Social Impacts of Costa Rica’s PSA Program

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Abstract
This paper discusses the social impacts of Costa Rica’s Payments for Environmental Services (PSA) program and their effect on rural poverty. Although the analysis is hampered by significant information gaps, we believe that the PSA Program has probably managed to have an impact on the poor. This impact is almost certainly positive on the poor who were able to participate, but is difficult to quantify. However, except for very few cases, it seems unlikely that the PSA was able to actually lift participants out of poverty. Participation of the poor was initially low but increased as measures were introduced to target the poor and facilitate their participation.

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Keywords
Payments for Environmental Services (PES), poverty, Costa Rica

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Cover photo
Farming area in the Cordillera de Talamanca, Costa Rica (Stefano Pagiola).

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Social Impacts of Costa Rica’s PSA Program

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1. Introduction

Costa Rica’s Payments for Environmental Services (Pagos por Servicios Ambientales, PSA) Program is one of the main government programs affecting the country’s rural landscape, channeling over US$14 million annually to rural areas. Unlike some other programs of Payments for Environmental Services (PES), such as the Rewarding the Upland Poor for Environmental Services (RUPES) Program in Asia (Arifin, 2006), Costa Rica’s PSA Program was not designed as a poverty-alleviation mechanism. Its main objective has always been to maintain and increase forest cover as means to deliver environmental services. The program has, nevertheless, sometimes been presented as an instrument for the “redistribution of wealth to strengthen the family economy in rural areas” (Ortiz and others, 2003). However, some studies have questioned the degree to which the PSA Program reduces poverty (Miranda and others, 2003; Ortiz and others, 2003; Zbinden and Lee, 2005; Hope and others, 2005; Coope Sol I Dar, 2002).

This paper discusses the social impacts of the PSA program and their effect on rural poverty. The task is daunting, as the information available is limited even though the program has almost 10 years of experience. To provide background to the analysis, we begin by examining poverty rates in Costa Rica and the characteristics of the poor (Section 2). We then review the available evidence on the extent to which the poor participate in the PSA Program, drawing on information from FONAFIFO’s contract database and on a review of several case studies of PSA program impact (Section 3). We then examine various factors that can affect participation by the poor in PES, using the framework suggested by Pagiola and others (2005). Section 4 examines factors affecting the eligibility to participate, Section 5 looks at factors affecting the participant’s desire to participate, and Section 6 looks at factors affecting participant’s ability to participate. In Section 7, we summarize the available evidence on the magnitude of the impact of the PSA program on the poor, both directly and indirectly.

As background to the analysis, it is important to highlight the somewhat turbulent beginnings of the PSA program. Initially, the PSA program was created to fill a vacuum left by the withdrawal of subsidies for reforestation, at a time when forest cover was rapidly declining in the country. The program’s main objective was clear-cut: to reduce forest clearing, and to increase forest cover. A harsh ‘learning-by-doing’ process took place. The ‘first-come, first-served’ participation policy implemented in the Program’s early years and the scarcity of information on the program were not conducive to participation by poorer landholders. Moreover the program was implemented in an atmosphere of considerable resentment of the government, a legacy of the expropriations that occurred during the creation of the National Parks System (Watson and others, 1997). Since these early days, there has been considerable evolution in the Program’s characteristics, including several
changes explicitly aimed at improving its impact on the poor. This on-going evolution further complicates the analysis of the PSA Program’s social impacts.

2. Who are Costa Rica’s poor and where are they located?

Compared with other Central American countries, Costa Rica is relatively well off. According to the United Nations Development Programme (UNDP), only 2.2 percent of the population lives in extreme poverty, using the international extreme poverty line of US$1/day, compared to 13.5 percent in Guatemala, 19.0 percent in El Salvador, 20.7 percent in Honduras, and as much as 45.1 percent in Nicaragua. Costa Rica ranks 48th among 177 nations on the UNDP’s Human Development Index (HDI) (UNDP, 2006).

Table 1: Poverty rates in Costa Rica, 2006

<table>
<thead>
<tr>
<th>Population (million)</th>
<th>Poor</th>
<th>Extremely poor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(% of population in region)</td>
<td>(% of poor in country)</td>
</tr>
<tr>
<td>Urban</td>
<td>2.29</td>
<td>21</td>
</tr>
<tr>
<td>Rural</td>
<td>1.65</td>
<td>25</td>
</tr>
</tbody>
</table>

