

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

Thomas Legrand<sup>1</sup>, Géraldine Froger<sup>2</sup>, Jean-Francois Le Coq<sup>3</sup>

**Abstract:** This article assesses, from an institutional point of view, the performance of the Costa Rican Payment for Environmental Services Program (PESP) as a conservation tool focusing on its main modality: the forest protection. The PESP has had a low direct impact on the forest cover of the country but may have had an important indirect impact as it served as compensation for the prohibition of forested land uses change. This program appeared also quite competitive from the point of view of its costs before the institutional transformation that occurred in 2008. The PESP has also proved to be a very effective fundraising tool, but it has failed in the development of strong synergies with other institutions for forest protection and it has not supported the development of sustainable forest management. From a cosean perspective, a significant potential for improvement of the PESP cost-effectiveness exists on the short term through changes in the program’s rules. However, these changes often deny the program’s institutional nature and could jeopardize the program effects on the long term. A safer way to improve the PESP performance is to focus on strengthening its management and governance

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<sup>1</sup> PhD student in Economics, director of Greensynergie, researcher at CEMOTEV, University of Versailles Saint Quentin-en-Yvelines, 47 Bd Vauban 78047 Guyancourt Cedex, France; tel: +33 (0)1 39 25 57 00; fax: +33 (0)1 39 25 53 00; mail: thomas.legrand@greensynergie.com

<sup>2</sup> Associate Professor in Economics, CEMOTEV, University of Versailles Saint Quentin-en-Yvelines, 47 Bd Vauban 78047 Guyancourt Cedex, France; tel: +33 (0)1 39 25 57 00; fax: +33 (0)1 39 25 53 00; mail: geraldine.froger@uvsq.fr

<sup>3</sup> Phd in Economics, Researcher at CIRAD, Visiting professor in the International Center on Economic Policies for Sustainable Development (CINPE) of the national University of Costa Rica (UNA), Costa Rica Aptado 739-3000, Heredia, Costa Rica; tel: + (506) 88 59 16 08 ; mail: jean-francois.le\_coq@cirad.fr

## Introduction

Ecosystems provide valuable services to local, regional and international communities (Millenium Ecosystem Assesment, 2005). However, traditional markets are underdeveloped or lacking for many environmental services (ES) such as watershed benefits, biodiversity, and carbon sequestration; this situation generates reduced incentives for landowners to protect the environment. Over the past decades, “Payments for Environmental Services” (PES) have received a great deal of attention as a natural-resources management approach (Landell-Mills and Porras, 2002; Wunder 2005, Corbera et al., 2007; Engel et al., 2008; Muradian et al. 2010). Wunder (2005, 2007) defines PES as voluntary transactions where a well-defined environmental service (ES) (or a land-use likely to secure that service) is being ‘bought’ by a minimum of one ES buyer from a minimum of one ES provider if and only if the ES provider secures ES provision during a determined time (conditionality). Pure PES schemes fulfilling all the criteria of Wunder’s definition may not always be possible, or even preferable (Wunder, 2005; Corbera et al., 2007). Institutional scholar have recently opposed coasean<sup>4</sup> perspective on PES and proposed alternative conceptual approaches. Muradian et al. (2010) 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*”.

Our contribution will focus on the case of Costa Rica to shed light on the debates over the assessment of PES. In Costa Rica, the PES program (PESP)<sup>5</sup> has been instituted in 1996 by the Forest Law 7575 that recognizes four ES provided by forest ecosystem: greenhouse gas mitigation through carbon storage and sequestration, watershed function, biodiversity and scenic beauty. This program is part of a 20 years-long process of forest policy evolution (Daniels et al., 2010) and appears undeniably as 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 the PESP management in cooperation with the National System of Conservation Areas (SINAC<sup>6</sup>), buys to landowners the ES generated by some defined land

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<sup>4</sup> The coasean approach tends to consider PES as markets instruments for environmental conservation governed by the search for cost-effectiveness. Wunder’s definition (2005) reflects this perspective.

<sup>5</sup> Programa de Pago por Servicios Ambientales (PSA program).

<sup>6</sup> It is an institutional system of decentralized and participative management that integrates the skills of the Ministry in charge of the environment (MINAE) in terms of forestry, wildlife and wildlife protected areas in

uses, mainly forest ones. Landowners may participate through several land use modalities which currently include: (1) reforestation through plantations, (2) protection of existing forests, (3) natural forest regeneration, (4) agroforestry systems, (5) forest management. After more than two hundred million cumulative dollars invested<sup>7</sup> (Fonafifo, 2010<sup>8</sup>), fifteen years of experience and over 700,000 ha of forest contracted in the program (some 13% of the national territory), we attempt to answer the question “what is the institutional performance<sup>9</sup> of the PESP as a conservation tool?”

