediaries, such as facilitation of accountability, use of boundary objects (as defined previously), participation across boundaries, mediation, translation, and coordination to address complementary expertise (Cash et al., 2002). Boundary organizations are seen as information sharing organizations, representing and incorporating diverse interests. Boundary organizations often work to not only bring together involved stakeholders for relevant issues, but also identify the boundaries (e.g., political, social, geographic) that must be crossed to

access these stakeholders, and to build and gain trust. Similar to intermediaries, boundary organizations are often placed in a balancing act of interests, aptly described by Klerkx & Leeuwis (2008) as “the balancing act of the boundary organizations as a ‘spider’ in the web of cross-cutting ties (p 193).”

Cash et al. (2003) identified roles that best contribute to boundary work: communication, management, and mediation, which can also be applied to intermediaries. Cash et al.’s (2003) study found that one-way, infrequent, and exclusive communication drastically limited project effectiveness. Those excluded from certain communications doubted the authenticity of information presented to them, regardless of its actual legitimacy. One group in the study (referred to by the acronym, PEAC) found that “by promoting communication that bridges the boundary between producers and users of forecasts, PEAC had increased the credibility and legitimacy of the information produced (Cash et al., 2003, p. 8088).” The second role, translation, was also identified as a role of intermediaries; translating academic jargon and presenting information at a level that all involved could understand was important to keeping communication channels open (Cash et al., 2003). The third role of mediation aided in improving the validity of the processes to participants through “increasing transparency, bringing all perspectives to the table, providing rules of conduct and establishing criteria for decision making (Cash et al., 2003, p. 8088).”

Intermediaries and boundary organizations share the distinct characteristic of their position; both are positioned between other actors, or actors and resources (Moss, 2009). Both groups take on different forms at different points in time, their roles may change over time (e.g. coordinating, and communicating) but their relative position between actor groups will stay the

same (Moss, 2009). This position between the actor groups is key to understanding how intermediaries contain characteristics of boundary organizations.

Some case studies have found that intermediary organizations see their roles adapting over time to become larger boundary organizations with multiple goals and foci:

The intermediary shifts from being a funding allocating body between government and researchers towards being a boundary organization that mediates at several boundaries, i.e. between varying constellations of users, researchers and government, hence addressing both the economic dimension (i.e. accountabilities) and the substantive dimension (i.e. bridging the different worlds of those involved in the network and their constituencies and creating mutual understanding and co-production) (Klerkx & Leeuwis, 2008, p. 186).

It is important for researchers, communities and others interested in connecting knowledge and action to clearly acknowledge that boundary spanning is an essential part of their work in order to promote different approaches to issues. Cash et al. (2002) found in their study of cases linking knowledge and action that those cases that effectively engaged participation from both sides of the boundary had higher project effectiveness than those cases where participation from both boundary sides was not achieved. In order to properly link knowledge and action, stakeholders on both (or all) boundary sides need to be involved at an appropriate level throughout the steps of engagement, translation, communication, and decision-making.

It could potentially be important to consider how and when potential PES intermediary actors function as boundary organizations, and if or how that informs the design of a PES program. The prospective link between intermediaries and boundary organizations has been presented in this section and will need to be investigated further in order to more clearly understand how intermediary actors could or already do perform boundary work and what implications that might hold for the design of PES programs.

CHAPTER II

RESEARCH INTRODUCTION, METHODS, RESULTS AND DISCUSSION

Introduction

Payments for ecosystem services (PES) are a market-based conservation tool in which ecosystem service beneficiaries compensate providers who protect, enhance, or restore ecosystem services (Engel, Pagiola, & Wunder, 2008; Daily et al. 2009; Kemkes, Farley, & Koliba, 2010; Milder, Scherr & Bracer, 2010). PES is being tested in diverse regions and contexts around the world, including regional initiatives such as the multiple ecosystem service credit exchanges developed in the Pacific Northwest (USA) by the Willamette Partnership, and efforts such as water funds across Latin America (Stanton et al., 2010), national programs such as Costa Rica's national PES program started in 1997 (Daniels et al., 2010) and China's Sloping Lands Conversion Program (Zhang, Tu, & Mol, 2008), and internationally, carbon markets and implementation of REDD+ (Oestreicher, et al., 2009). PES schemes in operation are primarily oriented towards conservation objectives, but many programs, particularly in the developing world, also incorporate livelihood and rural economic development objectives (Pagiola et al. 2005; Engel et al. 2008).

Alongside the rapid expansion of PES schemes, there has been a growing body of literature evaluating the strengths and limitations of PES as a conservation tool (Engel et al. 2008; Brouwer, Tesfaye & Pauw, 2011; Redford & Adams, 2009; Swallow et al., 2009; Vatn 2010). Recent reports have estimated that tens of billions of dollars are currently transacting through PES schemes globally, and analysts expect these amounts to continue to grow (Madsen, Carroll, & Moore, 2010; Hamilton et al., 2010; Stanton et al., 2010). This situation points towards the importance of ensuring that the development of new PES programs is fully informed

by previous experience to ensure that PES is an appropriate tool for the new context and that funds will be used effectively to achieve program goals.

Designing and implementing a PES scheme generally requires the involvement of three principle actor groups (Swallow et al., 2009). The first group is beneficiaries of ecosystem services who act as buyers in PES schemes. The second group is land managers who affect the supply of ecosystem services through land use and land management decisions and therefore act as sellers in PES schemes. While buyers and sellers are the only necessary actors for PES transactions to occur, a third group – generally called *intermediaries*– is often needed to connect these two. Efficiently and equitably linking buyers and sellers through a PES scheme can be challenging given the complex environmental, geographic, political, economic and social contexts in which PES operates. Accordingly, intermediaries can assist with PES operation by contributing to the transmission of information and resources, amongst other program functions (Moss, Medd, Guy, & Marvin, 2009; Pham et al., 2010). *Intermediaries* is a term used to describe actors operating between groups, though definitions vary across disciplines (Medd & Marvin, 2008; Moss et al., 2009). For this study, we define PES intermediaries as those actors who play a connecting role between buyers and sellers in a PES scheme. This definition does not limit the type of actors involved, but rather defines intermediaries by the work they perform instead of their organizational characteristics (Moss et al., 2009).

Role of Intermediaries

Intermediaries can be a variety of actors, from individuals to organizations to a collection of collaborative groups that are connected in some way to different PES stakeholders. These intermediaries span scales including local, regional, national, and transnational, and can include

organizations from the public (primarily government), private (e.g. consulting firms), civil society (typically NGOs), or other sectors (Kemkes, Farley, & Koliba, 2010; Swallow, et al., 2009). Intermediaries perform a variety of tasks, depending on their strengths or abilities, the context in which they are working locally, and regulatory measures (van Noordwijk et al., 2007; Pham et al., 2010; Pagiola et al., 2005; Mike & Simon, 2008; Moss et al., 2009). Intermediaries are positioned between groups or actors such as PES buyers and sellers, (Hecken & Bastiaensen, 2010; Pham, et al., 2010; Swallow et al., 2009; van Noordwijk & Leimona, 2010; Vatn, 2010). Their functions can also change over time, as projects develop (Moss, 2009). Intermediaries from the private, public, and civil sectors have been found to be the ‘dominant agent’ in some PES schemes, primarily due to their role in defining services, informing transaction prices, and engaging buyer and seller groups (Vatn, 2010).

There is a limited amount of data available specifically on the role of intermediaries in PES, especially on the services that are provided through intermediaries and the financial costs that exist for involving an intermediary (Bracer et al., 2007; Moss et al., 2009; Pham et al., 2010). What information does exist is mainly theoretical in nature and does not provide practical examples of cases (Bracer et al., 2005; Pham, et al., 2010; Moss et al., 2009). Our review of the existing PES literature on intermediaries, as well as additional key references on intermediaries more broadly, identified the following four overarching roles that intermediaries could perform: information exchange, administration and project implementation, networking, representation and mediation, and program design (Table 1; Corbera et al., 2007; Howells, 2006; Khurana, 2002; Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008; Milder, Scherr & Bracer, 2010; Mike & Simon, 2008; Moss, 2009; Moss et al., 2009; Pagiola et al., 2005; Peskett,

Schreckenberg, Brown, 2011; Pham et al., 2010; Swallow et al., 2009; van Noordwijk et al., 2007; Vatn, 2010; Wertz-Kanounnikoff & Kong-Apirak).

Information Exchange. An information gap often exists between PES buyers and sellers. Both are interested in understanding how they will be affected by a PES scheme but are cautious of their information sources. Particularly in developing countries, PES may not be well understood (at least initially) by ecosystem services buyers and sellers, nor by other decision makers or the general public (Pham et al., 2010). Intermediaries can help address these situations by providing comprehensive and stakeholder-oriented information. Intermediaries helping to bridge information gaps between actors can advance proper PES design and implementation. Case studies of PES projects in Vietnam have found the roles of intermediaries to include functions such as the transfer of information, knowledge, and resources (Pham et al., 2010, Swallow et al., 2009; see also Khurana, 2002; Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008). Intermediaries share information between various PES actors, particularly information related to contract design and implementation, and monitoring. Often, intermediaries serve a role as a trusted or authoritative information source, providing information as well as influence over actor behavior (Swallow, et al., 2009). PES intermediaries have also been shown to aid in bridging the knowledge gap between policy makers, organizations, and others with differing expectations and terminology through conversations and by editing prepared presentations appropriately for the target audience (e.g., ES buyers) (Pham et al., 2010). Intermediaries can play this important role of translating academic jargon and presenting information at a level easily understandable to all involved actors, which helps keep communication channels open (Cash et al., 2003). Intermediaries can provide information through research projects and through technical assistance to program actors (Peskest, Schreckenberg, Brown, 2011; Rosa et al.,

2004). Finally, through forms of information exchange such as training courses, intermediaries can provide significant nonmonetary benefits to involved stakeholders (Rosa et al., 2004; Wunder, 2006).

Administration and Program Implementation. Intermediaries can perform a range of administrative tasks, including: promotion of programs, administration of paperwork, support and funds, and supervision (Pagiola et al., 2005). Intermediaries have been found to encourage the support and development of local organizations and their internal structure (Pham et al., 2010; see also Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008; Wunder 2006). They can also play a role in their influence of support for other program actors, such as local NGOs and government groups administering ecosystem services production and transactions (Milder, Scherr & Bracer, 2010). Identifying and supervising appropriate conservation tasks to be conducted by ecosystem service sellers is another function of PES intermediaries (Corbera, Kosoy & Martinez-Tuna, 2007). PES intermediaries can assist with transactions, including transferring resources between PES actors, either in the form of a monetary payment or non-monetary resources, such as support and training (Corbera, Kosoy & Martinez-Tuna, 2007; Rosa et al., 2004; Milder, Scherr & Bracer, 2010; Vatn, 2010). Intermediaries can negotiate, implement, and guarantee contracts or other binding program agreements (van Noordwijk et al., 2007). Another program implementation function is monitoring, which includes the supervision of agreements, verification and measurement of ecosystem services (Pagiola et al., 2005; Peskett, Schreckenberg, Brown, 2011; van Noordwijk et al., 2007). Finally, intermediaries can work with multiple PES actors to obtain political support for a program and to increase program participation (Pham et al., 2010; Rosa et al., 2004; see also Khurana, 2002; Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008).

Networking, Representation and Mediation. Intermediaries are often seen as a go-between; they have been shown to function as trustworthy agents who assist with brokering information, conducting negotiations, and representing interests for all involved actors (Howells, 2006; van Noordwijk et al., 2007; Moss, 2009; Moss et al., 2009; Pham et al., 2010). Intermediaries can be required to balance the interests of PES actors (e.g., buyers and sellers), in order to represent both sets of interests as well as to establish trust with both sets of actors (Pham et al., 2010; Swallow et al., 2010; van Noordwijk et al., 2007). Intermediaries can facilitate negotiations and mediate between different program actors (Pham et al., 2010; van Noordwijk et al., 2007; Wunder, 2006). Specifically, intermediaries participate in roles such as contract and price negotiation (Peskett, Schreckenber, Brown, 2011). Intermediaries can act as agents for underrepresented populations, and they can assert influence and power in order to provide greater weight to the needs and concerns of economically and socially disadvantaged populations. Furthermore, intermediaries can support PES implementation by providing a means for competing viewpoints from diverse actors involved in environmental decisions to be acknowledged to promote more legitimate decision-making processes (Corbera, Brown & Adger, 2007). Legitimate decision-making also requires that those in the community trust the ‘mediating organization’, or intermediary establishing the market scheme (Corbera et al., 2007).

PES intermediaries can also perform networking functions such as facilitating connections among organizations and identifying potential project participants and opportunities. They have a major role in bridging the relationship between buyers and sellers (Van Noordwijk et al. (2007). PES intermediaries’ involvement in networking to identify program investment and funding prospects was found essential to contributing to initial project steps in Mesoamerican case studies by Corbera, Kosoy & Martinez-Tuna (2007).

Program Design. Intermediaries can assist in informing PES design, such as developing standards, scoping analyses, and stakeholder investigations, including elucidating potential actor roles and perspectives (Pham et al., 2010; van Noordwijk et al., 2007). Intermediaries have been found to aid in defining ecosystem services and prices, and in forming groups, such as buyers and sellers (Vatn, 2010). Intermediaries can also serve in an advisory role, such as providing input on PES regulations, frameworks, processes, and stakeholder actions and roles (van Noordwijk et al., 2007). Finally, intermediaries can function as honest brokers between potential PES actors during the design phase.

Challenges of Intermediaries

Intermediaries have the potential to contribute constructively to PES design and implementation. It is important to remember, however, that the complexity, diversity, and diverging interests among intermediaries and their associated relationships can result in negative impacts of intermediary involvement, particularly on the poorest populations (Rosa et al., 2004; Pham et al., 2010; van Noordwijk et al., 2007). Intermediaries can reduce the amount of benefits that producers and communities receive, contribute to a power imbalance, be influenced by the potential to increase their profit margin with the transaction, or negatively impact local culture or customs (Campbell & Shackleton, 2001; Mike & Simon, 2008; Pollard & Court, 2005; Rosa et al., 2004; Peskett, Schreckenberg, Brown, 2011; Pham et al., 2010; van Noordwijk et al., 2007; Corbera, 2009; Vatn, 2010).

Intermediary Potential in PES Programs

Careful consideration of the broader institutional context is fundamental to the successful design and implementation of PES (Brouwer, Tesfaye & Pauw, 2011; Corbera, Kosoy & Martinez-Tuna, 2007; Swallow et al 2005; Vatn, 2010). When introducing a PES scheme to a

region, program developers must be cognizant of already existing relationships between potential program actors related to social, political, economic, or environmental factors (Vatn, 2010).

Understanding the roles organizations in a region are currently conducting, how they are connected to other actors in the region, and their capacity to be involved in a PES scheme are all important considerations to selecting the appropriate group of actors to involve in a scheme. A recent meta-analysis of institutional design and economic performance of payments for watershed services found a negative correlation between the number of intermediaries involved in a PWS scheme and the effectiveness of the scheme meeting its environmental goals (Brouwer, Tesfaye & Pauw, 2011). This result highlights the importance of careful consideration of existing organizations, their functions, connections, and potential capacity for a PES program role.

