PAYMENT FOR ENVIRONMENTAL SERVICES PROGRAMS IN LATIN AMERICA AS AN INNOVATIVE ENVIRONMENTAL POLICY INSTRUMENT

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ABSTRACT

Payment for Environmental Services (PES) Programs in Latin America and Mexico have dominated the market-based environmental policy realm in the past decade due to their new paradigm for solving the problem for ecosystem degradation. There are at least three reasons why a careful examination of the design and implementation of these types of programs is important for the environmental policy discussion in developing world contexts. First and foremost, PES schemes offer several advantages: they are cost-effective, they are institutionally simpler, and they are potentially good for poverty reduction. Second, PES schemes embrace the user-based principle instead of the polluter-pays principle and, in some cases, they have elements of a conditional cash transfer program. Third, from a geographical perspective, PES programs are flexible and adaptive to local, regional, national and international scales. Despite the advantages from a policy design perspective, PES programs present a set of issues and barriers at the implementation stage, especially within developing world contexts where a set of preconditions must be in place in order for PES programs to work well.

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INTRODUCTION

In the 1990´s, Payment for Environmental Services (PES) appeared as an innovative market-based policy instrument for natural resource conservation. From there, it expanded throughout to most Latin American countries. After a decade of PES implementation, the empirical evidence regarding PES impact and effectiveness in Latin America is still diffused and inconclusive. Before we can evaluate the effectiveness and policy implications of PES, we must understand both its design and its implementation processes. Therefore, in this article the PES literature regarding five key issues is reviewed: PES scheme and program design; the political economy of Payment for Environmental Services; market and government failures associated with PES implementation; PES program effectiveness determinants, and distributional issues regarding PES.

The key question that environmental policy has engendered in the last 10 years is: Have PES schemes as public policy interventions changed the behavior of landowners where the environmental services are provided? Or, would landowners have protected the ecosystem regardless of intervention? A more subtle discussion has evolved around the question of whether "forest conservation on enrolled land is undermined by displacement of deforestation to other areas through spillover effects" (Alix-Garcia *et al.*; 2010; Pattanayak, 2010). Proponents of PES schemes claim that behavioral change is nurtured through the intervention while skeptics argue that potential and actual barriers (what they call "leakages") mitigate the effectiveness of the program. In the midst of this debate, practitioners, policy-makers, and scholars try to identify ways in which leakages of PES schemes could be minimized through careful consideration of institutional context, design, and implementation.

PES have become popular in developing world contexts because it is seen as a new paradigm for solving the problem for ecosystem degradation (Ferraro and Kiss, 2002). In particular, proponents of PES see it as a better course for environmental policy due to several potential advantages: cost-effectiveness, institutional simplicity, and poverty reduction. (Wunder *et al.;* 2008). Each of these advantages is based mainly on theoretical grounds. In practice, though, institutional constraints and bureaucratic and implementation failures may hinder their effectiveness.

Under some circumstances, PES intervention has proven more cost-effective than traditional command-and-control instruments such as designating natural protected areas. PES design reflects the famous Coase theorem regarding social costs: if property rights are well defined, a Pareto-efficient outcome will be achieved regardless of the initial distribution of benefits. Moreover, this result will be achieved without government

intervention. Two crucial assumptions underlie Coase´s theorem: property rights must be well-defined, and transaction costs of the bargaining process should be low. How far away are these theoretical assumptions from actual PES design and implementation? These central research questions seeks empirical evidence and dominates the contemporary Payment for Environmental Services academic literature. Another key feature of PES design is that it is based on the beneficiary-pays rather than on the polluter-pays principle. This change in notion implies a significant shift in traditional command-and-control environmental policy.