By region

<table>
<thead>
<tr>
<th>Region</th>
<th>Population (million)</th>
<th>Poor</th>
<th>Extremely poor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(% of population in region)</td>
<td>(% of poor in country)</td>
<td>(% of population in region)</td>
</tr>
<tr>
<td>Central</td>
<td>2.50</td>
<td>18</td>
<td>51</td>
</tr>
<tr>
<td>Chorotega</td>
<td>0.30</td>
<td>39</td>
<td>13</td>
</tr>
<tr>
<td>Pacífico Central</td>
<td>0.21</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>Brunca</td>
<td>0.30</td>
<td>36</td>
<td>12</td>
</tr>
<tr>
<td>Huetar Atlántica</td>
<td>0.41</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>Huetar Norte</td>
<td>0.22</td>
<td>27</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.94</strong></td>
<td><strong>23</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Notes: Totals may not add up because of rounding.

a. Using national poverty lines of US$90/month in urban areas and US$75/month in rural areas.

b. Using national extreme poverty lines of US$42/month in urban areas and US$38/month in rural areas.


Based on the national poverty criteria, approximately 23 percent of Costa Rica’s population is classified as poor, and 6 percent as extremely poor (INEC, 2007). Because almost 60 percent of the population lives in urban areas, most of the poor are located there. However, in relative terms, poverty rates are higher in rural areas. A quarter of the rural population is poor, compared to only 21 percent of the urban

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1 Costa Rica considers individuals or households as poor using a combined index based on whether their per capita income is lower than the per-capita cost of the basic basket of goods (canasta básica), an approximate cost of the non-food basic needs, and the household’s per capita income. The poverty line for 2006 was approximately US$90/month for urban areas and US$75/month for rural areas, and the extreme poverty line approximately US$42/month for urban areas and US$38/month for rural areas (INEC, 2006).
population. Among those under the poverty line, almost a third live under extreme poverty in rural areas, compared to only a fifth in urban areas (see Table 1).

The Social Development Index (Índice de Desarrollo Social, IDS) is an indicator that measures social lag in different geographic areas cantones of Costa Rica.\(^2\) It is based on several social variables, including education, infrastructure, child mortality, average consumption of electricity in residential areas, and proportion of children born of single mothers. The IDS value ranges from 0 (minimum) to 100 (maximum). The highest value of 100 is found in the Flores Canton in Heredia, and the lowest in Talamanca, Limón. As a practical rule-of-thumb, in social analysis cantones with IDS values of less than 40 are considered poor.

Much of the discussion about poverty in Costa Rica is centered on the urban-rural divide. According to Hertford and Echeverri (2003), there is a strong link between agricultural activities and poverty. Saborío and Rodríguez (2004) confirm a direct relation between dependency on agricultural income and poverty in Costa Rican households. They also find that rural households are less diversified in their income sources. Education levels are highly correlated with poverty, both for the household head and for other household members. Geographic isolation is also important: Individuals living near urban areas have more possibilities to market their produce and to find alternative jobs and other sources of off-farm income.

3. Contract allocation and poverty

Several empirical studies have looked at the social impacts of the PSA Program. Their main characteristics and results are summarized in Table 2. These studies tend to conclude that many of the landowners participating in the PSA program are not poor. Miranda and others (2003), for example, found that most participating landowners in the Virilla watershed were wealthy and derived their incomes from non-farm sources. Similarly, Zbinden and Lee (2005) found that 75 percent of conservation contracts in their Huetar Norte study area were received by relatively wealthy landowners who derive their main income from off-farm activities.

Although these studies are an important source of information, it is important to highlight that they are few and scattered, and tend to use different methodologies, making comparisons difficult. Most have focused on specific areas, and their results may not be representative of the country as a whole.\(^3\) In addition, very few studies compare participants to non-participants, and then only with very small sample sizes. Moreover, most of these studies were conducted before FONAFIFO introduced several social-oriented measures to incorporate poorer farmers in the PSA program, and so their results may not reflect the impact of the program in its current form.

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\(^2\) The IDS is computed at the level of cantones. Costa Rica’s seven provinces are sub-divided into 81 cantones, which are in turn sub-divided into 463 distritos.