Transaction costs can be high in PES programs (Hecken & Bastiaensen, 2010), so decisions about which intermediaries to involve can help minimize transactions costs. Examples include using intermediaries who foster community trust and engagement (Vatn, 2010), and intermediaries who coordinate activities across multiple sellers in PES transactions (Jack et al., 2008). Some ecosystem service studies advocate the use of pre-existing, and preferably experienced intermediaries in order to minimize program costs, such as government agencies or NGOs already working within the region (Kemkes, Farley & Koliba, 2010).

Evaluation of existing PES programs is providing an increasingly valuable set of information about the strengths and drawbacks of the appropriateness of PES as a conservation tool, and also about how program design parameters affect program success. For stakeholders exploring the PES development, this body of knowledge is essential to understanding which contexts are most appropriate for designing and implementing PES schemes.

The multi-faceted potential and limitations of PES intermediaries is evident. This situation highlights the need for sound research about which organizations are operating in a study area, and how they could best contribute to (or not contribute or even impede) the design, implementation, and effective management of a PES program. For stakeholders undertaking a feasibility assessment to launch a new PES scheme, purposeful consideration of the potential roles of intermediaries may provide program designers with valuable information to determine the most effective PES structure and which organizations could fill which roles.

Our study investigated the potential roles and involvement of intermediaries in the Chiriquí province in western Panama, where stakeholders are exploring the development of a regional PES program (Duke 2010). We conducted semi-structured interviews with potential PES intermediaries to address the following research questions: (1) What roles are intermediary organizations performing that contribute to conservation efforts in the study region, and what are the perceived organizational strengths and limitations for each of these roles? (2) What capacities do these organizations have that could contribute to the design and implementation of a regional PES program? (3) How are intermediary organizations in the study system connected, and what does this network and their organizational capacities suggest about opportunities to advance a regional PES program? Through investigating these questions, we seek to provide information that guides stakeholders in western Panama with PES program design, as well as to contribute to the broader scholarly and practitioner conversations about using PES as a tool for achieving conservation and livelihood outcomes.

METHODS

Study Region

Our project was conducted in the Chiriquí province of Western Panama (Figure 2). We focused on engaging intermediary organizations in the districts of Boquete, Renacimiento, and Bugaba, where there is active PES interest and to align our study with previous work in this region on potential landowner participation in a future PES program (Duke, 2010). Chiriquí province is globally important in terms of its biodiversity, with, for example, La Amistad National Park estimated to contain 4% of Earth's species (Clark et al., 2006). Chiriquí province is also a major agricultural region in Panama, known particularly for its vegetable production that contributes to regional and national markets.

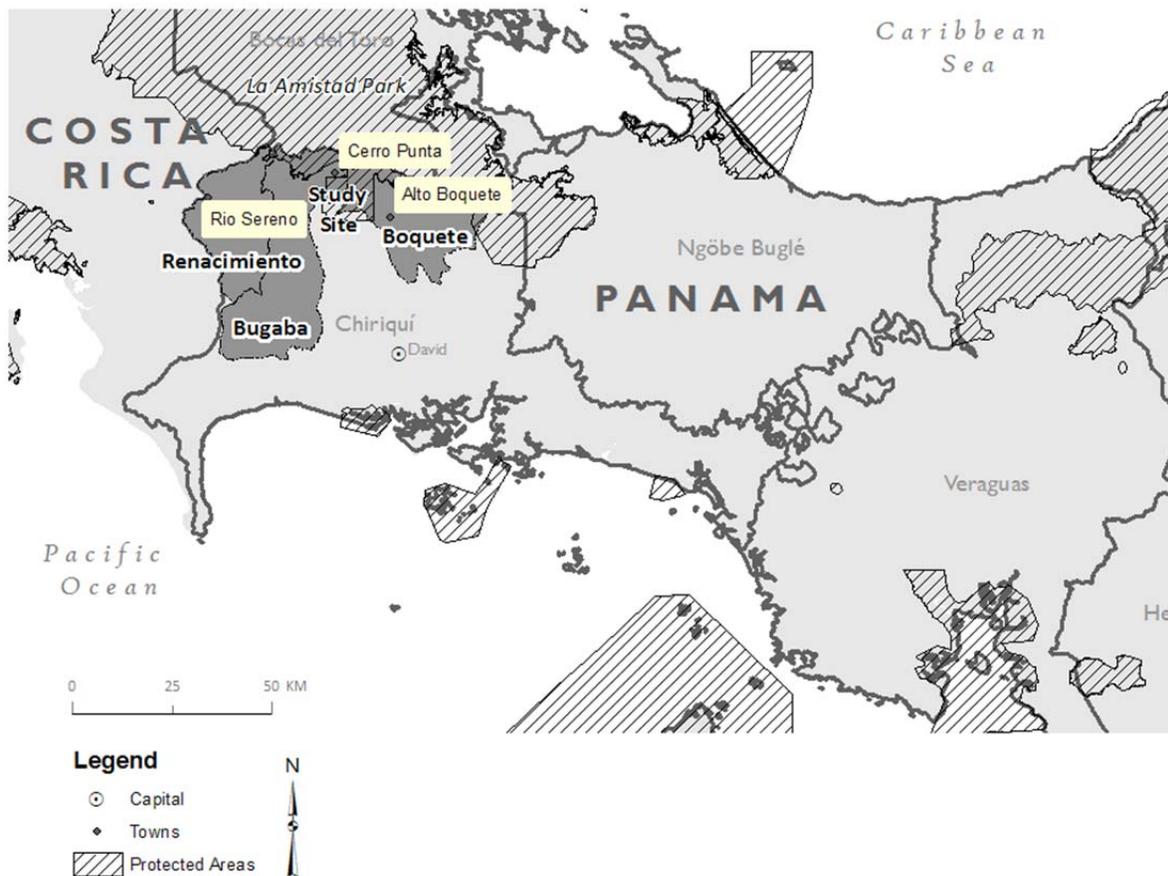


Figure 2. Map of Western Panama Study Region

As agriculture continues to expand in this region, and more intensive agricultural practices are being used (e.g., increasing fertilizer and pesticide use), concerns are rising about negative impacts to watershed health, habitat for biodiversity, and other conservation values (The Nature Conservancy, 2007). The interconnected fate of agriculture and conservation in this region has motivated diverse stakeholders to explore strategies for advancing conservation efforts, while still meeting the livelihood and regional economic needs of agriculture. Organizations from the public, private, civil, and academic sectors are collaborating to determine how best to address the environmental, economic, and social concerns of the area, primarily through building local capacity and encouraging neighboring communities to contribute towards sustainable conservation. In this context, stakeholders are exploring PES as a tool for achieving conservation and livelihood objectives. Regional interest in PES is complemented by broader analysis that also suggests that the Chiriquí province may have the right enabling conditions to advance markets for carbon, biodiversity, water, and other services (Clark et al. 2006; Gentry et al. 2007; Oestreicher et al. 2009; Shah, 2006).

Study Design

We employed a purposeful design strategy to select interviewees, which involves selecting cases for study because they are rich in information, and provide illumination to the topics in question (Patton, 2002). We targeted interviewees based on their current roles and involvement in environmental and agricultural activities in the study region. We used a purposive network sampling approach to select interviewees. This involved first conducting interviews with representatives of key organizations recommended by our two partner NGOs that facilitated our project and helped us connect with interviewees: Fundación Vida, Salud, Ambiente y Paz (FUNDAVISAP) operating from the district of Boquete, and Fundación para el Desarrollo

Integral, Comunitario y Conservacion de los Ecosistemas en Panama (FUNDICCEP) operating from the districts of Renacimiento and Bugaba. After completing this first round of interviews, we then followed the network of organizational ties that emerged from each interview (Glense 2010; Patton, 2002). We completed our interviews once we reached the point of information saturation and no new relevant organizations were suggested to contact (Glesne 2010).

We conducted topic driven, semi-structured interviews designed to investigate (1) organizational understanding of PES, (2) current organizational roles and perceived organizational strengths and limitations, and (3) each organization's perceived capacity and potential roles to contribute to a possible future regional PES program. At the beginning of each interview, we discussed the general concept of PES to have a shared understanding for the interview and also to provide information to interviewees who had limited or no previous PES knowledge. We utilized Table 1 describing the potential roles of PES intermediaries as a framework for analyzing the current roles of organizations in the study region, as well as for investigating their potential roles in a future PES scheme. We pilot tested our interview instrument with our two partner NGOs, after which we made minor adjustments, related mainly to clarifying appropriate Spanish word choice. To provide additional information and context for triangulation of results with information from the interviews, we employed additional data collection procedures, including observations, attendance of organization meetings, member checking with partner NGOs and other key contacts, and a focus on rich description throughout the study process (Glesne 2010, Patton 2002). We selected a qualitative process for this research since we determined it as the most effective manner in which to access detailed information about how different organizations of interest operated on-the ground and across their respective scales and regions (Patton, 2002).

Analysis

We transcribed and analyzed data from each interview using the qualitative data analysis software NVivo 9 (QSR International Pty Ltd. Version 9 2010). Interviews were translated from Spanish to English for transcription. We employed a grounded theory approach with a three-part coding procedure. We followed a three-part coding procedure involving first open coding of all transcribed interview data and our field notes in an iterative line-by-line process, with new codes decreasing with the analysis of each consecutive interview (Glesne, 2010; Strauss and Corbin 1998; Miles & Huberman, 1994). Second, we conducted axial coding, which involved reviewing codes and transcripts in order to group codes under more widely encompassing themes (Strauss & Corbin, 1998; Neuman, 2003) Finally, we conducted selective coding, which allowed us to find and group the data most relevant to answering our research questions (Neuman 2003). We have included interviewee quotes in the *Results* section in order to support and elucidate various findings. Quotes have been translated from Spanish to English. We identify the interviewee only by his or her organization sector and geographic scale to preserve confidentiality.

RESULTS

Study Population

We conducted interviews with individuals from 34 different organizations representing four sectors: (1) 15 civil sector organizations, including 10 NGOs, four community groups, and one civic club; (2) 10 public sector organizations, including seven provincial government and three municipal government; (3) five private sector organizations, including three businesses and two cooperatives; and (4) four academic organizations all from province-level universities (Table 2). These organizations also spanned multiple geographic scales in terms of where they operate,

including 14 local scale, 16 regional scale, and four national-international scale interviews. For the purpose of our study, the local scale includes organizations operating at or within the district level, which includes district-level or small watershed organizations, and government agencies such as municipalities. The regional scale includes organizations working on a scale larger than one district and equal to or less than the entire Chiriquí province. The national-international scale includes organizations operating across the entire nation of Panama or across multiple countries. The number of organizations differed across sector type and geographic scale due to their relevance to the study and based upon the contact recommendations we obtained through our sampling methodology.

Table 2. Organization Interviewees by Scale and Sector

| Organization Sector | Organization Scale | | | |
|----------------------------------|---------------------------|----------|----------|---------------------------|
| | All | Local | Regional | National International |
| | 34 | 14 | 16 | 4 |
| Civil Society | 15 | 8 | 4 | 3 |
| Non-Governmental Organizations | 10 | 4 | 3 | 3 |
| Community Organizations | 5 | 4 | 1 | - |
| Public | 10 | 3 | 7 | - |
| Government Agencies & Ministries | 8 | 1 | 7 | - |
| Municipal Government | 3 | 3 | - | - |
| Private | 5 | 3 | 2 | - |
| Businesses | 3 | 1 | 2 | - |
| Cooperatives | 2 | 2 | - | - |
| Academic | 4 | - | 3 | 1 |
| Public Universities | | | | |

Total n for all sector-scale interviewees = 35, Total organizations, n=34

Our total number of interviews ($n = 42$) exceeded the number of organizations that we sampled ($n = 34$), because for five organizations, we interviewed multiple individuals who represented distinctly different regions, geographic scales, or project foci within the same organization. These interviews included two representatives each from one local NGO, one regional NGO, one local government municipality, and one regional government agency. We also interviewed five representatives from one federal government agency with a large presence in the region, at local and regional scales, and across separate agency departments. Our 42 interviews included 46 individuals, as four interviews contained two people each. With regard to interviewees' positions within their organization, 21 were the director or president of their organization at their particular geographic scale, 13 were managers of an organizational department or specific project, and 12 were general organizational employees, project coordinators or members. Our interviews included 33 men and 13 women.

Our interviewees expressed that their organizations varied in their pre-interview understanding of the PES approach, including 26% with low knowledge, 31% with medium knowledge, and 43% with high knowledge. Organizations from the academic sector had the highest level of understanding, followed by the public, civil, and private sectors (high understanding = 75%, 44%, 41%, and 20% respectively). The private and civil sectors had the largest percentage of low PES understanding at 40% and 35%, respectively (low understanding public sector = 19%, academic sector = 0%). In terms of geographic scale, we found that organizations operating at larger scales had higher levels of PES understanding, with 100% of national-international scale organizations having high PES knowledge, compared to 55% of regional scale organizations and 17% of local scale organizations.

Of those interviewees who cited existing PES programs, Costa Rica's national PES program was mentioned most often (n=12). Some interviewees expressed their perception of a general lack of understanding about PES in the region. For example, one public sector interviewee believed the majority of PES knowledge resided within the government when he stated,

This is a problem. In Panama, the people don't know the concept [of PES]. First, we need to sensitize the authorities that there is a mechanism that could resolve many necessities and weaknesses in environmental [issues], hydrological aspects, forestry, and biodiversity of the protected areas. But those who understand this the best are from [public sector organization] but it is necessary to tie this [concept] to the municipalities, representatives, coordinators, civil society, schools and the normal person.

Intermediary Roles Performed by Interviewees' Organizations

We found that organizations across the public, private, civil, and academic sectors performed all four main roles of intermediaries as listed in Table 1. When considering all 34 organizations together, 97% identified information exchange, 91% identified administration and project implementation, 73% identified networking, representation and mediation, and 44% identified program design roles occurring in their organization (Table 3).