An extensive and dynamic literature exists about Costa Rica’s PES (Pagiola et al., 2002; Pagiola, 2008; Daniels et al., 2010, etc.) but relatively few studies have taken into account the institutional nature of the Costa Rican PESP in their understandings of its performance. They rather adopt a cosean perspective on the program (Muradian et al. 2010), focusing on its cost-effectiveness (efficiency). Based on interviews carried out in 2009 and 2010<sup>10</sup> that shed lights on the institutional nature of the program, our objective is to provide a new understanding of the PESP institutional performance, mobilizing existing impact studies of the PESP in Costa Rica. We focus on environmental and economic outcomes induced by this program<sup>11</sup>. Thus, our aim is thus to go beyond traditional impact studies that focus on direct and short term performance of the PESP and consider also indirect and long term outcomes. We also assess how effectively the PESP interacts with other institutions in order to analyze if the PESP contributes or not to strengthen the effectiveness of the institutional framework for forest protection in Costa Rica. Our paper focuses on the forest protection modality of the PESP (PESP-Protection), by far the most important<sup>12</sup>. The following section analyses the

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order to dictate the policies, plan and implement processes aiming at the sustainability of natural resources management of Costa Rica. The SINAC is made of 11 sub-systems called conservation areas and a central office.

<sup>7</sup> These payments come mainly from a tax on fuel but also from international donors as loans or donations (World Bank, Global Environmental Fund, KfW) and from the national private sector.

<sup>8</sup> This reference corresponds to datas available on Fonafifo website :

[http://www.fonafifo.go.cr/paginas\\_espanol/servicios\\_ambientales/sa\\_estadisticas.htm](http://www.fonafifo.go.cr/paginas_espanol/servicios_ambientales/sa_estadisticas.htm)

<sup>9</sup> Institutional performance (Mitchell, 2008) is an assessment of how PES achieves their stated objectives. This 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. PES performance should also evaluate the collateral benefits and negative outcomes induced by PES (Corbera et al., 2009).

<sup>10</sup> We have conducted interviews of different actors involved in the design, implementation and evolution of the program such as: civil servants, researchers, representatives of the private sector, including forestry organizations.

<sup>11</sup> We do not assess the social performance of the program.

<sup>12</sup> This modality concentrates most of the area contracted in the framework of the PESP: about 90% between 1997 and 2008.

environmental effectiveness of the Costa Rican PESP. Section 2 gives an overview of its costs. Section 3 presents an assessment of potential ways to improve the institutional performance of the PESP.

## **1. The environmental effectiveness of the Costa Rican PESP**

We first study to what extent the PESP has really contributed to the extension of forest cover, then we analyze if the PESP has generated the expected ES, and finally we conclude with an evaluation of the sustainability of PESP environmental outcomes.

### *1. The impact on forest cover*

We assess, on the one hand, to what extent the PESP beneficiaries have really implemented the agreed (forest) land uses, and, on the other hand, if these land uses would have been adopted anyway in the absence of the PESP (additionality<sup>13</sup>).

The PESP has established a system to monitor land user compliance with payment contracts but some deficiencies remain ; FONAFIFO only do this monitoring through forest covers studies through Landsat 7 (since the mid 2000s) and aerial photographs and the uploading on GPS maps of the farms under contract. Field visits for monitoring compliance are done by forest regents but only for the first three years of the contract when payments are released, which leaves the two last years of the contract unmonitored through field visits (Contraloria General, 2011). Non compliance results in the cancelling of the contracts and the refund of the payments but no data is available about the percentage of PESP beneficiaries that didn't comply with payment contracts and had to refund the payments received.

Regarding the second issue, the importance of the scale of the PESP and the success of the country in reversing the deforestation trend<sup>14</sup> make it tempting to establish a causal link between the PESP and the reduction of deforestation. However, the outcomes obtained in terms of environmental effectiveness can be discussed for several reasons.

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<sup>13</sup> For a PES scheme, additionality consists in paying for the adoption of practices that would not have been adopted in the absence of payment (Engel et al., 2008).

<sup>14</sup> The forest cover which represented 42% of the territory in 1997 has reached 48% in 2005 (FONAFIFO, 2007).