1. PAYMENT FOR ENVIRONMENTAL SERVICES SCHEMES DESIGN

According to Wunder *et al.* (2008), whose work represents the most generally accepted PES characterization among scholars, a Payment for Environmental Service scheme must contain three of the following five features. First, and similarly to other market-based instruments, a voluntary transaction must take place. Typically, there are four economic agents that might interact on a PES transaction: private owners, non-governmental organizations, firms, and governments. Any interactive combination of these four agents in a given scheme must be voluntarily. This is true even in the case of government-based PES programs. Second, and closely interrelated with the voluntary transaction condition, the environmental service (ES) must be bought by a (minimum one) ES buyer and, third, from a (minimum one) ES provider. Fourth, the ES must be well-defined (well-defined, in this case, the causal chain between the environmental resource and the service it provides is scientifically proven and ideally measured). Sometimes this relationship is not easy to establish either because little is known about the ES or because it is almost impossible to isolate a single ES from its ecosystem interactions. Despite this limitation, there are four conventional environmental services implemented in both developed and developing world contexts that scientists and policy makers agree on both the provision of service and the associated causal chain. These environmental services are: carbon sequestration, biodiversity conservation, hydrological services, and agro-forestry environmental services.

The fifth characteristic is conditionality and it refers to the assurance that the ES supplier guarantees the environmental service provision. Conditionality implies that the ES provider must comply with the agreed upon rules that are typically set in a given contract and which norm the behavior of the landowner towards the natural resource in order to guarantee provision of the environmental ser-

vice for a definite time period.

In addition to these five main characteristics, PES schemes may be differentiated by the "type and scale of ES demand, the payment source, the type of activity paid for, the performance measure used, as well as the payment mode and amount" (Engel *et al.*; 2008). Consequently, the effectiveness and efficiency of PES schemes crucially depends on their design.

Although Wunder's five-step definition has been broadly accepted and agreed upon by the environmental management scholarly community (as indicated by the number of citations), there is some disagreement about whether to include environmental policies that have PES characteristics but partially violate one or more of the five defining conditions (Sommerville *et al.*; 2009).

A key difference between PES schemes involves the nature of the buyer of the ES. Government-based or supply-side PES schemes compensate ES providers in the form of a Pigouvian subsidy. NGO's may also apply supply-side PES schemes. On the other hand, demand-side, also known as user-based schemes, imply that the compensation payment might be made to the ES receiver who is able to identify the direct benefits of the environmental service. Frequently, environmental services are ignored, underestimated, or neglected by users, unless the scale and the consequences are directly perceived by the user. Watersheds with upstream and downstream users are a good example of this situation.

Drawing a sample of developed and developing world countries, Wunder *et al.*. (2008) found that user-based and government-financed PES schemes have significant differences in terms of concrete performance indicators such as targeting; tailoring to local conditions and needs; monitoring and enforcement to achieve conditionality; and confounding objectives. In these four aspects, user-based schemes performed significantly better, on average. The policy implications of this key finding don't necessarily condemn government PES schemes to failure, nor do they suggest that user-based schemes are always the best way to go. A combination of both kinds of schemes may interact simultaneously, with the institutional setting determining which type of scheme might work better in a given space and time.

In practice, PES schemes may encompass a bundle of two or three environmental services at the same time. For instance, Asquith *et al.* found that in Los Negros, Bolivia, a PES scheme compensated upstream farmers for not cutting down trees, hunting, or clearing forest on enrolled lands while downstream irrigators paid for upstream cloud forest conservation. Since the payment is an annual *quid pro quo* in-kind compensation scheme that includes "transferring beehives supplemented by apicultural training" (Asquith *et al.*; 2008) to upstream farmers, a third environmental service in the form

of pollination is considered in this complex scheme.

In general, bundling different environmental services is a frequent, advantageous practice that seeks to simplify information within a complex ecosystem context. If well designed, a bundled PES scheme may provide benefits by expanding potential markets and increasing payments to a particular area. Services are either sold together or subdivided and marketed to different buyers (Kemkes *et al.*; 2010). It may also be argued that bundling environmental services fosters participation since it increases the scope of the potential targeted population. Despite these potential advantages, especially if care is not taken in design, bundling may increase transaction costs and increase leakages if "each service has a different spatial distribution and therefore different beneficiaries". (Kemkes *et al.*; *op. cit.*).