Table 3. Literature-Identified Intermediary Roles and How They are Being Performed by Interviewees/Study Region Organizations

| Literature-Identified Roles | | How Roles are Performed | | Organization Sector | | | | |
|---|-------------------------------------|-------------------------|----|---------------------|--------------|---------------|---------------|---------------|
| | | | | All | Civil | Public | Private | Academic |
| | | | | 34 | 15 | 10 | 5 | 4 |
| Information Exchange | | | | 33 | 14 | 10 | 5 | 4 |
| | | | | (97%) | (93%) | (100%) | (100%) | (100%) |
| Communicate Environmental Concepts & Program Logistics | Seminars, Trainings, & Meetings | 21 | 8 | 5 | 4 | 4 | | |
| Information Sharing & Knowledge Dissemination | Environmental Education | 20 | 10 | 5 | 2 | 3 | | |
| | Research & Technical Assistance | 18 | 4 | 6 | 2 | 3 | | |
| Inter-Group Communication at Appropriate Audience Level | Community Outreach | 14 | 6 | 6 | 2 | 0 | | |
| Administration & Project Implementation | | | | 31 | 14 | 10 | 4 | 3 |
| | | | | (91%) | (93%) | (100%) | (80%) | (75%) |
| Administration of Paperwork & Support | Facilitation & Support | 23 | 11 | 7 | 2 | 3 | | |
| Payment Administration | Funds Administration | 12 | 4 | 5 | 2 | 1 | | |
| Program Promotion, Supervision | Project Coordination, Supervision | 11 | 4 | 5 | 1 | 1 | | |
| Ecosystem Services Assessment, Monitoring | Monitoring & Evaluation | 6 | 2 | 4 | - | 1 | | |
| Networking, Representation & Mediation | | | | 25 | 10 | 8 | 4 | 3 |
| | | | | (73%) | (67%) | (80%) | (80%) | (75%) |
| Facilitate Actor Connections | Main Contact Hub for Region | 14 | 5 | 5 | 2 | 2 | | |
| Honest Brokers/Establish Trust | Credible & Trusted Source | 8 | 6 | 1 | 0 | 2 | | |
| Stakeholder Representation & Negotiation | Member & Participant Representation | 7 | 2 | 2 | 3 | 0 | | |
| Mediation | Mediation Specific Roles | 7 | 2 | 2 | 1 | 2 | | |
| Program Design | | | | 15 | 5 | 6 | 1 | 3 |
| | | | | (44%) | (33%) | (60%) | (20%) | (75%) |
| Development of Standards | Design Aspects of Projects | 14 | 5 | 5 | 1 | 3 | | |
| Informing Overall PES Design | Investigations Inform Design | 7 | | 3 | | 3 | | |
| | | 8 | 1 | 3 | - | 3 | | |

Information Exchange

We found that all public, private, and academic sector organizations were performing the roles of information exchange, with 93% of public of civil sector organizations also performing these roles. The most common type of information exchange performed by 21 organizations (8 public, 5 civil, 4 private, 4 academic) involved providing seminars, trainings, informational meetings, and hands-on field days to target audiences (rather than the public at large), particularly those involved in the region's agricultural production. The second most common type of information exchange performed by 20 organizations (10 civil, 5 public, 2 private, 3 academic) involved environmental educational programming at grade schools and universities in the region. The third most common type performed by 18 organizations (6 public, 4 civil, 3 academic, 2 private) involved the roles of research investigations and technical assistance. Seven organizations (3 academic, 3 public, 1 private) identified these roles as being their organization's primary focus, with outreach to agricultural producers being the primary audience. The fourth most common type of information exchange performed by 14 organizations (6 public, 6 civil, 2 private) was educational outreach to the community including activities such as informational fairs (e.g., water day) and participating in other community events that enable the organizations to disseminate information to, and be a source of information for, the broader public.

Administration and Project Implementation

We found that administrative and project implementation roles were identified by 100% of public, 93% of civil, 80% of private, and 75% of academic sector organizations. The most common type of administrative role performed by 23 organizations (11 civil, 7 public, 3 academic, 2 private) was facilitation and administrative support. Nineteen organizations (9

public, 8 civil, 1 private, 1 academic) described their part of this role of facilitation and support as including facilitation and coordination of meetings, events, and collaborative processes.

Another ten organizations (6 public, 4 civil) described their part of this role as support of other organizations via provision of resources such as meeting space, sharing of human, information, and financial resources, and training in administrative roles. One civil sector organization explained her organization's support of other organizations by stating,

What is certain is that all this mobilization of [organizational] management needs resources, and these small groups do not have that capacity, so there is more weight and responsibility on [our organization], because we have the vehicles, fuel, and other resources. So there is more responsibility placed on [our organization] for this project. The people are not prepared to function on their own. Small groups are not strong enough, but [our organization] is working to strengthen the people so they will get to that ability of standing on their own.'

The second most common type of administration and project implementation performed by 12 organizations (5 public, 4 civil, 2 private, 1 academic) involved administration and management of funds, between actors and for projects. The third most common type of administration and project implementation performed by 11 organizations (5 public, 4 civil, 2 private, 1 academic) involved the coordination, implementation, and supervision of projects or programs. The fourth most common form of administration and project implementation involved monitoring and evaluation of projects by 6 organizations, (4 public, 2 civil, 1 academic) primarily as a public-sector role.

Networking, Representation and Mediation

We found that networking, representation and mediation roles were being performed by 80% of private and public sector organizations, 75% of academic sector organizations, and 67% of civil sector organizations, and (73% across all sectors). The most common role performed by 14

organizations (5 civil, 5 public, 2 private, 2 academic) was networking, which was described by participants as being a main contact for people in their region to connect with other actors, as a conduit between actors, and as an entity that was well-known and could easily connect with a variety of actors. The second most common role performed by 8 organizations (6 civil, 1 academic, 1 public) was working as credible, honest, and trusted sources of information and support. Mediation-specific roles were performed by 28% of the sectors engaged in this role (2 public, 2 civil, 2 academic, 1 private), including activities such as mediating conflicts between different user groups (e.g., water allocation issues), and for some public and academic sector organizations, conducting mediation when approached by the public as fulfilling part of the organization's mission. The third most common role performed by 7 organizations (3 private, 2 public, 2 civil) involved activities to represent the interests of their organizational members or participants in their programs.

Program Design

We found that 75% of academic, 60% of public, 33% of civil sector, and 20% of private organizations were performing program design roles. The most common type of program design role performed by 14 organizations (5 civil, 5 public, 3 academic, 1 private) was overseeing the design of entire programs or contributing to the design of specific program components, such as the design of agricultural producer outreach activities, as part of larger collaborative projects. The second most common type of program design role performed by 7 organizations (3 academic, 3 public, 1 civil) was the use of investigations, research, and management plans to assist in or inform the design of programs, which was identified by 75% of the academic sector organizations.

Organizational capacity challenges to performing intermediary roles

Ninety-three percent of organizations identified organizational challenges and limitations, including a total of 31 region-wide challenges, 28 self-reported challenges specific to the interviewee’s organization, and 24 challenges related to particular organizational sectors (Table 4).

Table 4. Identified Organization Challenges

| | All | Civil | Public | Private | Academic |
|---|-----------|-----------|----------|----------|----------|
| | 34 | 15 | 10 | 5 | 4 |
| Organization Self-Reported Challenges | 28 | 14 | 8 | 4 | 2 |
| General Lack of Resources and Limitations | 22 | 12 | 7 | 2 | 1 |
| Available Funds Limit what Work is Done | 23 | 9 | 8 | 4 | 2 |
| Human Resource Limitations | 16 | 10 | 5 | 0 | 1 |
| Transportation & Equipment Limitations | 12 | 4 | 4 | 3 | 1 |
| Larger Context Limitations Reported by | 31 | 15 | 9 | 3 | 4 |
| Information Exchange is Limited in General | 10 | 5 | 3 | 1 | 1 |
| Information Available to the Public is Limited | 11 | 5 | 4 | 1 | 1 |
| Conservation Demonstrations or Examples are Limited | 10 | 5 | 3 | 1 | 1 |
| Training and Technical Support is Limited | 13 | 6 | 5 | 2 | - |
| Organization Trust and Credibility are Limited | 8 | 5 | 1 | 1 | 1 |
| Organizations Need Additional Support to Strengthen | 23 | 13 | 6 | 2 | 2 |
| Organizations Lack Access to Resources and/or Project | 12 | 7 | 2 | 1 | 2 |
| Organizations Need Help with Capacity Building and/or | 10 | 5 | 3 | 1 | 1 |
| Project Coordination and Collaboration Limitations | 9 | 5 | 3 | 1 | - |
| Representation and Mediation for Groups in the Area is | | | | | |
| Overall Sector Limitations | 24 | 10 | 8 | 4 | 2 |
| Public Sector Limitations | 21 | 8 | 8 | 3 | 2 |
| Limitations in Project or Other Sector Organization | 9 | 4 | 5 | - | - |
| Limitation in Resources to Complete Tasks | 8 | 4 | 4 | - | - |
| Limitations of a Centralized Government Affect Decision | 10 | 3 | 3 | 3 | 1 |
| Limitations of Unstable Political Change, Structure & | 16 | 6 | 7 | 1 | 2 |
| Existing Legal Regulations are Not Enforced | 6 | 3 | 2 | - | 1 |
| Civil Sector Limitations | 12 | 6 | 3 | 2 | 1 |
| Civil Sector Organizations Need Political | 5 | 3 | 1 | 1 | - |
| Individuality, Lack of Resources Limit Ability to Support | 7 | 5 | 1 | 1 | - |
| Private Sector Limitations-Individual Focused, Lacks | 5 | 2 | 2 | 1 | - |
| Political Representation | | | | | |
| Academic Sector Limitations-Disconnect Between | 3 | 2 | - | - | 1 |

The most common self-reported organizational challenge identified by 23 organizations (9 civil, 8 public, 4 private, 2 academic) involved funding limiting the work organizations could conduct. Funding limitations was described as restraining the ability of organizations to complete current projects to satisfaction, or to engage in or expand new projects. A local-scale public sector interviewee explained his organization's funding limitations by stating,

...we are not able to do anything as [organizational] representatives because we lack financial resources. There is not government support for things. There is a lack of resources to do what we are supposed to do as representatives of local government. There is interest; we just cannot do very much for lack of resources.

The second most common self-reported organizational challenge identified by 22 organizations (12 civil, 7 public, 2 private, 1 academic) was a general lack of resources (beyond just funding) and organizational limitations. The third most common self-reported organizational challenge identified by 16 organizations (10 civil, 5 public, 1 academic) was a limitation of human resources. Examples included having a limited number of reliable volunteers available to help the organization (civil sector), not having enough employees to cover the organization's entire assigned region (e.g., public sector: for outreach and technical support), and not being able to retain employees due to low wages or instability of funding to pay wages. Additionally, 12 organizations (4 public, 4 civil, 3 private, 1 academic) self-reported equipment, materials, and transportation limitations. Examples included a lack of computers, internet access, GPS devices, or other technological equipment to effectively perform field and office, too few informational brochures to distribute to target audiences; and insufficient transportation vehicles (in terms of actual number and their operating condition) to cover the assigned region and work tasks.

Thirty-one organizations (15 public, 9 civil, 4 academic, 3 private) identified additional challenges pertinent across the study region. The most common limitation cited by 23 organizations (13 civil, 6 civil, 2 private, 2 academic) was an identification of organizations in

the region needing additional support to strengthen them and their work. This lack of support for organizations included organizations' limited access to resources, and ability to continue incomplete projects; a need by resource-constrained organizations for assistance with capacity building and organizational self-sufficiency; and challenges with successfully coordinating projects or managing collaborations with other organizations.

The second most commonly cited limitation, identified by 13 organizations (6 civil, 5 public, 2 private) was a lack of technical support and training, including a scarcity of conservation demonstrations such as model farms or other applied learning opportunities for producers. The third most commonly cited limitation, identified by 12 organizations (7 civil, 2 public, 2 academic and 1 private) was a lack of access to resources and the related inability to ensure project continuity. Eleven organizations (5 civil, 4 public, 1 civil, 1 academic) described a limitation of sufficient information exchange and communication as relating to public access to information. Additionally, 10 organizations described a limited availability of information in general. A private sector interviewee expressed his experience with these limitations by stating,

The small organizations here lack access. In general small organizations in Chiriquí are in a little bit of a conflict, because there are many organizations that exist that are looking to obtain funds, work on individual projects, and information exchange and benefits don't arrive from their projects. The size of small conservation organizations limits their access to resources. Many organizations exist in an area, but they don't start with the exchange of information. Administration often [needs to] come first.

Twenty-five organizations (10 civil, 8 public, 4 private, 2 academic) also identified limitations pertinent to entire organizational sectors. Limitations of the public sector were most common (21 organizations: 8 public, 8 civil, 3 private, 2 academic). Sixteen organizations (7 public, 6 civil, 2 academic, 1 private) listed public sector limitations that related to overarching political factors (primarily at the federal level) including instability that arises when political change happens, political restructuring of public agencies, and challenges involving allocation of

and access to resources from Panama's centralized federal government in Panama City. A regional scale public sector interviewee explained the challenge of political change as,

The conditions people thought existed with [our organization] in the last year are not the same anymore. The people have a belief in [our organization] from the previous structure of participation when [we] welcomed participation, input, proposals, and worked with projects. Now [under the new political administration], we have restructured and people have a former concept of how we worked. It is not the same anymore. It is not like when it used to work so well with open participation.'

A related limitation mentioned by 10 organizations (3 public, 3 civil, 3 private, 1 academic) was the centralized government's adverse affect on the time needed for decision-making (e.g., to approve or disapprove a project), responsiveness to requests from regional public agencies (e.g. responding to equipment requests in a timely manner), and impacts on being able to complete projects. Nine organizations (5 public, 4 civil) also identified limitations in project or other sector organization support. Other public sector limitations identified by organizations included legal limitations such as insufficient public sector labor, resources, or motivation to enforce existing environmental regulations.

Civil sector limitations were identified by 12 organizations (6 civil, 3 public, 2 private, 1 academic) and included issues such as challenges to working collaboratively due to the independent nature or limited resources of civil organizations, and limited organizational ability to expand their scope of work or partnerships (5 civil, 1 public, 1 private). A related limitation mentioned by 5 organizations (3 civil, 1 public, 1 private) focused on how organizational effectiveness was diminished by the lack of political support for civil sector organizations. A civil sector interviewee described her experience with these challenges of limited support and political presence as,

The weakness [we experience] is that every 5 years there is political change...Political change at the municipal level is not bad, but at the province and central [Panama City] level you have to go, knock on doors, present yourself, share your information, start the

history and story of relationship all over again. It is important to have very strong relationships with the provincial directors [of government institutions], universities and those that have some relation to this [environment/conservation] subject. And it is not just one visit. Often in the first visit you just establish who you are then you have to return for more explanations.'

Private sector limitations were identified by five organizations (2 civil, 2 public, 1 private) and focused on private sector organizations being too individually focused and not open to collaboration, and lacking adequate political presence or representation in their work.

Academic sector limitations identified by three organizations (2 civil, 1 academic) referenced the disengagement of the academic sector from other sectors for collaboration opportunities and continuing or enhancing projects.

Organization-identified Potential Roles in a Future PES Scheme

We found that all public, private, and academic and 87% of civil sector organizations identified specific intermediary roles their organizations could best perform to support the design and implementation of a future PES program (Table 5).

Table 5. Organization-Identified Potential Roles in PES

| | All | Civil | Public | Private | Academic |
|--|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|
| Total Number of Organizations | 34 | 15 | 10 | 5 | 4 |
| PES Potential Roles | 32 (94%) | 13 (87%) | 10 (100%) | 5 (100%) | 4 (100%) |
| Information Exchange | 22 | 7 | 9 | 2 | 4 |
| Information Exchange | 19 | 7 | 6 | 2 | 1 |
| Investigation & Technical Assistance | 8 | - | 5 | - | 3 |
| Program Information & Promotion | 6 | 2 | 2 | 1 | 1 |
| Administration & Project Implementation | 20 | 7 | 8 | 1 | 4 |
| General Administration | 11 | 6 | 3 | 1 | 1 |
| Program Facilitation & Support | 15 | 4 | 7 | - | 4 |
| Coordination & Logistical Support | 7 | 2 | 3 | - | 2 |
| Networking, Representation & Mediation | 11 | 3 | 5 | 1 | 2 |
| Participant Contact | 8 | 3 | 3 | 1 | 1 |
| Representation & Mediation | 6 | 2 | 2 | 1 | 1 |
| Program Design | | | | | |
| Informing Program Design | 6 | 3 | 1 | 1 | 1 |

The most common type of program role identified by 22 organizations (9 public, 7 civil, 4 academic, 2 private) was information exchange, which includes the dissemination of information, outreach to the community, and generally performing the roles of communicating program information. Eight organizations (5 public, 3 academic) identified the information exchange role of investigation and technical assistance which was described as sharing existing

research, as well as conducting investigations to inform the PES program and providing technical assistance to actors involved in the program. Six organizations (2 civil, 2 public, 1 private, 1 academic) also identified with the information role of PES program information dissemination and promotion to the public and other interested actors.

