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A Payment by Any Other Name: Is Costa Rica's PES a payment for services or a support for stewards?

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1 ***Highlights***

- 2 • We studied perceptions of Costa Rica’s payments for ecosystem services program.
- 3 • Participants and leadership used different framings for the PES program.
- 4 • Leadership framed the program as a market mechanism.
- 5 • Participants more often saw the program as a *support for stewards*.
- 6 • Engaging a *support for stewards* framing might help prevent motivational crowding-out.

7 ***Abstract***

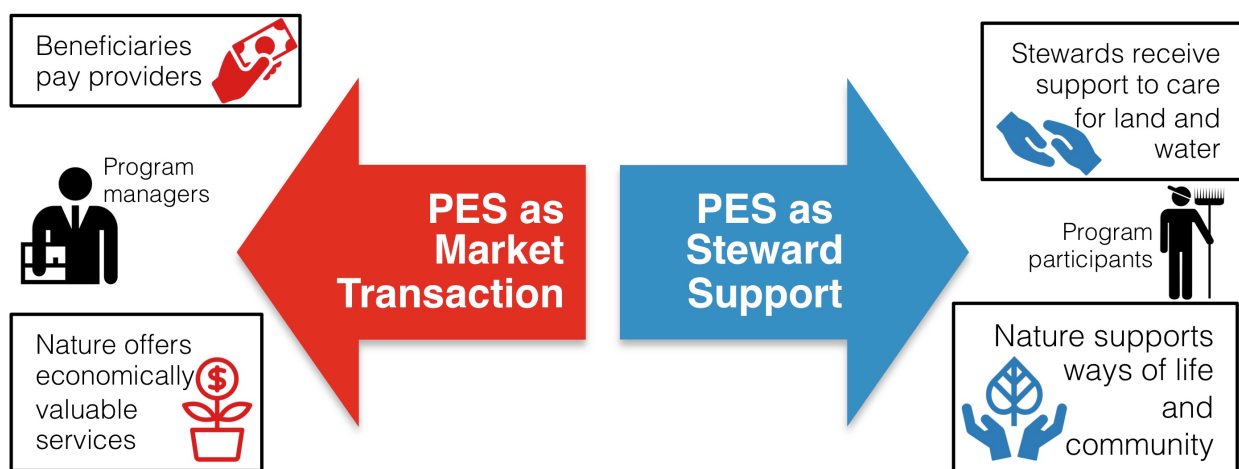
8 Financial incentives are increasingly popular in development and conservation. A common
9 application involves paying for conservation activities, such as for farmers to set aside land for
10 forests, known as payments for ecosystem services (PES). Debates about incentives such as PES
11 center around the promise and perils of applying market logics to conservation or development
12 goals. A key concern is the potential of financial motivations to crowd out non-financial
13 motivations such as altruism or responsibility. Theoretical debates about the potential impacts of
14 PES programs often assume that PES programs are understood as such by participants—as
15 transactions characterized by a payment for a service—but research has not sufficiently
16 investigated the extent to which these assumptions hold in practice. We studied Costa Rica’s
17 long-standing PES program in the traditional cattle ranching region of Guanacaste via in-depth
18 interviews with program managers, local experts and participants to better understand the range
19 of values and views associated with program payments. We find that whereas program
20 leadership primarily communicated the program as clearly-defined payments for specific
21 services provided, most farmer participants framed financial payments from the program as a
22 form of non-transactional support recognizing their ongoing care for the land and forest. This

finding—that market framings did not fully transfer from program leadership through local managers to farmer participants—shows how participants might experience PES programs not as payments for services per se, but as acknowledgement for land stewardship and an additional form of rural development assistance. The *support for stewards* framing of PES, as suggested by participants themselves, points to a potential leverage point in designing PES programs that enhance (rather than undermine) connections to nature. More broadly, incentive programs of all sorts might consider program framings that reinforce the kinds of values (e.g., social cohesion, health) they seek to improve.

Key words: incentives; payments for ecosystem services; motivational crowding-out; relational values; Latin America; Costa Rica

Acronyms: FONAFIFO (The National Fund for Forestry Finance), PSA (*Pagos por servicios ambientales*), PES (Payments for Ecosystem Services)

Graphical Abstract



1 INTRODUCTION

Incentive programs are increasingly popular in development (Banerjee, Duflo, Glennerster, & Kothari, 2010) and conservation efforts (Adhikari & Agrawal, 2013; Börner et al., 2017; Ferraro, 2011). Incentives and other market-based approaches carry the promise of economic efficiency, innovation, new funding opportunities, and the possibility to modify behavior via price signals and incentives (Jack, Kousky, & Sims, 2008; Kinzig et al., 2011). Financial incentives might inspire conservation behavior even in those with no such motivations—involving more people or companies in conservation efforts, in deed if not intent (Daily & Ellison, 2002; Helm, 2015).

But what are the long-term implications of motivation by economic reasoning? Might paying for socially- or ecologically-desired behavior change previously held rationales and motivations? A key concern is the potential of financial incentives to undermine long-term objectives, a phenomenon known as motivational crowding-out, where the use of financial incentives ‘crowds-out’ other types of motivations, including intrinsic and altruistic motivations (Bowles, 2008; Gómez-Baggethun & Ruiz-Pérez, 2011; Kosoy & Corbera, 2010; Luck et al., 2012; Muradian et al., 2013; Spash, 2008; Vatn, 2010). The idea of motivational crowding-out originated nearly 50 years ago when Titmuss surmised that morally-motivated blood donors would be less inclined to donate if there were a financial incentive, potentially even reducing the total supply (1971). More recently, in an experiment in 10 Israeli daycares, when a small fine for late pickups was instituted, parents were *more* likely than before to pick their children up late (Gneezy & Rustichini, 2000). That study’s authors propose that the fine became a price (to pay for additional daycare), thus crowding out parents’ principled motivations (being on time in respect of caregivers). Moreover, the increased tardiness remained even after the fine was removed (Gneezy & Rustichini, 2000). The issue of motivational crowding is relevant for a wide

1 variety of contexts, including environmental conservation (Rode, Gómez-Baggethun, & Krause,
2 2015), sustainable development (Agrawal, Chhatre, & Gerber, 2015), health care (Duchoslav &
3 Cecchi, 2019), and agrobiodiversity (Narloch, Pascual, & Drucker, 2012).

4 Given the increased use of financial incentives across a wide variety of development and
5 conservation contexts, motivational crowding-out has become a nontrivial concern, particularly
6 in the context of payments for ecosystem services (PES)—the focus of our study. Empirical
7 evidence on PES shows inconclusive results: sometimes financial incentives lead to crowding-
8 out and sometimes (though less often) they lead to its opposite—crowding-in, bolstering support
9 for or normalizing pro-environmental behavior (Rode et al., 2015; Van Hecken & Bastiaensen,
10 2010). Ezzine-de-Blas, Corbera, and Lapeyre propose a conceptual framework based on four
11 moderating factors (autonomy, competence, social relatedness and environmental relatedness)
12 and two contextual levels (personal and interpersonal) that might shape either a crowding-out or
13 crowding-in pathway for PES (Ezzine-de-Blas, Corbera, & Lapeyre, 2019).

14 In this paper, we develop a conceptual framework based on empirical evidence from Costa Rica.
15 Much work on crowding-out has focused on motivational changes as an endpoint, measured e.g.,
16 in terms of behaviors within lab or field experiments. However, from an environmental policy
17 perspective, the endpoint of greatest concern might be motivational shifts whereby a program
18 helps shape the way a recipient thinks about their relationship to the land or nature more broadly
19 (Bowles, 2008; Kosoy & Corbera, 2010; Spash, 2008). A few studies have examined motivations
20 and values in applied empirical contexts (Allen & Colson, 2018; Fisher, 2012; García-Amado,
21 Pérez, & García, 2013); as well Akers & Yasué (2019) consider the role of PES schemes in
22 changing values, framings, and responsibilities, including between people and nature.

1 We examine the intersections of PES and relationships to nature by employing the concept of
2 relational values, preferences, principles and virtues about relationships between people and
3 nature or among people via nature (Chan et al., 2016). We contrast relational values with two
4 framings of instrumental values—market and ecosystem services. Whereas held values (e.g.,
5 guiding concepts such as achievement, tradition, etc.) are considered to be relatively stable
6 (Bardi & Schwartz, 2016), relational values may be more dynamic (Chan, Gould, & Pascual,
7 2018). While motivation is an appropriate measure for much of the experimental work on
8 crowding-out, for our fine-grained empirical analysis, relational values provide a richer picture.
9 In so doing our approach aligns with and expands on that of Ezzine-de-Blas, Corbera, and
10 Lapeyre (2019), in that we too focus on the relationship to the environment.

11 In our conceptual framework and study, we examine how both the program payment and the
12 value of nature are framed by various groups. In economics and psychology framing effects
13 generally refer to the experimental frame (e.g., how an experiment is presented to participants).
14 In our study we examine how different groups themselves frame the payment via the language
15 used to describe it and the justifications given for this language. While it might seem inevitable
16 that PES employ market-based language (e.g., payment), empirically participants sometimes
17 describe such programs as offering a ‘help’ (Kosoy, Martinez-Tuna, Muradian, & Martinez-
18 Alier, 2007), and campesino groups have advocated for the alternative language of
19 ‘compensation’ (Rosa, Kandel, & Dimas, 2004). Scholars studying PES and PES-like
20 instruments have identified various types of framings or languages of PES (e.g., conservation,
21 poverty reduction or ecosystem steward framings), including alternatives to payment such as
22 ‘rewards,’ ‘compensation’ (Swallow et al., 2009), or ‘co-investment’ (van Noordwijk &
23 Leimona, 2010).

