

## Article

# Long-Term Effects of Payments for Environmental Services: Combining Insights from Communication and Economics

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**Abstract:** Interdisciplinary analytical perspectives can bring important insights to address complex sustainability problems. In this paper we present and apply a model that integrates perspectives from economics and communication sciences to address the question of what happens to pro-environmental behavior after the introduction and then the withdrawal of payment for environmental services (PES). In particular, we discuss the effects of financial incentives on social norms and the effects of norms on subsequent behavior after incentives have ended. This is important because the dominant literature on PES lacks a sophisticated understanding of social norms and fails to address what will happen to behavior once payments end. That literature addresses the potential problem that payments can crowd out or possibly crowd in intrinsic sources of motivation for pro-social behavior, but it lacks the sophisticated understanding of social norms that has the potential to help explain and address this phenomenon. We summarize experimental evidence based on our model showing that introducing a financial incentive for behavior change can change social norms around that behavior. These norms, in turn, can continue to influence behavior even after incentives have ended. PES programs can address this situation by actively evoking existing social norms in favor of conservation.

**Keywords:** interdisciplinary; motivation crowding; payment for ecosystem services; social norms

## 1. Introduction

It is increasingly understood that individual disciplinary research perspectives are likely to be inadequate to solve complex, real-world sustainability problems [1–4]. Interdisciplinary research approaches that combine insights from different disciplines into integrative models have the potential to better understand and address the complexity and subtlety of human behavior related to problems of environmental, economic, and social sustainability.

In this paper, focusing on the problem of what will happen to pro-environmental behavior once a program providing financial incentives for such behavior ends, we show how an integrated, interdisciplinary analysis can offer insights that can better address this question than a single-disciplinary perspective. Our context is payment for environmental services (PES), whereby natural resource users are paid in exchange for managing an ecosystem in a manner that provides environmental services to others e.g., [5–7]. Examples include receiving payments for planting trees and protecting forests for carbon sequestration and biodiversity conservation [8,9], or managing land in such a way that protects a watershed e.g., [10].

The early literature on PES took a narrow economic perspective, focusing on the ways in which PES could provide a superior incentive structure than previous approaches to conservation e.g., [5,7,11]. With this narrow perspective it appears to have ignored or lost sight of lessons, unrelated to economic incentives, from earlier conservation programs. More recent literature on PES has addressed a number of problems that can result [12–14], including the problem of motivation crowding out [15–17].

The basic idea of motivation crowding is that humans are driven by multiple sources of motivation (e.g., intrinsic and extrinsic), and that extrinsic motivation, such as financial incentives, can interact with intrinsic motivation, such as social and personal motivators [15–22]. Incentives that undermine intrinsic sources of motivation can crowd-out the targeted behavior, while incentives that reinforce intrinsic sources of motivation can crowd it in. Such effects can outlast the presence of the incentive [23,24]. By ignoring the possibility of motivation crowding PES, at least as it is portrayed in the theoretical literature with its singular focus on monetary incentives, risks failing to engage or worse yet to undermine the very behavior it tries to encourage [13–17,25].

The emergent literature on motivation crowding-out and crowding-in (when financial incentives leverage intrinsic sources of motivation) has struggled to explain why financial incentives influence intrinsic sources of motivation [15,18,21,22]. To date, it has not offered clear approaches to avoid negative effects. Moreover, the literature on PES has almost completely ignored the question of what will happen when payments eventually end, as they almost surely will given that PES program budgets are subject to funding constraints, political processes, and changing patterns of what kind of program is in vogue.

In this paper, we examine the role that social norm formation and change could play in motivation crowding resulting from PES. Some authors have suggested that social norms may play a role in motivation crowding, but they have not provided evidence e.g., [15,21,22]. We present a nontechnical summary of an interdisciplinary model that combines insights from economics and communication sciences to examine the interaction of financial incentives and social norms in PES and other behavioral payment programs. (A more technical treatment of the model, with implications for the communication sciences literature, can be found in [26].) Our model takes advantage of the much greater nuance with which the communication literature treats social norms than the economics and institutions literatures, which tend to dominate the academic discussion of PES. We summarize evidence from laboratory and field experiments in support of our model and discuss the implications. Our objective is to explain our approach and show how it can be applied to influence and leverage social norms so as to minimize crowding out and possibly encourage crowding in in behavioral payment programs such as PES.