The second most common type of program role identified by 20 organizations (8 public, 7 civil, 4 academic, 1 private) was administration and project implementation. Fifteen organizations (7 public, 4 civil, 4 academic) identified their administrative role to be project facilitation and support, such as supervising programs, transferring resources, managing program paperwork and contracts, supporting organizations with resources and administrative training, and assisting participants with program enrollment. Additionally, seven organizations (3 public, 2 civil, 2 academic) also identified the administrative role of coordination and logistical support, which includes functions such as the coordination of meetings, workshops, and providing meeting space.

The third most common type of program role identified by 11 organizations was networking, representation and mediation. Eight organizations (3 civil, 3 public, 1 private, 1 academic) identified their potential role as networking. Networking was described as playing the role of a main contact, providing information about and connection to a potential PES program for multiple actors, such as organizations across sectors, communities, and producer groups. Six organizations (2 civil, 2 public, 1 private, 1 academic) identified the potential role of representing the interests of program participants from different sectors, as well as providing mediation between participants when necessary.

The fourth most common type of program role identified by six organizations (3 civil, 1 public, 1 private, 1 academic) was advancing program design through conducting research or drawing upon previous program development experiences.

For the 2 organizations (2 civil) who did not specific intermediary roles for a future PES program, they chose not to do so because: they were unsure, without additional information, if there would be a role for their organization in a future project, they perceived themselves to not be in a position to make a potential role statement, and/or they perceived that their organization's participation in a future PES program would depend on being provided with additional resources.

Connections between Intermediary Organizations across Geographic Scales & Sector Type

We also collected information from organizations related to organizational networking, collaboration, and communication, recognizing the important role of organization-to-organization interactions in PES design and implementation. Ninety percent of all organizations identified organizations within our study sample with whom their organization was communicating or connected in some way. We used this information to depict the connections between interviewed organizations in our study region (Figures 3-5). We defined a connection as occurring when an interviewee stated a project, collaboration, or connection with another organization in our study. This occurred throughout the interviews, primarily when an interviewee was describing organization projects (often conducted in collaboration with other organizations), or how they shared information or resources. We then used this information to define four levels of connection strength by dividing connection percentages into quartiles (demonstrated by arrows as 0-25%, 26-50%, 51-75%, and 76-100% connection strength). The connection strength was determined by the percentage of organizations in each figure (shown as

circles representing a specific scale, sector, or sector-scale) that identified connections with their own or figure, other figures within the diagram.

When examining organizational connections by geographic scale, we found that the strongest connections existed between local and regional scales, and within regional scale itself (Figure 3). All of the organizations at the regional scale identified connections to organizations at their same scale. The second strongest connections existed between regional and international scale, and within local scale. The weakest connections existed between local and international-national scale, and within international-national scale.

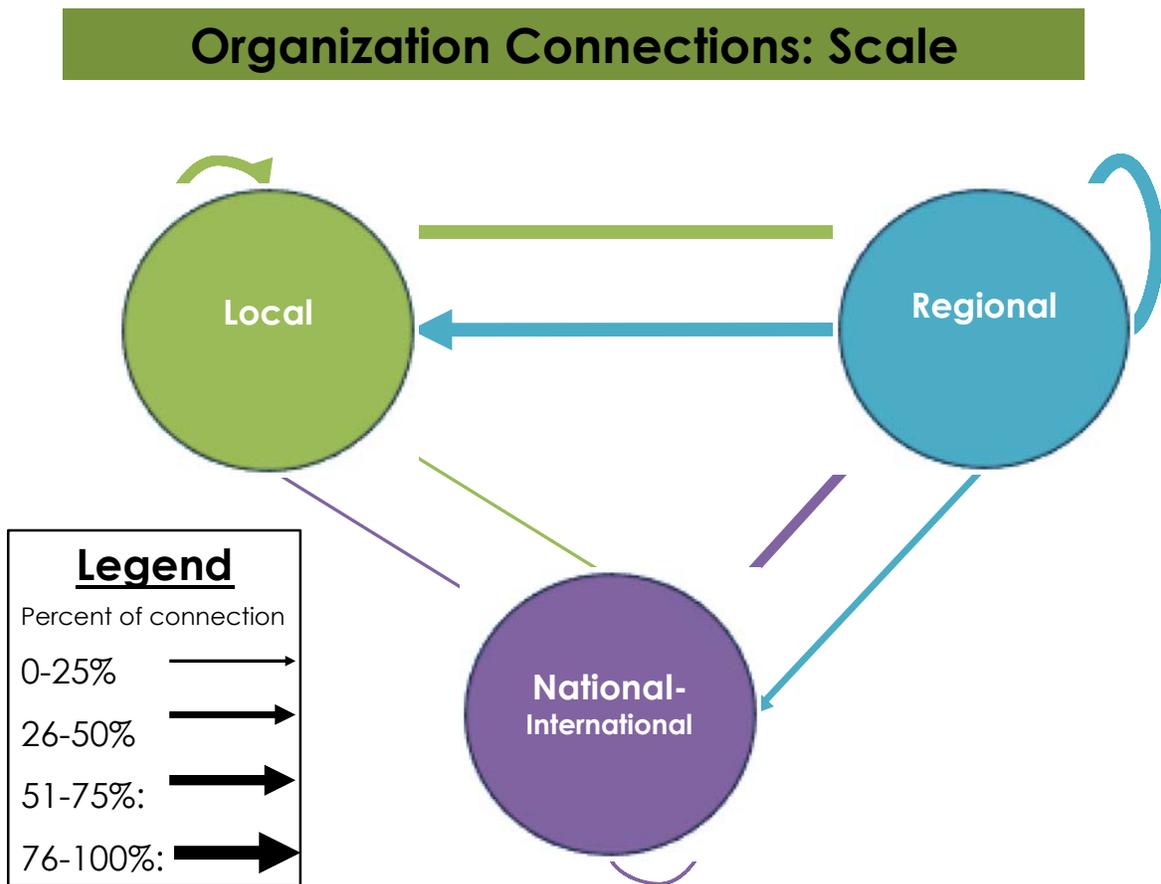


Figure 3. Diagram of network connections between interviewed organizations by level of scale

When examining organizational connections by organization sector, we found that the strongest connections existed between public and civil sectors, and within public and civil sectors (Figure 4). The private sector also had strong connections with the civil and public sectors. The academic sector's strongest connection was to the public sector. All sectors' weakest connections were to the private sector, with no connection from the academic to private sector.

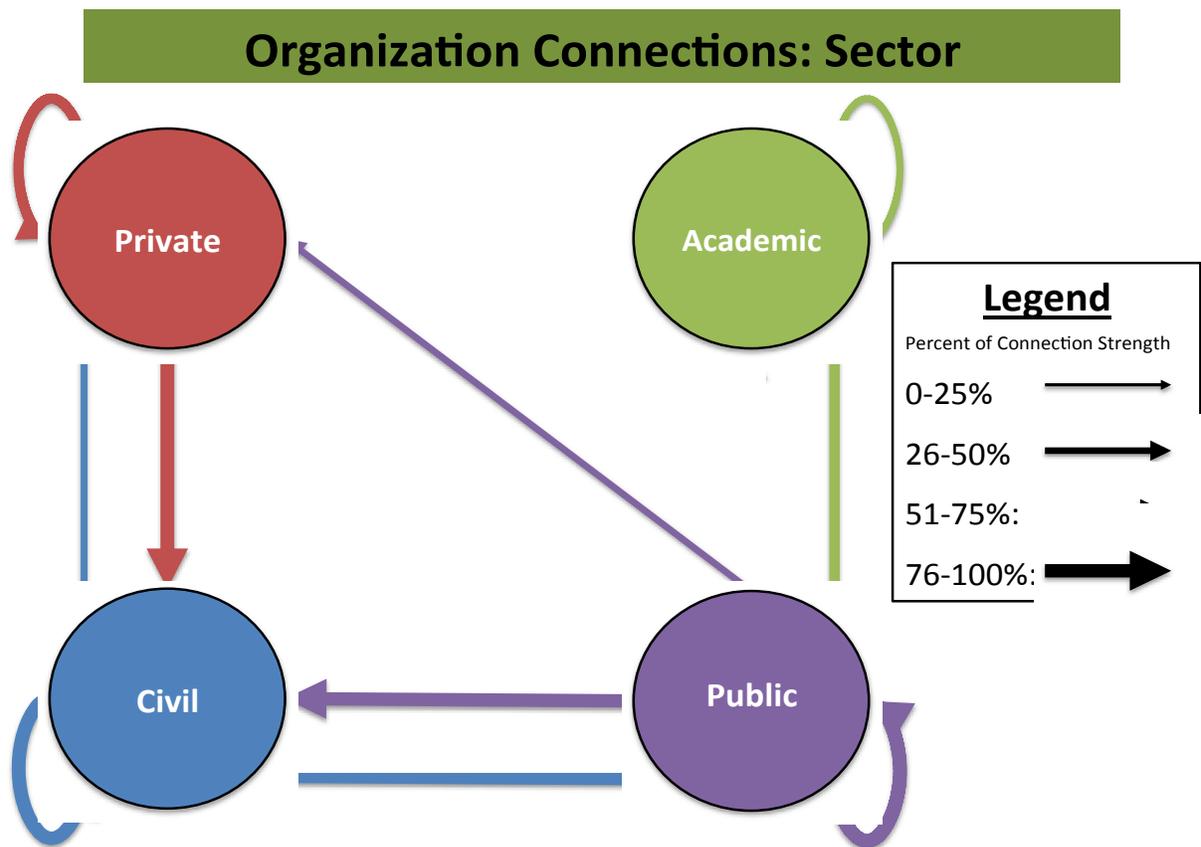


Figure 4. Diagram of network connections between interviewed organizations by organization sector type

Forty-five percent of organizations explained their communication and collaboration across sectors as intended to improve project success and expand project scope. A public sector interviewee described this connection as, “There are some projects other [non-governmental] organizations are working on that the government cannot do or does not have the resources to do.

Some of the [non-governmental] organizations have a relationship with the government so if they hear there is something the government cannot do, they might do it themselves.” A civil sector interviewee explained their collaboration with public-sector organizations by saying,

There are political mandates for the agencies and sometimes they [government agencies] don't have the resources [to work on the environmental education project]. So the agencies sometimes have to put some of this responsibility onto [our organization] instead...The agencies are supposed to have stable personnel to help with this project but that is not always the case...Environmental education should not be handled solely by environmentalists or organizations, the institutional presence is very important. Because if a child sees a community organization and a [government agency] working together this is a positive message for the children. And these types of things are what [we] are trying to obtain. [Our organization] is not always in agreement with the politics and development of [government] but we are aware that these are agencies that [we] have to work with.

When examining organizational connections by organization sector and geographic scale (or sector-scale), we found that the strongest and largest numbers of connections were linked to public-regional, followed closely by civil-regional, public-local, and civil-local (listed in order of connections, Figure 5). The strongest connections between actors in the network existed between civil and public, both regional and local. Civil-national-international contained thin connections from private, public and civil, and had out-going ties to public and civil. Private organizations contained more limited connections, only to the civil and public sectors, and with much stronger out-going connections than it received as in-coming connections from other sector-scales. Academic sector-scales contained the least number of and weakest connections, limited to public regional and local, and civil-regional. All civil and public sector-scales, and academic-regional identified connections within their own sector-scale.

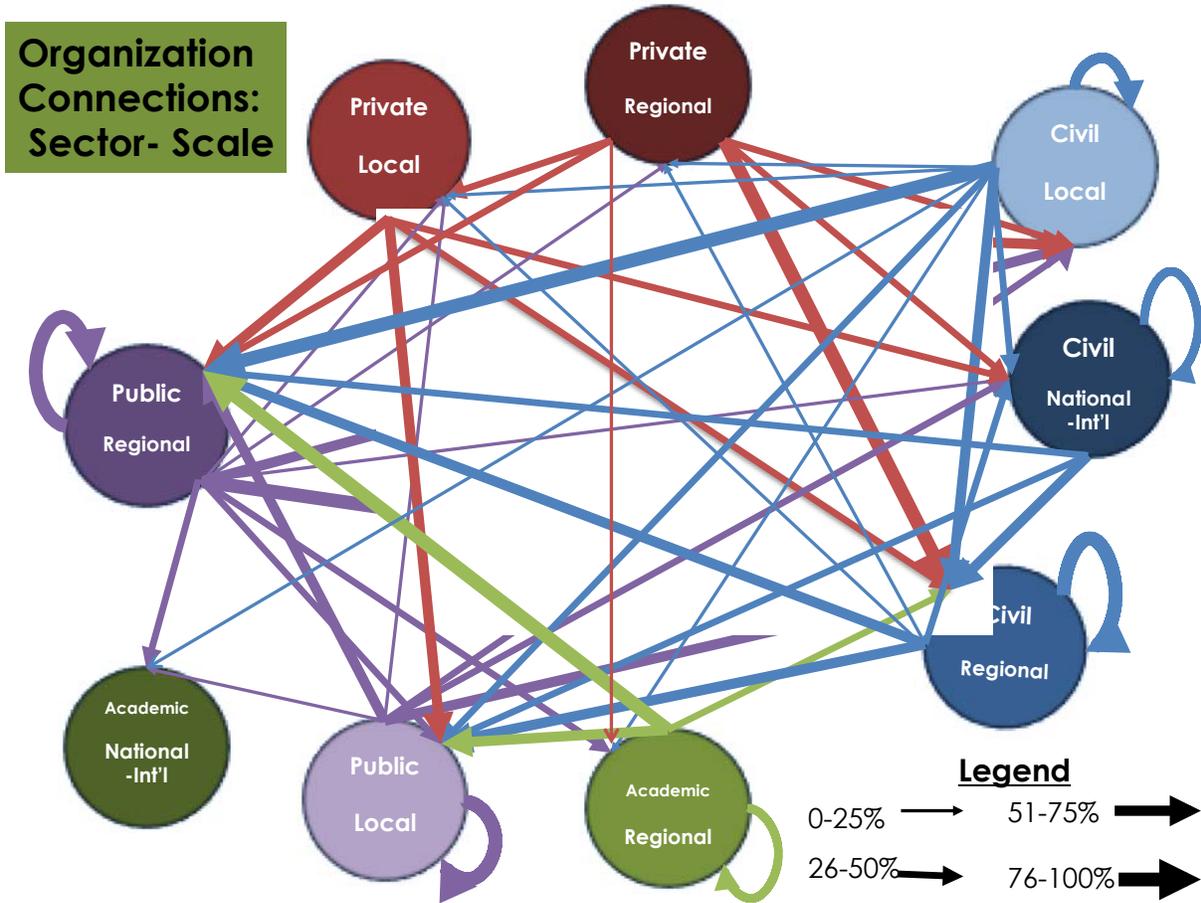


Figure 5. Diagram of network connections between interviewed organizations by level of scale and organization sector type

Organizations emphasized the importance of collaboration and involving all types of actors in projects, aptly described by a public-sector interviewee as,

If it is between involving few or many organizations in a program, between the two, involving a larger number of actors and organizations will result in more success for any type of project. Because if you only work with only one organization and only one producer you are not understanding the entire context. You have to work between many actors in order to create the best possible program (involving the most possible aspects, inputs, perspectives). You have to work in the middle of everyone in order to obtain the most successful program possible.'