2. THE POLITICAL ECONOMY OF PAYMENT FOR ENVIRONMENTAL SERVICES

Contemporary Payment for Environmental Services schemes utilize Coasian and Pigouvian insights. According to the Coase Theorem, if property rights are well defined, social and private return rates should be equal. Therefore, an efficient outcome could be achieved regardless of the initial allocation of those rights. The efficient outcome is achieved by bargaining between the two economic agents. For this to happen, transaction costs should be low and the number of participants should also be low. *Ex ante* government intervention is limited to make sure that property rights are well defined. *Ex post* government participation is limited to put in place conflict resolution mechanisms for potential disputes which, under Coasian conditions, shouldn't normally occur.

As the number of participants increases, however, collective action issues may appear. However, experimental economics literature has shown that the efficient outcome suggested by Coase may still hold even when the number of participants is relatively high. According to Hoffman and Spitzer (1986), the main conditions for the efficient outcome to hold even under a bigger than two person scenario are the capability of players –bargainers- to have open communication, side payments and enforceable contracts. Well-defined property rights are the cornerstone of Coase's theorem. However, there is a vast literature in natural resources that distinguishes between *de facto* and *de jure* property rights. Coase refers to the former, while the latter are not considered under the theorem but may be equally important regarding natural resource management (Baland and Platteau, 2003).

Payment for Environmental Services programs that are government-designed also have a

Pigouvian component. In a way, Payment for Ecosystem Services may be seen as a particular form of a Pigouvian subsidy. This kind of market-based policy instrument basically tries to identify the equilibrium price where social marginal benefits and costs meet, thereby correcting for a negative externality; (for example, excessive pollution levels) or augmenting production levels to ensure the optimal provision of positive externalities. Similar to a Pigouvian tax, the key challenge for governments is to set the level of the subsidy equal to the "price" at which marginal benefit and cost curves intersect. If this is not achieved, suboptimal results will emerge as a consequence and deadweight loss as well. Sometimes, PES schemes are a Coasian-Pigouvian combination. User-based and government-based PES schemes both imply a voluntary transaction between one provider and *at least* one buyer or consumer of the ES. However, under user-based schemes the buyer clearly identifies the externality and directly bargains and pays for the service without government intervention. In this sense, user-based schemes mimic the Coasian idea more closely. In addition, the key low transaction cost *Coasian* condition has different implications for user-based and government-based schemes. For example, it has been shown through case studies that user-based schemes have lower transaction costs than do government-based schemes (Wunder, 2008). This finding is not surprising since government based schemes lend themselves more to "leakages" via middle man interaction, program design, timing, side goals, and program service delivery.

Another implicit assumption of the Coase Theorem is that the economic agents engaged in bargaining are single units, typically private firms or individuals. However, many natural resources in developing world contexts are appropriated, provided, or managed in the form of common pool resource governance systems (Ostrom, 1990). This circumstance shifts the basic assumptions of the Coase Theorem in a context where all sorts of collective action issues may show up. Additionally, and since the theoretical assumptions of the Coase Theorem –well-defined property rights, low transaction costs, few participants or small groups and no wealth effects- are difficult to achieve in practice, the bulk of the PES literature proposes alternative frameworks which take into account institutional contexts and settings where PES schemes may take place, such as distributional issues, uncertainty, social embeddedness, and power relations (Muradian *et al.*; 2010). These frameworks do not directly challenge the Coase Theorem's usefulness regarding PES-scheme design. Rather, they contest efficiency, the basic criterion of the theorem, as the only criterion for defining objectives and measuring performance.

Although PES has thrived as a market-based policy instrument *par excellence*, it is frequently the

state- and community-based institutions, both formal and informal, that determine its success. Vatn (2010) argues that some PES schemes are nothing more than a "reconfiguration of the role of public bodies and communities becoming core intermediaries or buyers". The critical role of the state regarding regulation of property rights on the participant lands, strong participation of public agencies in many PES schemes worldwide, and the facilitation of these agencies for creating markets in the environmental realm are all factors that have to be considered for the "market-based" discussion (Vatn, 2010).

Not all contributors to the PES literature agree with the feasibility of applying the Coase Theorem to the environmental realm, particularly PES. In particular, the ecological economics approach, which differs theoretically in many ways from the neoclassical environmental economics approach, states that Wunder's five main characteristics of an environmental service are not only unattainable in practice but also inappropriate in some cases. This argument hinges on the very definition of environmental services, which, for the ecological economics school, is as follows: "PES is a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources" (Farley & Costanza, 2010).