## 2. The Limited Role of Social Norms in Conservation Programs

Uphoff & Langholz [27] observe that worldwide, of three important sources of motivation that guide people in managing natural resources, policies and programs to promote conservation have focused heavily on (1) legal and (2) economic sources of motivation, but they have paid little attention to (3) social and cultural sources of motivation, including social approval and disapproval. Conservation programs may include a component of moral suasion, i.e., an effort to instill the idea that conservation is the right thing to do, but normally with the understanding that moral sentiment alone cannot be expected to result in conservation, particularly if there are economic forces that oppose it [28]. Uphoff & Langholz [27] argue that ignoring social and cultural sources of motivation in promoting conservation is perilous because even if it is not the primary source of motivation, it can help tip the balance in cases where different sources of motivation point in different directions or do not lead to conclusive preferences.

Attitudes and social norms in favor of conservation behaviors make those behaviors much easier to enforce. A case in point is anti-littering campaigns in the United States in the second half of the 20th century. Fines for littering were coupled with a strong campaign to instill the attitude that littering is wrong. Fines are still in place, but most Americans have internalized the idea that littering is wrong and for them the fine is an unnecessary deterrent. This has led to a strong social norm against littering. In a

classic set of experiments, Cialdini and colleagues [29] demonstrated that littered environments and the presence of other litterers promote a norm for littering and influence littering behavior; conversely, clean environments make littering less likely.

It is not clear to what extent conservation programs in developing countries have aimed to incorporate attitudes and social norms in favor of conservation. Kerr et al. [28] report that virtually all watershed management programs in India use moral suasion as part of their approach in an effort to promote a norm of conservation, but this part of their work is rarely codified or recorded in project documents. Worldwide, it is not clear if this is a common approach, despite the experimental evidence indicating that attitudes and social norms can influence conservation-related actions e.g., [30,31].

The early literature promoting PES barely mentions social norms [32,33], focusing instead on the effectiveness and efficiency of PES initiatives e.g., [7,11,34]. Appreciating the roots of PES, and taking the perspective that innovative new policy approaches tend to be motivated in part by the weaknesses of those that preceded them, makes it easy to understand why this is so. PES emerged in the late 1990s, at a time of burgeoning criticism of the Integrated Conservation and Development Project (ICDP) approach, which had focused on building favorable relationships between conservation officials and local people, and attending not only to conservation needs but also local development interests [7,35]. ICDPs, in turn, had emerged as a response to limitations of “fortress conservation” approaches, which dated back to colonialism and were characterized by heavy-handed efforts to exclude local people from the natural resources on which they traditionally had depended [36–38]. ICDPs aimed instead to build positive relationships between conservation officials and local people. However, after a decade of experience, reviews of ICDPs had found disappointing performance [39–41].

From an economic theoretical perspective, PES offered a logical improvement over ICDPs, which focused on indirect incentives for conservation under the flawed assumption that if people had good relationships with conservation officials and their needs were taken care of, they would not exploit protected resources [34]. In contrast, PES offered a clearer recipe: in exchange for protecting natural resources, give people direct financial incentives conditional on performance [5–11,32,34]. Added to whatever benefits people could already obtain from conservation-oriented management, a direct payment could make this the most profitable and cost-effective management option. This was the narrative that accompanied PES as it emerged. Detailed discussions of the important roles of institutions and social norms in PES (discussed in Section 4) emerged in the PES literature only later e.g., [7,13,25,42,43].

### 3. Social Norms and Behavior

Extensive theoretical work in communication sciences has addressed the role of social norms in predicting individual behaviors. The theory of reasoned action [44], focus theory [29,45], the theory of normative social behavior (TNSB) [46], and other theories e.g., [47–49] discuss the influence of social norms on behaviors. By harnessing the power of social norms to influence behavior, norms scholars can contribute to the design of behavior-change programs such as PES by helping to harness the power of social norms to influence behavior.