\(^3\) Only one study attempted national coverage, that by Ortiz and others (2003); however, its results are based on telephone interviews, so that their sample is likely to be biased towards wealthier participants.
<table>
<thead>
<tr>
<th>Study</th>
<th>Study date</th>
<th>Geographic scope</th>
<th>Methodology</th>
<th>Main conclusions regarding poverty</th>
<th>Main limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortiz and others, 2003</td>
<td>2002</td>
<td>National</td>
<td>Phone interviews, focus groups</td>
<td>Most participants are relatively well off.</td>
<td>Phone interview limits the inclusion of poorer groups in the survey.</td>
</tr>
<tr>
<td>Miranda and others, 2003</td>
<td>2002</td>
<td>Rio Segundo and Rio Virilla watersheds</td>
<td>Personal interviews, Focus on water</td>
<td>Most participants are well off. Non-participants are not interested because of high opportunity costs. Poor people are not necessarily found on upper slopes.</td>
<td>Relatively small sample size. Area has very high IDS.</td>
</tr>
<tr>
<td>Miranda and others, 2004</td>
<td>2002</td>
<td>Huetar Norte</td>
<td>Focus groups, Focus on carbon</td>
<td>Reforestation provides income in the future. Small and medium farmers use reforestation as part of other strategies.</td>
<td>Relatively small sample size.</td>
</tr>
<tr>
<td>Muñoz, 2004</td>
<td>2002-03</td>
<td>Osa Peninsula</td>
<td>Personal interviews with 22 farmers (45 of participants in the area)</td>
<td>Most small farms are covered by forest. PSA is the main income for 44 percent of respondents, and is considered an important tool to raise people out of poverty.</td>
<td>Small sample size, does not include non-participants.</td>
</tr>
<tr>
<td>Zbinden and Lee, 2005</td>
<td>2003</td>
<td>Huetar Norte</td>
<td>Personal interviews (246 PSA participants and 141 non-participants)</td>
<td>Farm size, human capital and household economic factors, and information variables significantly influence participation in PSA program alternatives. Large farmers and forest owners are disproportionately represented among program participants.</td>
<td></td>
</tr>
<tr>
<td>Sierra and Russman, 2006</td>
<td>2003</td>
<td>Osa Peninsula</td>
<td>Database analysis (61 PSA participants and 585 non-participants)</td>
<td>Payments have limited immediate effects on forest conservation in the region, and encourage abandonment of lands in favor of conservation and against other (economical) activities including forest regrowth.</td>
<td>Database includes little socio-economic information from participants.</td>
</tr>
</tbody>
</table>
The data used in this paper was provided by FONAFIFO. It includes 5,305 observations on active contracts as of April 2007. These data provide useful but limited information. For example, they do not distinguish the different contract modalities and do not indicate which contracts are collective.\(^4\) They also do not include information on previous (expired) contracts, nor specify the year in which active contracts were signed, preventing any analysis of changes over time.\(^5\) FONAFIFO collects very little social and personal information about applicants, and nearly nothing on intermediaries and facilitators. FONAFIFO also does not keep track of rejected applications, limiting the possibility of comparing the characteristics of applicants who are accepted to those who are not. Nevertheless, some of the data in FONAFIFO’s database—such as location, property size, area under contract, and land titling status—can provide insights into the program’s impact on the poor—although, as we will show, this information must be interpreted with care.

Source: Computed from FONAFIFO data.

**Figure 1: Distribution of active contracts, by property size, 2007**

Figure 1 shows the number of active contracts by property size. Although the minimum areas for PSA contracts (1ha for reforestation and 2ha for conservation) are small enough to allow small farmers to participate, in practice most contracts are awarded to medium to large farms. Only 7 percent of all active contracts are on farms of less than 5 ha, while 25 percent are on farms of between 30 and 100 ha, and 34 percent are on farms of more than 100 ha. As discussed below, agroforestry contracts are substantially different.

Using farm size as a proxy for wealth is useful but can be misleading, as the actual value of land varies within the country. Land closer to urban areas or agricultural opportunities is more expensive than those farther away. Thus, a farmer

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\(^4\) Most contracts over 300 ha are likely to be collective contracts, but collective contracts could also cover smaller areas.

\(^5\) The program was administered by SINAC until 2003, using a different database from that currently used by FONAFIFO.
with two ha in San Rafael (Heredia) may be wealthier than a farmer with 300 ha in Matina (Limón). Even at the very local level, land values are likely to vary. For example, farms with beautiful views or access to tourist attractions, like volcanoes or beaches, can be up to 10 times more expensive than those without. With these caveats, using land as a proxy for wealth tends to confirm the results from previous studies that most participants are likely to be relatively wealthy.

Source: Computed from FONAFIFO data.

**Figure 2: Proportion of farm under active contracts, by property size, 2007**

The share of the property under contract has an inverse relation to the total size of the farm, as shown in Figure 2. Farms with less than 5 ha have 80 percent of their area under contract, on average, and properties under 30 ha have at least 70 percent of their area under contract. The proportion under contract decreases significantly for larger properties, especially for those over 300 ha.