Implications of this definition are non-trivial. If the ecological economics approach is followed, distributional goals could potentially hold more weight than efficiency goals. Moreover, the instruments to achieve environmental public goods will follow more Pigouvian and state-based approaches rather than Coasian criteria. It is important to note that neither of these approaches explicitly considers the critical role that communitarian rules might play in PES design such as social norms and preferences towards public intervention. Some authors have recently called attention to the inconsistency of government-based PES schemes in that a government-based policy is, in principle, incompatible with the market-based mechanisms that it tries to promote (Fletcher & Breitling, 2012). This structural incompatibility may be one of the reasons for eventual implementation failure and leakages. According to Sommerville *et al.* (2010), "PES-like" schemes –the ones that aren't completely voluntary transactions- are often considered inferior compared to those that comply with all the delineated characteristics, especially the voluntary aspect. However, the same authors argue that the focus should not be placed on the strict definition of the term and its characteristics but rather on a more flexible definition "best seen as an umbrella term for a set of resource-management tools that are based on the philosophy of implementing conditional positive incentives in a wide variety of institutional contexts" (Sommerville *et al.*; 2009; *op. cit.*).

3.EFFECTIVENESS AND LEAKAGES OF GOVERNMENT-BASED PES SCHEMES

PES literature offers two main pathways to measure effectiveness and efficiency of PES schemes. On the one hand, Wunder proposes a comparative framework between schemes which includes seven transaction costs-related variables: baselines and scenarios; opportunity costs; additionally; land use service link; leakages; permanence; and start-up and recurrent transaction costs (Wunder *et al.*; 2008). Each of these variables influences the potential effectiveness of a given PES scheme. For example, the higher the opportunity costs, the more carefully implemented a PES scheme should be in order to correctly compensate the potential enrolled participant. Failure to do so will lead to greater leakages, since shirking may appear as a consequence of imprecise opportunity costs definition. Inclusion of these variables may paint a more accurate picture of potential leakages and spillovers of a given scheme. The inductive nature of this approach is helpful in identifying leakages at the design and implementation phases of a given scheme.

Pattanayak (2010) argues that this kind of typology is useful for descriptive purposes although insufficient to measure real impacts of the actual implementation of the program in terms of additionality. In order to reach the next level –impact measurement- it is necessary to apply impact evaluation techniques that account for additionality and effectiveness by controlling confounding variables and thereby responding to the basic evaluation question: What would have happened in the absence of the intervention? (Pattanayak, 2010).

A second approach that dominates the PES literature regarding the effectiveness of PES is a matrix diagram proposed by Engel *et al.*. (2009). According to this approach, effectiveness of a PES scheme can be evaluated by comparing the value of environmental services. The most frequent and interesting possibilities are the ones that provide solutions that imply trade-offs between land use and environmental service benefits. Taking these trade-offs into account in designing PES schemes should improve efficiency. For example, PES schemes that offer potentially high environmental services value but low on-site profits for the private landowner are "leakage prone," since, other things being equal, the enrolled participant will always tend to deviate to improve its private benefit at the expense of a social (environmental) cost. Given the heterogeneity of available empirical data from PES cases in the developing world, Wunder's and Engel's proposed methods are useful in identifying the potential characteristics of a given PES

scheme design. Consideration of these attributes allows for better identification of the variables that might inhibit or foster program impacts. In other words, it is crucial to identify which variables favor spillovers or leakages.

Another leakage source for government-based schemes is incomplete contracts. Conditionality necessarily requires a contract between the environmental service user and the provider. As in any contract, but especially those concerning environmental issues, it is very difficult to include all the terms, conditions, and possible consequences of the provided environmental service (Barzel,1997; Williamson, 1985).Moreover, there is a trade-off between simplicity of the contract and the omission of details that might be important. There might also be a bias against the poorest households, those that are unfamiliar with technical language, and who just sign off with little knowledge of the consequences and commitments surrounding the contract.

