Forest Policy and Economics 37 (2013) 115–123

Contents lists available at ScienceDirect

Forest Policy and Economics

journal homepage: www.elsevier.com/locate/forpol

Institutional performance of Payments for Environmental Services: An analysis of the Costa Rican Program ☆

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ARTICLE INFO

Article history:
Received 19 April 2012
Received in revised form 29 April 2013
Accepted 29 June 2013
Available online 30 July 2013

Keywords:
Environmental services
Forest conservation
Institutions
Performance
Costa Rica

ABSTRACT

In the growing literature on "payments for environmental services" schemes, so far not much attention has been paid to their institutional dimensions when assessing their performance; this is especially true of the Costa Rican case. This paper provides an analysis of the institutional performance of the Costa Rican Payment for Environmental Services Program (PESP). While recognizing its low additionality, our analysis highlights its positive long-term and indirect environmental impacts via the discontinuation of agriculture and institutional interplays. It also recognizes social impact as a secondary objective of the program, concluding that its current social performance is poor. However, it concludes that the program has higher sustainability, due to its strong legitimacy, than Coasean analyses suggest by focusing solely on its financing. Our analysis shows the risks and limitations of Coasean recommendations that focus on improving PESP cost-effectiveness. It proposes instead to strengthen the program's strategic management, to give more importance to other modalities than the forest protection one and to improve other institutions of the forest sector. This includes stricter enforcement of the law prohibiting deforestation.

1. Introduction

Ecosystems supply valuable services to local, regional, and international communities (Millennium Ecosystem Assessment, 2005). However, traditional markets for many environmental services (ES) such as watershed benefits, biodiversity and carbon sequestration, are non-existent or underdeveloped; this situation reduces the incentives for landowners to protect the environment. Over recent decades, "Payments for Environmental Services" (PES) have received a great deal of attention as an approach to natural-resources management (Engel et al., 2008; Muradian et al., 2010; Wunder, 2005). Wunder (2005) defines PES as voluntary transactions in which a well-defined ES (or a land-use likely to secure this service) is being 'bought' by at least one ES buyer from at least one ES provider if, and only if, the ES provider secures ES provision during a specified period of time (conditionality). This approach has been qualified as "Coasean" (Muradian et al., 2010). It tends to view PES as market-based instruments for environmental conservation governed by the search for cost-effectiveness (efficiency), which it considers to be the main criterion for assessing PES performance. Nevertheless, "pure" PES schemes that fulfill all Wunder's criteria may not always be possible, or even desirable. Institutionalist scholars have recently opposed the Coasean perspective on PES, and proposed alternative conceptual approaches. For instance Muradian et al. (2010, p. 1248) consider PES as "a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with social interest in the management of natural resources".

Coasean analyses focus on direct (e.g. change in the behavior of ES providers as a result of PES contracts expressed through the concept of "additionality"[1]) and relatively short-term (corresponding to the duration of the PES contract) environmental impacts by assessing the efficiency (cost-effectiveness) of PES (Wunder, 2005, 2007), sometimes complementing this by an assessment of their effects on poverty (Wunder, 2005). Institutionalists have been seeking for a more comprehensive analysis. They propose analyzing the institutional performance, defined as an assessment of how a PES scheme achieves its own objectives, rather than adopting pre-defined criteria (Corbera et al., 2009), thus recognizing that there is no a priori reason for the efficiency criterion to predominate over other societal goals (Muradian et al., 2010). According to Corbera et al. (2009, p. 745–746), institutional performance assessments "should include an analysis of whether payments contribute to change or enhance ecosystem practices and secure environmental services flows, an evaluation of how PES measure and monitor the provision of ES, the methods and proxies used for such purpose, and the mechanism through which PES attempt to account for changes in ES provision over time, as a result of PES themselves or as a result of external factors […]. Institutional performance should also evaluate the

☆ This article belongs to the Special Issue: *Payments for Ecosystem Services and Their Institutional Dimensions: Institutional frameworks and governance structures of PES schemes*.

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[1] For a PES scheme, additionality consists of paying for practices that would not have been adopted in the absence of payment (Engel et al., 2008).

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http://dx.doi.org/10.1016/j.forpol.2013.06.016

collateral benefits and negative outcomes induced by PES at the local level". Their analysis emphasizes the long-term and indirect impacts of PES, especially those generated by the interplay between PES and other institutions. Other institutionalist authors have also included in the assessment of PES institutional performance their institutional impacts (relationships between the landowners and institutions, forestry sector institutions) and cultural impacts (environmental awareness, motivation of those involved) (Locatelli et al., 2008), and especially whether they have the capacity to strengthen the long-term will to act cooperatively (Vatn, 2010).

This paper tests this analytical approach by looking at the Costa Rican PES program (PESP).[2] This program was instituted in 1996 by Forest Law 7575 which recognizes four ES provided by forests: greenhouse gas mitigation through carbon storage and sequestration, watershed function, biodiversity and scenic beauty. Although it was established to address the deforestation problem, according to the law, the PESP also aims to "remunerate the owner [editor's note: of the forest and forest plantation] for the ES generated by the conservation of its forest". Thus, its philosophy is "to 'recognize' the environmental services of whoever is providing them" (Pagiola, 2008, p. 718), characterizing its nature as a "reward for environmental services" (Wunder, 2005). The PESP is part of a 20-year long process of forest policy development (Daniels et al., 2010). It appears undeniably to be a precursor and a model in the developing world (Pagiola et al., 2002). The National Forestry Financing Fund (FONAFIFO), the trust fund in charge of managing the PESP, acts as a broker between buyers and suppliers (forest landowners) of environmental services. Landowners may participate in several different ways, which currently include: (1) reforestation through plantations, (2) (existing) forest protection, (3) natural forest regeneration, (4) agroforestry systems, and (5) forest management (sustainable extraction of wood). The main funding has been via a fuel tax, although from the outset the objective has been progressively to establish a funding system based on contributions from ES users (Presidencia de la Republica de Costa Rica, 1998). After more than two hundred million cumulative US$ invested,[3] fifteen years of experience and some 5% of the national territory covered, we now attempt to answer the question "what is the institutional performance of the PESP?"