First, it is difficult to isolate the effects of PESP of those induced by others environmental policies and of the economic context. Indeed, the PESP has been instituted along with the prohibition of deforestation<sup>15</sup>, for which it represents in some ways compensation. As this measure has allowed reducing deforestation - although politic will is lacking for a proper enforcement - and as it has been made acceptable and thus possible by the PESP, this program can claim to have contributed indirectly to reduce deforestation (Pfaff et al., 2008a). Nevertheless, the fall of the profitability of livestock farming reducing the incentive to convert forests in pastures, in particular in isolated areas (Pagiola, 2008), the development of ecotourism (Rojas and Aylward, 2003) and the increase in emigration (Kull et al., 2007) have also contributed to reduce deforestation. Furthermore, the trend of increasing forest cover dates from the early 1990s that is to say before the launching of the PESP (Wunder, 2007).

Moreover, many beneficiaries of the PESP would have protected the forest if the PESP-Protection did not exist, which characterizes a low additionality of the program (Miranda et al., 2003; Ortiz et al., 2003) and can explain the long awaiting list of people wishing to participate in the program, the demand being three times higher than the possibilities of funding (Rojas and Aylward, 2003). Indeed, based on the beneficiaries' declarations, additionality of the program is estimated between 25% (Ortiz et al. 2003, at the national level) and 50% (Morse et al. 2009, in the North Caribbean plain) of the areas contracted.

Thirdly, econometric modeling used to assess the impact of the PESP-Protection on forest cover give contradictory results, depending on the period and areas studied, the assumptions set the methodologies adopted and their ability to treat methodological challenges<sup>16</sup>. The estimates of the additional avoided deforestation due to the PESP contracts range from none<sup>17</sup> (Sierra and Russman, 2006) or less than 1%<sup>18</sup> (Pfaff et al., 2008a) to 56%<sup>19</sup> (Tattenbach et al.,

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<sup>15</sup> The Forest Law 7575 says in its article 19 that « On the lands covered with forest, changing land uses will not be allowed ».

<sup>16</sup> According to Daniels et al. (2010), difficulties to assess the impact of the PESP on forest cover are particularly strong for the first years of the PESP and lie on three interrelated themes: spatial data considerations, sampling considerations and the effects of institutional path dependency. We found also huge differences (a proportion of more than 1 to 20) among these studies between deforestation estimates for the 2000-2005 that serve to build contrafactual scenario (known as "baseline") against which they estimate the additionality of the program.

<sup>17</sup> In the Osa region, between 1997 to 2003.

<sup>18</sup> From 1997 to 2000, at the national level.

<sup>19</sup> From 1999 to 2005, at the national level. This figure of 56% results from our calculations based on their numbers (110,000 hectares of avoided deforestations on an average of 196,000 hectares contracted), assuming a linear growth of the areas under contract between 1999 and 2005.

2007). Robalino et al. (2008) found it to be 2%<sup>20</sup> and Arriagada et al. (2010) estimated it to be between 11% and 17% from 1997 to 2005 in the Central Volcanic Cordillera Conservation Area<sup>21</sup>.

Additionality of the PESP seems low and variable according to regions, but seems to have globally increased overtime (Robalino et al., 2008, 2011) thanks to a better targeting<sup>22</sup> of the program. Nevertheless it must have been higher than for the other main conservation tool: the protected areas network. Indeed, Pfaff et al. (2008b) found that during the 1986-1996 period, when deforestation rate was higher than during the PESP implementation period, the protected areas network have saved 2% of the forest area it covers, that is to say some 0.2% per year.

It is worth reminding that additionality has never been set as an objective of the program. The PESP does not target participants on the basis of the deforestation risk but rather on the basis of the areas' potential in terms of ES generation. Its philosophy is « *to 'recognize' the environmental services of whoever is providing them* » (Pagiola, 2008).

## 2. *The impacts on the generation of environmental services*

The program's impacts in terms of the generation of environmental services have not been monitored yet and are thus very difficult to estimate. The impact of land uses promoted by the PESP on the hydrological and biodiversity conservation services will be carried out in the future on pilot projects in the framework of the MMBIEM project<sup>23</sup>. However, while the ES generated by the program have not been yet measured directly, the potential of ES generation

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<sup>20</sup> From 2000 to 2005 at the national level.

<sup>21</sup> In the studies done by Morse et al. (2009) and Sesnie (2006) in the area of San Juan – La Selva biological corridor in northern Costa Rica, there are indications that the PESP have been effective in reducing deforestation. However, these studies were not able to precisely assess to what extent.

<sup>22</sup> While the Costa Rican PESP did not initially prioritize applications to the program, some criterias have been defined since 2003 in order to target the most important lands for ES provision and also to fight against poverty. Priority areas for the protection modality corresponded in 2009 to the « conservation blanks », the lands in wildlife protected areas, the lands in biological corridors, the indigenous territories, the districts with a low index of social development and the relevant areas for hydrological services.