1 As well as framing the payment, PES programs may vary in the language used to articulate the
2 value of nature. Different ‘value languages’ are often associated with particular valued entities
3 and ways of valuing those entities (Avcı, Adaman, & Özkaynak, 2010; Martinez-Alier, 2008;
4 Trainor, 2006). In this paper, we thus consider PES programs as ‘value articulating institutions,’
5 following Vatn’s (2005) synthetic approach to institutions, and we consider that they might play
6 a role in shaping the way we ‘make sense of’ the world, create or articulate values, and
7 coordinate behavior. Thus, the language used by a program frames what is valuable
8 (economically valuable goods and services versus valued trees, birds and clean water), what is
9 appropriate behavior (self-interest versus moral responsibility) and the sorts of relationships that
10 occur between people and nature (e.g., nature as service provider versus people as stewards of
11 nature). If PES programs intentionally or unintentionally situate the sorts of relationships that
12 occur between people and nature, and the ways people value and perceive nature, this might
13 indicate a long term shift in how nature is perceived and valued—beyond the specific context of
14 the program itself (Gómez-Baggethun & Ruiz-Pérez, 2011; Kosoy & Corbera, 2010; Luck et al.,
15 2012; Spash, 2008). We examine these values and meanings at one point in time, as a point of
16 departure for assessing the role that the PES program can potentially play within larger
17 socioeconomic and ecological drivers of conservation.

18 While a PES program may employ certain languages around payments and the values of nature,
19 these do not necessarily correspond with the views held by program participants. Yet the
20 different experiences of participants, intermediary organizations, and program management have
21 not been directly assessed in the degree to which they adopt market-based language. Just as
22 people who live within biosphere reserves often do not know the reserve exists or do not
23 internalize the state’s intent for the land and their practices (Levine, Muthukrishna, Chan, &

Satterfield, 2017; Sundberg, 1998), participants may not always perceive PES as market-based. They may use or prefer different languages, such as help, support, recognition or compensation (Clot, Grolleau, & Méral, 2017; Kosoy et al., 2007). A farmer may see a payment for services as a *recognition* and reward for his/her status as an ideal farmer in the tradition of their particular agricultural practice.

In this paper we develop and employ a conceptual framework that considers two contrasting framings of PES programs: 1) PES as Market Transaction and 2) PES as Support for Stewards (see fig. 2). PES as Market Transaction refers to the framing of the program as paying for monetarily valued ecosystem services. PES as *support for stewards* draws from the idea of compensation for stewardship and protection of ecosystem services. The latter frame arose as a response and alternative conceptualization of PES, articulated by sustainable rural development advocates (McAfee & Shapiro, 2010; Rosa et al., 2004). Our overall framings are inspired by two paradigms of PES suggested by McAfee and Shapiro: “conservation efficiency” (parallel to our PES as Market Transaction) and “compensation for ecosystem services” (parallel to our PES as *support for stewards*) (2010). Along with these overall framings, we conceive of a spectrum of framings for the payment and the value of nature. We then examine how different groups fall along the spectrum and how they define the different points along this spectrum. Ultimately, our goal is to bring a more fine-grained empirical view of if and/or how a PES program embodies and translates market framings along the chain of leadership through to participants, and what that might mean for motivational crowding.

2 METHODS

2.1 Study area

Few PES programs in the world are as well-known as the *Pagos por Servicios Ambientales* (PSA) run by FONAFIFO (The National Fund for Forestry Finance) in Costa Rica. The PSA was established in 1996 as part of Forestry Law 7575, which also banned further forest conversion, punishable by prison sentence (Porrás, Barton, & Miranda, 2013). Four ecosystem services are included: GHG mitigation, water protection, biodiversity protection, and scenic beauty (www.fonafifo.go.cr). The program operates several different management options for land-owner participation, the most common of which are forest conservation (which pays to maintain existing forests) and reforestation (which subsidizes plantations of native or more often exotic trees), which together encompassed 95% of hectares enrolled in 2015; in contrast regeneration of new native forests comprised 4% of total enrolled hectares (Departamento de Gestión de Servicios Ambientales, 2015). Forest conservation pays 64 USD/ha per year in renewable contracts of 5 years. Reforestation pays landowners 816 USD/ha over a ten-year period. The higher amount for reforestation is intended to partially cover the costs of buying and maintaining plantation trees. Between 1997 and 2012 the program signed 15,375 contracts with landowners, enrolling nearly 1 million hectares for forest conservation, reforestation and natural regeneration as well as 4.4 million trees in agroforestry projects in a country of 51,100 square kilometers (Porrás et al., 2013) and 4.86 million people (23% rural) (The World Bank, 2017).

Our study focused on the Nicoya Peninsula in the northwestern province of Guanacaste. The region is one of the driest in Costa Rica, with annual precipitation ranging from 1,500 to 3,500 mm (Echeverri, Frishkoff, Gomez, Zook, Juárez, Naidoo, et al., 2019a). It encompasses tropical dry forests, tropical rainforests, natural savannahs, as well as various agricultural landscapes, and includes several protected areas (e.g., Diría National Park, Barra Honda National Park, Monte

1 Alto Natural Reserve) (Echeverri, Naidoo, Karp, Chan, & Zhao, 2019b). The region is also home
2 to numerous bird species (e.g., Long-tailed Mankin, Clay-colored Thrush, Organe-chinned
3 Parakeet, Great-tailed Grackle) (Dinat, Echeverri, Chapman, Karp, & Satterfield, 2019;
4 Echeverri, Naidoo, Karp, Chan, & Zhao, 2019b). Guanacaste is the poorest province in Costa
5 Rica and has a population estimated at 326,953 in 2011 (the most recent census) (Instituto
6 Nacional de Estadística y Censos, 2012). Guanacaste has historically been dominated by
7 agriculture and has a tradition of extensive cattle ranching (Zúñiga, 2009). Major economic
8 activities generally follow the geography of the area. Tourism dominates the peninsula's coasts.
9 Large export-oriented farms occupy lowlands and cultivate sugar cane, melon, and rice. Small-
10 holders in the highlands engage in extensive cattle ranching along with subsistence agriculture
11 and gardening (e.g., corn, beans, vegetables, chickens). We selected this study site based on
12 existing contacts with local partner organizations and interest from local groups for research in
13 the area (while many parts of Costa Rica have received large numbers of international
14 researchers, our region had relatively few and was thus not over-saturated with research). At the
15 national level, Costa Rica's National Biodiversity Strategic Action Plan has called for increased
16 research in Guanacaste, in light of challenges around biodiversity and climate change in the area
17 (Ministerio de Ambiente y Energía, Comisión Nacional para la Gestión de la Biodiversidad,
18 Sistema Nacional de Áreas de Conservación, 2016).

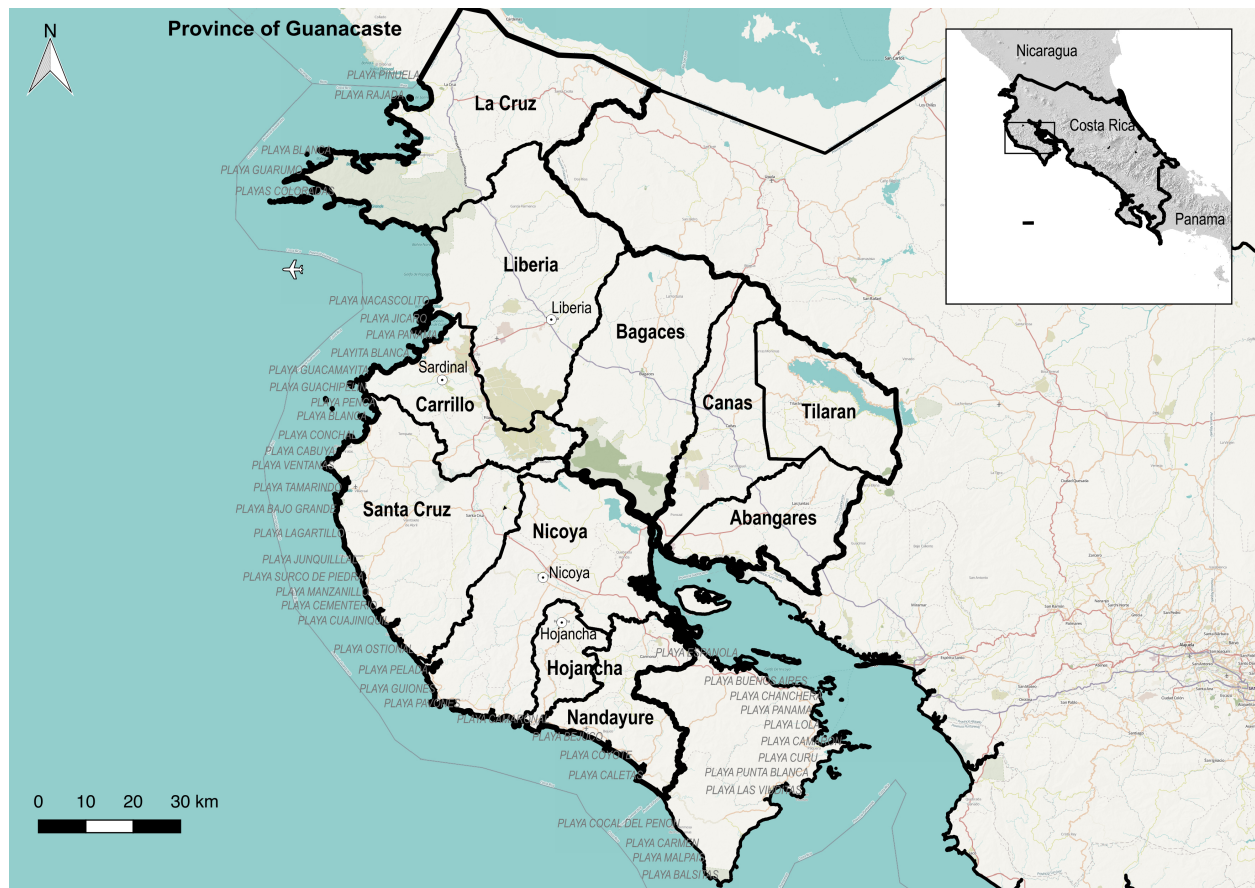


Figure 1. Study Area. Image created by Silja Hund and used with permission.