There is an extensive and dynamic literature about Costa Rica's PESP, mainly based on a Coasean perspective (Pagiola et al., 2002; Pagiola, 2008). It has relied to a great extent on analyses of PESP efficiency (Arriagada et al., 2010; Pfaff et al., 2008; Robalino et al., 2011; Sierra and Russman, 2006), and to a lesser extent analyses of its impact on poverty (Miranda et al., 2003; Ortiz et al., 2003; Zbinden and Lee, 2005). Relatively few studies (e.g. Locatelli et al., 2008; Pascual et al., 2010) have taken into account the institutional nature of the Costa Rican PESP in their understanding of its performance, and none has provided an overall assessment of it. Our objective here is to provide a comprehensive understanding of the institutional performance of PESP, and to compare the usefulness of this approach to the Coasean perspective on performance assessment. While incorporating some results of the Coasean analysis, we intend to provide a more complete assessment of PESP performance, our institutionalist perspective transcending rather than opposing the Coasean one (Muradian et al., 2010). Thus, building on the analytical frameworks of Corbera et al. (2009), Locatelli et al. (2008) and Vatn (2010) for assessing institutional performance, our analysis will not only focus on analyzing the program's impacts on changing practices and generating ES, but also consider its effects on institutions and environmental awareness, its social impacts, as well as the program's sustainability and its management. Following the definition of institutional performance given by Corbera et al. (2009), we will complement Coasean assessments by taking the program's own objectives and its institutional nature into account, while emphasizing its indirect and long-term outcomes.

While Section 2 presents the methodology used, Section 3 assesses the performance of the Costa Rican PESP from an institutionalist perspective. This includes an analysis of its environmental performance, its social impact, its sustainability, and its management, extending Coasean analysis to consider the program's own objectives, along with its indirect and long-term effects. Section 4 provides an overview of the main recommendations for improving the institutional performance of PESP. It presents Coasean recommendations, emphasizing their limitations, and proposes alternative ways to improve the program's institutional performance.

2. Data and methods

To develop our analysis of the Costa Rican PESP's institutional performance, we rely on an extensive review of scientific literature and archival documents such as: internal and external reports as well as official documents that include manuals of procedure, national decrees, legislation and other executive documents. This bibliographic survey included quantitative assessments of the program's performance, adopting generally a Coasean approach and criteria, that we have critically analyzed in terms of the methodologies, assumptions used, interpretations of results and recommendations. This literature also provided us with first results and assumptions on the institutional nature of the PESP (design process, program's objectives and philosophy).

To complement this data, we have conducted some 50 semi-structured interviews, aiming at: (1) a better understanding of the program's institutional nature; (2) a qualitative assessment of its institutional[4] and cultural impacts, legitimacy and management; and (3) the collection of complementary quantitative data necessary for institutional performance assessment. These direct interviews, carried out during two specific field works in 2009 and 2011, involved various different types of actors that participated in the design, implementation, and evolution of the PESP, including civil servants, academics, representatives of the forest, environmental and agricultural sectors (companies, civil society/NGOs and professionals) and politicians (for more details, see Annex 1 — Interviews distribution by actor types).

We asked them to explain:

- Why the PESP and its main features have been adopted and evolved? And what were their roles and strategies in this process?
- What has been the program's institutional nature?
- And how well has it performed in terms of management, environmental and social impacts, and sustainability? (for more details, see Annex 2 — Interview guideline).

The first set of questions enables us to capture the context, the interplays between actors, and their motivations. The second set was used to capture the (institutional) nature and performance of the PESP, especially its long term environmental impact, as well as the program's legitimacy and its sources. We have also gathered specific quantitative data (such as FONAFIFO's operational costs or % of non-compliance on PES contracts), in particular from FONAFIFO's staff.

The qualititative data collected through the interviews has been critically assessed. First, we have analyzed to what extent the views expressed are widely shared among actors in order to be able to pay special attention to conflicting perspectives. In those cases, we distinguish actors' perceptions that are by nature subjective and whose differences should be recognized (for example on the program's legitimacy) from information on the program's nature and performance that can be considered more objective and subject to verification. Then, we have

[2] Programa de Pago por Servicios Ambientales.

[3] Data available from the FONAFIFO website: http://www.fonafifo.go.cr/paginas_espanol/servicios_ambientales/sa_estadisticas.htm.

[4] Especially, the program's role in the prohibition of deforestation and environmentalization of the forestry sector.

Table 1
Assessments of PESP-Protection additionality.
Source: authors.