DISCUSSION

Our research objective was to investigate the potential roles of intermediary organizations to inform efforts in western Panama to develop a regional PES program. In defining this objective, we sought to incorporate information from experience with existing PES programs and the literature on PES and intermediaries to identify important questions to ask about the potential roles of intermediaries in a future regional PES program. To achieve our research objective, we collected information related to current roles performed by intermediary organizations in the study region that contribute to conservation efforts, identification of the relative strengths and limitations of organizational capacity, understanding potential contribution to the design and implementation of a regional PES program, and exploration of organization connections across sector types and geographic scales.

Our discussion highlights our main findings regarding potential intermediary roles, organization limitations and connections, and potential to work across sectors and actor groups. We also include our perspective on potential research limitations and implications.

Potential Intermediary Roles

Our results demonstrate the capacity of intermediaries in the study region for participating in a future PES program, especially within administration and information exchange, which are integral to a PES program. Identifying roles and capacity of intermediary organizations in our study provides a baseline of information about the landscape of organizations in the region, and their potential to participate in a program. Our results inform program design focused on seeking pre-existing, experienced intermediaries already working within the region, in order to minimize program costs (Kemkes, Farley & Koliba, 2010).

Information Exchange, Administration and Program Implementation

Organization identification of potential PES roles supported what organizations identified as currently existing roles, with administration and program implementation and information exchange functions being the most highly identified in both cases. Intermediaries have been found to encourage the support and development of local organizations and their internal structure, which were also administrative functions prevalent across organizations in our study (Pham et al., 2010; see also Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008; Wunder 2006). Organizations identified information exchange functions, such as the transfer of information, knowledge, and resources, functions that have been identified as roles of intermediaries in existing PES programs (Pham et al., 2010, Swallow et al., 2009; see also Khurana, 2002; Lee & Mahanty, 2007; Leimona & Lee, 2008; Locatelli et al., 2008). The results demonstrate potential for successful information exchange and communication and dissemination within the study region, which is essential to bringing together all actors to inform the design of a PES program.

Networking, Representation and Mediation

The results suggest that there is capacity in the role of networking, which has been demonstrated to be useful in PES for situations such as bridging relationships between buyers and sellers (Van Noordwijk et al., 2007) and networking to identify program investment and funding prospects (Corbera, Kosoy & Martinez-Tuna, 2007). The work across organization sector and scale appears to support high collaborative capacity in the region (Figure 5).

Intermediary roles identified in the PES literature of facilitating negotiations and mediating between different program actors (Pham et al., 2010; van Noordwijk et al., 2007; Wunder, 2006) are also present in the intermediary organizations we interviewed. Public-sector

organizations that identified mediation or conflict resolution roles in their work indicated that these were functions they regularly performed between actors, as part of their organizational mandate. This suggests the potentially significant capacity of these organizations to perform such roles in a PES program. Additionally, several private-sector organizations identified with the role of representing their own members. This could be useful in a PES program, if for example, these private-sector organizations were able to represent larger groups, such as producers, or coffee associations. This type of representation could also be limiting due to the complexities of multiple groups advocating for their members. This consideration highlights the importance of understanding what and how actors are engaged in a potential program region in order to identify organizations that could represent multiple sellers, which can reduce costs and streamline the process (Jack et al., 2008).

Organizational Limitation Considerations

Additionally, organizations in the study region identified a number of organizational, sector type, and region wide limitations, which will need to be carefully considered in assessing organization capacity and PES program potential. For the networking aspect of the study, it is important to understand the primarily government-related challenges affecting organizations across scales and sectors. Collaboration across sectors can be seen in this study as a way organizations deal with sector limitations and work to improve their capacity, by working to improve their project region or effectiveness with the incorporation of other sector actors who are able to perform where the other sector might be limited. This type of cross-sector collaboration would be important to understand and incorporate accordingly in PES design, in order to maximize organization capacity.

In taking a broader view of challenges, region wide limitations emerge, such as challenges of a centralized government, political restructuring and change, and waning economic conditions reducing the influx of foreign money into civil sector organizations. These national and international issues are not specific to Panama, they are occurring in countries around the world, and are becoming increasingly important to recognize in PES program design.

Our results demonstrate the interconnectedness of organizations, which emphasizes the importance in considering organizational ties, communications and general networks for the identification of potential project participants, as well as for gaining contacts and information about the current economic, political and environmental climate.

Organizational Connections Across Sector and Scale

The connection maps identify important considerations for PES program design (Figures 3-5). Careful consideration of the broader institutional context is fundamental to the successful design and implementation of PES (Brouwer, Tesfaye & Pauw, 2011; Corbera, Kosoy & Martinez-Tuna, 2007; Swallow et al 2005; Vatn, 2010). In general, the strongest connections are shown to exist between local and regional civil and public sector organizations. Connecting to the private or academic sector, and much of the international scale appears to be best facilitated via connections through these local-regional public and private actors. The organization connections findings support the importance of engaging all sectors across scale, in order to take advantage of the connections that exist between sectors and scales. Our connection maps provide a snapshot of what we understand to be occurring within and between organization sectors and scales. This understanding is fundamental when introducing a PES scheme to a region; program developers must be cognizant of already existing relationships between potential

program actors related to social, political, economic, or environmental factors (Vatn, 2010). The overall implication that connections vary not only across scale and sector, but also within the components of sector-scale relationships is an important consideration when attempting to decide whom to include in a PES program.

Depending on one sector or select organization(s) to act as intermediaries in a program is not always feasible, especially when direct user-financed programs are not possible, and involvement by civil sector organizations, or government, as intermediary buyers are the only achievable solutions (Engel, Pagiola, Wunder, 2008). Our connection figures demonstrate that engaging only one organization sector or scale as intermediaries (or other actors) in a program could result in a lack of connection to other sectors, or scale, thus decreasing PES program intermediaries' effectiveness at working on the appropriate geographic scale and with all suitable actors (Figures 3-5).

Organization Potential to Work Across Sectors and Actors

Organizational Potential to Work Across Sectors

Our exploration of connections between intermediary organizations across geographic scales & sector type provide examples and understanding of cross-sector and scale collaborations. For example, our study found in some cases that government agencies receive help or collaboration from NGOs to manage programs outside of their funding, geographic, or political restrictions. Similarly, in the United States, a watershed payment program cannot usually be run solely by a government agency, as the agency may be limited in what project roles they are allowed to take on (e.g. distribution of payments, program monitoring). This critical junction is where the intermediaries step in to fill gaps in roles other organizations cannot perform, and acting as the conduit and trust builder between potential participants and program implementers.

For example, our results might suggest that the public (56%) and academic sectors (75%) can provide technical assistance, while the private sector is better prepared to handle representation (60%), and the civil sector can work more freely between groups to administer, and disseminate information (88% both), but will often still need other sectors to produce technical information, design programs, and support their work. This example highlights the clear need to involve intermediaries from different sectors in all stages of PES program design and implementation.

Organizational Potential to Conduct Program Participant Outreach

The intermediaries we interviewed reported stronger connections to actors that would be on the “supply side” of a PES program (e.g. agricultural producers) than those on the “demand side” (e.g. those utilizing the ecosystem services) of PES. These results suggest that capacity in the study region to reach out to landowners and land managers on the supply side of PES may be greater and better established than to reach out to the demand side of PES. For PES to be successful, intermediaries need to bridge supply- and demand-side actors, so there may be work needed in this region to bring in intermediaries better connected to the demand side or to build stronger demand-side connections amongst existing organizations. This consideration relates to the general sense amongst PES analysts that engaging PES buyers (from those benefiting from the ecosystem services) remains a limiting factor for PES expansion (Wunder, 2009). In many cases, PES schemes are found to be dependent on the assistance of external donors instead (Wunder, 2009).

Implications

Our research supports our earlier assertion that investigation of intermediaries can provide constructive information aiding conversations about the design and implementation of a PES program. Effective program design is fundamental to successful PES programs (Engel,

Pagiola, & Wunder, 2008). In light of the increasing popularity of PES schemes emerging across the globe, the necessity of effective program design is becoming increasingly critical. Careful consideration of PES actors in order to properly inform program design should be drawn from a comprehensive understanding of what roles existing literature and experiences with PES has demonstrated are important for different actor groups. The utilization of a framework, such as what we used in this research could aid in more strategic assessment of actor potential, thus creating more efficient and effective approaches to informing PES program design.

CHAPTER III: CONCLUSIONS

My research identified roles that intermediary organizations are performing that contribute to conservation efforts in the study region. The interviews and related research in the region helps paint a picture of organizational capacity of these actors, their potential future roles, and what areas they identify as limitations or challenges both currently, and into the future. Understanding how intermediary organizations in the study system are connected, and what this network and their organizational capacities suggest about opportunities to advance a regional PES program is a challenging question that my research might have only begun to unearth.

It is clear that organizational ties and communication are important for understanding the intricate web of connections amongst all actors, not just intermediaries in the region. While I was able to collect a rich, detailed set of data from my research, I believe that there is still much investigation to be done into the organizational connections, in order to understand how best to implement conservation and/or livelihood improvement projects in the region. The success of these types of projects will ultimately depend on local buy-in and actor participation across both sectors and scale. My research paints a broad landscape view of what intermediary actors and some of their related connections look like in the region. A critical next step will be in using this information to gain detailed insight into other actors that will be critical to the development of any program(s) in the region. This conclusions section contains my reflections upon the research I conducted, potential future directions, and other research considerations. This section is intended to provide the reader with additional concluding thoughts, as well as more specific insight into the complex landscape of the study region, and some of the political, economic and social realities that will inevitably affect future conservation or related projects in the area.

Research Reflection

The 'Right' Intermediary

After reading Chapter II, questions that comes to mind are likely things such as, who is the *right* intermediary for the job?, or what are the *right* characteristics for this intermediary? I find these to be impossible questions, since I believe that the 'right' question is not *who* is best for the intermediary role, but instead, a two-fold question: (1) what roles are important to a program functioning in the specific region (or context)?, and (2) what organization(s) can work together to best perform these roles? Training one organization to cover all roles could be more time and resource intensive than having multiple actors involved, each performing the roles that are their respective strengths, and complementing each other's work. This consideration is essential for the area, for collaborative conservation approaches, as well as specifically for PES project implementation. This question also encompasses more than just this study region, it is something we should be asking as early as the design or assessment phase of any project involving local communities, livelihoods and the environment. Intermediaries play a critical connecting role in situations across the globe, and incorporating their perspective and knowledge is essential to fully understanding project actors and appropriate area development.

Many Roles, Many Intermediaries

In my research so far, I have found that just one intermediary will be unable to fill all of the roles, particularly some of the roles that could be conflicting. Different organizations can fill different intermediary roles. The following are descriptions of some of the sector strengths and weaknesses I found within my research region that aid in understanding why there might not be one perfect intermediary, but instead several organizations to better fill the roles.

Academic sector organizations are able to provide a plethora of research, studies, investigations, and other related non-biased research. This is a fundamental function of a university, so it would not be stretching their resources too thin to provide access to their available data, and encourage future relevant research. A government organization might find themselves understaffed, particularly in the current environment of economic shortages, so their commonly-cited issues of limited available field technicians and equipment would put them in a difficult position to provide the majority of research for PES investigations. The private sector can provide connections to potential ES buyers that are usually far stronger than other sectors, due to their often-closer ties. The private sector also has access to different funding sources that could make their contributions to a PES project less dependent on public funds (which the public and academic sectors face). The civil sector also has strengths, such as its connections to the other sectors, its representation of groups such as agricultural producers, and their funding, which can be used to focus directly on a specific cause (e.g. environmental conservation). The public sector (including the academic, state-universities) can be limited in their ability to work with outside funding, or to process funding through to a non-governmental project. The civil and private sectors are more able to fill this role of accounting for, and transferring project funds.

Civil sectors are more limited by funding and staff but less politically driven and less directly affected by political change. The number of intermediaries is not as important as their suitability for different roles.

These considerations lead to an important point for future research, involving understanding how to deal with multiple intermediaries and their subsequent intermeshing of roles and responsibilities across sectors and scale, as well as identifying when the number of intermediaries involved is providing diminishing returns.

An example of this question of the number of intermediaries to involve in a project can be seen in my research by the roles of representation and mediation, and program design being identified by fewer organizations. However, these might be roles that do not necessarily require a multitude of organizations. Involving many intermediaries in a PES scheme can have adverse effects on program effectiveness (Brouwer, Tesfaye & Pauw, 2011). Some roles or PES program components might be best performed comprehensively by one or just a few strong organizations, instead of several organizations using a piecemeal approach. For example, only a few organizations identified actual program design as a role they perform, however, of those who did identify it, some indicated that it was one of their main functions within the organization, thus demonstrating their experience and capacity in the role. Therefore, if an organization such as a government agency that routinely designs programs has a specific strength in doing so, then the organization might have the capacity to better perform the role of program design independently than several organizations who each try to design a piece of a program. The scope of our research was not able to encompass this issue in great detail; however, this is an important consideration for future research.

The 'Right' Intermediary for the Study Region

There appears to be a lack of organizations within the study region operating at a scale and capacity sufficient enough to possibly manage a PES project, especially on their own. While some of the national and trans-national NGOs operating in the region might have the knowledge or understanding to spearhead such a project, severely underfunded and understaffed offices limit their ability to do so.

When looking at organizations by region (Renacimiento and Bugaba as compared to Boquete), it is clear that the NGO partner operating at the regional level in Renacimiento and

Bugaba would have far greater expertise and capacity to play a large role in a PES program, while the partner NGO in Boquete would likely find the task overwhelming and impossible. This difference is due to the dissimilarity in scale and capacity of the two organizations. FUNDICCEP in Renacimiento and Bugaba operate with three full-time co-directors, and seven to ten additional staff positions. FUNDICCEP's projects span several districts within Western Panama, and focus on collaboration with larger and smaller organizations across sectors. FUNDAVISAP in Boquete is completely staffed by volunteers, all of whom work full-time outside of their varying commitments to the organization. FUNDAVISAP also appears to be issue-driven, focusing on specific projects when they are salient to community members and organization volunteers, but not working on long-term projects consistently, so their staffing is more a voluntary influx. FUNDICCEP's experience working through day-to-day operations, coordinating capacity building with local organizations and their experienced and consistent staff, combined with over a decade of working closely with national and trans-national NGOs to build their own capacity clearly puts them in a better position to take on a larger role in a PES-type project. These considerations are critical when assessing what regions not only *need* a conservation-type program, but also, what ones could actually help run the program within their existing infrastructure.