<sup>23</sup> The « Mainstreaming Market Based Instruments for Environmental Management » project (commonly called Ecomarkets II) is a 80 millions US\$ project from the Global Environment Facility, the World Bank and the Government of Costa Rica supporting the development of the PESP during the 2007-2012 period (World Bank, 2006).

can be estimated indirectly through the analysis of the characteristics of the PESP areas of intervention. The actual ES generation depends on the additionality of the program.

The PESP-Protection impact in terms of hydrological services seems weak. Until 2010, the PESP has been largely focused on the areas where few hydrological services were likely to be generated<sup>24</sup>. In addition, the idea that forest land uses promoted by the PESP would improve the hydrological services is based upon a belief very rooted in Costa Rica and in the rest of Central America that the forest are always beneficial to hydrological services (Pagiola, 2002) while this link is in fact not well established scientifically (Tattenbach et al., 2007; Pagiola, 2008; Bishop and Landell-Mills, 2002). Nevertheless, in Costa Rica, the main concern is about water quality, reduction of sedimentation and flow level regulation for which the link with forest cover is better established (Tattenbach et al., 2007; Pagiola, 2008). Finally, hydrological services generation is expected to improve with a better targeting of key areas being implemented.

The PESP impact in terms of biodiversity conservation can be estimated by analysing to what extent the lands enrolled in the PESP are located in priority areas for biodiversity conservation. In 2005, some two thirds of the active contracts correspond to priority areas for biodiversity conservation according to the GRUAS II<sup>25</sup> study's definition (Pagiola, 2008; Tattenbach et al., 2007; Hartshorn et al., 2005), which seems to be a fair performance. However the assessment of the Ecomarkets project considers that PESP areas of intervention are too scattered (Hartshorn et al., 2005). Other assessment considers that the targeting of important areas for biodiversity has decreased between 1998 and 2009 (Contraloria General, 2011).

The potential amount of carbon maintained in forest due to the PESP depends on the type of forest ecosystem protected by the program: tropical humid forest countain more carbon than dry forests for example. While there is no data available on this issue, the areas involved in the PESP seem to correspond to the diversity of the Costa-Rican forests which store on the whole an important amount of carbon (Contraloria General, 2011).

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<sup>24</sup> In more than 65% of the cases according to Tattenbach et al. (2007).

<sup>25</sup> The GRUAS study is a proposal of land uses planning 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

Altogether, while the generation of ES depends actually of the additionality of the PESP, the areas involved in the program are fairly important for biodiversity conservation but not for hydrological services generation and 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 does not result from an efficient targeting of the program, as, according to Contraloria General (2011), all land can qualify to the program, and there is no real prioritization process.

### 3. *The sustainability of the PESP environmental impacts*

From a contractual point of view and in the case of contracts for forest protection, there is no expectative of sustainability apart from the renewing of the contracts<sup>26</sup>, which is what FONAFIFO tries to do to the extent of the available resources, except for the contracts concerning non priority areas (Pagiola, 2008).

The most important factor of the sustainability of the program is its financing. The PESP has been a very effective tool for raising funds for environmental conservation<sup>27</sup>, managing that this funding is widely recognized among Costa Ricans as legitimate according to our interviews. This is a major achievement, which is too often not recognized in the assessment of its performance. If the tax on fuel seems to be a reliable source of funding, the dependency of the program on this tax is worrying as pressures could be exercised to reduce it in the future, for example in the case of an important increase in energy price. The implementation of the water tariff is encouraging as it should generate 5 millions US\$ per year (Pagiola, 2008). Markets' fundings, which would be a source of sustainability of the program, are still limited. Individual contracts with ES users (hydropower companies, breweries...) only represent 2.5% of the funds distributed between 1997 and 2010 (FONAFIFO, 2010). Carbon markets have not proved yet to be a solution for the funding of the program as expected initially but FONAFIFO hopes they could generate some 1 million US\$ from 2012 (Pagiola, 2008). The funding of the PESP dedicated specifically to biodiversity conservation have

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<sup>26</sup> As we have already mentionned, deforestation is forbidden, which allows to some extent the sustainability of forest protection.

<sup>27</sup> More than two hundred million cumulative dollars have indeed been channelled though it (FONAFIFO, 2010)



remained limited to date and mainly come from international donors. REDD+<sup>28</sup> financing could be a major source in the future<sup>29</sup>, the PESP being expected to serve as the main institutional framework for channelling them (Government of Costa Rica, 2010).