Studies	Scope	Period	Additionality (% of the area contracted where deforestation has been avoided due to PESP-Protection)
Pfaff et al. (2008)	Nationwide	1997–2000	Less than 1%
Robalino et al. (2011)	Nationwide	2000–2005	Between 3 and 3.5%
Arriagada et al. (2010)	Regional Central Volcanic Cordillera Conservation Area	1997–2005	Between 11% and 17%
Sierra and Russman (2006)	Regional Osa Region	1997–2003	Virtually 0%

systematically looked for other qualitative and quantitative data backing or contradicting the information and positions expressed by the interviewees. For example, some forest sector representatives we interviewed exaggerated the increase of FONAFIFO's operational costs due to its institutional transformation as we noticed when analyzing FONAFIFO's accounting documents.[5]

Based on this methodology for applying the institutionalist analytical framework, the following section presents the results of our assessment of the PESP's institutional performance.

3. Towards an assessment of the institutional performance of PESP

The program's own objectives imply that the assessment of the institutional performance of PESP should include an analysis of its environmental and social impacts, and the program's sustainability. In addition, following Corbera et al. (2009), we include an analysis of its management, which is a key to achieve these objectives.

3.1. The PESP's environmental impacts

The environmental objectives of the program have not been clearly defined and prioritized, but they include: reducing deforestation and extending forest cover on the one hand, and generating environmental services on the other hand.

3.1.1. Impacts on forest cover

After a long period of deforestation that culminated at the end of the 1980s, Costa Rica has enjoyed an increase of its forest cover at the national level from 42% of its territory in 1997 to 53% in 2005 (Government of Costa Rica, 2010).

To assess the environmental performance of the program, Coasean analyses rely on the assessment of its additionality (Pagiola, 2008), i.e. the extent to which the forest land uses promoted by the PESP would not have been adopted anyway in its absence. These analyses have mostly focused on the forest protection modality of the PESP (PESP-Protection), which has concentrated most of the contracted area (about 90% between 1997 and 2008).

The results of these assessments vary depending on the period and area studied, the assumptions made, the methodologies adopted and their ability to deal with methodological challenges (see Table 1). As Daniels et al. (2010) point out in their critical meta-analysis of these studies; on the whole, the additionality of PESP seems to be low: most of the ES providers within the PESP would have protected the forest even if PESP-Protection had not existed. Nevertheless, these studies do show that the additionality of the program is variable depending on the region, and overall seems to have increased over time (Robalino et al., 2011), and that the extension of forest cover in Costa Rica does not seem to be associated with significant problems of "leakage" (Meyfroidt et al., 2010). According to Coasean analyses, the program appears to be mainly characterized by a deadweight effect, which could explain the long waiting list of people who want to participate in the program demand being three times higher than the funding available (Rojas and Aylward, 2003). However, additionality does seem to be higher for the reforestation modality (Pagiola, 2008; Daniels et al., 2010).

Furthermore, the trend towards increasing forest cover dates from the early 1990s; that is to say from before the PESP was launched (Wunder, 2007), and other elements also seem to have contributed to reducing deforestation, such as the prohibition of deforestation, the fall in the profitability of livestock farming, which has reduced the incentive to convert forests into pastures, particularly in remote areas (Pagiola, 2008), the development of ecotourism (Rojas and Aylward, 2003), the increase in emigration (Kull et al., 2007), the removal of perverse legal incentives, and the development of environmental awareness (Evans, 1999).

However, the assessment of the program's environmental performance from an institutionalist perspective should extend beyond a mere analysis of its short-term additionality (limited to the duration of the contract) and considering only its direct effects (on contracted ES providers) and complete this by an analysis of its indirect and long-term effects. This is especially true in the case of Costa Rica, which is based on the logic of reward for environmental services, where additionality has never been an objective of the program, and where ES providers are not targeted based on the deforestation risk criterion.

First, according to Daniels et al. (2010, p. 2116), "avoided deforestation is an incomplete measure of PES impact", even for the PESP-Protection modality. In fact, the PESP-Protection not only impacts ES providers' behavior in the area contracted, but also has favored agriculture abandonment and consequently forest regeneration in other areas, because the money received from PES contracts allows ES providers to develop non-agricultural activities (Daniels et al., 2010). Moreover, in practice, agricultural land has always been accepted for PESP-Protection contracts in some regions, thus promoting the natural regeneration of the forest instead of the protection of existing forests (Daniels et al., 2010).

Second, the interplay between different institutions must be taken into account when assessing the programs' environmental performance. From this perspective, long-term performance depends on whether the program is able to strengthen the effectiveness of the institutional framework for forest protection in Costa Rica, by means of its interplay with other institutions. This framework consists of social norms, values and practices, regulation, organizations …

According to Hartshorn et al. (2005, p. 12), "contracts may contribute to environmental protection indirectly by making the social norms and preferences of the participants more conservation-oriented", mainly through the institutionalization of ES value recognition. This change in the perception of forest ecosystems by ES providers who have participated in the program has been noticed in several studies (Locatelli et al., 2008; Miranda et al., 2003; Ortiz et al., 2003), although none of them has used a control group of non-participants in the PESP in order to isolate the effects of the program. According to Ortiz et al. (2003), 95% of the contracted ES providers interviewed think that the program has taught people to value the forest. If its direct impact on the social values of forest

[5] Indeed, they oppose this institutional transformation, which, according to them, makes FONAFIFO more bureaucratic and, by improving FONAFIFO's operational costs, reduce the funds remaining to pay forest owners.

Table 2
ES generation potential of land contracted under the PESP.
Source: authors.