It has been shown that asymmetric information is a recurrent source of market failure under typical PES schemes. Normally, the environmental service provider has better information than the environmental buyer–including governments-regarding the conditions and management of their natural resources. This asymmetry may be used to advantage by providers in order to obtain "informational rents." If a significant number of participants in the program use informational rents, program effectiveness and additionality will be reduced. Contract design is therefore a key instrument in potentially reducing asymmetric information. There are several ways to tackle asymmetric information and therefore reduce the leakages of a given program. Ferraro identifies three concrete mechanisms for this: "1) acquire information on observable landowner attributes that are correlated with compliance costs; 2) offer landowners a menu of screening contracts; and 3) allocate contracts through procurement auctions" (Ferraro, 2008). While the first option is the most standardized and used in different PES schemes, the second one implies a great deal of creativity and flexibility by the ES buyer. The third option is less common due to political difficulties. The goal of each of these approaches is "to reduce informational rents without distorting the level of environmental services provided." Which scheme is better greatly depends on the institutional context in which it will be placed. For instance, the third approach implies a sophisticated setting of community-level information and bureaucratic practices.

The contract period is also very important. There is a debate regarding the optimal time period a contract should encompass in order to ensure that the environmental service continues to be provided even after contract termination. This may imply a behavioral change from the ES provider. The experimental economics litera-

ture depicts a vast set of situations where participants of the environmental service scheme may fail to comply despite what is established on the contract. Credible commitment issues may appear once a contract is terminated. In other words, they may not be "morally" committed to preserving the ES once the agreement is enacted. In many cases, the goal of environmental services conservation is not just to restrain people from using the natural resource base. It may also imply a series of actions or practices towards sustainability that aren't necessarily appraised, embraced, or appropriated by the ES supplier once participation in the program is finished. Ultimately, a crucial goal of any PES program is to achieve a behavioral change among former program participants. The hope is that they will become pro-conservationists and environmentally educated in such a way that they might develop their own sustainable economic and environmental long term plans.

Another important leakage regarding PES design is known as *slippage*. Although individual compliance might be sufficiently high for some communities as a result of participating in the program; neighbor communities may change their behavior adversely regarding program goals (Shapiro, 2010). Higher deforestation rates from neighbor communities, for example, may offset lower deforestation rates from participating beneficiaries. At the implementation level, bureaucratic or government failures may also influence PES effectiveness. If several agencies carry out a given program, coordination is needed. Moreover, if different government levels are involved, legal and institutional frameworks must be fine-tuned. Pattanayak *et al.* (2010) warn about the multiagency issue. Because each agency might play a specific role in the program and therefore has a vested interest on it, inefficiency may come as a result (Pattanayak, 2010; Libecap, 2006). For instance, in the Mexican PES case, a forest development agency is responsible for running the program while the water federal agency collects the fees and revenues that are used for funding the PES program. Simultaneous program participation by beneficiaries may also be a government failure that reduces potential impacts of the program and raises transaction costs at the implementation level. This is especially true for programs whose incentives are not aligned, thereby sending mixed and contrary signals to program participants. A crucial factor in avoiding leakages of any PES scheme, thereby augmenting its effectiveness, is the development of a baseline to compare *ex ante* and *ex post* results. If baseline data is incomplete or poorly developed, it is very difficult to estimate impacts accurately. Geographical information systems may provide a substitute or complement as a resource for creating baseline data.

A key factor for the success or failure of a government-based PES program implementation is

the middleman who works directly with the participant community at all stages of the program. In the absence of efficiency wages and/or low skills, intermediaries are prone to shirk in the form of weak supervision or collusion with the PES provider. This issue leads to leakages from the program. Obviously, the intermediary leakage is reduced when skilled intermediaries are already in place, but this is often not the case, so training is crucial. Another way to improve intermediation performance is by utilizing existing nonprofit organizations as intermediaries. Yet another way under user-based PES schemes is to take advantage of the participation of the users in a group organization, such as a local utility department that lets users "make a payment through an additional fee on their bill" (Kemkes *et al.*; 2010). *Ceteris paribus*, the nearest potential participants with lower learning curves will be favored by the middleman. Bribing in the form of "unofficial tips" may be another source for inefficiency and participation bias. There are several ways to tackle the middleman issue: sound training; efficiency wages; and the implementation of quotas that favor minorities and reduce potential poverty biases. Despite its importance, the middleman or intermediary issue is scantly addressed in the PES literature. Pascual *et al.*. (2010) maintain that the bargaining power of both the agents and the intermediary or middle man critically influence the performance, and hence the effectiveness and additionality, of PES schemes (Pascual *et al.*; 2010).