The Need for a Project Owner in the Region

An important research consideration is if the role of coordinating collaborative conservation efforts, such as a potential PES project is a role separate from those currently associated with intermediary organizations in the study region (as identified in Table 1). It is clear there needs to be a leader, or a project 'owner' in the region to move projects such as this potential PES project forward. This role requires leadership, commitment and clear connections across both sectors

and scale to ensure positive and productive working relationships with other potential participants and actors.

During my research in Panama, I was told by several interviewees and other related individuals that there was no ‘dueno’, or owner to the proposed PES project, which would stall its progress and further development until some organization or group of organizations stepped into the ‘owner’ role. In the Spanish language, ‘dueno’ is a strong term for owner, indicating an important role with high responsibility and often permanence.

It is important to consider questions such as, if a larger scale organization comes in as the owner of a project, do they have the appropriate ties at the local level to create buy-in and provide outreach and understanding? Also, will they have the buy-in and investment that a more local organization would have? Historically, these larger NGOs might aid in beginning a project, but eventually ownership is supposed to be transferred to a more local level, so how would that be feasible for this region, and what does that look like?

Organization Sector Roles

Another research finding to consider was the hesitancy of the civil sector to offer potential roles and responsibilities for their organization. This could be due to the realities they face of being dependent on varying funding streams, and clearly being underfunded and overcommitted currently. It is possible that the academic and public sector were more willing to volunteer their potential roles because they are also underfunded, but might view this as an opportunity to gain additional funds. Public sector organizations are historically starved for sufficient funding, so their ‘can-do’ attitude about taking on additional roles in a potential project could just be their historical reaction to new projects, particularly projects that don’t require their own monetary investment to function.

Study Design and Research Considerations

I employed best practices in my research, and attempted to do my best to address potential research challenges. This was an exploratory study, and I utilized a purposeful sampling of relevant organizations because this would allow me to use the existing network to connect to organizations in the region, which was the intent of my research. This does mean that my study was not conducted with randomly selected participants, so it is not necessarily generalizable to the entire organization population. I did however, conduct interviews until I had thoroughly followed the linkages of connected organizations, which indicates that I was able to collect a detailed and rich data set with my interviewees, whose organizational ties spanned several sectors and scales.

Uneven organization representation did occur, with some organizations having more than one representative interview. This was in order to capture more comprehensive information about organizations engaged in multiple projects spanning different geographic scales. These interviewees from the same organizations provided different responses due to their different locations within the same organization (e.g. working in different project areas or scales).

The majority of my interviews were conducted with a representative from one of my two partner organizations present. This was in order to increase my credibility with the interviewee (since the partner organizations had the established connections to these actors), and to alleviate any potential language barriers arising from my Spanish skills. It is possible that this situation generated social desirability bias where the interviewee provided responses they thought were consistent with regional or societal norms of the perceived viewpoints of myself or my partner organization (Vaske, 2009).

All interview scripts and related research were developed in English and relevant pieces were then translated to Spanish for conducting the interviews. Forty-one of the 42 interviews were conducted in Spanish. While my Spanish skills were adequate for the interviews, the majority of my interviews were conducted with a project partner present in case translation or assistance was needed. Overall communication was not an issue in the interviews, but some issues of word choice did emerge, demonstrating a contrast between what word I used to explain a term, and what word the interviewee chose. Also, interviewees occasionally used all-encompassing words such as ‘support’ to describe a multitude of organization functions. I attempted to elucidate more details of such terms when possible.

This research was part of an investigation of a *hypothetical* PES program, and not an investigation to inform the design of a program being developed, or a program already in place. Therefore, some interviewees found it challenging to expound on their potential roles(s) from a list of general descriptions of intermediary roles, and without specific details on how the regional PES program would operate.

Future Research Directions

Our work was exploratory in nature, and helped us understand PES knowledge in the region, current roles being performed, and connections between organizations. Our exploration of these topics can indeed help inform the design of a PES program in the region, and provides some interesting information for contribution to the broader PES discussions and program implementations. Clearly, next steps in this research project will need to continue, including: (1) work in the area with previously-engaged actors to discuss future project steps, (2) the identification of other potential program actors, specifically buyers, (3) investigation of funding

sources to move the project forward, and (4) more in-depth exploration of PES program design considerations specific to the region.

One of the most immediate next steps for this project will involve holding a meeting, with previously engaged actors and actors that I interviewed, to present my study results and discuss future steps of the collaborative research project. Presentation and distribution of my research results in Panama with project partners and interviewees is tentatively planned for March 2012. This approach was used for discussing next project steps for my work, and is a critical step in keeping the project moving forward. This meeting will bring together organizations from all four sectors (public, private, civil, and academic) to discuss this project collectively for the first time. This group dynamic could be an opportunity that provides new insights or conversations about next project steps and PES potential in the region. This step is also critical to moving the project forward as a collaborative endeavor.

The first step in this project involved surveys of potential PES providers, and the second step investigated intermediaries. An important next investigation step would be the identification of other potential program actors, specifically buyers. My research has enhanced our understanding of organizations in the region, how they operate and how they are connected, all of which will be fundamental information for approaching potential PES buyers in the region. Exploring the buyer side of the PES equation is a critical piece to fit into our puzzle of informing PES design, and one of the largest remaining pieces to address.

Another potential future research step to consider is in the investigation of potential funding sources (other than potential buyers in the region) and organizations that can assist in funding, training, designing and implementing a program, such as national and international scale organizations with experience in PES program implementation. Such actors have played

essential roles to-date in advancing conservation efforts in the study region, and they also have played recognizable roles in supporting the advancement of many PES programs currently in operation, throughout Latin America and elsewhere around the world.

The results of my research clearly demonstrated the need to consider a multitude of design considerations in implementing PES in the region. Interviewees mentioned many considerations that they believe should inform PES study design in the region. These considerations included, agricultural producer eligibility requirements for participating in the program, such as minimum land size and land title requirements, and the most appropriate ecosystem services to include in a program (e.g., watershed services, carbon sequestration and storage). An additional PES program design consideration involved interviewees' perceptions about which organizational sectors and actor types should be involved in specific PES program roles. Examples of these perceptions include: the government should have more regulatory roles and the NGOs should have more facilitation roles. These considerations for informing potential PES program design could be investigated more thoroughly and systemically throughout actors in the region to further our understanding of the current context and perceptions of PES programs, which could provide useful insight to informing program design.

In a broader context, future research in the realm of PES should incorporate more thoughtful consideration and investigation of potential program actors. Clearly, there is no one-size-fits-all approach that can be used for identifying either potential actors or their capacity in a program. However, the recent increase in PES programs is beginning to generate an increase in case studies, and the academic literature is maturing in its evaluation of the strengths and limitations of the PES approach. Lessons learned should be incorporated into approaches for implementing new or modifying existing PES schemes, in order to create more sustainable,

efficient, and equitable programs. One of the most important things PES practitioners and researchers can do in their work is to learn from existing examples about what works and what does not work, recognizing as well the critical importance of placing general lessons learned in the context of each region where a program is in operation. Practitioners can learn about other specifics such as which roles different PES actors generally play in programs, in order to create more organized approaches to identifying potential PES actors in a region, their current roles, potential and capacity.

REFERENCES

- Bracer, C., Scherr, S., Molnar, A., Sekher, M., Ochieng, B.O. & Sriskanthan, G. (2007). Organization and governance for fostering pro-poor compensation for environmental services: CES Scoping Study Issue Paper, 4. *World Agroforestry Centre ICRAF Working Paper*, 39.
- Brouwer, R., Tesfaye, A & Pauw, P. (2011). Meta-analysis of institutional-economic factors explaining the environmental performance of payments for watershed services. *Environmental Conservation* 38(4):380–392.
- Campbell B. & Shackleton, S. (2001). The organizational structures for community-based natural resource management in Southern Africa. *African Studies Quarterly* 5 (3). [online] URL: http://web.africa.ufl.edu/a_sq/v5/v5i3a6.htm
- Cash, D., Clark, W., Alcock, F., Dickson, N., Eckley, N., Guston, D., Jager, J. & Mitchell, R. (2003). Knowledge systems for sustainable development. *PNAS*, 100 (14), 8086-8091.
- Carroll, N. & Jenkins, M. (2008). Forest Trends and the Ecosystem Marketplace. Payments for ecosystem services: Market profiles. *Forest Trends and The Ecosystem Marketplace*.
- Carroll, N. & Jenkins, M. (2010). The matrix: Mapping ecosystem service markets. In *Ecosystem Marketplace. Integrated Solutions: Water Biodiversity and the clean*

development mechanism. 2009. *EM Market Insights: Beyond Carbon. The Katoomba Group, Forest Trends and Ecosystem Marketplace*, 1-40.

Clark, T. W., Ashton, M. S., & Dixon, L. (2006). Innovation and Appraisal of Sustainability Efforts in La Amistad, Bocas del Toro, Panama and Talamanca, Costa Rica Region – A Synthesis. *Journal of Sustainable Forestry*, 22(1), 183.

Corbera, E, Kososy, N, Martinez-Tuna, M. (2007). Equity implications of marketing ecosystem services in protected areas and rural communities: Case studies from MesoAmerica. *Global Environmental Change*, 17, 365-380.

Corbera, E. Brown, K., & Adger, N. (2007). The equity and legitimacy of markets for ecosystems services. *Development and Change*, 38 (4), 587-613.

Daily, G., Polasky, S., Goldstein, J., Kareiva, P., Mooney, H., Pejchar, L., Ricketts, T., Salzman, J., & Shallenberger, R. (2009). Ecosystem services in decision making: Time to deliver. *Frontiers in Ecology and the Environment*. 7(1). 21–28.

Daily, G., Alexander, S., Ehrlich, P., Goulder, L., Lubchenco, J., Matson, P., Mooney, H., et al. (1997). Ecosystem services: Benefits supplied to human societies by natural ecosystems. *Issues in Ecology*, 2, 1-16.

- Daily, G.C. (ed.). 1997. *Nature's Services: Societal Dependence on Natural Ecosystems*. Island Press, Washington, DC.
- Daniels, A., Bagstad, K., Esposito, V., Moulaert, A., & Rodriguez, C. (2010). Understanding the impacts of Costa Rica's PES: Are we asking the right questions?. *Ecological Economics*, 69, 2116-2126.
- Duke, E. (2010). Informing the design and governance of a pro-poor payment for ecosystem services program in Western Panama. (Unpublished master's thesis). Colorado State University, Fort Collins: Colorado.
- Engel, S., Pagiola, S., Wunder, S. (2008). Designing payments for environmental services in theory and practice: An overview of the issues. *Ecological Economics*, 65, 663-674.
- Ferraro, P., & Kiss, A. (2002). Direct payments for biodiversity conservation. *Science*, 298, 1718-1719.
- Ferraro, P., & Simpson, R. (2002). The cost-effectiveness of conservation payments. *Land Economics*, 78, 339-353.
- Ferraro, P., & Pattanayak, S. (2006). Money for nothing? A call for empirical evaluation of biodiversity conservation investments. *PLoS Biology* 4(4), e105 (0482-0488).

- Glesne, C. (2010). *Becoming qualitative researchers: An introduction*. (4th ed.) Pearson Education Inc: Boston, MA.
- Gentry, B (2007). Emerging markets for ecosystem services: What did we learn?. *Emerging Markets for Ecosystem Services: A Case Study of the Panama Canal Watershed*, Gentry, B., Newcomer, Q., Ainsfeld, A., Fotos, M. (ed). The Haworth Press: Binghamton, NY.
- Goldman, R., Thompson, B., & Daily, G. (2007). Institutional incentives for managing the landscape: Inducing cooperation for the production of ecosystem services. *Ecological Economics*, 64, 333-343.
- Hamilton, K., Sjardin, M., Peters-Stanley, M., & Marcello, T. (2010). Building bridges: State of the voluntary carbon markets 2010. *Ecosystem Marketplace and Bloomberg New Energy Finance Report*.
- Hovland, I. (2003) Communication of research for poverty reduction: a literature review. ODI Working Paper 227. Overseas Development Institute, London, UK.
- Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, 35, 715-728.
- Huang, M. & Upadhyaya, S. (2007) Watershed-based payment for environmental services in Asia. Working Paper No. 06– 07. *Sustainable Agriculture and Natural Resource*

Management Collaborative Research Support Program, Office of International Research, Education, and Development ,Virginia Tech, Virginia.

Hecken, G., & Bastiaensen, J. (2010). Payments for ecosystem services: justified or not? A political view. *Environmental Science & Policy*. 13. 785–792.

Miles, M. & Huberman, M. (1994). *Qualitative Data Analysis* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Jack, B.K., Kousky, C., Sims, K. (2008). Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms. *PNAS*, 150 (28), 9465-9470.

Kemkes, R., Farley, J., & Koliba C. (2010). Determining when payments are an effective policy approach to ecosystem service provision. *Ecological Economics*, 69, 2069-2074.

Kerr, J. (2002). Watershed development, environmental services, and poverty alleviation in India. *World Development*, 30, 1387–1400.

Khurana, R. (2002). Market triads: A theoretical and empirical analysis of market intermediation. *Journal for the Theory of Social Behavior*, 32 (2), 239-262.

- Klerkx, L. & Leeuwis, C. (2008). Delegation of authority in research funding to networks: Experiences with a multiple goal organization. *Science and Public Policy*, 35 (3), 183-196.
- Kosoy, N., Corbera, E., & Brown, K. (2008). Participation in payments for ecosystem services: Case studies from the Lacandon rainforest, Mexico. *Geoforum*, 39, 2073-2083.
- Kosoy, N., Martinez-Tuna, M., Muradian, R., & Martinez-Alier, J. (2007). Payments for environmental services in watersheds: Insights from a comparative study of three cases in Central America. *Ecological Economics*, 61, 446-455.
- Koellner, T., Sell, J., Gahwiler, M., & Scholz, R. (2008). Assessment of the management of organizations supplying ecosystem services from tropical forests. *Global Environmental Change*, 18, 746-757.
- Kristjason, P., Reid, R., Dickson, N., Clark, W., Romney, D., Puskur, R., MacMillan, S., Grace, D. (2009). Linking international agricultural research knowledge with action for sustainable development. *PNAS*, 106 (13), 5047-5052.
- Kroeger, T., & Casey, F. (2007). An assessment of market-based approaches to providing ecosystem services on agricultural lands. *Ecological Economics*, 64, 321-332.
- Locatelli, B., Rojas, V., & Salinas, Z. (2008). Impacts of payments for environmental

- services on local development in northern Costa Rica: A fuzzy multi-criteria analysis. *Forest Policy and Economics*, 10, 275-285.
- Lee, E. & Mahanty, S. (2007). Payments for environmental services and poverty reduction: Risks and opportunities. *Regional Community Forestry Training Center*: Bangkok, Thailand.
- Leimona, B. & Lee, E. (2008). Pro-poor payment for environmental services: some considerations. January Brief. *World Agroforestry Centre*, and Bangkok, Thailand: Regional Community Forestry Training Center, Indonesia.
- Medd, W. & Marvin, S. (2007). Strategic intermediation: between regional strategy and local practice. *Sustainable Development*, 15 (5), 318-327.
- Milder, J., Scherr, S., & Bracer, C. (2010). Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries. *Ecology and Society* 15(2). 4.
- Mike, H., & Simon, M. (2008). Research note 1: Glossary of intermediaries. *University of Salford*, SURF Center, Salford, UK.
- MA, Millennium Ecosystem Assessment. (2005). Ecosystems and human well-being: Synthesis. *World Resources Institute*, Washington, DC.