Beyond the established contractual obligations, PESP effects on the long run can also be assessed looking at its capacity to make social norms and values regarding forest conservation evolve. This aspect has been little studied until now and there is no consensus about it. Hartshorn et al. (2005) say that « *PSA contracts may contribute to environmental protection indirectly by making the social norms and preferences of the participants more conservation-oriented* », thanks in particular to the institutionalization of the recognition of ES value. This perception change of forest ecosystems has been noticed by several studies (Locatelli et al., 2008; Miranda et al., 2003; Ortiz et al., 2003) but none of them have used a test group constituted of non-participants to the PESP in order to isolate the effects of the PESP. According to Ortiz et al. (2003), 95% of the beneficiaries interviewed think that the program has taught the people to value the forest<sup>30</sup>. If its direct impact on the social values of forest landowners is hard to demonstrate, there is no doubt, according to our interviews, that the PESP has played major role in the shift of the social vision of the forest from the traditional perspective of a mere source of wood to the new institutionalized vision of the forest as a source of various environmental services that are key to the development of the country (Segura and Moreno, 2002).

Finally the institutional performance of the PESP on the long term lies also in its ability to strengthen or not the effectiveness of the institutional framework for forest protection in Costa Rica. From this perspective the PESP has represented a major institutional innovation, supporting “*a process of “debureaucratisation” [...] dealing more closely with intermediaries and local entities and less at the national level*” and fostering inter-institutional coordination (Miranda et al. 2003). It has also contributed to make the prohibition of deforestation possible according to our interviews, and has reinforced the institutional framework necessary to take advantage of future potential opportunities of financing for ES provisions such as REDD+.

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<sup>28</sup> 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.

<sup>29</sup> The Government of Costa-Rica (2010) is estimating to 330 millions the necessary funds to find in the framework of REDD+ to be channeled through the PESP for the 2010-2030 period.

<sup>30</sup> The PESP does not explicitly provide conservation education materials to participants but some organizations that serve as intermediaries in the framework of the PESP have played a key role in spreading environmental information and education.

However, the lack of strategic planning of the PESP and unefficient cooperation between SINAC and FONAFIFO have weakened the capacity of the program to integrate itself more successfully to the institutional framework for forest protection and strengthen it (Contraloría General, 2011). Furthermore, the PESP has not been able to support the development of sustainable forest management in Costa Rica as it was supposed to do originally: the modality “forest management” of the PESP was cancelled in 2003 before reappearing in 2010. This has contributed to a shortage of wood production that led the country to import important quantity of woods, on the one hand, and an increase of illegal wood harvesting with a negative impact on forest cover, on the other hand (Barrantes, 2008).

## **2. The costs of the Costa Rican PESP**

In order to assess the performance of the program from the point of view of its costs, we first study the level of the transaction costs, then the level of the payments, before comparing the overall costs of the PESP to those of the implementation of protected areas.

### *1. The transaction costs*

Among the transaction costs, we distinguish the costs of access to the program borne by the participants (the laying out of the application folder including the design of a management plan, monitoring of the contract compliance) from the administrative costs of FONAFIFO functioning (selection, contractualisation, monitoring and fundraising and management). The costs associated to the design of the program are not considered, due to the lack of information available.

The estimates of access costs to the PESP borne by the participants vary from 12 to 18% of the payments total amount (Miranda et al. 2003). FONAFIFO functioning costs have been initially limited by the law in 1996 to 5 % of the PESP budget, and then this limit has been raised to 7% in 2003. The program appeared then particularly competitive in controlling its costs: in the USA, administrative costs often represent 25% of the budgets of the conservation contracts (Ferraro and Kiss, 2002) while in the case of Water Conservation Fund in Quito, these costs are estimated between 10 to 20 % of the payments channelled through the fund (Landell-Mills and Porras, 2002). However, the institutional transformation of

FONAFIFO into a classic public institution made its costs boom since 2008 to reach 22% of the budget in 2008 according to our interviews<sup>31</sup>.

Our analysis shows that transaction costs of the Costa Rican PESP represent some 40% of the total amount of the channelled payments, without considering the costs of the program design. This amount is higher than the level of transaction costs usually observed in developed countries and stands in the highest part of the bracket of the carbon sequestration program’s transaction costs in developing countries<sup>32</sup> (Wunder, 2007). The PESP costs could be thus considered as relatively high since the evolution of FONAFIFO status in 2008.