2.2 Interviews

We conducted 43 semi-structured interviews with five groups: family farmers currently or recently enrolled in the PSA (23), corporate farmers currently or recently enrolled in the PSA (4), intermediary organization staff who administered the PSA (6), FONAFIFO staff (3), key informants such as local NGO or government leaders, researchers, or farmers who had specifically chosen not to enroll in the PSA (7). Intermediary organizations in Costa Rica include NGOs, agricultural cooperatives and associations, as well as the cantonal agricultural centers (Bosselmann & Lund, 2013). In 2016, nation-wide there were 19 NGOs acting as

1 intermediaries that helped farmers solicit PSA contracts (FONAFIFO, 2019b). As well, most
2 cantons have a Cantonal Agricultural Center that serves as an intermediary. There are also a
3 larger number of forestry engineers (*regentes forestales*) who serve as intermediaries and prepare
4 PSA contract applications on behalf of landowners, some of whom also work for various entities
5 including NGOs, CACs, farmers groups and in some cases as employees of larger corporate
6 farms. Most interviews were conducted in the Nicoya peninsula (the cantons of Santa Cruz,
7 Nicoya, Hojancha and Nandayure) while a smaller number of respondents were interviewed in
8 the cantons of Liberia, Tilarán and Cañas in order to increase the diversity of farm sizes and
9 types (see fig. 1). The FONAFIFO regional office in Nicoya received 377 applications for PSA
10 contracts in 2014 though many contracts are not funded (FONAFIFO, 2019a).

11 All interviewees (except for key informants) were asked a closed-ended question on payment
12 languages followed by open-ended discussion of their answer. Farmer interviews additionally
13 involved questions about 1) their farm and land management and 2) motivations and experiences
14 of enrolling, and costs and benefits of the PSA. Open-ended questions facilitated elicitation of
15 values and focused on topics around nature, farming, forests, water (due to its local salience and
16 relationship to forest protection) and birds (which are common sights and sounds and provided a
17 useful way to elicit values around nature). Key informant, intermediary and FONAFIFO staff
18 interviews focused on themes around agriculture, water and the PSA program.

19 Fieldwork was facilitated by established relationships with local organizations as part of the
20 umbrella project *FuturAgua*, which focuses on local adaptation and water management under
21 changing climate conditions (Babcock, Wong-Parodi, Small, & Grossmann, 2016; Echeverri,
22 Frishkoff, Gomez, Zook, Juárez, Naidoo, et al., 2019a; Morillas, Hund, & Johnson, 2019).

23 Participants were identified via partnerships with local organizations where selection focused

1 reaching a diversity of perspectives and experiences. We used non-proportional quota sampling
2 to include a variety of different farm sizes, women and men, different socio-economic groups,
3 participants in both forest conservation and reforestation and intermediaries and FONAFIFO
4 staff with different kinds of positions. Participants were added until saturation was reached (i.e.,
5 new ideas no longer emerged with additional interviews). Interviews were conducted in
6 participants' homes, farms or places of work and lasted approximately one hour. All interviews
7 were conducted by the lead author in Spanish during May to July of 2016 and transcribed by a
8 local research assistant. Transcripts were coded using NVivo for themes including perceptions
9 and values around nature, farms and land management; experiences and opinions about the PSA;
10 and languages used to describe the program and nature (described in detail below).

11 The PSA-enrolled farmers who were interviewed for this work included those controlling areas
12 that ranged from 2.5 to 1000 hectares, with a median of 72.5 hectares. The percentage of farm
13 area enrolled in the PSA ranged from 1 to 100%, with a median of 56%. Seven of the 27 farmers
14 interviewed had their entire farms enrolled. A large majority were enrolled in forest
15 conservation, with smaller numbers enrolled only or additionally in reforestation; this general
16 pattern parallels national enrollment in the program. Many respondents were over the age of 50,
17 which likely reflects the fact that contracts are usually held by the oldest generation in the
18 family, even where adult children manage day-to-day operations. Many participants, especially
19 older family farmers, had only a few years of formal education. Female participants were
20 specifically sought out such that despite the small numbers they may be slightly over-represented
21 in the sample (15% of all PSA contracts were with women in 2015 (based on data from
22 fonafifo.go.cr) versus 26% of our farmer sample). For additional details on sample
23 characteristics see supplementary information.

2.3 Analysis of payment and value languages

To assess how participants and staff saw PSA payments, a closed-ended question was asked: “How do you see the money you receive: as a payment, a gift, a help, a recognition or something else?” This was followed by open-ended discussion of the answer. In the analysis, the category of gift was dropped as no interviewees chose it and a new category was added, ‘incentive,’ which many interviewees suggested. A few alternative words were volunteered by respondents and grouped based on analysis of interviewees’ explanations and context. For example, replies of ‘assistance’ were grouped with the *ayuda* [help/support] category because many interviewees used the word *ayuda* to refer to government assistance; and ‘compensation’ was grouped with *reconocimiento* [recognition] because *reconocimiento* was often coupled with the concept of financial compensation for the activity (e.g., forest protection). In two cases, the respondent gave two answers, in which case each response was weighted by one half for the data in fig. 3. This study conceptualizes each of the payment categories studied as follows:

Table 1 Payment Languages and Meanings. Explanation of the four payment languages examined in our study. Note that while Kosoy et al (2007) found participants used the term *apoyo*; our initial fieldwork showed that residents in the Nicoya Peninsula more often used the nearly synonymous word *ayuda*.

Spanish Term	English Translation	Meaning of the Term	Implications for Motivational Crowding-out	Source
Pago	Payment	Funds in return for service as in a transaction; action not performed without funds.	Signals that the land manager is economically motivated and that a corresponding instrumental rationality is the appropriate frame to apply to this situation.	Name of FONAFIFO’s program; common in PES literature
Incentivo	Incentive	Funds to encourage action; action unlikely without funds.	Signals that land managers have some non-economic motivations for conservation but require an additional ‘push’ in the form of a monetary payout. Partial economic framing.	Suggested by interviewees; common in PES literature

Reconocimiento	Recognition	Funds to acknowledge existing stewardship.	Signals that land managers are being recognized/rewarded for conservation implemented regardless of the monetary payout. Reciprocal framing.	Used on FONAFIFO's website and empirical results from Costa Rica (Chan, Anderson, Chapman, Jespersen, & Olmsted, 2017).
Ayuda	Help/Support	Funds to enable ongoing farming and land stewardship.	Signals that land managers are being supported in their ongoing conservation. Logic of aligned interests to protect and steward the forest.	Empirical results from Costa Rica (Kosoy et al, 2007)

Interviews were coded for languages related to participant values about nature, including the entirety of all respondents and all interview content. Where interviewees discussed or mentioned payment, prices, or monetary values in relation to nature, such as making money from ecosystem services or native forests, we coded such passages as “market values.” Production of ‘ecological goods’ such as producing oxygen was coded as both ecosystem service and market language given that it is a particularly market-based framing of ecosystem services. The ecosystem services code encompasses language around benefits of ecosystems for people and specific ecosystem services or categories. Relational values were coded for sections where respondents discussed their relationships to the land, farms, place, lifestyle, plants or animals, as well as relationships between people mediated by these.

3 RESULTS

In order to organize the different value languages presented and coded across interviews and the perceptions of payment meaning articulated by participants, we used two analytic frameworks. The first (perceptions of payments) was derived from concurrent cases in Costa Rica as well as

the particular meanings of different words as derived from the data in this study. The second seeks to capture a spectrum of value languages.

3.1 A payment by any other name—Payment languages across groups

We investigated four different perceptions of the ‘payment’ in PES, organized to offer a spectrum from more to less market-based language, with *payment* at one end and *help* at the other (see Fig. 2 and Table 1). The language that denotes a ‘payments’ framing for ecosystem services implies a fully market-based relationship, as it is the same language used for the actual purchase of products or services. The language of incentives, moving along the continuum, instead denotes a lesser degree of ‘marketism’ in that land managers have some non-economic motivations for the conservation, but require an additional ‘push’ in the form of a monetary payout. Recognition can be in the sense of social status (i.e., ‘recognition as an environmentally responsible land steward’) or in the sense of financial reward (i.e., FONAFIFO recognizes landowners for the provision of ecosystem services via a payment mechanism). Finally, the language of stewardship in the form of ‘help’ or ‘support’ moves away from that of a market-based system. *Ayuda* connotes government assistance or support. It shifts the focus from the land manager’s actions to their needs.