ES	Scientific basis of the supposed links between forest cover and ES generation	% of areas contracted that are important for ES generation
Biodiversity protection	Strong	More than 65% according to the GRUAS II study's definition of priority areas for biodiversity conservation* (Tattenbach et al., 2007). But the areas of intervention are too scattered (Hartshorn et al., 2005)
Watershed protection	Weak for water quantity, stronger for water quality, reduction of sedimentation and flow level regulation, which are more important in Costa Rica (Tattenbach et al., 2007; Pagiola, 2008).	Less than 35% (Tattenbach et al., 2007)
Carbon storage and sequestration	Strong	No specific data available PESP seem to correspond to the diversity of the Costa-Rican forests, which collectively store large amounts of carbon (Contraloria General, 2011)

* GRUAS study is a land use planning study devised in 1996 that identified priority areas for biodiversity conservation. In 2003, the GRUAS II study adopted a broader definition of these areas including the priority biological corridors.

landowners is hard to demonstrate, it is widely[6] recognized among the Costa Rican actors we interviewed (2009, 2011), as a politician recognized, that "the PESP has played a major role in strengthening the environmental awareness", shifting the social vision of the forest towards that of a source of various ES (and not just of wood), which are key factors in the development of the country.

Moreover, most of the actors (forest sector leaders, politicians)[7] involved in the design and negotiation of the Forest Law 7575 that created the program, consider that the PESP has helped to make the prohibition of deforestation, enacted in this same law, politically acceptable and thus possible (interviews, 2009 and 2011), as was already recognized by Pagiola et al. (2008) and Pfaff et al. (2008). The forest sector leaders we interviewed (2009, 2011) consider the PESP both as a payment for ES generated and as "a compensation for the lost incomes due to this prohibition" as one of them expressed it. While this legal ban is widely recognized as one of the main factors behind the reduction in deforestation, the PESP can claim to have an important indirect impact on forest cover.

Furthermore, through its emphasis on the benefits derived by society from forest conservation, the PESP has been a very effective tool for securing additional public funds (through fuel tax, world bank loan and water tariff, the latter also financing hydrological services provided by protected areas) for environmental conservation.[8] This is a major achievement, which all too often is not recognized in the assessment of its performance. The program has also reinforced the institutional framework necessary to take advantage of future potential opportunities of financing for ES provision, such as REDD+.[9] Indeed, REDD+ is based on the same logic as PES, though at the international level, and thus can easily be implemented through local and national PES programs, as it will be in Costa Rica, where the PESP will be the main institutional platform for REDD+ implementation (Government of Costa Rica, 2010).

In addition, it has constituted a major institutional innovation, supporting "a process of "debureaucratization" […] dealing more closely with intermediaries and local entities and less at the national level" and fostering inter-institutional coordination (Miranda et al., 2003, p. ii). Indeed, the program has relied extensively for its implementation on organizations and professionals of the forest sector, fostering the coordination of public and private organizations and the collaboration of the latter with other public agencies or companies in the framework of the program.[10] The PESP represents a substantial part of the forest sector's organizations and professionals' income, which are in charge of devising management plans and ensuring compliance. According to our interviewees (forest organizations representatives, FONAFIFO officials, 2009 and 2011), in some areas, for example in the Tempisque Conservation Area, "forest professionals rely almost entirely on the PESP for their living" as reported by a FONAFIFO employee. It has thus contributed to make more acceptable the process of environmentalization of the sector, characterized by paying greater attention to forest protection than wood production.

Nevertheless, the PESP has not been able to support the development of sustainable forest management in Costa Rica: the modality "forest management" of the PESP was canceled in 2003 before reappearing in 2010. This has contributed to a shortage of wood production that forced the country to import large quantities of wood, on the one hand, and increased illegal wood harvesting with a negative impact on forest cover, on the other (Barrantes, 2008).

3.1.2. Impacts on the generation of environmental services

The program's impacts on the generation of ES have been studied by Coasean analyses, and should be taken into account in assessing its institutional performance (Corbera et al., 2009). These impacts have not yet been monitored, and are very difficult to measure. However, the potential for ES generation can be very roughly estimated indirectly by assessing the scientific basis of the supposed links between forest cover and ES generation on the one hand and of the characteristics of the PESP areas of intervention, on the other (see Table 2).

Overall, while the generation of ES depends on the additionality of the PESP according to the Coasean perspective, the areas involved in the program are fairly important for biodiversity conservation, but not for the generation of hydrological services, and they do represent an important carbon sequestration and storage potential. No study has been carried on to assess specifically the scenic beauty of the areas contracted under the PESP. However, this performance in terms of ES generation does not result from efficient targeting of the program, but is rather due to the general characteristics of the Costa Rican forest, as until 2011 most of the land could qualify for the program, and there was no real prioritization process according to the potential ES of the land.

[6] If no interviewees denied the program has played a role in this evolution, the representatives of poor famers and of the most "radical" ecologist organizations (both represented in COECOCEIBA for example), tended to minor it. Indeed, they are the strongest opponents to the program, due to its low-level of accessibility for poor farmers and the inclusion in the program of the reforestation and forest management modalities that are perceived as not pertinent from the point of view of biodiversity conservation.

[7] And none of the actors interviewed has opposed this idea.

[8] For more details, see Section 3.3query. The sustainability of PESP.

[9] REDD+ is an international system of incentives, currently under discussion, to Reduce Emissions of greenhouse gases resulting from Deforestation and forest Degradation in developing countries.

[10] Miranda et al. (2003) specify the example of collaboration at the local level between the Ministry of Environment, the FONAFIFO, the NGO FUNDECOR, a public energy company, and the Ministry of Education in the framework of the PESP, aiming at improving environmental conservation.