- Mollinga, P. (2010). Boundary work and the complexity of natural resources management. *Crop Science*, 50, S-1-S-9.
- Mooney, H.A. and Ehrlich, P.R. 1997. "Ecosystem services: a fragmentary history". In: Daily, G.C. (ed.) *Nature's Services: Societal Dependence on Natural Ecosystems*. Island Press, Washington, DC.
- Moss, T., Medd, W., Guy, S., & Marvin, S. (2009). Organizing water: the hidden role of intermediary work. *Water Alternatives*, 2 (1), 16-33.
- Moss, T. (2009). Intermediaries and the governance of sociotechnical networks in transition. *Environment and Planning*, 41, 1480-1495.
- Naidoo, R., Malcolm, T., & Tomasek, A. (2009). Economic benefits of standing forests in highland areas of Borneo: quantification and policy impacts. *Conservation Letters*, 2, 35-44.
- Neuman, W. (2003). *Social research methods: Qualitative and quantitative approaches*. (5th ed.) Boston, MA: Pearson Education, Inc.
- Oestreicher, J., Benessiah, K., Ruiz-Jaen, M., Sloan, S., Turner, K., Pelletier, J., Guay, B., Clark, K., Roche, D., Meiners, M., & Potvin, C. (2009). Avoiding deforestation in Panamanian protected areas: An analysis of protection effectiveness and implications for reducing

- emissions from deforestation and forest degradation. *Global Environmental Change*. 19. 279-291.
- Pagiola, S. (2008). Payments for environmental services in Costa Rica. *Ecological Economics*, 65, 712-724.
- Pagiola, S., Ramierz, E., Gobbi, J., de Haan, C., Ibrahim, M., Murgueitio, E., Pablo Ruiz, J. (2007). Paying for the environmental services of silvopastoral practices in Nicaragua. *Ecological Economics*, 64, 374-385.
- Pagiola, S., Arcenas, A., & Platais, G. (2005). Can Payments for Environmental Services Help Reduce Poverty? An Exploration of the Issues and the Evidence to Date from Latin America. *World Development*, 33 (2), 237-253.
- Pagiola, S., Agostini, P., Gobbi, J., de Haan, C., Ibrahim, M., Murgueitio, E., Ramirez, E., Rosales, M., Pablo Ruiz, J. (2004). Paying for Biodiversity conservation services in agricultural landscapes. (Environmental Economics Series Environment Department Paper No 96). *The World Bank Environment*.
- Pattanayak, Wunder, & Ferraro, (2010). Show me the money: Do payments supply environmental services in developing countries?. *Review of Environmental Economics and Policy*, 4 (2), 254-274.

Patton, M. (2002). *Qualitative Research & Evaluation Methods*. (3rd ed.) Sage Publications: Thousand Oaks, CA.

Peskett, L., Schreckenberg, K., & Brown, J. (2011). Institutional approaches for carbon financing in the forest sector: Learning lessons for REDD+ from forest carbon projects in Uganda. *Environmental Science & Policy*, 14, 216–229.

Pham, T.T., Campbell, B., Garnett, S., Aslin, H., & Hoang, M.H. (2010). Importance and impacts of intermediary boundary organizations in facilitating payment for environmental services in Vietnam. *Environmental Conservation*, 37 (1), 64-72.

Pollard, A., & Court, J. (2005). How civil society organizations use evidence to influence policy processes: a literature review. ODI Working Paper 249. *Overseas Development Institute*.

Redford, K. & Adams, W. (2009). Payment for ecosystem services and the challenge of saving nature. *Conservation Biology*, 23 (4), 785-787.

Rosa, H., Kandel, S., & Dimas, L. (2004). Compensation for environmental services and rural communities: Lessons from the Americas. *International Forestry Review*, 6 (2), 187-194.

Shay, A. (2006). Conservation through sustainable agriculture-The case of the Cerro Punta watershed, Panama. *Journal of Sustainable Forestry*, 22 (1): 143.

- Strauss, A. & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Swallow, B., Kallesoe, M., Iftikar, U., van Noordwijk, M., Bracer, C., Scheer, S., Raju, K., Poats, S., Duraiappah, A., Ochieng, B. Mallee, H.m & Rumley, R. (2009). Compensation and rewards for environmental services in the developing world: Framing pan-tropical analysis and comparison. *Ecology and Society*, 14 (2): 26.
- Swinton, S., Lupi, F., Robertson, G., Hamilton, S. (2007). Ecosystem services and agriculture: Cultivating agricultural ecosystems for diverse benefits. *Ecological Economics*, 64, 245-252.
- Turner, R. & Daily, G. (2008). The Ecosystem Services Framework and Natural Capital Conservation. *Environmental and Resource Economics*, 39 (1), 25-35.
- The Nature Conservancy. (2007). *Amistad Biosphere Reserve, Costa Rica and Panama: Parks in Peril End of Project Report*. Arlington, Virginia, USA. The Nature Conservancy.
- UNESCO, United Nations Environment Program, World Conservation Monitoring Centre. (2006). *Talamanca Range-La Amistad Reserves / La Amistad National Park Costa Rica & Panama*. Available at <http://Sea-Bov.Unep-Wcmc.Org>.
- van Noordwijk, M. & Leimona, B. (2010) Principles for fairness and efficiency in enhancing

environmental services in Asia: Payments, compensation, or co-investment? *Ecology and Society* 15(4). 17.

van Noordwijk, M., Leimona, B., Emerton, L., Tomich, T., Velarde, S., Kallesoe, M., Sekher, M., & Swallow, B. (2007). Criteria and indicators for environmental service compensation and reward mechanisms: Realistic, voluntary, conditional and pro-poor. CES Scoping Study Issue Paper no. 2, ICRAF Working Paper, 37. Nairobi, Kenya: World Agroforestry Centre.

Vaske, J. (2009). *Survey research and analysis: Applications in parks, recreation and human dimensions*. State College, Pennsylvania: Venture Publishing Inc.

Vatn, A. (2010). An institutional analysis of payments for environmental services. *Ecological Economics*, 69, 1245-1252.

Wertz-Kanounnikoff, S., & Kong-Apira, M. (2008). Reducing forest emissions in Southeast Asia: A review of drivers of land use change and how payments for environmental services schemes can affect them. CIFOR Working Paper No. 41. *Center for International Forestry Research*, Bogor, Indonesia.

Wunder, S. (2005). Payments for environmental services: Some nuts and bolts. *Center for International Forestry Research*, CIFOR Occasional Paper No. 42.

- Wunder, S. (2006). Are direct payments for environmental services spelling doom for sustainable forest management in the tropics? *Ecology and Society*, 11 (2), 23.
- Wunder, S., Engel, S., Pagiola, A. (2008). Taking stock: A comparative analysis of payments for environmental services programs in developed and developing countries. *Ecological Economics*, 65, 834-852.
- Wunder, S. (2009). Between purity and reality: Taking stock of PES schemes in the Andes. In Ecosystem Marketplace. Integrated Solutions: Water biodiversity and the clean development mechanism. 2009. *EM Market Insights: Beyond Carbon. The Katoomba Group, Forest Trends and Ecosystem Marketplace*, 1-40.
- Zhang, L., Tu, Q., & Mol, P.J. (2008). Payment for environmental services: The sloping land conversion program in Ningxia Autonomous region of China. *China & World Economy*, 16 (2), 66-81.
- Zilberman, D., Lipper, L. & McCarthy, N. (2008). When could payments for environmental services benefit the poor? *Environmental and Development Economics*, 13 (3), 255-278.

APPENDIX A:

INTERVIEW SCRIPT AND MATERIALS

Interview Script

ESCRITURA DE LAS ENTREVISTAS

Gracias por haber aceptado participar en esta entrevista. Este estudio puede ayudar e informar organizaciones de conservación en el futuro. La entrevista dura aproximadamente 60-90 minutos para completar. Sus respuestas serán confidenciales y su participación es voluntaria. Usted puede terminar la entrevista en cualquier momento. Por favor, avíseme si usted tiene alguna preocupación. Si usted no desea responder a una pregunta por favor avíseme y continuaremos con la próxima pregunta.

El objetivo de este estudio es conocer la posibilidad de desarrollar un programa de pagos por servicios ambientales (o PSA) en esta región.

Para este estudio, estamos entrevistando organizaciones como la suya que podrían tener un papel importante en un programa de pagos por servicios ambientales (PSA). En concreto, estamos explorando formas de apoyar y conectar usuarios y proveedores en una programa regional de PSA. En la actualidad, no existe tal programa en esta región, pero existe la posibilidad de crear uno.

Vamos a hacerle preguntas sobre todo relacionadas con el conocimiento de su organización e interés en el desarrollo de un programa de pago por los servicios en esta región. También se le preguntará acerca de la importancia de los diferentes intermediarios para conectar usuarios y proveedores en un programa de pago por servicios ambientales (PSA) que mejoran el medio ambiente.

Al contestar las siguientes preguntas, tendría en cuenta que usted está siendo entrevistado como representante de su organización, y, (en consecuencia), sus respuestas deben ser desde el punto de vista de su organización. Ya habrá tiempo al final de nuestra entrevista, donde puede compartir sus opiniones personales o puntos de vista sobre los temas de la discusión.

Me gustaría pedirle permiso para grabar esta entrevista. Grabación digital me permite grabar sus respuestas con más precisión y también tomara menos tiempo ya que no se tendrá que tomar tantas notas. Si Ud prefería que yo NO uso está grabando, sólo voy a escribir notas a mano. ¿Está bien si grabo esta entrevista?

Si es posible, por favor podría hablar un poco despacio? (Estoy practicando, pero...) Ahora mi español es un poco débil y yo agradecería su ayuda.

Sección I: ANTECEDENTES DE LA ORGANIZACIÓN

1. **Primero, me gustaría hacerle algunas preguntas generales sobre su papel de trabajo y su organización.**
 1. **¿Cuál es su título o su posición en la organización?**
2. **¿Cuáles son sus responsabilidades de trabajo en general?**
3. **¿En qué tipos de proyectos trabaja su organización en relación con la conservación, la agricultura y el desarrollo económico?**

SECCIÓN II: EL CONOCIMIENTO DE SU ORGANIZACIÓN DE PSA

Me gustaría preguntarle el nivel del conocimiento en su organización acerca de los programas de pagos por servicios ambientales. Ud. sabe que es una programa de pagos por los servicios ambientales? (*Si no*) Si Ud. quisiera, yo podría darle un poco de información sobre los pagos por servicios ambientales.

[I #1] Los servicios ambientales son los beneficios que recibe la gente de la naturaleza e incluyen cosas como comida, agua limpia, regulación del clima y la belleza (de tierra) *paisaje*. Estos servicios vienen de tierras públicas, y tierras privadas. Tradicionalmente, los dueños de fincas sólo han recibido el pago por muy pocos de estos productos, como el ganado y los cultivos, pero no reciben el pago por estos otros beneficios que vienen de su tierra. Hay proyectos que están trabajando para cambiar esta situación. Los programas de pagos por servicios ambientales (PSA) son una nueva manera de conservación que incluye los usuarios de los servicios ambientales, (tales como empresas y organizaciones públicas), y pagos a propietarios de tierras por el manejo de sus tierras que producen servicios beneficios para el medio ambiente.

En Costa Rica y otros países alrededor del mundo, los que trabajan en la tierra, como los dueños de fincas, reciben los pagos para la gestión (el manejo) de sus tierras para proporcionar servicios importantes, que apoyan el bienestar humano. Estos servicios incluyen aire y agua limpios, laderas estables, belleza escénica, hábitat para las abejas y otros animales (*que polinizan algunos cultivos agrícolas*), y otros servicios. Los propietarios reciben pagos por estos servicios, además de los ingresos para la alimentación y otros productos cultivados en sus tierras. La participación en estos programas de PSA es voluntaria y no es necesario por la ley.

Organizaciones, como la en que usted trabaja, con frecuencia participan en este tipo de proyecto, con asistencia en el desarrollo de proyectos, diseño e implementación. Si una organización o grupo de organizaciones que trabajan en su comunidad decidiera ofrecer este tipo de programa, su organización, posiblemente, podría ser incluida en el diseño e operación del proyecto. Estamos tratando de aprender acerca de lo que existe un potencial en este región para la creación de un proyecto. Específicamente, estamos interesados en aprender cómo las organizaciones como la suya podría contribuir o beneficiarse de tales programas posibles.

1. **¿Su organización sabe acerca la idea de los programas de pagos por servicios ambientales (PSA)?**
 1. *En caso afirmativo:*
 1. **¿Qué sabe su organización acerca de los pagos por servicios ambientales?**

2. **¿Tiene algún proyecto que se refiere a los pagos por servicios ambientales?**
 3. *En caso afirmativo, ¿podría usted decirnos acerca de los objetivos del proyecto?*
 4. **¿Cómo está involucrada su organización?**
2. *En caso negativo:*
1. **Además de la explicación básica que acabo de dar, ¿hay algo más que yo puedo explicar a aclarar su comprensión de un proyecto de PSA?**

Sección III: INVESTIGANDO LAS FUNCIONES DE LOS INTERMEDIARIOS EN PSA

La siguiente sección incluye preguntas relacionadas con las diversas funciones que las organizaciones pueden adoptar para apoyar el diseño y operación de un programa de PSA en esta región. Vamos a cubrir diferentes puntos dentro de esta sección. Esta sección es la parte más larga de la entrevista.

Programas de pagos por servicios ambientales por lo general incluyen tres tipos de participantes (*Ilustración # 1*). El primero corresponde a los usuarios de servicios ambientales, lo que podría ser del sector privado (por ejemplo, una empresa de bebidas que se beneficia de manejo de la tierra que protege la calidad del agua) o una agencia del gobierno que actúan en nombre del bien público (por ejemplo, la reforestación o el apoyo a la conservación de bosques para proteger el hábitat de la fauna).

El segundo grupo se llama proveedores, o vendedores y son dueños de fincas y otras personas que están trabajando en la tierra. Los proveedores consiste en propietarios que suministran servicios ambientales a través de su gestión de la tierra. Estas prácticas de gestión de la tierra pueden ser cosas tales como la plantación de árboles en los bordes de agua para reducir la erosión del suelo y mejorar la calidad del agua.

El tercer grupo, que llamaremos los intermediarios incluye a las organizaciones que están conectados a los usuarios y proveedores y que ayudan a coordinar transacciones, pagos, y medias del servicios. Es este último grupo, vamos a enfocar la discusión en esta entrevista.

Basado en una revisión de programas de pagos por servicios ambientales que funcionan en todo el mundo, los intermediarios tienen las siguientes funciones para apoyar la operación del programa: [*Ilustración # 3*]: el intercambio de información, diseño de programas, administración, y representación y mediación. Esta ilustración muestra algunas de las cosas que hemos visto como importantes en otros programas en otras partes del mundo. Voy a preguntarle una serie de preguntas para cada una de estas cuatro funciones principales.