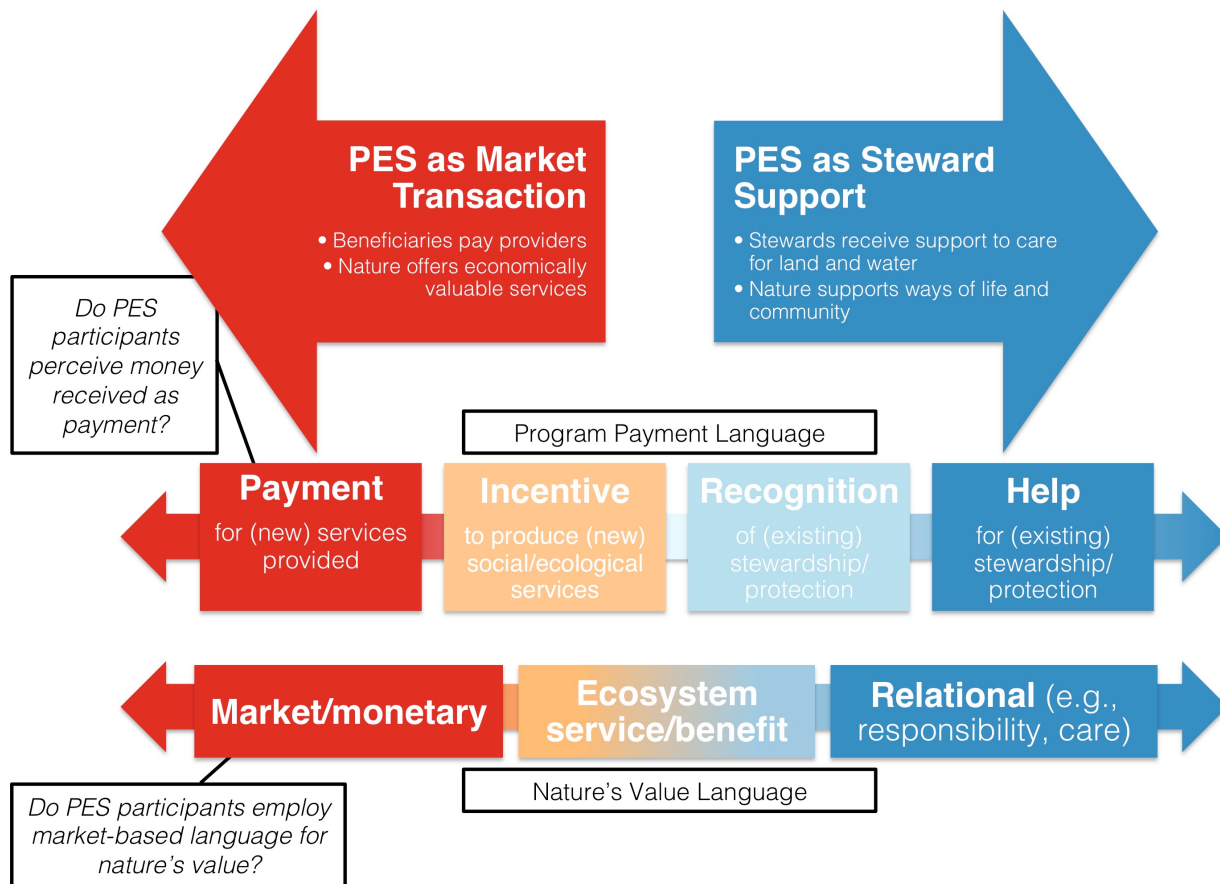
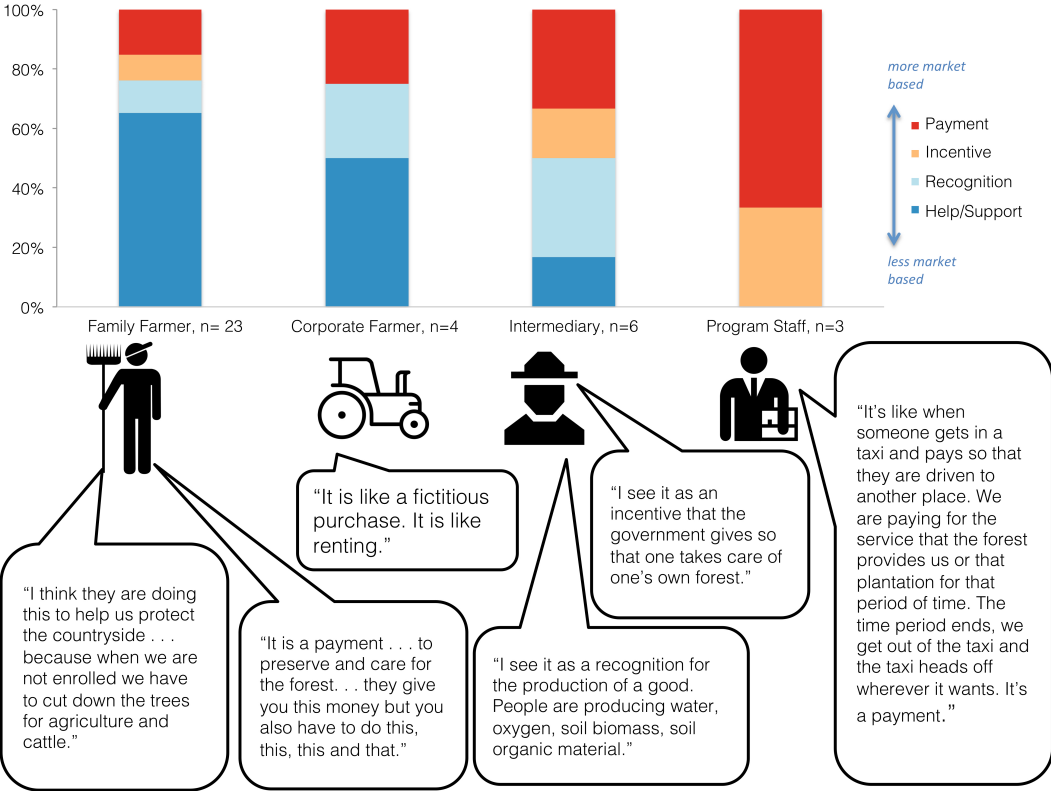


Figure 2. Mapping payment languages and languages of the values of nature expressed in PES programs: A Spectrum. The above analytical framework explains the conception of languages used in PES programs. The arrows on the top represent the two ‘archetypical forms’ of PES in this spectrum. The middle row represents the different payment languages along a spectrum of more (left) to less (right) market-based. The bottom row maps the languages of nature’s value onto this same spectrum. The questions represent the hypothesized steps towards motivational crowding-out: first, participants would perceive the program as offering a payment and second, participants might then employ market-based language regarding nature’s value.

We found that participants and program staff described the payments in the FONAFIFO program in substantially different ways. Most family farmers saw the payment as an *ayuda*, meaning a help, support or assistance, whereas for FONAFIFO staff the program clearly offered a payment as a market transaction. These differences are depicted by the representative quotes in fig. 3. In addition to the representative quotes, fig. 3 describes the different percentages of each group’s views of the payment. Intermediaries had the most diverse views of the payments, perhaps reflecting their position of working both with the government rules and regulations as well as

1 with small-holder farmers. Differences in how each group describes the program and payment
2 are described by payment language in the following sections.



3 **Figure 3. Payment Language by Group.** The percent of each type of response is shown by group. The responses
4 within each group are organized along a spectrum of more to less market focused, from help (blue) to payment (red).
5 Representative quotes from the different groups characterize responses by group and response type. The most
6 dramatic differences are shown by the payment responses where the family farmers tended to see payment as a form
7 of care, moving to the corporate farmer who compares the program to renting, to the FONAFIFO staff who
8 describes the payment in purely market terms using the analogy of a taxi ride. Family farmers are individuals, often
9 small-holders, who own and manage land. Corporate farmers are staff members at large agro-industrial operations.
10 Intermediaries are extension, technical, or NGO staff that facilitate participation in the PSA for family farmers.
11 Program staff members are direct staff of FONAFIFO, at the head or regional offices. Quotes, from left to right:
12 Interview 28, 36, 02, 35, 42, 13
13

14
15 **3.1.1 Payment (*pago*)**

16 Within the response of 'payment,' the description varied by group along the axis of increasing
17 market logic. For the quoted family farmer, the payment referred to money given to protect and

1 care for the forest, whereas the corporate farmer compared the payment to paying rent, and the
2 FONAFIFO staff person compared it to a taxi ride (see fig. 3). The taxi analogy fully displayed
3 market language; not only does one pay for the taxi ride, but for a specific period of time, after
4 which the contract is void. Applying this logic to forest conservation could mean that after the
5 contract ends, the landowner ‘heads off where she or he wants,’ which for the longevity of
6 conservation is concerning, e.g., if the forest were cut down after the contract. Market logic also
7 determined the price offered to landowners. While many groups have criticized the program for
8 paying too low a price (e.g., the quoted intermediary in fig. 4), for program leadership, demand
9 for participation proved the price was right.

10 Only a few family farmers saw the money as a payment (three used both languages of payment
11 and help and two primarily used payment language). In the clearest example of a farmer seeing
12 the PSA as a payment, they conflate the intermediary (Fundecongo in this case) with the PSA:

13 *Fundecongo gives me this to take care of the farm, so now I don't take care of it with my*
14 *money but with Fundecongo's money. According to them it is a payment for the services*
15 *that the forest offers: producing oxygen. [Interview 33]*

16 The respondent is focused on the costs of taking care of the forest, which no longer must be paid
17 out of pocket, but also understands that program as paying for ‘production of oxygen’ (using
18 ecosystem services language).

19 **3.1.2 Incentive (*incentivo*)**

20 Some respondents used the language of incentive to emphasize that the amount of money offered
21 by the program was small. For example, the family farmer below explains:

1 *... In reality it is an incentive, it's not much money. But with the passing of the years, the*
2 *thing is the farm is turning into a very beautiful forest but there's no profitability because*
3 *now it is forest and you can't think about extracting wood. [Interview 08]*

4 This farmer appreciated the beauty of the forest, but because of the forestry law was not allowed
5 to extract wood. Even without enrolling in the PSA, in most cases farmers are not allowed to cut
6 down trees in forested areas—either for timber or for creating pasture. For the intermediary
7 quoted in Fig. 3, the ‘incentive’ was not to discourage land conversion but rather to encourage
8 better care of that land. However, some respondents pointed out that the payment or the
9 possibility of such may reduce illegal land conversion, a potential crowding-in effect (e.g.,
10 sometimes farmers not enrolled in the PSA ‘accidentally’ burn down their forest in order to
11 create more pasture or crop land).

12 **3.1.3 Recognition (*reconocimiento*)**

13 We might expect many farmers to use the language of recognition, given this language is used on
14 FONAFIFO's website. The PSA is described as a ‘financial recognition on the part of the state’
15 for the ecosystem services provided by forests and forest plantations (www.fonafifo.go.cr).

16 Among respondents, recognition was more often used when the landowner was already willingly
17 protecting the forest and FONAFIFO would recognize that effort in the form of financial
18 compensation. A family farmer explains: “*You go to the office and ask for the service. You say*
19 *I'd like the forested areas of my farm to be recognized with payments for ecosystem services.*”
20 *[Interview 05]*. Another family farmer saw the money as both a recognition and a help (and not a
21 payment):

22 *It's not a payment because it's a lot that you have to invest but yes, it is a great help or a*
23 *recognition that allows one to keep an eye on the forest so that no one goes in. I see it as*
24 *a recognition to the owners of properties to maintain them and to guard them. And also,*

1 *it is a help for the owners, so that every now and then they can obtain a little benefit, buy*
2 *a little something nice. [Interview 35]*

3 In this case the money has multiple purposes: to recognize the work that the owners must put in
4 to guarding and maintaining the land, and also to help them financially to ‘buy a little something
5 nice.’ This use of ‘recognition’ contrasts with that on FONAFIFO’s website. Whereas the
6 website describes the monetary benefit as recognizing the ecosystem services provided by the
7 forest, the family farmer above describes the monetary benefit as recognizing their own labor of
8 care and protection of the forest. FONAFIFO recognizes the ‘labor’ of the forest, but not of the
9 landowner.