We focus here on the TNSB because it uniquely places norms at the center of theorizing and identifies the factors that enhance and attenuate norms’ effects on action. The TNSB conceptualizes social norms as a function of communication that is: (1) about behavior; (2) among a group of people; and, (3) in a particular cultural context [50]. The TNSB is concerned with people’s perceptions of socially normative behavior rather than actual behavior, because it is perceptions of what is normative that is theorized to have the strongest influence on behavior. Communication has the power to influence people’s perceptions about both the prevalence of behaviors (*descriptive norms*) [29], and their perceptions of what others believe about how people should behave (*injunctive norms*) [46]. Perceived descriptive norms are formed through observation of, and communication about, behaviors. Descriptive norms are positively associated with behavior; that is, under some conditions, people are more likely to take an action when they see many others around them doing that behavior. Efforts

have been made to harness the power of descriptive norms to promote responsible drinking on college campuses [51], encourage conservation actions like reducing water use [30,31], and to reduce littering [29]. Such efforts take advantage of positive descriptive norms by highlighting these norms through manipulating facets of the environment or messaging and then testing the norms' effects on action. For example, in a classic study on social norms and littering, Cialdini and colleagues [29] created environments that were either clean or littered in order to prime a focus on norms and found this influenced people's littering.

Perceived injunctive norms moderate the relationship between descriptive norms and behavior, enhancing this relationship. Injunctive norms prescribe behavior and are a group's beliefs about which actions are appropriate and inappropriate. For example, if I am considering whether or not to join a PES effort and I know that important others around me think it is the "right" thing to do, I will be more likely to join. Injunctive norms can be accompanied by implicit or explicit social sanctions for non-compliance with what is normative. For example, people who do not act as others think that they should may be ostracized from a group [50,52]. If a group of people is working together to clean up a littered ecosystem and one person continues to litter, that person may be marginalized from the group.

A key insight from the communication literature is that the moderating and indirect effects of norms are important influences on behavior. For example, perceptions of injunctive norms have both direct and moderated effects on behaviors [46,53]. When injunctive norms interact with descriptive norms, they heighten the effect of descriptive norms on behavior. In a study of college drinking behavior, Rimal [51] found that the interaction between descriptive and injunctive norms accounted for a small but statistically significant percentage of the total variance in drinking behavior. In particular, not only did students perceive a high prevalence of drinking, but they also perceived that their fellow students approved of it. These factors combined to influence their own drinking behaviors.

*Group identity* also moderates the relationship between descriptive norms and behaviors. Group identity refers to feelings of affinity with one's social group and the desire to be connected to that group [46]. When group identity is salient, it motivates norm-consistent behavior. Salient group identity also motivates normative behavior because individuals expect that others in the group will endorse their compliance with those norms [50]. Thus, the TNSB posits that descriptive and injunctive social norms have a greater influence on one's behavior when the social norms emanate from a group with which one identified. [46]. In one study for example, one's group identity as a childcare worker enhanced the effects of perceived descriptive norms about handwashing on reported handwashing behaviors [53].

*Outcome expectations* refer to a person's belief that enacting a given behavior will confer the results that they find desirable [54]. Descriptive norms have a stronger influence on behavior for behaviors with positive outcome expectations. That is, when one sees many other people engaging in a behavior and believes that good things will happen as a result of enacting that behavior, one will be more likely to do it.

Although the TNSB focuses primarily on perceived norms and the factors that enhance their effects, it recognizes that perceived norms, or the way a given individual perceives the social norm, can differ from collective norms—the norms that actually prevail in a group or culture. This distinction is important because people may misperceive collective norms, in which case interpersonal communication can transmit incorrect beliefs about prevalent behavior. An example is the prevalence of binge drinking on college campuses, which is often much lower than students perceive it to be; these normative misperceptions can be corrected through communication campaigns [50].

The careful treatment of norms in the communication science literature, and the consistently clear distinction between descriptive and injunctive norms, stand in contrast to the economics and institutions literatures that have the strongest influence on policy and practice in PES. Those literatures often do not define norms, assuming a common understanding of them e.g., [55–59]. Some studies consider norms as prevalent behavior (descriptive norms, e.g., [60]), while others treat norms as unwritten societal rules, subject to social sanctions for non-compliance (injunctive

norms, e.g., [21,51,52,54,55,59,61,62]). Still, other papers treat norms as internal moral norms, separate from perceptions of others' behavior and of what others perceive to be correct behavior (e.g., [63]). Some studies even define norms in one way but actually treat them in another. This lack of conceptual clarity muddles the results of studies designed to study normative systems.

Longitudinal studies of social norms are rare, as are studies of the role cultural context plays in the influence of descriptive and injunctive norms on behavior, despite calls for more such work to better understand the boundary conditions of normative influences [64]. Moreover, despite clear evidence that social and psycho-social factors can work in concert with economic incentives to influence action, few studies have explored the role of monetary incentives in normative influence.