## 2. *The level of payments*

Payment per hectare had long been uniform across all contracts within each modality (i.e. forest protection, reforestation, natural forest regeneration, agro-forestry systems and forest management) but, since 2009, lands with exceptional ES value receive higher compensation within the “forest protection” modality of the program<sup>33</sup>. In 1997, the price proposed for the modality of forest protection, was 45,4 US\$/ha per year for five year period<sup>34</sup> which corresponds to the opportunity costs of the lowest profitable alternative use (extensive cattle raising). This amount seems low, when compared to opportunity costs of others alternative uses<sup>35</sup>. Nevertheless, the importance of the demand shows that it is somehow very attractive. This can be explained by the fact that many of the applicants may have conserved their forests anyway. Furthermore, this price has raised due to political pressures from the PESP beneficiaries to 64 US\$/ha in 2005 and came to a maximum of 80 US\$/ha for some protection contracts in 2009. As this increase of price was not necessary to find a sufficient number of people wishing to participate to the program, the program already facing a demand higher

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<sup>31</sup> The compliance of FONAFIFO to the normative of public sector administration has led to a substantial increase of the number of employees in order to perform new tasks required by this status (reporting, internal control,...), as well as an increase of labor costs due to mandatory contribution to public pension and social funds, according to our interviews.

<sup>32</sup> According to Wunder (2007), the transaction costs of the Canadian program of land diversion represent some 25% of the total costs while those of the conservation reserve program in the USA are probably lower. The transaction costs of the carbon sequestration programs in developing countries vary between 6% and 45% of the payments.

<sup>33</sup> Payments range from 64US\$/ha/year for classical forest protection and protection within protected areas to 75 US\$/ha/year for protection in conservation blanks and 80 US\$/ha/year for protection of hydrological resources.

<sup>34</sup> The exchange rate used is from the 31/12/2006.

<sup>35</sup> For example, some landowners are offered 600 US\$ per year for the renting of their land for pineapple production (Contraloria General, 2011).

than available fundings, we can conclude that it resulted in a decrease of the program cost-effectiveness.

### *3. The comparison with another conservation scheme, the protected areas*

The protection cost of the forest resources through the PESP is largely lower than the traditional system of land buying by the State and protection through a national park : from 1,4 to 4 times less expensive depending on the hypothesis set<sup>36</sup> (Sage, 2000; Hartshorn et al., 2005). The PESP costs considered payments levels and administrative costs but not access costs, while the national parks' costs include land buying and parks' establishment and management costs necessary to ensure protection (Sage, 2000). These studies do not compare the benefits generated by each scheme, those being considered arbitrarily as equal. However, unlike land buying by the State, the PESP requires to be continuously funded and its costs may increase overtime with the raise of the opportunity costs of forest protection associated with the country's economic development.

Although the costs of the PESP seem competitive when compared to the costs of the protected areas, there is a potential to reduce the PESP costs and thus improve the cost-effectiveness of this program.

### **3. What potential for improving the PESP performance?**

#### *1. A potential for improvement on the short run through changes in the program's rules...*

According to the coasean perspective on PES, the improvement of the PES performance through changes in the program's rules can be reached through two levers: the improvement of its environmental effectiveness and the decrease of its costs.

The relative lack of targeting and of differentiation of the level of payments, which are early characteristics of the program inherited from the former forest incentives programs, can be considered as sub-optimal: they don't allow in fact to generate the maximum of ES (through the targeting) at the best cost (through payments adjusted to the opportunity costs of

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<sup>36</sup> They respectively consider a period of time of 30 and 15 years and discount rate between 6% and 16%.

beneficiaries) (Pagiola 2008). Nevertheless some (FONAFIFO civil servants) consider that higher differentiation may lead to major costs of monitoring and control, reducing the cost-effectiveness of the program.

Wunscher et al. (2008), using the example of the Nicoya peninsula, estimate that with constant budget, the ES generated by the PESP could be doubled. They estimate that the biggest part of the potential for efficiency improvement (+93% on a global improvement potential of +105%) come from the payments flexibilization to adjust them to the big variations in terms of costs borne by the beneficiaries: opportunity costs, transaction costs and the direct costs of implementing the measures required in the framework of the protection contracts. This leads to a decrease of the average payments' level. According to them, the use of an ES production index to target the lands to be integrated in the program leads to a moderate improvement of the PESP efficiency, as the levels of ES generated by different lands are quite similar. Finally the targeting of the lands using the deforestation probabilities turns out to be not very attractive because of the low variations of the deforestation risk within the region<sup>37</sup> (Wunscher et al., 2008).