3.2. The PESP's social impact

While affirming that the PESP is not designed to be a poverty reduction program (Pagiola, 2008), Coasean analyses have nevertheless assessed its social performance, focusing on the program's effects on poverty. Our institutional analysis shows that social performance is considered as a secondary objective of the program for two reasons. First, the forest law states that the activities of FONAFIFO should benefit small and medium producers. Secondly, the program has taken measures intended to increase the benefits of the PESP for small landholders. It includes the creation of a system of collective contracting (1998) in order to reduce transaction costs, the abandonment of the requirement for a formal land title (2002), the inclusion of districts with low levels of development among the priority areas of the program (2004), and the creation of the agroforestry system modality (2003) fitting better with small landholders farming systems.

Most of the analyses show that the program has not in fact particularly benefited small farmers, especially because of the high levels of transaction costs and opportunity costs they face (Miranda et al., 2003; Ortiz et al., 2003; Zbinden and Lee, 2005). According to these authors, on the whole ES providers tend to be better-off landowners, especially in the case of PESP-Protection and PESP-Forest Management. In comparison with other farmers, ES providers within the PESP tend to be quite large landowners, with legal land titles, relatively high education and income levels, and who derive a substantial share of their income from non-agricultural activities. Most of them do not live on the farms under PES contracts.

The measures intended to increase small landowners' participation in the PESP have not in fact done so. According to our calculations based on data from FONAFIFO,[11] Ortiz et al. (2003)[12] and Contraloria General (2011),[13] the average number of hectares per participant contracted under the PESP has risen from 57 ha for the 1997–2002 period to 108 ha for the 2003–2009 period. Moreover, these measures have been poorly implemented: the collective contract system was abandoned in the mid 2000s, the agroforestry system modality has not concentrated significant levels of funding (between 2 and 3% of the total funding since 2003), the targeting system of poor districts has proved ineffective and the alternatives to land title requirement have proved to be difficult to operationalize.

The program's impact on non-participants is not clear. Its effect on employment has been positive, but rather minor[14] within the forestry sector due to the low level of funding dedicated to the reforestation and forest management modalities, which have concentrated less than 10% of the areas contracted. While forest protection under the PESP may have a negative effect on employment by limiting agricultural activities, this effect seems to be slight, and may be even positive in some cases. Indeed, most of the areas would not have been used for agriculture in any case (see Section 3.1, PESP low additionality). Moreover, these areas may also contribute to the tourism activities that generate 13% of national employment, and the PES received for forest protection may in fact have generated employment, as the payments have mostly been spent by forest owners on contracting workers in the local areas (Ortiz et al., 2003), resulting in increased investment in farms (Miranda et al., 2003).

3.3. The PESP's sustainability

According to the Coasean analyses, the most important factor of the PESP's and its environmental effects' sustainability is the program's financing, as contracts need to be continuously renewed (Pagiola, 2008). Financing from ES users appears theoretically to be the most sustainable option, and was the objective of the program (Presidencia de la Republica de Costa Rica, 1998). However, from 1997 to 2010, the program has relied primarily on government funding via the income derived from a tax on fuel (62.5%)[15] and World Bank loans (25.5%), which will have to be reimbursed. Finance from ES users has been limited to agreements with private companies (2.5%) and international cooperation grants (9.5%). However, this source of funding will probably increase in the future. According to FONAFIFO staff (interview, 2011), the recently created fund for sustainable biodiversity, mainly funded by international donors, should generate 2.5 million US$ annually from 2014, the same amount being expected from the water tariff, which has been progressively implemented over the past 3 years. Carbon markets have not so far proved to be a way of funding the program, as expected initially but FONAFIFO hopes they could generate some 1 million US$ yearly from 2012 (Pagiola, 2008). Two major and sustainable sources of finance are contemplated in the future: the Government of Costa Rica (2010) expects REDD+ to nearly double the funds channeled through the program, although additionality considerations may impede this, while the expected development of a cap-and-trade system in Costa Rica could provide considerable resources. This could reduce the program's dependency on the fuel tax, which is a worrying feature at present, especially as pressure could be exerted to reduce it in the future, for example if energy prices increase sharply.

From an institutionalist perspective, while the objective of relying mainly on ES users financing has not been achieved, the program's dependency on public money implies that its permanence will also depend on its legitimacy. This legitimacy seems strong when we consider that it has lasted for 15 years despite political changes and its foreseen central role in REDD+ implementation (Government of Costa Rica, 2010). Our interviews confirm that it is indeed very highly regarded by Costa Rican society, politicians, and the main forest stakeholders.[16] As the current president of the National Assembly's Commission on the Environment recognized: “all of us [editor's note: the Costa Rican people], politicians and non-politicians are very proud of the PESP […], we are proud of having reversed the deforestation process. 98% of the Costa Rican have an enormous environmental awareness” (interview, 2011). Indeed, according to our interviews, along with the system of protected areas, the program symbolically represents Costa Rican society's commitment to and success in reversing the trend towards deforestation, to which it is commonly associated. Thus, as a politician told us (interview, 2009) “it contributes to the international reputation of the country [editor's note: as a “green country”], having made Costa Rica a reference in that sense”. Costa Ricans are particularly proud of this achievement, which constitutes one of the two main pillars – along with the army abolition – of national identity. From this perspective, our interviews suggest that the program's support of forest owners dedicated to conservation, and its reward logic constitute the main pillars of its legitimacy,[17] although this logic has been challenged by the compensation logic advocated by some forest sector representatives and the “additionality” logic defended by some academics we interviewed (2009, 2011). This legitimacy should ensure the PESP's permanence on the long run: “the PESP is very consensual […], nobody will quit it” told us a former diputee. Forest owners' willingness to participate

[11] Number of PES contracts, number of hectares contracted.