4. Are Costa Rica’s poor eligible to participate in the PSA Program?

Whether the poor are eligible to participate in a PES program depends on the program’s eligibility rules. A basic eligibility criterion is that applicants need to have land to enter the PSA Program. Unfortunately, no data are available on how many of the poor are landless.⁶

**Spatial eligibility**

As environmental services are highly site-specific, an important eligibility criterion in almost all PES programs is that applicants be located in areas that provide environmental services (Pagiola and others, 2005). This issue is linked to the wider issue of who the poor are, and where they are located. A large proportion of Latin America’s poor are found in rural areas (De León, 2006). It has often been assumed that most of these rural poor are concentrated in marginal lands—areas facing soil limitations, steep and uneven terrain, and unfavorable climates. Moreover, these areas often have difficult access to markets and poor infrastructure (CGIAR, 1997).

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⁶ The National Institute of Census and Statistics (Instituto Nacional de Estadística y Censos, INEC) does not include questions on land ownership in interviews used to measure the poverty indicator.
These areas are also thought to be important for service provision. By combining these two assumptions, it has been natural to assume that the poor would likely be the primary recipients of payments for environmental services. Whether this presumed relationship holds is not clear, however. A study in Ecuador suggests that the poor being concentrated in the marginal agricultural lands of rural areas may actually be a misconception (Anand, 2002) while a study in Guatemala finds no correlation between poverty rates and the importance of an area for water services (Pagiola and others, 2007).

Source: Based on data in ITCR, 2004.

Figure 3: Poverty in PSA Program priority areas

Initially, the PSA Program did not have priority areas, and contracts were allocated on a first-come, first-served basis. After the first years of experience, and following advice from the Ecomarkets project, FONAFIFO gradually introduced several criteria to prioritize applications. The initial prioritization, introduced with the Ecomarkets Project in 2001, focused on areas of high biodiversity significance.

Figure 3 shows how the PSA Program’s priority conservation areas, as defined under the Ecomarkets Project, are related to the poorest cantones. As can be seen, the overlap between these areas is relatively limited. The poorer cantones are mostly
located on the edges of the country, while the priority conservation areas seek to form a natural biological corridor across the country. Although it is true, as a World Bank study found, that some of the areas targeted by the Ecomarkets project are among the country’s poorest areas (World Bank, 2000), it is also true that many other areas with high poverty rates are not within these priority areas.

Partly in response to this lack of overlap, an explicit social criterion for prioritization was introduced in 2005, adding cantones with an IDS of less than 40 to the PSA Program’s priority areas. Figure 3 also shows that modifying the criterion to include all cantones with an IDS under 45 would allow the program to incorporate many other areas of high poverty such as Osa, Pococi, and Bagaces, which are just slightly over the cut-off point of 40. In summary, during much of the PSA Program’s lifetime, its prioritization was likely to be only mildly favorable for the poor. The recent inclusion of particularly poor cantones in the Program’s priority areas is a step in the right direction, though it is too soon to assess how effective it has been.

**Property eligibility**

PES programs are targeted to people that own land, automatically excluding landless people. Even among landholders, small property size, insecure tenure, or lack of title may make individual properties ineligible to participate.

In order to enter the PSA Program, applicants for reforestation contracts need to have at least 1 ha and those for conservation contracts need at least 2 ha. In theory, these minimum areas are small enough to allow small farmers to participate. As already discussed in Section 3 above, however, property size can be a misleading indicator of wealth.

Applicants also have to have valid property titles or possession rights, which limits those with unclear land titles. In some areas, such as Monteverde, farms are subdivided among children, but title deeds are kept informal (Hope and others, 2005). Initially, full titles were required for participation in the PSA Program. When funding came from private sources, however, FONAFIFO was able to accept possession rights. This was initially done, for example, in the case of conservation financed by the Platanar hydroelectric power company (Pagiola, 2002).

The requirement to have land titles was dropped in 2003, but participants must still provide cadastral maps with clear boundary demarcation. The impact of this new measure to help with legal problems has been limited so far, and to date only five percent of all active contracts use possession rights instead of legal title deeds. Almost 70 percent of contracts using possession rights are located in ten cantones (see Table 3), three of them in poor areas with low IDS. For the all active contracts in 2007, the proportion of contracts using possession rights is inversely (and statistically significantly) correlated to the IDS. Because of lack of information on non-participants, however, it is difficult to say whether the number of contracts using possession rights is low because: (a) most farmers have clear property titles (the positive version), or (b) non-titled land has many problems in establishing clear possession rights (the negative version).
Some projects, like Ecomarkets, have allocated funds to helping farmers establish their possession rights or land titles, and some intermediaries, like FUNDECOR, assist farmers in formalizing property rights if legal possession exists and there are no disputes from neighboring farms. But this is a difficult process and few intermediaries are willing to do it, especially in the presence of conflicts with neighbors.