Nevertheless, the practical implementation of this tool allowing the targeting of the lands (according to their deforestation risk and the capacity to generate ES) and the differentiation of the payments is facing several challenges: scientific ones (to access a very precise information regarding the participation costs of potential beneficiaries, the deforestation risk and the capacity to generate ES of the proposed lands), administrative ones (digitalization of applications...) but above all political ones (as it could be seen as unfair<sup>38</sup>) (Engel et al., 2009). The increase of the transaction costs inferred by the implementation of this new tool seems negligible<sup>39</sup> as they are estimated at 0.27% of the overall budget of the program each year (Engel et al. 2009).

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<sup>37</sup> The low variations found in the study area between lands in terms of ES generated on the one hand and of deforestation risks on the other hand 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 what found Wunscher et al. (2008) at the Nicoya peninsula level.

<sup>38</sup> “*In particular, landowners may resist differential payments once homogenous payments have already been introduced, as these may be seen as arbitrary discrimination*” (Engel et al. 2009). Moreover, favorizing landowners that are more prone to deforest may be perceived as inequitable.

<sup>39</sup> They recognize however that FONAFIFO may not share their vision.

2. ... which may reveal itself counterproductive on the long run

If the differentiation of payments and targeting may be considered as options for improving the PESP efficiency on the short term, it is necessary to take into account the impacts of these options on the social norms and values plus the legitimacy of the program to estimate the improvement potential of its institutional performance on the long term.

Indeed, it is possible to speculate about the impact on social norms and values of the efficiency gains resulting from a differentiation of payments that leads to a decrease of payments' levels. In fact, a reduction of current payment levels may jeopardize the efforts of conscientization of the population towards a better valuation of immaterial benefits provided by forests which was one of the long term objectives of the PESP. Furthermore, according to Kosoy et al. (2007), the level of the payments received does not allow in some PES schemes to compensate integrally the opportunity costs of numerous beneficiaries, who nevertheless participate to 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 behaviours, the payments being too low to incite the actors prone to deforest not to do it, but rather to reinforce « *good environmental stewardship* ». (Kosoy et al., 2007) and support law compliance. This is often the case of the Costa Rican PESP (Miranda et al., 2003; Ortiz et al., 2003). However, if the payments were reduced in the Costan Rican PESP, they could result counterproductive. As a matter of fact, extrinsic rewards can impact negatively on intrinsic motivation (Deci et al., 1999 quoted by Wunder, 2005), such as the community's own interest or the pride derived from forest conservation. This risk seems particularly high in the case of payments of small amounts (Heyman and Ariely, 2004, quoted by Wunder, 2005) – which is the case of the Costa Rican program - where the efforts in terms of conservation could result lower than in the case in which there would be no payment at all. The same is true for the reconsideration of the egalitarian principle, by which the levels of payments are the same whatever the ES values or their provision costs are. If the differentiation of payments allows to maximize the efficiency of the PESP on the short term, it can also jeopardize it on the longer term. Pascual et al. (2009) consider the egalitarian principle as a “fairness criteria”

which is the pillar of the PESP legitimacy<sup>40</sup>. Several Costarican actors have resisted the differentiation of payments initiated in 2009<sup>41</sup> according to our interviews.

Finally, the targeting of the lands according to their deforestation risks (search for additionality) can create perverse incentives: channelling payments only towards the landowners that may degrade the environment can incite the people to degrade the environment if they are not paid for the ES they provide (Wunder, 2005). Some examples at the international level such as the case of the PES RISEMP<sup>42</sup> project (Pagiola et al., 2004) underline this danger. Although this type of targeting seems important to raise the efficiency of the program, due care is necessary to avoid creating perverse incentives.

The implementation of an effective prioritization process of the applications should be an important step towards the improvement of the PESP performance but decisions on this issue should be carefully assessed. To conclude, by promoting an excessive focus on economic incentives to tackle deforestation, these measures may reinforce the idea that forest landowners need to have their opportunity costs compensated in order not to deforest. This could thus undermine the political legitimacy and will to enforce the prohibition of deforestation enacted by law that the PESP helped to make possible. The PESP should support law compliance and enforcement rather than replacing it.

### *3. A safer way : the improvement of management and governance of the PESP*

The quality of the management of the PESP by FONAFIFO and SINAC has been judged little satisfactory by the Costa Rican institution in charge of assessing the way public funds are used<sup>43</sup> (Contraloria General, 2011). According to its assessment, SINAC should complete its tasks of defining a policy and a strategic plan<sup>44</sup> for the PESP to follow. It should also ensure the monitoring, evaluation and controlling of the program, for which it has largely failed until

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<sup>40</sup> Pascual et al. (2009) underline that they focus on the distributive effects of the PES on the ES providers, but that this analysis could be deepened to include a broader range of actors, in particular ES buyers and ES potential providers.