10 **3.1.4 Help/Support (*ayuda*)**

11 Farmers’ emphasis on the labor of the landowner is also reflected in the ways family farmers
12 describe the program as offering a help or support to them. The monetary benefit was often
13 characterized as help to protect the forest from various threats—a substantial expense. The most
14 important threat is that of forest fires, both natural and human in origin, that spread quickly
15 during the dry season. FONAFIFO requires that recipients maintain firebreaks around the
16 contracted land. These must be cut back twice a year, a time-consuming task which farmers must
17 either pay for or carry-out themselves. Additional threats mentioned include illegal logging,
18 marijuana planting, poaching, and even orchid theft. When farmers then spoke of PES funds
19 helping them to protect the forest, this referred to actual costs, not just opportunity costs. For
20 example, one farmer focused on care and protection of the land: *“Everything is for taking care of*
21 *the land, for protecting the land, this is what the money is for.” [Interview 18]*

22 Further examining the responses of family farmers that used *ayuda* showed two distinct but
23 overlapping meanings: a financial support to 1) help the farmers care for and protect the forest

1 and, 2) to support the family's income. For example, the *ayuda* quote in Fig. 3 goes on to explain
2 that the payment is also to help small-holder farmers, especially given the terrible drought they
3 recently suffered. Another explained that the payment helped them economically but also
4 described themselves as the type of person that conserves land:

5 *If we were a different type of person we would say no and make this a pasture for cattle,*
6 *but we decided to conserve the land. So, I imagine it is a help because it doesn't pay for*
7 *many things, but it does help us a bit. [Interview 19]*

8 For many other participants, the name 'Pagos por Servicios Ambientales' never came up as they
9 discussed the program. These participants saw themselves as enrolled with the intermediary
10 organization (e.g., Fundecongo) that coordinated their inscription in the PSA (see for example
11 the way Fundecongo is described as the PSA in the final quote under 'Payment' above). Many
12 never dealt directly with FONAFIFO and few knew FONAFIFO by name (some believed they
13 were enrolled with the intermediary organization and expressed confusion when asked about
14 FONAFIFO or the PSA). Instead, these farmers had a personal relationship with a representative
15 of an intermediary organization. As these groups provided a variety of extension and other
16 services, they may have then seen the PSA program as another *ayuda* delivered by this group.

17 The PSA program's official name seemed to be more important for younger participants. While
18 older and less educated respondents tended to see the program as a help, the responses are more
19 varied for respondents under 50 years of age and with at least some university education. This
20 trend is epitomized by experiences in two interviews where in both cases the respondent's adult
21 son interrupted the respondent (who was answering 'ayuda') to say that the money was a
22 payment. After all, the sons explained (in both cases), the name of the program said it was a
23 payment. In a third interview, an adult daughter explained that she saw the money as a payment
24 but that her mother would see it as a help.

3.2 Value about nature languages across groups

We focus on three value languages: relational (including such value languages as responsibility and care), ecosystem services-based languages (including those of services and benefits from nature), and market-based languages (including a focus on transaction and monetary benefits). These are illustrated in the conceptual framework (Fig. 2). Relational values focus on the relationships that people have with nature or with each other via nature (Chan et al., 2016). They may be especially central for people with close relationships to the land, such as farmers. Relational values are further categorized in Table 2. The use of ecosystem services language focuses on the benefits to humans as derived from ‘nature.’ This could include descriptions or lists of specific ecosystem services (ES, e.g., pollination, carbon sequestration) or more general language focusing on the services and benefits to humans provided by nature. Market-based language might be based too on ecosystem services (ES) language but takes the further step of referencing monetary benefits or values. If motivational crowding-out is occurring, we might expect participants to use more market-based language and less relational values language. ES language can be seen as an intermediate step, in that it focuses on the instrumental value of nature but does not necessarily monetize that value.

We found differences in the ways that program managers and participants discussed the values of nature and forests. These are summarized in fig. 4. Family farmers expressed a rich array of values regarding their relationships to land, animals and trees. These ‘relational values’ are categorized with examples in table 2. Family farmers primarily discussed the value of their land and forests in these relational terms and much less often employed languages relating to market values, monetary reward or ecosystem services. FONAFIFO staff however, spoke of the values of land and trees primarily using the languages of markets and ecosystem services. The

frequencies of the languages used are summarized in Fig. 4 along with example quotes illustrating each value language. Corporate farmers and intermediaries fell in between family farmers and FONAFIFO staff, in terms of the ways the spoke about nature. These groups employed a mixture of relational, ecosystem service and market-based language.

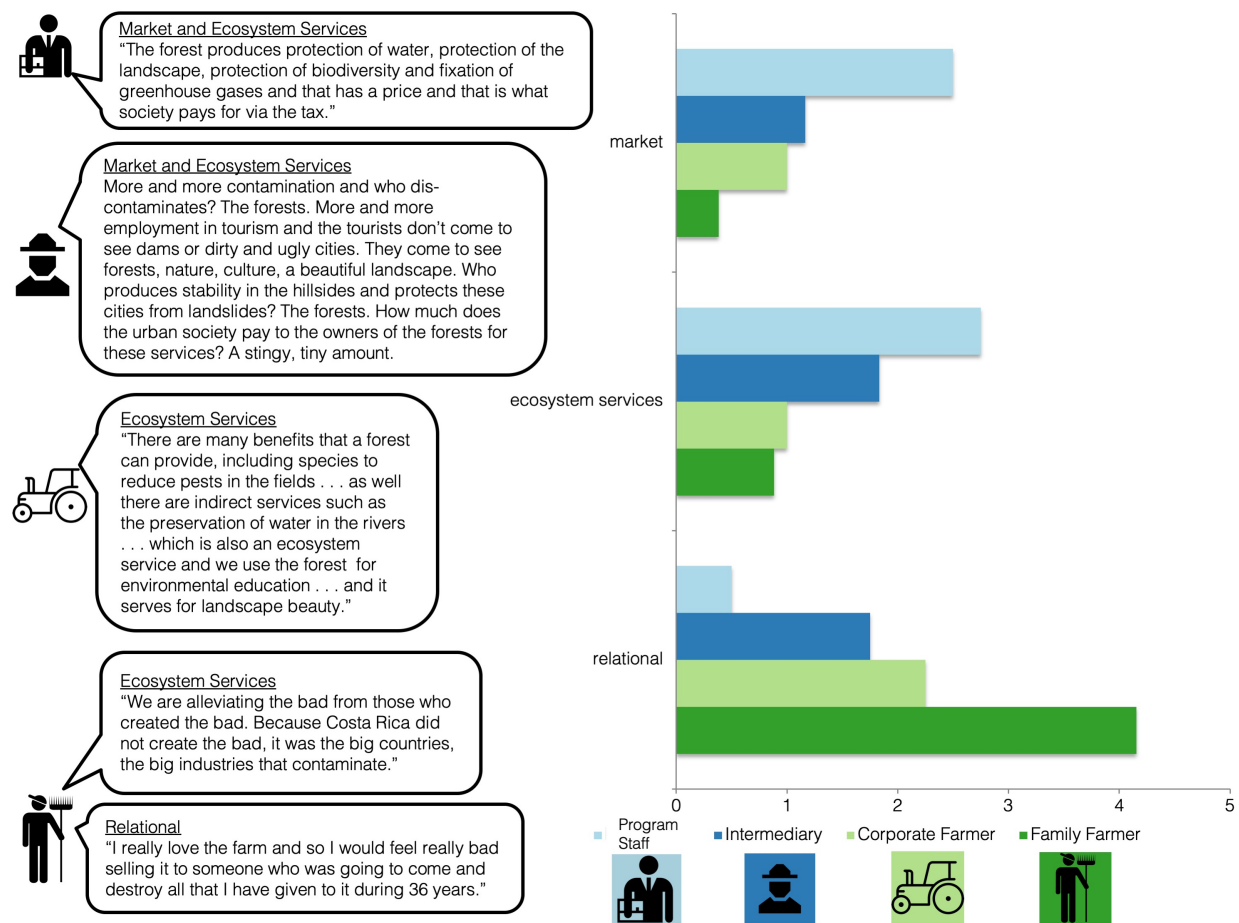


Figure 4. Values of nature language by group. The frequency of each type of response is shown by group. The x-axis shows number of text selections coded at that value divided by number of participants in each group. n=FONAFIFO (3), Intermediary (6), Corporate Farmer (4), Family Farmer (26 including 3 key informants that were also family farmers but not enrolled in the PSA). Family farmers are individuals, often small-holders, who own and manage land. Corporate farmers are staff members at large agro-industrial operations. Intermediaries are heads of CACs, *regentes forestales*, or NGO staff that facilitate participation in the PSA for family farmers. FONAFIFO staff members are direct staff of the national organization, at the head or regional offices. See text for definitions of market, ecosystem services, and relational languages of value. Exemplary quotes from different groups also with their value language designation are included in the left-hand side of the Fig. Quotes, from top to bottom: Interview 13, 21, 06, 16, 22

3.2.1 Market value of nature

In many cases, market and ES language were used in conjunction, as shown in fig. 4. The FONAFIFO quote focuses on the specific ES that the program is supporting via a price paid for by society. The intermediary quote, however, is much richer in detail (e.g., tourists do not come to see ‘dirty and ugly cities’) and frames the very same payments for ES as a question of justice between urban beneficiaries and rural forest owners/services providers. Whereas for FONAFIFO staff the price is fair and paid for by the tax, for the intermediary the price paid for the ES provided by forests is in no way commensurate with their real value.

One FONAFIFO staff member suggested that the PSA served to crowd-in motivations, similar to the example of motivational crowding-in mentioned in the introduction, where outside elites signal the value of biodiversity (Van Hecken & Bastiaensen, 2010). The staff member explained that the PSA has changed the mentality of the people from one of seeing the forest as useless to one where it can potentially generate a bit of (needed) income: *“People need money and the forest does not generate money. So, this ecosystem service [program] has served to change this mentality that the forest is useless and doesn’t produce.” [Interview 09]*

3.2.2 Ecosystem Service value of nature

Ecosystem services language use differed by group. As shown in fig. 4, FONAFIFO staff focused on the four ecosystem services paid for by the program. These four services are listed on FONAFIFO’s website (www.fonafifo.go.cr), along with specific (national or global scale) beneficiaries: science, pharmacology, urban areas, and tourism. Reflecting the market-based structure of the program, one FONAFIFO staff person explained that they monitor the contracts: *‘every year, every tree, every time they carry out the contract’ [Interview 12]*. The corporate

farmer in fig. 4 lists ES in a very straightforward and comprehensive way but includes ecosystem services beyond those paid for by the program and which have local benefits (e.g., pest reduction and environmental education).