Table 3: Main areas using possession rights in active contracts, 2007

<table>
<thead>
<tr>
<th>Province</th>
<th>Canton</th>
<th>Total number of contracts</th>
<th>Contracts using possession rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Alajuela</td>
<td>San Ramón</td>
<td>134</td>
<td>22</td>
</tr>
<tr>
<td>Guanacaste</td>
<td>Upala</td>
<td>149</td>
<td>9</td>
</tr>
<tr>
<td>Heredia</td>
<td>Sarapiquí</td>
<td>537</td>
<td>14</td>
</tr>
<tr>
<td>Limón</td>
<td>Limón</td>
<td>163</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Pococi</td>
<td>250</td>
<td>35</td>
</tr>
<tr>
<td>Puntarenas</td>
<td>Golfito</td>
<td>118</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Osa</td>
<td>243</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Puntarenas</td>
<td>184</td>
<td>35</td>
</tr>
<tr>
<td>San José</td>
<td>Perez Zeledón</td>
<td>305</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: FONAFIFO data.

To be eligible for the forest conservation contract, properties must also have forest cover. Studies show that there is a strong correlation between farm size and the presence of forest: 0.678 in the Northern region (Zbinden and Lee, 2005), and 0.86 in the Virilla Watershed (Miranda and others, 2003). Non-participants have considerably less forested area. Zbinden and Lee (2005) reported that only 67 percent of non-participants had more than two hectares of forest (making them eligible for participation in forest protection). A study in Osa by Sierra and Russman (2006) also shows that non-participants have little or no charral cover (secondary forest), and suggests that the program could benefit a larger number of farmers if it could be directed towards restoration objectives.

5. Do Costa Rica’s poor want to participate in the PSA Program?

The desirability of participation in a PES program is linked to the benefits that potential participants perceive the program to offer. In general, PES programs in developing countries can involve benefits such as direct payments, contribution to cash income, and the generation of alternative economic activities. Financial payments make a clear, immediate contribution to local incomes (Grieg-Gran and others, 2005). Other benefits may have different time scales. For example, the full benefits of reforestation contracts are realized only when the mature timber is sold (typically after 12 to 20 years). PES can also provide a source of financing for a
transition to alternative, more sustainable livelihood strategies. The stability of PES payments may also be in itself desirable, when other income sources give much more variable income (Pagiola and others, 2005). Other non-monetary benefits that may make participation in the program desirable include perceived protection of land against invasions.

If payment levels are uniform, opportunity costs become a key factor and payments will tend to go to the owners of low-productivity land (Pagiola and others, 2005). The PSA program sets payments at a level roughly equivalent to the opportunity cost of extensive livestock production on marginal land. One would expect, therefore, the program to mainly reach areas with lower opportunity cost. To determine whether this is the case, we collected information on average land values in each district from real estate websites during April 2007. Some of these values have to be treated carefully, as they may be affected by factors such as restrictions on land sales (for example, in indigenous areas in Talamanca) or the impact of tourism (for example, in Uvita, on the Osa Peninsula).

Figure 4 shows how the distribution of contracts varied with land values. As might be expected, we find that more PES contracts were awarded in districts with low land values. More than forty percent of contracts were received in districts with average land values of less than US$2/m², and less than ten percent in districts with average values of more than US$15/m².

The analysis also shows a strong positive correlation between land values and the IDS. From the social point of view this is good news, as it means that a majority of contracts are found in areas with lower levels of social development. This situation could be the result of lower IDS areas having lower opportunity costs, thus making PES participation more attractive. It may also be due to FONAFIFO’s adding areas with low IDS to priority areas in 2003.

Within districts, it is likely that more isolated areas further from urban centers have lower opportunity costs and higher participation rates. As isolation is correlated with higher poverty, this may also imply a greater share of poorer participants.

The land use restrictions that participants must accept when they enter into PSA contracts also affect the desirability of participation. For example, under forest protection contracts cattle are prohibited from entering enrolled areas, even for purposes such as shelter during rainstorms. Miranda and others (2003) find that this discourages many farmers from entering the program. Muñoz (2004) reports that farmers feel restricted by their inability to use fallen timber in their land under

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7 Information was obtained mainly from www.clasificados.co.cr and www.economicos.com, as well as from several independent real estate websites for Costa Rica in April 2007, focusing on properties advertised as being for sale for agricultural use (as opposed to residential or commercial use). We decided not to use the information on property value available from the Land Registry because many properties are undervalued for tax purposes.
protection. How strictly these restrictions are applied in practice is difficult to establish, however.\textsuperscript{8}

![Figure 4: Distribution of active PSA contracts by average value of land and IDS, 2007](image)

\textit{Sources:} Contract data from FONAFIFO; Value of land estimated from real estate websites; IDS data from ENAC.