[12] Percentage of collective contract and average number of persons in a collective contract.

[13] Number of agroforestry system contracts that are not expressed in hectares.

[14] The forest protection modality generates employment almost only for forest professionals, while other modalities favor employment through the whole value chain of the forestry sector.

[15] In order to legitimize this public funding in a context of structural adjustment policies, this source was originally conceptualized as a temporary system of ES user funding (Presidencia de la Republica de Costa Rica, 1998), stressing the fact that fuel consumers would thus offset their greenhouse gas emissions. But, as the fuel tax was already in existence before the program, it seems more appropriate to view this as government funding.

[16] Our interviews show that the only opponents to the program are representatives from poor farmers and the most “radical” ecologist organizations, both of which relatively lack social and political weight.

[17] They are the reasons most frequently quoted by the interviewees.

Table 3
Comparison between Coasean and institutionalist approaches for the assessment of the PESP performance.
Source: authors.

Dimensions of performance	Coasean approach to performance assessment		Assessment in terms of institutional performance	
	Criteria/approach (Pagiola, 2008)	Results	Criteria/approach	Results
Environmental performance	Direct and short-term additionality	Low for PESP-Protection Average for PESP-Reforestation	Same as the Coasean approach	Same as the Coasean approach
	Excluded	–	Long-term and indirect impacts through agriculture abandonment and institutional interplays	The PESP has favored: – Agriculture abandonment, – Prohibition of deforestation, – Environmental awareness, – Modernization of the forest sector governance, – Additional funds for conservation It has not favored the development of sustainable forest management
	ES generation	Strong for carbon and biodiversity, weak for water	Same as the Coasean approach	Same as the Coasean approach
Social performance	Not considered an objective but assessed from its effects on poverty reduction	Low	Benefits to small and medium landholders considered to be a secondary objective	Low
Sustainability	ES users financing	Low	Same as the Coasean approach	Same as the Coasean approach
	Excluded	–	Legitimacy	High
	Excluded	–	ES providers participation	High
Management	Excluded	–	Operational	Average
	Excluded	–	Strategic	Low

is another key element of its sustainability, which seems secured as the demand has always largely exceeded the funding available in every area according to FONAFIFO officials (interviews, 2009 and 2011).

3.4. The PESP's management

According to Corbera et al. (2009), PES institutional performance assessments should include an analysis of its operational management. The program has implemented management processes on farm localization, contracts, registration, payments, etc., that are robust enough to ensure control over its operations, although it lacks an integrated information system with reliable and sufficient data. At the moment, two systems are in use – one for geographic information, and the other for project management – and these are not properly connected with each other, and the data are neither reliable nor sufficient (Contraloria General, 2011). The PESP has also established a strong system for monitoring land user compliance with payment contracts, and according to FONAFIFO staff non-compliance is now at a very low level (interviews, 2009 and 2011). In contrast, there is no data measuring the generation of ES. Administrative costs have been relatively well controlled, although they have tended to rise. Initially limited by law in 1996 to 5% of the PESP budget, this limit was raised to 7% in 2003, when FONAFIFO opened its own branches. In 2008, the institutional transformation of FONAFIFO into a conventional public institution has resulted in the increase of these costs that reached 12% of the budget in 2008 according to FONAFIFO (interview, 2011).[18] This is quite low when compared to the USA, where administrative costs often account for 25% of budget for conservation contracts (Ferraro and Kiss, 2002), and in the case of the Water Conservation Fund in Quito, these costs are estimated between 10 and 20% of the payments channeled through the fund (Landell-Mills and Porras, 2002).

Our research reveals the need to include in assessments of Costa Rica's PESP the strategic management of the program, which still displays some major deficiencies. The program's overall goals have not been developed into specific objectives and targets, and no strategic plan has been drawn up for steering FONAFIFO's activities and the PESP evolution. Moreover, no reporting on FONAFIFO's activity or the program's performance is scheduled on a regular basis (Contraloria General, 2011).

The assessment of PESP performance gives different results for the Coasean and institutionalist approaches, as synthesized in Table 3. This leads to divergent recommendations, as we will see in Section 4.

4. Main recommendations for improving the institutional performance of PESP

After discussing the recommendations derived from a "Coasean approach" to efficiency performance, we will suggest alternative recommendations for improving PESP institutional performance.

4.1. The recommendations derived from a "Coasean" approach

According to the Coasean perspective on PES, performance can be improved by changes in the program's rules achieved via two levers: improvement of its environmental effectiveness and cost cutting.

According to some authors (Wünscher et al., 2008; Engel et al., 2009), the relative lack of targeting and of differentiation of the level of payments, which were early characteristics of the program inherited from the former forest incentives programs, can be considered as less than ideal: they do not make it possible to generate the maximum ES (by means of targeting) at the lowest cost (through payments adjusted to match the opportunity costs of ES providers). Nevertheless some FONAFIFO civil servants consider that higher differentiation may lead to major monitoring and control costs, thus reducing the cost-effectiveness of the program (interviews, 2009 and 2011).