In contrast, a number of both family farmers and intermediaries used ecosystem service language to argue for distributional justice. The family farmer quoted in fig. 4 exemplifies this thinking—by protecting their forest, farmers in Costa Rica were ‘alleviating the bad’ done by big industrial countries. Another respondent argued that the payment should be higher because of the value of the sacrifice that the farmers were making. The intermediary quoted in fig. 4 also used ecosystem services and market-based language to argue that the amount paid by the PSA is too small given the benefits of farmers caring for their forests. A number of farmers believed that the money from FONAFIFO came from these big industrial countries. FONAFIFO staff however, explained that despite a series of promises, pilot projects and proposals, major funding from outside the country had yet to materialize. The program is primarily funded via national taxes and contributions.

3.2.3 Relational value of nature

Respondents, especially family farmers, discussed a rich variety of relational values. These included stewardship and connection to the land; family and historical ties to place; the value of the farming and countryside lifestyle; as well as concern for and connection to plants and animals. Many talked about planting fruit trees for animals and birds, for example one explained how the bananas in his garden are for the birds because birds themselves cannot plant trees. When his neighbors ask for some, he says they can take a ‘child’ from the banana plant and grow their own. Others talked of attachment to trees. One described the story of a friend who had to

cut down a large tree to pay the hospital bills for his daughter: “*a daughter in the hospital and the tree fallen, two sadnesses.*” Relationships to farm animals were also important. Explaining why his cattle preferred to drink water in the corral, one farmer said: “*in the corral they have water, they have honey, they have salt and they have love*” [Interview 22]. See additional examples of relational values in table 2.

Table 2 Example relational values elicited in interviews. “People and Nature” refers to values regarding appropriate or desired relationships between people and nature, including living a good life in harmony with nature. “Eudaimonia” is a concept loosely translated as ‘living a good life.’ “Virtues” refer to characteristics of a person.

Relational Value	Type of Relational Value	Example Quote
Stewardship of the Land	People and Nature	In one occasion I was cutting the saplings in the pasture with a tractor and there was a blackberry tree, and it was a little bush and I raised up the plow and I left it and now it is a tree. And I say, look it was my decision to leave it or remove it. . . many times we see a little tree and we do not value it and we say, let’s cut it because it is small and when will it ever be big? But the years pass and we see. [Interview 08]
Respect for Nature	People and Nature	Respect is knowing that this world is for everyone, for the animals just as much as for human beings. [Interview 10]
Rural Lifestyle	Eudaimonia	People say how much they are jealous of me and I agree. To live like this is very beautiful and very tranquil. One is healthy and very relaxed. We work hard physically but the compensation is incredible, enough to make one want to leave the city to be able to come here and enjoy the sun. The truth is that living in this peace has no price. [Interview 38]
Identity	Virtue	I am not a destroyer. When I had cattle, I had to cut down forest to make pasture. But afterwards I stopped and now I have forest again. As long as I live I will continue. When I die, I don’t know what will happen to it. But I know what kind of person I am. [Interview 33]
Responsibility	Virtue	I feel good because I plant many trees. On Sundays and days off work, I collect seeds and place them to germinate and afterwards I plant them. I always say that the planet belongs to everyone and we must take care of it. . . but I also pollute and sometimes cut down a tree so I need to have a balance. When I throw things out, I recycle, you understand? So, if we all act in this way, we will be very different. [Interview 27]

1 In some cases, relational values were closely coupled to the idea of the program as a *help*. For
2 example, the following quote explains how a farmer feels sad cutting down trees for pasture,
3 expressing a relational value. At the same time, they describe the PSA as a ‘help’ from the
4 government (or from donations from abroad) which reduces the needs of farmers to cut down the
5 forest for pasture: *“I cut down many trees and it hurts me to go cutting down these young tress to*
6 *create pasture. This help from the government or donations from abroad allows us to try to*
7 *maintain the forest”* [Interview 28]. On the other hand, some participants expressed values of
8 care along with ideas of the program as a payment. For example, the second farmer quote in Fig.
9 3 says that the program is a payment to care for the forest. Thus, while some respondents
10 coupled ideas of payment and market language or help and relational values, others combined
11 these in different ways.

13 **4 DISCUSSION**

14 In the case of the PSA in Costa Rica, program managers framed the value of nature as providing
15 monetarily quantifiable benefits. Yet participants often framed the program as providing help or
16 support for their ongoing stewardship of the land, a stewardship that would have occurred even
17 in the absence of such a payment; they often spoke of nature in terms of their relationships with
18 the land, its history, and the plants and animals (both wild and cultivated) that used that land.
19 This confirms findings of strong relational and pro-environmental values across both PES and
20 non-PES farmers in the Nicoya region (Klain, Olmsted, Chan, & Satterfield, 2017) and parallels
21 Kosoy et al. (2007) whose PES participants in Central America perceived their payments as an
22 ‘apoyo’ (a synonym to *ayuda*).

1 We suggest two explanations for this divergence of views. First, because the PSA was
2 implemented simultaneously with a ban on land conversion, in many cases the program is not
3 paying for a change in management or even a significant opportunity cost (Allen & Colson,
4 2018; Porras et al., 2013). The language of *payment* and *incentive* assume farmers would not
5 protect the forest without the PSA, whereas *recognition* and *help/support* imply they would do so
6 regardless of the program. Given that in most cases farmers are legally required to maintain
7 forests, they may see the program as a help or recognition for their efforts to care for the forest.
8 This care extends beyond the opportunity cost of the land, as it includes protection from various
9 threats. In this context the PSA, as experienced by participants on the ground in our study site,
10 might fit better with the idea of ‘co-investment in landscape stewardship’ as landowner’s
11 investments of time and labor, along with government supplied payments, are used to care for
12 the forest (van Noordwijk & Leimona, 2010). This occurs despite official language that aligns
13 more with a paradigm of ‘compensation for opportunities skipped’ which is how van Noordwijk
14 and Leimona classify Costa Rica’s PES, highlighting the difference between official program
15 structure and framing versus on-ground implementation, as well as potential differences across
16 regions within one program and country (2010).

17 Second, rather than repeating the official program language, intermediaries seem to have
18 ‘translated’ the program framing into language appropriate for the farmers they worked with,
19 including both the significance of the monetary benefit as well as the purpose for protecting the
20 forest. Future work should examine how intentional their ‘work of translation’ is and what
21 factors impact their choices around how to describe the program. Contextual factors such as the
22 intermediary’s mission, values, network and purpose impact their inclusiveness in organizing
23 PSA contracts with small-holders (Bosselmann & Lund, 2013). These factors might also

1 influence the ways they chose to frame the program when speaking with potential participants.
2 As well, intermediaries in other regions of Costa Rica might use different types of framings than
3 those found in our study area. Even without actively translating the program, intermediaries
4 likely shaped the way farmers perceived the PSA based on their existing relationship of
5 providing agricultural extension and assistance. Farmers may have categorized the PSA more
6 with the organization they worked with than the source of the funding—thus perceiving it as
7 another form of rural development assistance. This conflation by farmers of FONAFIFO and
8 intermediaries was also found in a neighboring region of Costa Rica, the Bellbird Biological
9 Corridor (Allen & Colson, 2018).

10 Our results indicate two implications for research on motivational crowding-out in PES. First is
11 the potential for program participants and intermediaries to reframe a PES program. In our case,
12 a program with an explicitly market-based framing was reconceived by farmers themselves as a
13 *support for stewards*. Our study shows that when considering PES design to avoid motivational
14 crowding-out, not only the official program framing counts; also important are the ways that
15 intermediaries and participants themselves frame the program. Future research might examine if
16 the same phenomenon could work in reverse—e.g., a program that was officially framed as a
17 *support for stewards* but reframed by participants as a payment for services. While we surmise
18 that this reframing helped hinder motivational crowding-out, as a snapshot study we were unable
19 to directly observe if and how participants' conservation motivations changed (or not) due to
20 program participation. Longer term research could examine the interactions between how
21 different groups frame PES and how motivations change (or not). For example, in a Mexican
22 study, García-Amado et al. found that length of time receiving PES payments correlated with a

1 decrease in intrinsic motivations and an increase in monetary motivations (García-Amado et al.,
2 2013).

3 A second implication is the potential of examining relational values to understand motivational
4 crowding. Research on motivational crowding has examined logics of reciprocity and trust
5 between people (Bowles, 2008; Fehr & Falk, 2002). In the context of conservation programs, we
6 might ask if there are elements of reciprocity between people and nature (e.g., between a farmer
7 and her land; between fisher and fish; forester and forest) that also impact how monetary
8 payments for conservation impact motivations. Incorporating relational values into motivational
9 crowding studies may also help untangle the interactions between crowding-out of pro-
10 environmental motivations and commodification of nature.

11 **4.1 ...would smell just as sweet?**

12 The language used to describe payments can take many forms, including, payments, markets,
13 rewards and compensation (Shelley, 2011; Wunder & Vargas, 2005). These different languages
14 might imply alternative ‘logics’ such as reciprocity, trust, and normative motivations (Vatn,
15 2005). Even Wunder himself, who proposed the most commonly cited definition of PES, has
16 suggested that the language of service users and service providers is more appropriate than that
17 of buyers and sellers (Wunder, 2015). Beyond concerns of motivational crowding-out, the choice
18 of program-framing language can impact the success of the program. For example, in Bolivia a
19 PES program using the language of *pago* (payment) was seen by local communities to represent
20 privatization and land appropriation, leading to substantial resistance (Wunder & Vargas, 2005).
21 And in a cross-site comparison of programs across Asia, Leimona et al. concluded that a

1 language and logic of ‘co-investment in environmental stewardship’ can facilitate PES programs
2 that are fair, efficient and sustainable (2015).