\textbf{6. Are the poor able to participate?}

Farmers may be eligible and willing to participate in the PSA program, and yet unable to do so because of various obstacles. While it is true that potential obstacles do not necessarily mean actual obstacles, the following discussion focuses on the main limitations highlighted by existing literature. Among these, technical complexity is unlikely to be an obstacle in the case of the PSA Program, as the vast majority of contracts simply call for retaining existing forest.\textsuperscript{9} Likewise, lack of credit is unlikely to be an obstacle for the same reason.

\textit{Property size}

As noted earlier, the minimum areas for contracts are 1 ha for reforestation contracts and 2 ha for conservation contracts. In practice, however, the majority of contracts are located on medium to large farms, with 30 to 300 ha (see Figure 1).

Zbinden and Lee (2005) found that PSA participants in the Northern region had considerably larger farms than non-participants. A farmer with 10 additional hectares of land is 27 percent more likely to enter the program. Similarly, Miranda and others (2003) found that farmers in the Virilla Watershed with larger properties were more likely to enter the PSA Program than those with smaller farms, as did Hope and others (2005) in the Monteverde area.

\textsuperscript{8} These restrictions are enforced by the Ministry of Environment through the legal framework: laws, regulations, executive normative, etc, which includes wood confiscation and monetary penalties to infringe.

\textsuperscript{9} For an example of a PES program that requires participants to adopt technically complex practices, see Pagiola and others (2008).


**Transaction costs**

Pagiola and others (2008) argue that high transaction costs may be the greatest obstacle to higher participation by the poor in PES programs. There are two main types of transaction costs involved in PSA contracts: (a) the costs borne by FONAFIFO or other actors in the program, which may discourage them from enrolling smaller holdings; and (b) those borne by the applicants, which may dissuade them from participating.

The overall cost for managing the PSA Program is roughly 7 percent of the total annual budget. This includes the cost of reviewing and checking each application, disbursing payments, and other administrative expenses. This cost is covered by the institution and does not fall on participants. There are other intermediate institutions providing services to the participants. Although these institutions charge a percentage of the payment (up to 18 percent), some NGOs like FUNDECOR or CODEFORSA help smaller farmers by cross-subsidizing their applications with profits from larger applications. CODEFORSA, for example, usually makes a loss when dealing with small farmers while making a profit, or at least breaking-even with larger farmers (J. Méndez, pers. comm., 2006). In both cases, for FONAFIFO and intermediate groups, there is an incentive to focus on larger landowners.

Applicants also face a series of transaction costs. At first, applications could only be made directly to FONAFIFO’s central office, and had to fulfill 11 requirements (such as a certified cadastral plan, ownership, technical studies with GPS coordinates, and a contract with forest engineer), many of which had to be obtained through multiple visits to different institutions. Although there have been efforts to streamline procedures, they remain relatively onerous. Regional offices have been opened in Limón, Guápiles, Sarapiquí, San Carlos, Palmar Norte, Nicoya, Cañas, and San José. This has facilitated access, but small farmers located in remote areas with limited road access may still face problems, and travel expenses could become prohibitive, especially if several visits are required. Applications must also have a technical study, prepared by an authorized forestry engineer (‘regente’). These highly detailed studies indicate the area under forest or to be reforested, and the areas that require payments. The average cost of preparing a technical study and management plans is more or less fixed, and does not vary significantly with property size. This actively discourages intermediaries in targeting small properties, as larger properties provide greater economies of scale. Ortiz and others (2003) suggest that farmers prefer to enter into protection contracts because the management plans are simpler and less expensive. Preparing an application, entering into a contract and managing a PSA project requires especial skills that less educated and usually poorer farmers do not have (Zbinden and Lee, 2005). In some cases, regentes prepare do all the paperwork and assist the farmer in exchange for a fee (up to 18 per cent of the payment).

In an effort to overcome the obstacles created by high transaction costs in small properties, FONAFIFO developed a system of collective contracts (‘contratos globales’). In this modality, an intermediary organization (such as FUNDECOR) provided technical assistance to a group of small farmers and submitted a joint
application to the PSA program. Based on experience, the approach has been revised so that applications for each group member are submitted individually to FONAFIFO, to prevent the whole group from being affected if one farmer breaks his or her contract (Pagiola, 2008).