These insights from the communication literature can help to improve the approaches common in the economics and institutions literatures, which dominate the literature on natural resource management policy and practice and PES in particular. They tend to look only at the direct effects of norms, and do not consider which social group is the source of norms and the extent of an individual's identification with that group. On the other hand, the communication literature has not examined the relationship between financial incentives and social norms—either how incentives influence norms, or how norms influence how people perceive behavior that is supported by financial incentives.

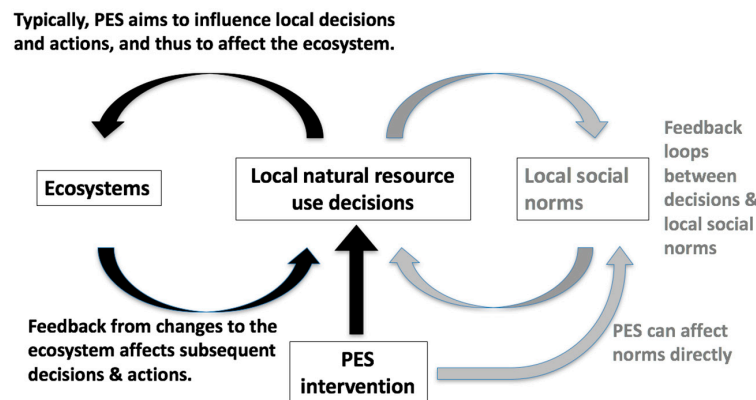
#### 4. A Model of Financial Incentives in Normative Systems (FINS)

The motivation crowding literature suggests that financial incentives interact with social norms in unexpected ways e.g., [15–24]. However, to date this literature lacks a sufficiently sophisticated articulation of social norms to sufficiently analyze the roles of social norms in motivation crowding out and, potentially, to take advantage of social norms to overcome crowding out and perhaps even help promote crowding in. Moreover, the economics literature on motivation crowding has not made a strong effort to incorporate social norms into the utilitarian decision paradigm in a systematic way e.g., [18,65]. Meanwhile, the communication literature offers important insights regarding social norms but has not addressed their interaction with financial incentives. In this section, we summarize a model that addresses this gap. The model integrates communication and economic theories, relying on the work described above and in [50]. It examines the effects of financial incentives on social norms, which in turn can influence behavior even after financial incentives have ended.

Figure 1 describes the general thinking behind our model as it applies to PES. A typical economic analysis of the effects of a PES program examines its direct effects on a natural resource user's decisions and actions and the effects of those actions on the ecosystem the program is intended to protect (shown in black in the figure). Resulting effects on the ecosystem can in turn affect the user's subsequent natural resource management actions, for example if initial changes raise the user's returns to continuing those changes.

In addition to the direct effect on people's actions, when a PES program is introduced, this intervention also influences behavior through descriptive and injunctive norms (shown in grey in Figure 1). In particular, any financial incentive for a given behavior is introduced into a social context of existing behaviors, normative expectations, and group dynamics. Financial incentives affect behavior directly, but the existing collective and perceived descriptive norms can moderate or mediate these effects. Existing group norms likely will influence how people respond to a financial incentive, and also their actions in the future once the financial incentive is no longer available. In addition, financial incentives for behavior should influence normative perceptions because of their effect on the collective norm, i.e., by enhancing the actual prevalence of a behavior in a population.





**Figure 1.** How a payment for environmental services (PES) intervention influences local natural resource management decisions both directly, and indirectly through social norms. Black arrows and text indicate standard assumptions of PES. Grey arrows and text indicate additional hypothesized relationships related to social norms.

People receive normative information in many ways, but one is via the observation of group members' actual behaviors over time. It may be the case that when financial incentives for behaviors are in place, the actual prevalence of the behavior will increase and there may also be changes in the ways that norms are perceived. The collective norm for prevalence of the behavior will increase because more people are engaging in the behavior compared to before the incentive. Other group members will observe this behavioral prevalence, enhancing the perceptions of the prevailing descriptive norm. Perceived descriptive norms may or may not correspond precisely to the collective (actual) descriptive norm [66]. In other words, even as a financial incentive changes the actual prevalence of a behavior, the corresponding perception of that change could be either an overestimate or an underestimate.