Wünscher et al. (2008), using the example of the Nicoya peninsula, estimate that for the same budget, the ES generated by the PESP could be doubled. They estimate that the most of this potential efficiency improvement (+93% out of an overall potential improvement of +105%) could come from making payments more flexible, so that they can be adjusted to match the wide variations in terms of the costs borne by the ES providers: opportunity costs, transaction costs and the direct costs of implementing the measures required in the framework of the protection contracts. This could reduce the average payment by nearly 50%. According to these authors, using an ES production index to target the land to be included in the program leads to a moderate improvement in PESP efficiency, as the levels of ES generated by different land

[18] The compliance of FONAFIFO with public sector administration norms has led to a substantial increase of the number of employees in order to perform the new tasks required by this status (reporting, internal control, …), as well as an increase in labor costs, due to mandatory contributions to pension and social funds.

areas are in fact quite similar. Finally, targeting land using the deforestation probabilities turns out not to be a very attractive option either, because of the narrow variations in the deforestation risk within the region[19] (Wünscher et al., 2008).

According to Engel et al. (2009), the increase in transaction costs likely to be achieved by implementing this new tool is negligible,[20] and estimated to be 0.27% of the overall budget of the program each year. Nevertheless, the practical implementation of this tool allowing the targeting of land (on the basis of their deforestation risk and their capacity to generate ES) and the payment differentiation is facing several challenges: scientific ones (the need for very precise information about the participation costs of potential beneficiaries, the deforestation risk and the capacity of the proposed land to generate ES), administrative ones (digitalization of applications for example), but above all political ones (it could be seen as being unfair[21]) (Engel et al., 2009).

4.2. The limits of these recommendations from an institutionalist perspective

These recommendations could improve PESP efficiency in the short term, but it is necessary to take into account the impacts of these options on the social norms and values and on the legitimacy of the program before we can estimate the potential improvement in its institutional performance in the long term.

Indeed, these recommendations are based on an erroneous interpretation of the institutional nature and role of payments in a PES program such as that of Costa Rica. According to Kosoy et al. (2007), in some PES schemes the level of payment received does not provide full compensation for the opportunity costs of numerous beneficiaries, who nevertheless participate in the programs as they would have conserved the forest anyway due to social and cultural norms and values. The role of the payment is not to change behavior; the payments being too low to incite people who want to deforest not to do it, but rather to reinforce "good environmental stewardship" (Kosoy et al., 2007) and support law compliance. This is the case of the PESP, where the program's dominant logic is rewarding, not giving incentives, and the motivation is based equally on three aspects: economic benefits, ES enjoyment and compliance with social norms and individual beliefs (Miranda et al., 2003; Ortiz et al., 2003).

These recommendations based on a "Coasean" approach give priority to a purely utilitarian logic, whereas the program should only provide the forest owner with the economic incentive required to "tip the balance" in favor of conservation. They can have a negative effect on its institutional performance in the long run for two reasons.

First, while the PESP aims at strengthening intrinsic motivations, these recommendations may have a negative impact on them by promoting the logic of individual gain to the detriment of the existing logic based on social norms and values. In fact, it has been observed that extrinsic rewards, when based on the logic of individual interest, can impact negatively on intrinsic motivation (Vatn, 2010), particularly when this involves payments of small amounts (Heyman and Ariely, 2004), which would be the case in Costa Rica if the recommendations of Wünscher et al. (2008) and Engel et al. (2009) were adopted. The efforts in terms of conservation can thus be smaller than they would be if no payment was made at all. If these recommendations are followed, the program could even create perverse incentives, inciting people to damage the environment if they are not being paid for the ES they provide (Wunder, 2005). Some examples at the international level, such as the PES of the RISEMP[22] project (Pagiola et al., 2004), underscore this danger. Moreover, a reduction of current payment levels could also jeopardize the attempt to increase the population's awareness of the immaterial benefits provided by forests, which is one of the long-term objectives of the PESP.

Second, by opposing the institutional nature of the program – especially its reward for ES nature where payments are intended to strengthen good environmental stewardship, and have long been of equal amounts[23] — on which the program has largely built its legitimacy – they could jeopardize its sustainability.

4.3. Our recommendations based on an institutionalist perspective

Our analysis of the institutional performance of the PESP highlights the need to strengthen the program's strategic management. This would include the definition of a strategic plan, which should clarify its goals, objectives, logic of action, priorities, and activities. This plan would make it possible to establish a framework for the monitoring and evaluation of the program based on clear indicators. This would call for an integrated information system with reliable and sufficient data. Better strategic management of the program would provide greater transparency and the tools required for more effective deliberation to guide the evolution of the program. Indeed, according to the Contraloria General (2011), the PESP, whose governance is dominated by the forest sector, has so far focused mainly on reinforcing forest sector interests[24] than on supporting ES generation as it is supposed to.

This necessary clarification would help to define more appropriate recommendations, including on the modalities to favor. Indeed, this choice would depend on the relative importance given to conservation rather than more productive use of the forest on the one hand, and among the different ES on the other hand, considering for example that plantations store carbon, but do not seem to provide any significant biodiversity protection benefits. Indeed, our analysis also shows that the environmental and social performance of the PESP could be increased if more funding was allocated to the "forest management", "reforestation" and "natural regeneration" modalities. While "forest management" and "reforestation" may create more economic activity and reduce the pressure on the forest for wood, "natural regeneration" and "reforestation" may prove to have a more direct impact in the short term on forest cover. However, for the program to be effective in supporting the forestry sector, it needs to be complemented by other reforms. These include improving the currently very restrictive legal and institutional framework of the sector, which have been the main impediment affecting the sector over the last 15 years (Barrantes, 2008), and in particular ending the (unwritten) administrative ban on approving forest management plans[25] and providing a more secure legal framework for forestry. More generally, the sector needs structural changes to improve its aggregated value and enable it to offer better prices for wood[26] in order to make forest land uses more attractive.