Local Agricultural Associations (Centros Agrícolas Cantonales) have been the main groups promoting collective contracts. However, many of these groups face financial and managerial difficulties. FONAFIFO’s proceedings manual specifies that organizations applying must have an “adequate organizational structure”, but it is not clear how this is to be evaluated or monitored. Small organizations with few resources can be heavily affected by these regulations, which direct that they must have an accountant, manager, forest engineer, and available vehicles (Gutierrez, 2001). Overall, the number of collective contracts has been declining in favor of individual contracts (Ortiz, 2004).

FONAFIFO regularly revises its application policy. This provides a useful opportunity to incorporate ongoing lessons into the management of the program. However, the changing rules of the game can result in uncertainty and losses of hard won credibility, especially in remote places where information flows are constrained and MINAE or FONAFIFO have little presence (Miranda and others, 2003, Muñoz, 2004; Hope and others, 2005). A more active presence of these institutions would facilitate information, and may help reduce the need for intermediation charges, which would result in more money reaching the farmer.

**Agroforestry contracts**

The introduction of an agroforestry contract, in 2003, was explicitly intended to provide a modality that would be easier for small landholders to adopt. The contract pays landholders who adopt agroforestry practices on a per tree basis, thus making participation possible even for farmers with very small holdings, and without requiring land to be taken out of production. Moreover, payments are frontloaded, with 65 percent of the payment being made in the first year, thus helping to offset the initial investments needed.

At present, agroforestry contracts represent only 9 percent of all active contracts. About 70 percent of all agroforestry contracts are found in only seven cantones, all of them with strong agricultural links (see Table 4). The majority of agroforestry contracts are found in Perez Zeledón (108 contracts, representing 35 percent of all contracts in the area). Farm sizes in agroforestry contracts are definitely smaller than for conservation or reforestation contracts. The average farm size is 23 hectares, with a majority allocating a smaller area to agroforestry activities, compared to an average of 100 hectares allocated to conservation or reforestation. Only 7 percent of agroforestry contracts are on farms of 300 ha or more. Most (70 percent) are on farms with less than 10 ha, and 75 percent of properties of less than

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10 FONAFIFO publishes a Manual in the official Gazette every year, indicating priority areas, requirements, and other procedures (FONAFIFO, 2007).

11 These values do not include average farm size for Buenos Aires, where some farms belong to indigenous territories and are particularly large.
two hectares are contracts for agroforestry projects. However, the majority of agroforestry contracts are found in areas with medium IDS levels (with the exception of Buenos Aires).

Table 4: Main areas with agroforestry contracts

<table>
<thead>
<tr>
<th>Province</th>
<th>Canton</th>
<th>PSA contracts</th>
<th>Average farm size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Agroforestry</td>
</tr>
<tr>
<td>Alajuela</td>
<td>San Carlos</td>
<td>715</td>
<td>34</td>
</tr>
<tr>
<td>Limón</td>
<td>Pococi</td>
<td>250</td>
<td>58</td>
</tr>
<tr>
<td>Puntarenas</td>
<td>Buenos Aires</td>
<td>125</td>
<td>35</td>
</tr>
<tr>
<td>San José</td>
<td>Dota</td>
<td>99</td>
<td>42</td>
</tr>
<tr>
<td>San José</td>
<td>Puriscal</td>
<td>92</td>
<td>43</td>
</tr>
<tr>
<td>San José</td>
<td>Tarrazú</td>
<td>49</td>
<td>30</td>
</tr>
<tr>
<td>San José</td>
<td>Perez Zeledón</td>
<td>307</td>
<td>108</td>
</tr>
</tbody>
</table>

Note: a. Includes a few very large farms located in indigenous territories

Source: FONAFIFO data.

7. Impact of payments on the poor

The primary impact of the PSA Program will clearly be on participants. In addition, there may also be indirect impact on non-participants (Pagiola and others, 2005).

Impact on participants

For participants, the primary impact will likely arise from the payments they receive, net of the costs they bear (including transaction costs, the opportunity cost of foregone land uses, and out-of-pocket costs).

The relationship of payments to total household income is difficult to establish without specific data. Miranda and others (2003) found that the average impact for participants in the Virilla watershed was small, partly because the areas receiving payments are small, but also because many participating landowners are wealthy and derive their incomes from other (non-farm) sources.