1. [*Ilustración #4*] Intercambio de información: Los intermediarios a menudo actúan como comunicadores entre los diferentes grupos. Como comunicadores de la información, los intermediarios hacen cosas como: prestar asistencia en el intercambio de información entre usuarios, proveedores, y otros grupos involucrados en el programa de pago por los servicios ambientales, y proporcionar información accesible sobre el concepto de pagos por servicios ambientales a las partes interesadas y el público en general. Los intermediarios traducir los términos científicos en un lenguaje más apropiado para el público en general.

Los intermediarios pueden proporcionar información a los posibles participantes acerca de cómo funciona la programa.

(También, ellos pueden prestar asistencia en el intercambio de información entre proveedores, usuarios y otros grupos involucrados en el programa de pago por los servicios ambientales. Por ejemplo, la información muy técnica sobre las condiciones ambientales de la zona no puede ser fácilmente comprensible para una persona no-científico, como dueño de finca/empresario/político).

[Preguntas]:

1. **¿Cree que esta función de intercambio de información es necesario si un proyecto de PSA se llevaron a cabo en esta región?**
2. **¿Qué piensa acerca de la importancia de estas características (o ejemplos) de intercambio de información en un programa de PSA, o en proyectos de conservación en general?**
3. **¿Ve usted las características del intercambio de información en el trabajo de su organización? ¿Cuales características y cómo?**
 1. *En caso afirmativo, ¿cómo realizar esta función de intercambio de información?*
 1. **¿Con cuales otras organizaciones hacen ustedes este intercambio de información ?**
 2. **¿Qué tipo de información se intercambio?**
 2. *Si no, ¿usted cree que su organización podría o debería desempeñar este función?*
4. *¿Cuáles son las fortalezas y debilidades de su organización en el intercambio de información?*
5. **Si un programa de PSA se han desarrollado aquí, ¿cree usted que su organización podría desempeñar un papel en el intercambio de información?**
6. **¿Cuales otras organizaciones en este lugar participando en el intercambio de información?**
 1. *En caso afirmativo, ¿Puede explicar cómo la organización (s) están haciendo el intercambio de información?*
 2. *Si no, ¿Tiene usted ideas que explican la falta de participación de las organizaciones en este lugar en el intercambio de información?*

2. [Ilustración #5] El segundo función-El diseño del programa.

Los intermediarios pueden ayudar en el desarrollo y el diseño de un programa de PSA. Un parte muy importante en el diseño de programas que los intermediarios hacen en las etapas iniciales es para ayudar con la identificación y el contacto con los participantes posibles del programa.

También, los intermediarios convocan las partes interesadas para obtener sus ideas en el diseño del programa (por ejemplo, servicios de destino del ecosistema, el derecho propietario de la tierra, la estructura de pago, los límites geográficos). Los intermediarios pueden asegurar que las

preocupaciones específicas de las regiones y los grupos de interés específicos se han incorporado en las conversaciones del diseño del programa. La elaboración de normas y directrices del programa, incluido un protocolo para el monitoreo y la evaluación del programa son mas ejemplos de funciones de los intermediarios.

[Preguntas]:

7. **¿Cree que esta función del diseño del programa es necesario si un proyecto de PSA se llevaron a cabo en esta región?**
8. **¿Qué piensa acerca de la importancia de estas características del diseño del programa en un programa de PSA, o en proyectos de conservación en general?**
9. **¿Ve usted las características del diseño del programa en el trabajo de su organización? ¿Cuáles características y cómo?**
 1. *En caso afirmativo, ¿cómo realizar esta función del diseño del programa?*
 1. **¿A qué escala se trabaja en la asistencia con el diseño del programa?**
 2. **¿Alguna vez trabajan ustedes para ampliar o reducir sus proyectos de diseño de los programas? (por ejemplo, ampliar un proyecto local, o de minimizar un proyecto regional)**
 2. *Si no, ¿usted cree que su organización podría o debería desempeñar este papel?*
 3. *Cuáles son las fortalezas y debilidades de su organización en el diseño del programa ?*
10. **Si un programa de PSA se han desarrollado aquí, ¿cree usted que su organización podría desempeñar un papel en el diseño del programa?**
11. **¿Cuáles otras organizaciones en este lugar participando en el diseño del programa?**
 1. *En caso afirmativo, ¿Puede explicar cómo la organización (s) están haciendo el diseño del programa?*
 2. *Si no, ¿Tiene usted ideas que explican la falta de participación de las organizaciones en esta región en el diseño del programa?*

3. [Ilustración #6] El tercer función-Administración.

Frecuentemente, los intermediarios hacen tareas administrativas, así, similar a las que se ilustran antes (*en el diagrama que mostraba que antes-figura 1*). Estas tareas administrativas incluyen cosas tales como la promoción y difusión de información a los posibles participantes sobre el programa de PSA, y administración de proyectos incluye actividades como la gestión de los contratos, y administrar los fondos del programa. Un otro ejemplo de administración de los intermediarios es prestar asistencia y apoyo con el papeleo y los requisitos de elegibilidad del programa.

[Preguntas]:

12. **¿Cree que esta función de la administración es necesario si un proyecto de PSA se llevaron a cabo en esta región?**

13. **¿Qué piensa acerca de la importancia de estas características de administración en un programa de PSA, o en proyectos de conservación en general?**
14. **¿Ve usted las características de la administración en el trabajo de su organización? ¿Cuales características y cómo?**
 1. *En caso afirmativo, ¿cómo realizar esta función de la administración?*
 2. *Si no, ¿usted cree que su organización podría o debería desempeñar este papel?*
 3. *¿Cuáles son las fortalezas y debilidades de su organización en la administración?*
15. **Si un programa de PSA se han desarrollado en este región, ¿cree usted que su organización podría desempeñar un papel en la administración de una programa?**
16. **¿Cuales otras organizaciones en este región participando en administración?**
 1. *En caso afirmativo, ¿Puede explicar cómo la organización (s) están haciendo administración?*
 2. *Si no, ¿Tiene usted ideas que explican la falta de participación de las organizaciones en este región en la administración?*

4. [Ilustración #7] Por ultimo, el cuarto función-La Representación y la Mediación.

Los intermediarios también pueden ser representantes de un grupo o de los intereses de varios grupos. Esto puede ser especialmente importante cuando un grupo de no tiene una voz muy fuerte, y necesitan la representación de una organización con cierta autoridad en la región. Intermediarios abogar por el mejor interés del grupo (s) que representan, como proveedores, usuarios, y otros participantes del programa. Los intermediarios pueden representar a los proveedores y / o usuarios mediante la negociación de un contrato del programa. También ellos ayudan a establecer la confianza entre los participantes del programa.

[Preguntas]:

17. **¿Cree que esta función de la representación y la mediación es necesario si un proyecto de PSA se llevaron a cabo en esta región?**
18. **¿Qué piensa acerca de la importancia de estas características de la representación y la mediación en un programa de PSA, o en proyectos de conservación en general?**
19. **¿Ve usted las características de la representación y la mediación en el trabajo de su organización? ¿Cuales características y cómo?**
 1. *En caso afirmativo, ¿cómo realizar esta función de la representación?*
 2. *Si no, ¿usted cree que su organización podría o debería desempeñar este papel?*
 3. *¿Cuáles son las fortalezas y debilidades de su organización en la representación?*
20. **Si un programa de PSA se han desarrollado en este región, ¿cree usted que su organización podría desempeñar un papel en la representación y la mediación?**
21. **¿Cuales otras organizaciones en este región participando en la representación?**

1. *En caso afirmativo, ¿Puede explicar cómo la organización (s) están haciendo la representación y la mediación ?*
2. *Si no, ¿Tiene usted ideas que explican la falta de participación de las organizaciones en este región en la representación y la mediación?*

PARTE 2 DE LA SECCIÓN III:

1. **¿ Más allá de las funciones que hemos mencionado hasta ahora, hay funciones adicionales que los organizaciones pueden desempeñar en esta región lo cuales serían importantes para que un programa de PSA pueda funcionar mejor y tener éxito?**

1. *En caso afirmativo, ¿qué cosas o funciones?*
2. *En caso afirmativo, haga las siguientes preguntas:*
3. *¿Cree que esta función es necesario si un proyecto de PSA se llevaron a cabo aquí?*
4. *¿Qué piensa acerca de la importancia de estos características en un programa de PSA o en proyectos de conservación en general?*
5. *¿Ve usted las características en el trabajo de su organización? ¿Cuales características y cómo?*
 1. *En caso afirmativo, ¿cómo realizar esta función?*
 2. *Si no, ¿usted cree que su organización debería desempeñar este papel?*
6. *Si un programa de PSA se han desarrollado en este región, ¿cree usted que su organización podría desempeñar un papel?*
7. *¿Cuales otras organizaciones en este ámbito participando en este función?*
 1. *En caso afirmativo, ¿Puede explicar cómo la organización(s) están haciendo el papel?*
 2. *Si no, ¿Tiene usted ideas que explican la falta de participación de las organizaciones en este ámbito en el papel?*

2. **¿Cuál de estas funciones (y las demás funciones identificadas en esta entrevista) cree usted que las organizaciones en esta lugar en la actualidad tienen *la mayor* capacidad para ofrecer? ¿Por qué? (Con su organización?-can skip 1 below)**

3. **¿Cuál de estas funciones (y las demás funciones identificadas en esta entrevista) cree usted que las organizaciones en esta región en la actualidad tienen *menos* capacidad para ofrecer? ¿Por qué? (Con su organización?-can skip 2 below)**

4. **¿Tiene usted alguna otra reacción o algunos pensamientos de estas funciones de los intermediarios que usted le gustaría mencionar ahora?**

Y ahora, tengo algunas preguntas de esta sección acerca de estas funciones y cómo se relacionan específicamente con la organización de usted. ...

1. **¿Hay funciones que hemos hablado que su organización tiene como bien posicionada para contribuir a un programa en el futuro de PSA? ¿Por qué?**

2. ¿Por el contrario, hay funciones que hemos hablado que su organización no tiene las condiciones de asumir? ¿Por qué?

SECCIÓN IV: PREGUNTAS ADICIONALES SOBRE LA ORGANIZACIÓN Y PSA

Gracias por todas sus respuestas útiles. (*Tenemos solo un pocos minutos mas para terminar la entrevista.*) A continuación, me gustaría hacerle algunas preguntas adicionales relacionadas con su organización y los pagos por servicios ambientales.

Tres objetivos posibles para un programa de PSA en esta región sería el apoyo de la administración:

- (1) de los bosques** (conservación de los bosques que ya está en desarrollo),
- (2) reforestación** (plantación de árboles en el área deforestada), y
- (3) operaciones agroforestales** que combinan árboles que crecen en combinación con la gestión de la tierra para la producción agrícola o ganadera.

1. **¿En el grupo de estos objetivos posibles, cuales son más interesantes a su organización?**
 1. **¿Por qué?**
2. **¿En cuales objetivos tiene su organización la mejor posición para apoyar, y por qué?**
3. ***Y, una pregunta relacionada a PSA en general--¿Si su organización fueron a participar como intermediario en un programa de PSA, cuales son los recursos necesarios para que sea posible y deseable su participación?***
 1. **(por ejemplo, el financiamiento, los empleados adicionales)**

SECCIÓN V: COLABORACIÓN CON OTRAS ORGANIZACIONES

Ahora estamos en casi la última sección de la entrevista, y me gustaría hablar de otras organizaciones en este ámbito que están trabajando en proyectos parecidos a su organización.

1. **¿Conoce usted personas o organizaciones que trabajan en temas relacionadas con el PSA en esta área?**
 1. ***[En caso afirmativo]: ¿Quién está trabajando en estos temas, y que están haciendo?***
 2. **¿Dónde están trabajando? ¿Cómo sabe usted acerca de su trabajo?**
2. **¿Qué otras organizaciones que trabajan en esta región cree usted que podría estar interesado en participar en un proyecto de PSA en el futuro?**
3. **Cuales otras organizaciones que podrían desempeñar un papel importante de intermediación recomendaría usted ponerme en contacto para solicitar una entrevista?**

1. **¿Tendría el nombre o información de contacto de una persona específica que me recomienda para solicitar una entrevista?**

SECCION VI: COMENTARIOS PERSONALES

Gracias, que concluye a todas nuestras preguntas acerca de su organización.

En este punto, nos gustaría invitarlos a formular comentarios de la entrevista de su perspectiva personal. También, por favor no dude en hacer preguntas acerca de nuestro proyecto.

CONCLUSIÓN

Gracias de nuevo por su tiempo. Si tenemos preguntas adicionales después de esta entrevista, ¿sería bien que se ponga en contacto de nuevo para una breve discusión? [Tiene una tarjeta?]

Por favor contáctanos si tiene alguna idea más o preguntas que se ocurren en el futuro [*proporcionar la tarjeta de proyecto y ilustración*] ..

Voy a estar en Panamá hasta el medio de julio haciendo más entrevistas y el trabajo con los socios del proyecto en esta investigación. Luego regresará a Colorado para organizar y analizar los datos de mis entrevistas. Espero que tendré un informe del proyecto sobre esta investigación en enero de 2012, que voy a compartir con usted y todos los otros entrevistados.

Interview Materials

These interview materials were used within the interviews as visual aids to promote enhanced understanding and dialogue.



Principios Centrales de PSA



FUNCIONES DE LOS INTERMEDIARIOS

| FUNCIONES | EJEMPLOS |
|-----------------------------------|--|
| Intercambio de Información | <ol style="list-style-type: none"> 1. Proporcionar información accesible sobre el concepto de pagos por servicios ambientales (PSA) a las partes interesadas y el público en general 2. Proporcionar información a los posibles participantes acerca de cómo funciona el programa. 3. Prestar asistencia en el intercambio de información entre compradores, vendedores y otros grupos involucrados en el programa de pago por los servicios ambientales. |
| Diseño del Programa | <ol style="list-style-type: none"> 1. La identificación y el contacto con los participantes posibles del programa. 2. Convocar las partes interesadas para obtener sus ideas en el diseño del programa (por ejemplo, servicios de destino del ecosistema, el derecho propietario de la tierra, la estructura de pago, los límites geográficos). 3. Asegurar que las preocupaciones específicas de las regiones y los grupos de interés específicos se han incorporado en las conversaciones del diseño del programa. 4. La elaboración de normas y directrices del programa, incluido un protocolo para el monitoreo (seguimiento) y la evaluación del programa. |
| Administración | <ol style="list-style-type: none"> 1. Promoción y difusión de información sobre el programa de Pagos por Servicios Ambientales. 2. Administración de proyectos incluye actividades como la gestión de los contratos, y administrar los fondos del programa. 3. Prestar asistencia y apoyo con el papeleo y los requisitos de elegibilidad del programa. |
| Representación y Mediación | <ol style="list-style-type: none"> 1. Representación de los intereses y preocupaciones de los compradores, vendedores y otros participantes del programa. En algunos casos, ser un tercero grupo neutral. 2. Representación de los compradores y / o vendedores en el proceso de negociación del contrato. 3. Sirviendo como intermediarios honestos de la información y recursos entre los participantes del programa. 4. Ayudar a establecer la confianza entre los participantes del programa. |