PES programs in developing countries often contract with community groups to provide an environmental service collectively, in exchange for collective payment [8]. Such an approach can only succeed if members of the community group cooperate with each other. In a case characterized by a non-cooperative norm, for example, where local people do not cooperate to manage a given natural resource that they hold in common, incentives can be necessary to enhance contributions to the collective good. That is, without financial incentives, if a person sees other people being non-cooperative, that person will be likely to act non-cooperatively as well, unless the person clearly receives a payoff for being cooperative. Once that incentive is removed, people are likely to return to their low, pre-incentive cooperation levels.

Where a cooperative norm among group members already prevails, financial incentives may induce additional cooperative behavior, but it is not clear what will happen to cooperative behavior after those incentives are removed. For example, an incentive payment that induces prosocial behavior could contribute to a descriptive norm of undertaking that behavior, but if people know that the behavior is undertaken only for payment, an injunctive norm could develop that the behavior is not inherently worth doing. In this case, PES affects descriptive norms and injunctive norms in opposite ways, eroding the power of descriptive norms to influence behavior. Conversely, perhaps some people would react to a government payment for conservation behavior by thinking that conservation behavior must be extremely important. This could conceivably enhance the injunctive norm in favor of conservation, and thus, the payment would have consistent effects on both descriptive and injunctive norms. In short, both perceived descriptive norms and injunctive norms will change over time as will their influence on behavior. This effect will be dependent on the presence or absence of a financial incentive on behavior, but the direction of that effect is not known.

The strength of the FINS model stems from integrating ideas and approaches from two different disciplines into a single analytical model. Achieving this is often a major challenge in interdisciplinary work [3,4], and it is often more challenging in research that combines different social science disciplinary

perspectives than in research that combines multiple natural science disciplinary perspectives or a social science and a natural science perspective, because different social science perspectives often examine closely related phenomena from completely different frames, making completely different assumptions [67]. However, successfully reconciling these differences offers important possibilities of generating new insights.

#### *Tests of the FINS Model*

Lapinski et al. [26] tested the FINS model by using a public goods experiment in a campus computer laboratory setting in the U.S. In a public goods experiment, subjects had to decide how much to contribute between a public account, which maximized the benefits to the group as a whole, and a private account, which maximizes their own personal gain. The experiment followed a  $2 \times 2$  research design with two treatments: sorting participants by their initial inclination to cooperate, and offering a temporary incentive payment to contribute to the public good in the second of the three six-round phases. Data gathered over the course of the experiment about group identification and normative perceptions permitted the testing of hypotheses regarding the effects of incentives on descriptive norms and behavior after the incentives had ended. Data from the experiment showed a significant interaction between the presence of a financial incentive and perceived descriptive norms. In the short term, when the incentive was in place, any positive impact of perceived descriptive norms on contribution behavior disappeared. In addition, presence of an incentive reduced the positive impact of the initial level of cooperation on subsequent contributions to the public account. Over time, the financial incentive weakened the effect of descriptive norms on contribution levels and the weakening effect remained even after the financial incentive had ended. In short, the data provide evidence that introducing and then removing a financial incentive for a cooperative behavior can undermine a social norm for that behavior.

Two subsequent, more advanced tests of the model revealed quite different insights. In a framed field experiment conducted in Qinghai, China, a subject pool of Tibetan Buddhist nomadic herders participated in a modified public good experiment in which they were asked to volunteer to participate for up to seven days in a patrol against illegal trapping of wildlife [68]. Similar to the previous experiment, in one treatment a temporary financial incentive to promote contribution to the public good was offered in the second of three rounds. In a second treatment, the participants were repeatedly given a message reinforcing the strong injunctive norm among Tibetan Buddhists in favor of protecting wildlife. In addition, a series of survey questions over the course of the experiment served to measure subjects' perceived both descriptive norms and perceived injunctive norms around volunteering to patrol against illegal trapping in order to track their evolution over the course of the experiment. The payment treatment was framed in a way that represented recognition and validation by the Chinese government of traditional Tibetan practices of protecting sacred natural resources including wildlife, and giving them autonomy in order to pursue it in the manner they saw fit. Details of the approach are available in [68].