In remote areas, where economic alternatives are few (especially legal activities), the impact of the payments on household income is stronger. The PSA program can be very important for the livelihoods of vulnerable farmers living in isolated rural landscapes, such as the Osa Peninsula, helping them in their short-term survival although not necessarily lifting them out of poverty (Muñoz, 2004). PES is the main source of income for 44 percent of participants in a survey in the Osa Peninsula conducted by Muñoz (2004). However, as Sierra and Russman (2006) point, many participants tend to use the PES money for immediate consumption or for engaging in other (usually urban) activities, rather than investing in the farm or abandoned lands, therefore limiting the potential impact on vulnerability over the long term.
In addition to payments, the PSA Program can also have other impacts. Invasion of seemingly abandoned lands is one of the legacies of Costa Rica’s colonization. For many years, people could claim ownership of empty lands if improvements were demonstrated. Empty lands were usually forests, and ‘improvements’ usually meant their removal. Although the law has been eliminated, it remained a hidden ‘perceived’ threat to tenure if it was left as forests. By taking part of the PSA program, which is a direct contract with the State, farmers have reported increased land tenure security (Miranda and others, 2003).

**Impact on non-participants**

There is a danger that because most of the funds going to forest protection, other productive activities that require labor are reduced (Hope and others, 2005; Pagiola and others, 2005). The overall impact of the PSA in terms of labor in other areas is limited (Ortiz and others, 2003; Miranda and others, 2004). In most cases, farmers may contract some type of off-farm labor, usually temporary (for example, for maintenance of fences and trails). In a study of reforestation in the northern region, Miranda and others (2004) found that the PSA Program does not result in increased demand for labor, as most of the additional work required is usually undertaken with family labor. In general, farms in the PSA Program use considerably less labor than those not taking part, especially because protection is the main activity. Zbinden and Lee (2005) report that non-participants have more on-farm family labor, which suggest higher participation in more profitable agricultural activities.12

The PES program has had, on the whole, a modest indirect positive impact on job creation in the country, especially in the form of forestry engineers, program administrators and technical supervisors (Miranda and others, 2003). However, such opportunities are unlikely to benefit the poorest groups in the country, who lack access to technical and specialized education.

8. Summary

An important constraint in improving the PSA Program’s impact on the poor is that there is a trade-off between this objective and that of improving the program’s efficiency. Many remote areas with low levels of social development could definitely benefit from payments, but these may not be the most important areas for service provision. Moreover, the large number of applications, even at the previous payment level of about US$40/ha/year, suggests that the Program’s financial efficiency could be improved by lowering payment levels: lower payments would still result in substantial forest protection, but would reduce the program’s impact on individual participants.

The analysis of social impacts presented in this paper is hampered by significant information gaps. The data collected by FONAFIFO does not have any useful information on the participants’ economic or social background. This

12 See also Sills and others (2008) on land use impacts, and Ross and others (2007) on general equilibrium impacts.
information can only be obtained through direct fieldwork, using personal interviews or focus groups. Available studies on social impacts were carried out during the first half of the program (around 2002-03), so little is known about the impacts of more recent measures taken by FONAFIFO to encourage participation of the poor. In addition, many of these studies concentrate on participants, and little is known about those farmers who do not participate, seriously limiting the ability to create a baseline to compare the impacts of the Program. No record exist on rejected applications, which also limits the understanding on what are the most common obstacles, and who is more likely to face them.

Bearing these caveats in mind, we believe that the available evidence suggests that, despite not having poverty alleviation as its main objective, the PSA Program has probably managed to have an impact on the poor. This impact is almost certainly positive on the poor who were able to participate. The magnitude of this impact is difficult to quantify at this point. Current estimates of the impact vary significantly, but methodologies are mostly non-comparable and significant information gaps exist. However, except for very few cases, it seems unlikely that the PSA was able to actually lift participants out of poverty.

Participation of the poor was low during the early days of the PSA program. This is likely to be changing as new measures are introduced to target the poor and facilitate their participation, though the effectiveness of these measures is so far unknown, partly because they are still recent, but also because there are no studies with comparable methodologies across the country.

Further improvements to the PSA Program could improve participation by the poor. The program and its requirements remain obscure in remote areas where farmers have little access to information. Targeting outreach and promotional campaigns could tackle this problem. Capacity building on environmental projects alongside the payments could help farmers maximize the potential benefits of the program and stretch the benefits beyond the flow of cash payments. Improving the impact of the program on the poor will depend largely on the creation and strengthening of strategic alliances with other specialized institutions at the local, national, and international levels. Participation by the poor seems to be much higher in areas with strong local organizations that mediate the application process and help to organize small farmers, like Huetar Norte. These activities can be costly, however, and funding is limited.

Finally, at the risk of repeating an old tune, more research is vital at this stage of reaching the first ten years of the PSA Program. A longitudinal analysis of the evolution of the PSA is necessary to understand how the different milestones of the program have affected participation. Also, a large-scale study involving personal interviews in different parts of the country is required, where the same methodology is used to allow for comparisons. An immediate step to deal with information gaps can be taken almost immediately by FONAFIFO, by including a series of socio-economic questions in the contracts database.
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