In fact, our analysis shows that the program's institutional performance depends largely on its interactions with other institutions. From this perspective, the focus on economic incentives, such as PESP, to reduce deforestation should not deter the state from improving the enforcement

[19] The variations found in the study between different land areas in terms of the ES generated on the one hand and of deforestation risks on the other may be higher at the national level. Thus, using these two criteria to target PESP participants is probably more promising at the national level to improve the efficiency of the program than Wünscher et al. (2008) found at the level of the Nicoya peninsula.

[20] They do however recognize that FONAFIFO may not share their vision.

[21] "[…] landowners may resist differential payments once homogenous payments have already been introduced, as these may be seen as arbitrary discrimination" (Engel et al., 2009, p. 9). Moreover, giving priority to landowners who are more likely to deforest may be perceived as unfair.

[22] The Regional Integrated Silvopastoral Ecosystem Management Project (2002–2007) aimed to promote improved silvopastoral practices in degraded pasture areas through PES mechanisms in Nicaragua, Costa Rica and Colombia.

[23] Pascual et al. (2010) consider the equal level of payment to be a pillar of the program's legitimacy. Several of the Costa Rican actors interviewed have resisted the differentiation of payment based on potential ES levels introduced in 2009.

[24] These interests have been reinforced within the limits set by the program's focus on the forest protection modality.

[25] Since the late 90s, following political instructions, the forest administration has been very slow and reluctant to approve forest management plans.

[26] The sector has largely focused on the production of scaffolding at very low prices (Barrantes, 2008).

of the forest law that prohibits deforestation, a measure the program helped to make acceptable. If in 1997, the PESP was intended to offer a cost-efficient way to achieve law compliance, part of this goal should now be addressed through stricter law enforcement, taking advantage of the new technological means that have been developed since then.

5. Conclusion

Analysis of the institutional performance of PESP, based on the program's own logic and objectives and taking into account its indirect and long-term impacts, provides a more complete assessment than those based on the Coasean approach, and thus leads to more reliable conclusions (see Table 3).

This institutional analysis concludes that environmental performance was better than when it was assessed through a Coasean perspective focusing on its direct and short-term impact. Indeed, the program has supported not only agricultural abandonment but also above all the institutional changes in the forest sector by reinforcing environmental awareness, making it possible to prohibit changes in forested land uses and supporting the modernization of the governance of the sector. This analysis also recognizes social impact as a secondary objective of the program and concludes that its current social performance is poor. Although the program has not achieved its objective of establishing a financing system based on contributions from ES users, it appears to be more sustainable than Coasean analyses suggests, since it is widely recognized among Costa Ricans as being legitimate, and has been effective in securing public funds.

The limitations of the Coasean approach are shown by the recommendations that deny the program's institutional nature as a reward for environmental services, in which payment is intended to reinforce intrinsic motivations. Our recommendations emphasize improving the program's strategic management, clarifying its objectives and ensuring better monitoring and evaluation of its performance. It indicates that the program's institutional performance could be increased by allowing more funds to be channeled outside the “forest protection” modality. It also emphasizes the need to strengthen other institutions, with which the PESP interacts, in order to strengthen the program's institutional performance.

Acknowledgments

We would like to thank the two anonymous external referees for their useful and constructive comments. This research has been funded by the French National Agency of Research (ANR-08-STRA-13). We acknowledge the support of SERENA (Environmental Services and Rural Space Uses) project. The views expressed and any errors remain our own responsibility.

Annex 1. Interviews distribution by actor types

Types of actors interviewed	Number of interviews
Civil servants (from FONAFIFO, Ministry of Environment, Ministry of agriculture …)	16
Forest sector organizations' representatives (private sector and civil society organizations/NGOs …)	17
Environmental organizations' representatives (civil society organizations/NGOs)	7
Agricultural sector organizations' representatives (private sector and civil society organizations/NGOs, especially poor farmers' ones)	5
Politicians	4
Academics	7
Total	56

Due attention has been paid to favor a diversity of points of view within each type of actors interviewed.

Annex 2. Interview guideline

I. Main decisions regarding the PESP's creation and evolution

A list of decisions to be analyzed has been established. They concern:

- The emergence of the ES/PES concept,
- The PESP creation,
- The legal framework (for example the forest law of 1996 prohibiting deforestation)
- The PESP modalities evolution
- The PESP payments' level evolution
- The PESP budget and its repartition among modalities
- The PESP access modes and conditions
- The PESP prioritization criteria
- The PESP funding
- The PESP management.

For each decision, depending on the interviewee's background, the following issues have been discussed:

- How and why this decision has been taken?
  - Context of the decisions
  - Main actors involved and their interplays (their positions, arguments, resources, strategies …)
  - Decision's process (analyses, decisions' criteria, justification …)

II. The program's institutional nature

- The PESP's philosophy: what is it in theory and in practice? Is it good?
  - What should be/are the criteria to define the ES “buyers” (the PESP's funding)?
  - What should be/are the criteria to define the ES providers?
  - What should be/are the criteria to define the level of payments?

III. The program's performance

- The PESP's environmental impacts
- The PESP's social impacts
- The PESP's economic impacts
- The PESP's management
- The PESP's sustainability
- The PESP's legitimacy and fairness.

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