Other leakages may arise when PES beneficiaries are communities rather than individuals. There is a vast literature that studies common pool resources dynamics as well as the risks and opportunities that communitarian arrangements offer (Ostrom, 1990). The fact that an agreed-upon contract takes place between a public sponsor and a community in order to guarantee and preserve conditions for ES provision tells us very little about the internal dynamics of the community itself and, ultimately, which outcomes and impacts will be generated as a consequence. Local *rules of use* may be incompatible with PES program requirements. Internal agreements or disagreements within communities may hinder or scale up program outcomes and impacts. For example, by comparing the design and implementation of three different programs in Cambodia, Clements *et al.*. (2010) found that PES program effectiveness was significantly greater where local rules of use were taken into account (Clements *et al.*; 2010). The mechanisms of this inclusion were through local institutions empowerment and intrinsic motivation reinforcement. The latter aspect addresses the "crowding out" market failure that occurs when there is a gap between a community's intrinsic motivation and government or market-based logic. Crowding out occurs because "introducing monetary incentives can undermine collective action

that is motivated by social norms" (Kerr, 2012). Because payments may introduce a purely instrumental or utilitarian logic that disrupts environmental virtues that were historically practiced by local communities, crowding out may appear even under conditions where the scheme was set properly and according to market principles (Vatn, 2010). There are not Pareto efficient cases where, in addition to no additionality being made, the landowner acts as a poorer steward of the natural resources than before the program was implemented. This phenomenon is known as "*crowding out*" because government programs crowd out former institutional arrangements (Cardenas, 2000).

If PES beneficiaries hold property in common, the three factors that are stressed by Ostrom (1990) directly apply to PES schemes, namely, institutional supply, credible commitment, and monitoring. Externally, and due to asymmetric information and incomplete contracts, the ES buyer monitors the accomplishment of predefined goals regarding the environmental service. Internally, and at a communitarian level, another set of rules to ensure monitoring are required to comply with the environmental goal as defined in the transaction. Good communitarian monitoring, based on trust, punishment, and informal interactions are crucial to PES scheme compliance.

At first glance, if a participant community does not comply with predefined rules, it seems reasonable that they be admonished or ejected from the program. The payment then would go to a community that shows more potential to attain program goals with the respective transferring and transaction costs. However, in some cases it might be more productive to identify the main drivers from the non-compliant communities. Perhaps they share characteristics with other *ex-ante* rejected or non-participant communities that have not participated in the program, yet have similar weighting on providing and preserving the environmental service at the relevant unit of analysis. Therefore, if we explore and gain a better understanding of the nature and characteristics of the local dynamics drivers, the consequent knowledge generated might be used for PES program or scheme redesign in terms of contracting, monitoring, and, ultimately, goal achievement.

Taking account of communitarian dynamics is crucial for PES scheme performance. This is especially true when the benefits of the scheme are transferred to communities that either hold land in common or where the environmental service is associated or is perceived by the community to be a public good. In these cases, "there is a danger of cooption of benefits by subgroups within the community that leads to widespread disillusionment" (Sommerville *et al.*, 2010). Alternatively, those who receive the transfer as representatives of the community may apply informal command

and control internal policies or patronage practices in order to manage their program performance as a group. In a way, these practices countervail the original spirit of the program which is incentive-based and market driven.

All in all, the literature on PES focuses on ways in which additionality levels become high and leakage effects remain low (Wunder, 2008). It is not uncommon to find cases in which participating landowners' behavior is not altered by the implementation of the program. If this is the case, then the program or PES scheme is not really adding to the preservation of the natural resource that provides the ES. Another way to consider additionality is what happens after the PES contract is terminated. In theory, ES providers should behave post PES as if they were still participating in the program. For this to happen, long term behavior must be altered in such a strong way that it changes preferences, values, or cultural attitudes. If this does not happen, then we can say that additionality is not obtained. (Pattanayak, 2010). Rather, beneficiaries of the program made sustainable practices in order to receive program benefits while they were enrolled, yet endurance wasn't developed to guarantee long term results.