<sup>41</sup> Mostly because of pressures from the World Bank.

<sup>42</sup> The Regional Integrated Silvopastoral Ecosystem Management Project funded by Global Environment Facility aims to promote improved silvopastoral practices in degraded pastures areas through PES mechanisms. It has been implemented from 2002 to 2007.

<sup>43</sup> The « contraloria general ».

<sup>44</sup> This should clarify the goals, objectives, priorities, activities and indicators for the control and assessment of the program.

now. FONAFIFO should strengthen the control of the PES contracts compliance, and the monitoring and reporting<sup>45</sup> of the program’s performance. These improvements should ensure a better coordination of SINAC and FONAFIFO and thus strengthen synergies between the PESP and others institutions for forest protection. They should also support the improvement of the decision-making process through an increase of the program’s transparency regarding its goals, activities and results. Indeed, until now, the PESP, whose governance is dominated by the forest sector, has been more focused on reinforcing the forest sector and promoting woodland expansion than to support the generation of ES as it is supposed to do (Contraloría General, 2011). The system for allocating quotas for PES contracts to the different modalities and geographical areas should also be revised in order to better match the demands. Currently, some lands are enrolled in modalities that do not match with their characteristics in order to take advantage of the quotas available in these modalities. Finally an integrate information system with reliable and sufficient datas, is necessary to better manage the program. At the moment, two systems are being used - one for geographic information, and the other for project management – and are not properly connected between themselves, while datas are not reliable and sufficient.

## **Conclusion**

The PESP direct impact on the forest cover of the country is difficult to demonstrate. It is necessary to replace the PESP in the framework of a change in the forest policy of the country, especially the prohibition of forested land uses change, for which it has been considered as compensation, to assess its likely positive impact on forest cover. Furthermore, the PESP appears to be more efficient on the short term than the protected area network, the main alternative tool for conservation. However, the ES generation potential by lands under contract seems far from optimal due to a lack of prioritization of the lands to contract. The PESP appeared also quite competitive regarding the level of transaction costs and functioning costs until 2008, before FONAFIFO functioning costs boomed due to its institutional transformation. The analysis of the payments’ levels, that appears already quiet low in Costa Rica, seems however to show a potential for decrease at first sight. Furthermore, the PESP has represented a major institutional innovation that could allow the country to better take advantage of international schemes such as REDD+ and has permitted to channel important

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<sup>45</sup> For example, no report on Fonafifo’s activity is being devised on a regular basis.



financial resources towards conservation, thanks to its capacity to build public support for forest protection. This can prove decisive to ensure on the long run forest conservation in Costa Rica. However, it has failed to develop fully successful synergies with other institutions for forest protection, and to support the development of sustainable forest management.

A significant potential for improvement of the PESP cost-effectiveness exists on the short term, mostly through the differentiation of the payments levels or through the targeting of the areas most prone to be deforested. Nevertheless, these recommendations arise from a coasian perspective on the program, which has already influenced its evolution, towards becoming a mere market instrument, which it is not (Muradian et al. 2010). They do not take into account the institutional nature of PESP and the meanings that the stakeholders have given to this program and that ensure its legitimacy. In fact, according to our interviews, this evolution would oppose some of its founding principles (non search of additionality, same level of payments within each modality...), around which the different actors have built its legitimacy. This could jeopardize the program's viability as Wunder (2007) recognizes: « *a PES scheme needs to strike some balance between short-term efficiency and fairness, the latter influencing long-run conservation viability* ». Moreover, these recommendations, by giving priority to a purely utilitarian logic, may weaken on the long run the social norms and values impacting forest conservation and could eventually reveal themselves counterproductive (Martinez-Allier 2002, Vatn 2010). Thus the search for the improvement of the PESP institutional performance must take into account its potential effects on the long term and consider, on the one hand, the nature of this institutional arrangement in order not to undermine its legitimacy and, on the other hand, its potential impact on social values and norms dealing with conservation. A safer way to improve the PESP institutional performance is to focus on strengthening its management starting from the strategic planning of the program to its implementation, control, and monitoring. This could bring more transparency and the necessary tools to support a more effective deliberation to guide the evolution of the program.

To conclude, the focus on economic incentive such as the PESP to reduce deforestation should not deter the State from improving the enforcement of the forest law that prohibits deforestation, a measure the program helped to make acceptable. If in 1997 PESP was supposed to be a cost-efficient alternative to support law compliance, part of this goal should

now be addressed through stricter law enforcement, taking advantage of the new technological means developed ever since.

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