3 Some farmers and intermediaries employed the language of PES to articulate views about
4 distributional justice. They argued that, as rural land stewards, their lands have provided valuable
5 ecosystem services for many years (far before the PES program began). The carbon that their
6 forests sequester alleviates the emissions of urban residents or more industrialized countries.

7 This argument reframes PES as a compensation for ongoing stewardship rather than an incentive
8 to change practices. This idea of ‘compensation for ecosystem services’ is highlighted by
9 McAfee and Shapiro as a response of rural *campesino* groups to PES programs (2010).

10 *Campesino* groups such as UNAFOR in Costa Rica and PRISMA in El Salvador have elaborated
11 this vision of redistribution, by which PES programs can be seen as *compensation* for ecosystem
12 services. Such groups have taken the idea and language of PES and transformed it to articulate
13 their own values and position (e.g., distributional justice as above or employing PES to support
14 the rights, values and livelihoods of rural communities). In this way, PES can serve as an
15 instrument to “turn farmers from polluters of soils and water into ecosystem managers”
16 (Friedmann & McNair, 2008, p. 430).

17 In Costa Rica, the group UNAFOR is working to create a ‘campesino PSA’ that would
18 compensate smallholders for many of the biodiversity-supporting practices that they already
19 engage in. This would contradict one of the key principals of PES—that of additionality—by
20 paying for ES that providers would supply regardless (Pattanayak, Wunder, & Ferraro, 2010).

21 However, others have argued that a focus on such small-scale additionality could detract from
22 the larger land-scape scale changes we might hope for from PES (Chan et al., 2017). If PES
23 programs are to lead to large scale change, then they should reinforce and not undermine values

1 of stewardship and responsibility (Chan et al., 2017). One of the mechanisms of motivational
2 crowding-out is via reciprocity (Fehr & Falk, 2002). When those already engaged in stewardship
3 are ‘punished’ via ineligibility for payments, they may be tempted to reciprocate by no longer
4 engaging in that stewardship. Compensation for ecosystem services, however, could support land
5 managers to ‘do more’ in their stewardship. Beyond PES, the choice of language and the framing
6 of policies and programs of all sorts can have important implications for their impacts, including
7 impacts on motivation (Cárdenas, Stranlund, & Willis, 2000).

8 Policies are not passively absorbed by all actors, but rather modified, translated, and contested
9 (McAfee & Shapiro, 2010). Our results point to the importance of language and program framing
10 in the debate around market-based conservation. Most importantly, they show that different
11 groups interpret the program in different ways. Even when program leadership and official
12 communications have adopted a strongly market-based language and framing of PES, this does
13 not mean that the on-ground participants experience the program in this way. By integrating an
14 understanding of the different experiences of participants and managers, PES and incentive
15 programs more broadly may be able to more effectively capture some of the benefits while
16 avoiding the most problematic side effects.

17
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5 REFERENCES

- Adhikari, B., & Agrawal, A. (2013). Understanding the social and ecological outcomes of PES projects: A review and an analysis. *Conservation and Society*, 11(4), 359. <http://doi.org/10.4103/0972-4923.125748>
- Agrawal, A., Chhatre, A., & Gerber, E. R. (2015). Motivational Crowding in Sustainable Development Interventions. *American Political Science Review*, 109(3), 470–487. <http://doi.org/10.1017/S0003055415000209>
- Akers, J. F., & Yasué, M. (2019). Motivational Crowding in Payments for Ecosystem Service Schemes: a Global Systematic Review. *Conservation and Society*, 17(4), 377–13. http://doi.org/10.4103/cs.cs_18_90
- Allen, K. E., & Colson, G. (2018). Understanding PES from the ground up: a combined choice experiment and interview approach to understanding PES in Costa Rica. *Sustainability Science*, 14(2), 391–404. <http://doi.org/10.1007/s11625-018-00653-w>
- Avcı, D., Adaman, F., & Özkaynak, B. (2010). Valuation languages in environmental conflicts: How stakeholders oppose or support gold mining at Mount Ida, Turkey. *Ecological Economics*, 70(2), 228–238. <http://doi.org/10.1016/j.ecolecon.2010.05.009>
- Babcock, M., Wong-Parodi, G., Small, M. J., & Grossmann, I. (2016). Stakeholder perceptions of water systems and hydro-climate information in Guanacaste, Costa Rica. *Earth Perspectives*, 3(1), 3. <http://doi.org/10.1186/s40322-016-0035-x>
- Banerjee, A. V., Duflo, E., Glennerster, R., & Kothari, D. (2010). Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. *BMJ (Clinical Research Ed.)*, 340, c2220. <http://doi.org/10.1136/bmj.c2220>

- 1 Bardi, A., & Schwartz, S. H. (2016). Values and Behavior: Strength and Structure of Relations.
2 *Personality and Social Psychology Bulletin*, 29(10), 1207–1220.
3 <http://doi.org/10.1177/0146167203254602>
- 4 Bosselmann, A. S., & Lund, J. F. (2013). Do intermediary institutions promote inclusiveness in
5 PES programs? The case of Costa Rica. *Geoforum*, 49, 50–60.
6 <http://doi.org/10.1016/j.geoforum.2013.05.009>
- 7 Bowles, S. (2008). Policies designed for self-interested citizens may undermine “the moral
8 sentiments”: evidence from economic experiments. *Science*, 320(5883), 1605–1609.
9 <http://doi.org/10.1126/science.1152110>
- 10 Börner, J., Baylis, K., Corbera, E., Ezzine-de-Blas, D., Honey-Rosés, J., Persson, U. M., &
11 Wunder, S. (2017). The Effectiveness of Payments for Environmental Services. *World*
12 *Development*, 96, 359–374.
- 13 Cárdenas, J. C., Stranlund, J., & Willis, C. (2000). Local Environmental Control and Institutional
14 Crowding-Out. *World Development*, 28(10), 1719–1733.
- 15 Chan, K. M. A., Anderson, E., Chapman, M., Jespersen, K., & Olmsted, P. (2017). Payments for
16 Ecosystem Services: Rife With Problems and Potential—For Transformation Towards
17 Sustainability, 140, 110–122. <http://doi.org/10.1016/j.ecolecon.2017.04.029>
- 18 Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., et
19 al. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proc Natl*
20 *Acad Sci*, 113(6), 1462–1465. <http://doi.org/10.1073/pnas.1525002113>
- 21 Chan, K. M. A., Gould, R. K., & Pascual, U. (2018). Editorial overview: Relational values: what
22 are they, and what’s the fuss about? *Current Opinion in Environmental Sustainability*, 35,
23 A1–A7. <http://doi.org/10.1016/j.cosust.2018.11.003>
- 24 Clot, S., Grolleau, G., & Méral, P. (2017). Payment Vs. Compensation For Ecosystem Services:
25 Do Words Have A Voice In The Design of Environmental Conservation Programs?
26 *Ecological Economics*, 135, 299–303. <http://doi.org/10.1016/j.ecolecon.2016.12.028>
- 27 Daily, G. C., & Ellison, K. (2002). The New Economy of Nature: The Quest to Make
28 Conservation Profitable. Washington, D.C.: Island Press.
- 29 Departamento de Gestion de Servicios Ambientales. (2015, December 13). Resumen de
30 contratos por tamaño de fincas y de proyectos, del Programa de Pago por Servicios
31 Ambientales. Retrieved September 30, 2017, from <http://www.fonafifo.go.cr>
- 32 Dinat, D., Echeverri, A., Chapman, M., Karp, D. S., & Satterfield, T. (2019). Eco-xenophobia
33 among rural populations: the Great-tailed Grackle as a contested species in Guanacaste,
34 Costa Rica. *Human Dimensions of Wildlife*, 31, 1–17.
35 <http://doi.org/10.1080/10871209.2019.1614239>
- 36 Duchoslav, J., & Cecchi, F. (2019). Do incentives matter when working for god? The impact of
37 performance-based financing on faith-based healthcare in Uganda. *World Development*, 113,
38 309–319. <http://doi.org/10.1016/j.worlddev.2018.09.011>
- 39 Echeverri, A., Frishkoff, L. O., Gomez, J. P., Zook, J. R., Juárez, P., Naidoo, R., et al. (2019a).
40 Precipitation and tree cover gradients structure avian alpha diversity in North-western Costa
41 Rica. *Diversity and Distributions*, 16, 131–12. <http://doi.org/10.1111/ddi.12932>
- 42 Echeverri, A., Naidoo, R., Karp, D. S., Chan, K. M. A., & Zhao, J. (2019b). Iconic manakins and
43 despicable grackles: Comparing cultural ecosystem services and disservices across
44 stakeholders in Costa Rica. *Ecological Indicators*, 106, 105454.
45 <http://doi.org/10.1016/j.ecolind.2019.105454>