Lack of additionality in a PES program may have several behavioral implications. First, there is a debate on how much time is needed before a behavioral or preference change is made, assuming that the ES suppliers did not already have a consistent PES behavior. If all other market failures are addressed but Payment for Ecosystem Services is directed to beneficiaries who would have conserved the ES supply in the absence of the program, it is just a transfer without positive net impacts. Therefore, it is crucial to efficiently target the object population under a scheme where participants need to realize a tangible environmental benefit.

4. PRECONDITIONS FOR PAYMENT FOR ENVIRONMENTAL SERVICES SCHEMES

As argued by Engel *et al.*; careful design is critical for PES efficiency and effectiveness. Consequently, program design should be aligned with the institutional and social preconditions that prevail within the targeted population context. The question then becomes, should PES schemes respond to the preconditions that already exist in a given context, or, should PES schemes foster desirable conditions that have not yet been put in place?

Considering local communitarian dynamics is especially important under a weak institutional context. As Engel and Palmer (2008) demonstrate for the case of Indonesia, PES schemes that are not carefully developed to account for communitarian dynamics may be counterproductive in their outcomes. For example, where logging communities do not have

clearly defined property rights (even after decentralization) and, at the same time, there is economic pressure from logging companies to obtain timber, a standardized PES scheme that ignores local informal dynamics may merely serve as a leverage negotiation tool for informal landowners to get better deals with logging companies (Engel & Palmer, 2008). This is a good illustration of what Ostrom calls policy prescriptions as "the only way" referring to the common mistake that environmental policy makers make when they deem the prisoner's dilemma, the tragedy of the commons or Olson's group theory as the only possible results when collective action issues arise (Ostrom, 1990). If a PES scheme is implemented in a market-based structure without first understanding of local rules in use, then the natural resource management outcomes may well be worse than no intervention at all. Furthermore, such a scenario may also lead to a "tragedy of the commons" (Hardin, 1968). In this sense, public intervention may hinder self-enforcement mechanisms that work at the informal level in local communities and result in positive outcomes.

In the same vein, Kosoy *et al.* (2007) found evidence in Central America that PES schemes may serve as an environmental conflict-resolution mechanism between upstream and downstream environmental service users and providers (Kosoy *et al.*; 2007). Other scholars like Cranford and Mourato (2011), suggest that PES are more effective if designed and implemented in a "two-stage approach." This means that a community-based environmental management (CBEM) approach should be implemented in the first stage in order to foster education, alternatives, and social consensus. Such preconditions might be followed by the typical incentive-based mechanisms under which a traditional PES scheme works (Cranford & Mourato, 2011). These kinds of preconditions (cognitive, alternative, and social agreements) differ from market preconditions, such as property rights definition, financial markets, or contracts that are typically discussed. From the policy perspective, one drawback of the two-stage approach is timing. Robust knowledge and potential change at the first stage might take a great deal of time and thus be incompatible with policy agendas. However, at least taking into account the communitarian variables at the first stage might improve further design, implementation, and effectiveness of a given PES scheme.

In the two-stage approach, the government has several roles. First, it is responsible for ensuring that preconditions hold, that is, guaranteeing that property rights are well defined and encroachment is punished and enforced. Second, it collaborates to maintain low transaction costs. Third, it develops a legal and institutional context, such that flexible schemes may be put in place without need of complex reforms. Fourth, it certifies sound

environmental practices under potential user-based PES schemes.

Consequences of incomplete preconditions on eventual program implementation are uncertain. If the potential target population is sufficiently large, there might be a bias against the poorest households (those lacking the preconditions to participate). Following the Coase Theorem, clear property rights definition is a basic pre-condition. However, in many developing countries where the PES operates, property rights for potential participants are ill-defined, especially for the poorest households. Although not properly a market failure, this inconsistency may have important distributional consequences.