The results of the experiment showed that neither the temporary incentive nor the injunctive norm treatment had a significant direct impact on participation in voluntary patrols. On the other hand, the temporary incentive raised the perceived injunctive norm in favor of patrolling, and this increase persisted even after the incentive had been removed. The perceived injunctive norm in turn had a significant positive effect on participation in patrols, including after the temporary incentive had been withdrawn. In this experiment, a payment framed in a way that respected local traditions and local autonomy strengthened injunctive norms in favor of volunteering, crowding in this behavior even after the payment had been withdrawn. This suggests that just as social norms can play a part in motivation crowding out due to financial incentives, it may also be possible to put them to work to play a role in mitigating crowding out or even promote crowding in.

Another experiment followed exactly the same approach as the Qinghai experiment, but with a real incentive for a very different activity in a very different population. The context was patrolling

against littering during tailgate parties prior to football games. Tailgating is a popular activity before college and professional football games in the United States (U.S.), with thousands of fans holding parties in the parking lots outside the stadium for a few hours before the game. They can generate a great deal of trash, and many universities have implemented measures intended to encourage orderly trash disposal. In our experiment, students were asked to volunteer their time to patrol against littering during tailgate parties prior to football games on campus. As in Qinghai, there was an injunctive norms message treatment and a financial incentive treatment.

Results of the experiment [69] showed that the anti-litter patrol was not popular among the student participants, with very low prevalence of participation (a very low collective norm) and a low perceived injunctive norm. In contrast to the Qinghai case, despite significant relationships between norms and incentives in this case, there does not appear to be a possibility of taking advantage of social norms to promote participation in antilitter patrols, mainly because norms regarding that behavior are so low to begin with. If people perceive that participation in a behavior is very low and that most people do not think it is important, then those perceptions will more than likely further contribute to reducing the prevalence of the behavior rather than raising it.

Financial incentives interacted with social norms in all three of the applications described above. In the initial, context-free campus public good experiment, payment reduced a perceived descriptive norm in favor of contributions to the public good, and removing payment demonstrated crowding out effects. In the Qinghai experiment, a carefully framed payment raised the perceived injunctive norm, which in turn raised contributions to the public good even after the payment had been withdrawn. In the campus anti-litter patrol experiment, low contributions to the public good and low perceived and injunctive norms regarding contribution to the public good meant that there was no possibility of putting norms to work to promote it.

By incorporating insights from communication sciences regarding the influence of social norms on decision-making, the FINS model becomes a potentially powerful tool for understanding and possibly avoiding the motivation crowding-out effects that financial incentives occasionally bring, as long as there are norms in favor of the behavior in question. Through identifying ways in which social norms interact with economic and other variables in affecting decisions, our model helps researchers to design lab and field experiments and to develop empirical strategies in searching for improved designs of PES programs with favorable long-term impacts.

## 5. Implications for PES Design

Although PES may have been conceived as an arrangement for private exchange, the extreme challenges in observing and verifying connections between a given land use and desired environmental outcomes, and of organizing potential buyers and sellers on a meaningful scale, mean that the vast majority of PES initiatives worldwide are funded by governments and donor agencies. As a result, given political processes and budget constraints, payments are likely to end at some point. The conventional theory of PES acknowledges that it is only intended to affect behavior for as long as payments keep flowing. Our research, however, shows that it is important to gain insights on what happens to behavior after payments end, beyond simply assuming that it returns to its previous status quo.

Our model can generate insights regarding what happens to behavior when financial incentives have ended, and perhaps provide insight on how to encourage longer-lasting positive effects of payments. In our model, PES influences behavior both through the payment for as long as the payment lasts, and beyond the time of the payment through its effects on social norms. The effect of payment is to increase the actual prevalence of protecting the ecosystem for as long as the payment is in place. What is more likely to affect behavior over time, however, is the perceived descriptive norm, i.e., what people perceive others to be doing as opposed to what they are actually doing. If the payment does not affect the perceived descriptive or injunctive norm, it is unlikely to affect behavior beyond the period when the payment is offered. In addition, payment may or may not influence injunctive



norms of cooperation or protecting an ecosystem; it could contribute to a belief that it is important to protect the ecosystem, or it could contribute to a belief that it is only important to protect an ecosystem in exchange for money. Clearly, these two effects have alternative impacts on the ecosystem after payment has ended.

The implication for actual PES programs is that instilling a perceived descriptive norm and an injunctive norm in favor of protecting an ecosystem is important for promoting long-term positive effects. On the other hand, it is critically important to avoid instilling an injunctive norm that protecting the ecosystem is only worth doing in exchange for money. This would clearly constitute motivation crowding out by introducing new motivation not to protect the ecosystem that did not exist prior to the intervention.