- Ezzine-de-Blas, D., Corbera, E., & Lapeyre, R. (2019). Payments for Environmental Services and Motivation Crowding: Towards a Conceptual Framework. *Ecological Economics*, 156, 434–443. <http://doi.org/10.1016/j.ecolecon.2018.07.026>
- Fehr, E., & Falk, A. (2002). Psychological foundations of incentives. *European Economic Review*, 46(4-5), 687–724. [http://doi.org/10.1016/S0014-2921\(01\)00208-2](http://doi.org/10.1016/S0014-2921(01)00208-2)
- Ferraro, P. J. (2011). The Future of Payments for Environmental Services. *Conservation Biology*, 25(6), 1134–1138. <http://doi.org/10.1111/j.1523-1739.2011.01791.x>
- Fisher, J. A. (2012). No pay, no care? A case study exploring motivations for participation in payments for ecosystem services in Uganda. *Oryx*, 46(1), 45–54. <http://doi.org/10.1017/S0030605311001384>
- FONAFIFO. (2019a). *Datos históricos de las solicitudes de ingreso PSA recibidas, período 2003-2018*. (pp. 1–25). Ministerio de Ambiente y Energía. Retrieved from <https://www.fonafifo.go.cr/es/servicios/estadisticas-de-psa/>
- FONAFIFO. (2019b). *Resumen de contratos PSA tramitados por organizaciones y por regentes independientes, período 1997 – 2018*. (pp. 1–2). San Jose, Costa Rica: Ministerio de Ambiente y Energía. Retrieved from <https://www.fonafifo.go.cr/es/servicios/estadisticas-de-psa/>
- Friedmann, H., & McNair, A. (2008). Whose Rules Rule? Contested Projects to Certify “Local Production for Distant Consumers.” *Journal of Agrarian Change*, 8(2-3), 408–434. <http://doi.org/10.1111/j.1471-0366.2008.00175.x>
- García-Amado, L. R., Pérez, M. R., & García, S. B. (2013). Motivation for conservation: Assessing integrated conservation and development projects and payments for environmental services in La Sepultura Biosphere Reserve, Chiapas, Mexico. *Ecological Economics*, 89(C), 92–100. <http://doi.org/10.1016/j.ecolecon.2013.02.002>
- Gneezy, U., & Rustichini, A. (2000). A fine is a price. *The Journal of Legal Studies*, 29(1), 1–17. <http://doi.org/10.1086/468061>
- Gómez-Baggethun, E., & Ruiz-Pérez, M. (2011). Economic valuation and the commodification of ecosystem services. *Progress in Physical Geography*, 35(5), 613–628. <http://doi.org/10.1177/0309133311421708>
- Helm, D. (2015). *Natural Capital*. Yale University Press.
- Instituto Nacional de Estadística y Censos. (2012). *Instituto Nacional de Estadística y Censos (Costa Rica) X Censo Nacional de Población y VI de Vivienda: Resultados Generales* (No. 317.286, I-59-d, X). (J. C. Rivas, F. R. Hernandez, R. B. Cordero, I. S. Carvajal, & P. D. Gutierrez, Eds.) (pp. 1–142). San Jose, Costa Rica: Gerencia de Logística y Recursos Institucionales.
- Jack, B. K., Kousky, C., & Sims, K. R. E. (2008). Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms. *Proc Natl Acad Sci*, 105(28), 9465–9470. <http://doi.org/10.1073/pnas.0705503104>
- Kinzig, A. P., Perrings, C., Chapin, F. S., Polasky, S., Smith, V. K., Tilman, D., & Turner, B. L. (2011). Paying for ecosystem services—Promise and peril. *Science*, 334(6056), 603–604. <http://doi.org/10.1126/science.1210297>
- Klain, S. C., Olmsted, P., Chan, K. M. A., & Satterfield, T. (2017). Relational values resonate broadly and differently than intrinsic or instrumental values, or the New Ecological Paradigm. *PLoS ONE*, 12(8), e0183962. <http://doi.org/10.1371/journal.pone.0183962>
- Kosoy, N., & Corbera, E. (2010). Payments for ecosystem services as commodity fetishism. *Ecological Economics*, 69(6), 1228–1236. <http://doi.org/10.1016/j.ecolecon.2009.11.002>

- 1 Kosoy, N., Martinez-Tuna, M., Muradian, R., & Martinez-Alier, J. (2007). Payments for
2 environmental services in watersheds: Insights from a comparative study of three cases in
3 Central America. *Ecological Economics*, 61(2-3), 446–455.
4 <http://doi.org/10.1016/j.ecolecon.2006.03.016>
- 5 Leimona, B., van Noordwijk, M., de Groot, R., & Leemans, R. (2015). Fairly efficient,
6 efficiently fair: Lessons from designing and testing payment schemes for ecosystem services
7 in Asia. *Ecosystem Services*, 12, 16–28. <http://doi.org/10.1016/j.ecoser.2014.12.012>
- 8 Levine, J., Muthukrishna, M., Chan, K. M. A., & Satterfield, T. (2017). Sea otters, social justice,
9 and ecosystem-service perceptions in Clayoquot Sound, Canada. *Conservation Biology*,
10 31(2), 343–352. <http://doi.org/10.1111/cobi.12795>
- 11 Luck, G. W., Chan, K. M. A., Eser, U., Gómez-Baggethun, E., Matzdorf, B., Norton, B. G., &
12 Potschin, M. B. (2012). Ethical Considerations in On-Ground Applications of the Ecosystem
13 Services Concept. *BioScience*, 62(12), 1020–1029. <http://doi.org/10.1525/bio.2012.62.12.4>
- 14 Martinez-Alier, J. (2008). Languages of valuation. *Economic and Political Weekly*, 43, 28–32.
- 15 McAfee, K., & Shapiro, E. N. (2010). Payments for Ecosystem Services in Mexico: Nature,
16 Neoliberalism, Social Movements, and the State. *Annals of the Association of American*
17 *Geographers*, 100(3), 579–599. <http://doi.org/10.1080/00045601003794833>
- 18 Ministerio de Ambiente y Energía, Comisión Nacional para la Gestión de la Biodiversidad,
19 Sistema Nacional de Áreas de Conservación. (2016). *Estrategia Nacional de Biodiversidad*
20 *2016-2025, Costa Rica* (No. FMAM-PNUD) (pp. 1–146). San José, Costa Rica: Fundación
21 de Parques Nacionales-Asociación Costa Rica por Siempre.
- 22 Morillas, L., Hund, S. V., & Johnson, M. S. (2019). Water Use Dynamics in Double Cropping of
23 Rainfed Upland Rice and Irrigated Melons Produced Under Drought-Prone Tropical
24 Conditions. *Water Resources Research*, 55(5), 4110–4127.
25 <http://doi.org/10.1029/2018WR023757>
- 26 Muradian, R., Arsel, M., Pellegrini, L., Adaman, F., Aguilar, B., Agarwal, B., et al. (2013).
27 Payments for ecosystem services and the fatal attraction of win-win solutions. *Conservation*
28 *Letters*, 6(4), 274–279. <http://doi.org/10.1111/j.1755-263x.2012.00309.x>
- 29 Narloch, U., Pascual, U., & Drucker, A. G. (2012). Collective action dynamics under external
30 rewards: experimental insights from Andean farming communities. *World Development*,
31 40(10), 2096–2107. <http://doi.org/10.1016/j.worlddev.2012.03.014>
- 32 Pattanayak, S. K., Wunder, S., & Ferraro, P. J. (2010). Show Me the Money: Do Payments
33 Supply Environmental Services in Developing Countries? *Review of Environmental*
34 *Economics and Policy*, 4(2), req006–274. <http://doi.org/10.1093/reep/req006>
- 35 Porras, I., Barton, D. N., & Miranda, M. (2013). *Learning from 20 years of payments for*
36 *ecosystem services in Costa Rica. International Institute for Environment and Development.*
37 London.
- 38 Rode, J., Gómez-Baggethun, E., & Krause, T. (2015). Motivation crowding by economic
39 incentives in conservation policy: A review of the empirical evidence. *Ecological*
40 *Economics*, 117, 270–282. <http://doi.org/10.1016/j.ecolecon.2014.11.019>
- 41 Rosa, H., Kandel, S., & Dimas, L. (2004). Compensation for environmental services and rural
42 communities: lessons from the Americas. *International Forestry Review*, 6(2), 187–194.
- 43 Shelley, B. G. (2011). What should we call instruments commonly known as payments for
44 environmental services? A review of the literature and a proposal. *Annals of the New York*
45 *Academy of Sciences*, 1219(1), 209–225. <http://doi.org/10.1111/j.1749-6632.2010.05941.x>

- 1 Spash, C. L. (2008). How Much is that Ecosystem in the Window? The One with the Bio-diverse
2 Trail. *Environmental Values*, 17(2), 259–284. <http://doi.org/10.3197/096327108x303882>
- 3 Sundberg, J. (1998). NGO Landscapes in the Maya Biosphere Reserve, Guatemala.
4 *Geographical Review*, 88(3), 388. <http://doi.org/10.2307/216016>
- 5 Swallow, B. M., Kallesoe, M. F., Iftikhar, U. A., van Noordwijk, M., Bracer, C., Scherr, S. J., et
6 al. (2009). Compensation and Rewards for Environmental Services in the Developing
7 World: Framing Pan-Tropical Analysis and Comparison. *Ecology and Society*, 14(2).
8 <http://doi.org/10.5751/ES-02499-140226>
- 9 The World Bank. (2017). Costa Rica. Retrieved September 30, 2017, from
10 <https://data.worldbank.org/country/costa-rica>
- 11 Titmuss, R. (1971). The gift of blood. *Trans-Action*, 8(3), 18–26.
12 <http://doi.org/10.1007/BF02804100>
- 13 Trainor, S. F. (2006). Realms of Value: Conflicting Natural Resource Values and
14 Incommensurability. *Environmental Values*, 15(1), 3–29.
15 <http://doi.org/10.3197/096327106776678951>
- 16 Van Hecken, G., & Bastiaensen, J. (2010). Payments for Ecosystem Services in Nicaragua: Do
17 Market-based Approaches Work? *Development and Change*, 41(3), 421–444.
18 <http://doi.org/10.1111/j.1467-7660.2010.01644.x>
- 19 van Noordwijk, M., & Leimona, B. (2010). Principles for fairness and efficiency in enhancing
20 environmental services in Asia: payments, compensation, or co-investment. *Ecology and*
21 *Society*, 15(4), 17.
- 22 Vatn, A. (2005). Rationality, institutions and environmental policy. *Ecological Economics*,
23 55(2), 203–217. <http://doi.org/10.1016/j.ecolecon.2004.12.001>
- 24 Wunder, S. (2015). Revisiting the concept of payments for environmental services. *Ecological*
25 *Economics*, 117, 234–243. <http://doi.org/10.1016/j.ecolecon.2014.08.016>
- 26 Wunder, S., & Vargas, M. T. (2005). Beyond “Markets;” why terminology matters. Retrieved
27 February 20, 2015, from
28 http://sanrem.cals.vt.edu/1010/Wunder2005_Beyond%20Markets%20terminology%20matte
29 [rs.pdf](http://sanrem.cals.vt.edu/1010/Wunder2005_Beyond%20Markets%20terminology%20matte)
- 30 Zúñiga, L. (2009). Santa Cruz de Guanacaste: cultura local, turismo y globalización. *Revista De*
31 *Ciencias Sociales*, (123-124), 35–48.