Preconditions are important to ensure the development of any PES scheme. For instance, if property rights are not well defined, interchange and bargaining between buyers and sellers of the environmental service simply cannot take place. Given the fact that many developing world countries have incomplete property rights definition at a national scale, it is common for PES programs to be targeted to geographical units where there are enough potential participants that possess with the basic preconditions of a PES program.

5. DISTRIBUTIONAL ISSUES OF PAYMENT FOR ENVIRONMENTAL SERVICES PROGRAMS

Distributional issues are often overlooked in the PES literature. This is not surprising since, following the Coase Theorem, it doesn´t matter what the initial allocation of property rights is, as long as it is well defined and transaction costs are negligible. The problem with relying on the Coase Theorem is that the initial allocation of property rights might be very unequal. Hence, the bargaining power of the involved economic agents isn´t the same. This feature of the Coase Theorem has led some authors in the PES literature to argue in favor of equity and to question efficiency as the sole criterion for PES-scheme design. Even under efficiency grounds, distribution matters if potential win-win situations regarding poverty alleviation and environmental service provision are to be achieved. These situations are not uncommon considering the potential trade-off deep connection between environmental sustainability and alleviating poverty environment and poverty that prevails in many developing world contexts

Pascual *et al.* (2010) go one step further and argue that not

only is equity advisable under win-win PES scheme contexts that seek for efficiency as the main goal and poverty alleviation or another distributional rule as a by-product (Pascual *et al.*; 2010), but also that PES schemes should aim for equity even when equity is achieved at the expense of some efficiency (the classical efficiency-equity trade-off). This tradeoff in favor of equity is justified by fairness procedural reasons in order to break up power imbalance among the social groups involved and to address path dependence issues and bias against poorest households. Typically, these programs have a high income bias, since the existence of clearly defined property rights is associated with higher income levels. Hence, there is a bias against the poorest amongst the poor (Muñoz, 2008). Other experiences have shown that the mere existence of PES schemes might encourage nonparticipants and local governments to speed up property rights definition and certification processes in order to become participants in the future (Sommerville *et al.*; 2010).

A second key precondition is minimum poverty levels thresholds. Very poor communities are automatically excluded from participation in the program since they are incapable of complying with all the requisites that participation demands. Some of these communities live very close to the forests from which they make their livings. Some of them apply sustainable practices; some of them do not. Therefore, if the PES scheme does not include a component that addresses the lowest income households, who happen to live in areas where significant environmental services are provided, conservation success at a global scale might be hindered.

Much of the literature says that PES programs should not have only a single environmental goal, especially in developing world contexts (Pagiola, 2005). Depending on contextual circumstances, a sound PES program may also contribute to social benefits in addition to ES preservation. The most popular side goal found in the PES literature is poverty alleviation. Defenders of this approach say that, because a significant number of PES beneficiaries are poor and live within marginalized areas, a well-targeted PES program may contribute to both goals simultaneously: ES supply and poverty alleviation.

Not everybody agrees with the idea of including poverty alleviation and/or other side goals in government PES programs (Landell-Mills *et al.*; 2002; Kerr, 2002). The argument stresses the fact that there are already too many market failures and potential leakages surrounding PES schemes in developing world contexts. Adding yet another goal component to a given program would further reduce its chance of success. The more side goals that are added to a program, the more difficult it will be to manage. Side goals, reduce flexibility and divert focus from key issues of PES programs

such as additionality. Therefore, according to this view, a sound PES program should limit its scope to environmental service provision regardless of distributional and equity concerns. In this sense, the only concern of an efficient PES should be the achievement of Pareto efficient levels. Adding side goals to a PES program implies a detour to the main efficiency goal of an environmental service provision. Policy-makers and some economists are attracted by the idea that poverty alleviation can be met through environmental service provision. The social benefit to simultaneously tackling both goals is enormous. What are the implications if the poorest of the targeted population are excluded from the program? None, from a Paretian or Coasian perspective, neither of which takes distributional issues into account. As long as participants of the program are part of the targeted population and efficiency criteria are satisfied, the program should be considered plausible from a social standpoint. This reasoning implies, however, that every potential beneficiary of the program is valued equally, regardless of income status, and therefore their marginal contributions to the goals of the program are also of equal value.

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