A further feature of our model is that, as demonstrated in the communication science literature on social norms discussed above, normative effects on behavior may be indirect and interactive, with their strengths depending on the extent of group identity with those social groups from which the norms emanate, as well as the attitudes about the activity in question. Agencies initiating PES can take advantage of this in several ways. For example, to the extent that there are pro-conservation norms in place, identifying communities with a history of cooperative interactions and strong ties to each other can facilitate the success of PES implementation efforts. In addition, understanding and paying attention to which social groups hold greater sway with a given target population can help in promoting both the behavior in question and efforts to promote a belief that it is important. Another example is working through existing local, well-respected institutions with connections to local people as PES efforts are initiated and implemented.

These implications of our model may help explain a number of findings in the literature, and to support various approaches observed in existing PES programs. Three examples illustrate approaches that PES initiatives can take to incorporate normative sources of motivation. First, published articles reporting on Conservation International's Conservation Stewards Program (CSP) focus primarily on the fact that payments are conditional on performance (e.g., [70,71]). What receives very little attention is that CSP devotes a great deal of effort to building relationships between local communities and conservation officials, to ensuring to the extent possible that all community members perceive that conservation agreements are fair and address their diverse interests, and to engaging local people in participatory monitoring of both conservation and livelihood impacts [72]. These efforts likely promote an injunctive norm and demonstrate a descriptive norm in favor of conservation, and they can help build group identity that can strengthen the effects of those norms. The CSP approach also puts a strong premium on institution-building to manage local conflicts that may arise as part of adhering to a conservation agreement [72]. This can potentially help build group identity in a way that will strengthen any normative effects emanating from the initiative.

Second, the Payment for Hydrologic Environmental Services (PSAH is the Spanish abbreviation) in Mexico offers payment to rural communities in exchange for protecting forests, and public documents focus narrowly on the financial terms of contracts between the program and participants [73]. In contrast, in public presentations to rural communities, officials present the program as offering compensation in recognition of the direct costs and opportunity costs that rural communities face in protecting the forest resources that are "their patrimony", for the benefit of themselves and of the country as a whole. In other words, the financial incentives are offered alongside, not in place of, an appeal to pride and to moral sentiment (personal observation of a PSAH meeting, Coyomeapan, Puebla State, 5 March 2009). This approach clearly draws on injunctive norms, stating explicitly that the public appreciates the efforts that local people make towards conservation. It sends the message that the objective of a payment is not to manipulate people but to recognize the extra costs they are being asked to bear on behalf of society.

Third, Van Noordwijk & Leimona [74] promote a modification of PES that they refer to as co-investment in environmental stewardship. In the co-investment model, parties jointly agree on a management plan and the natural resource manager is trusted to carry it out.

Van Noordwijk & Leimona [74] and other authors present evidence to show that by demonstrating greater respect for local autonomy, this approach can appeal to social as well as financial sources of motivation when compared to strict conditionality with a stronger element of external control [75–79]. In other words, it could be an approach to promote crowding in. In addition, a jointly-negotiated approach with a greater degree of local representation and initiative has more potential to put social norms to work, since injunctive and descriptive norms tend to have a stronger effect on behavior when group identity is stronger, as discussed above [46,50]. In particular, messages that emerge from within the group or that draw attention to attitudes and behaviors within the group will be far more powerful than those coming externally.

The FINS model supports aspects of some PES initiatives and helps to explain which aspects of these programs should contribute to their long-term success. The model offers clear suggestions regarding the importance of promoting a perceived descriptive norm and an injunctive norm in favor of conservation, as well as the importance of understanding the critical role of group identity that enables norms to take hold. It offers a strong analytical framework for arguments such as those put forward by van Noordwijk & Leimona ([74]) regarding the potential benefits of adapting PES to a co-investment approach that provides more space for local initiative and representation. In addition to appealing to social sources of motivation and creating space for social norms to become salient, this approach allows for a greater focus on institutional development as opposed to a narrow focus on the details of the business transaction [7,13,22,43,74–79], as well as a greater focus on social justice [75,80]. The concrete suggestions that the interdisciplinary FINS model offers are an important addition to the literature on motivation crowding out, which to date has offered little regarding specific approaches to protect against it.

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