

Payments for Environmental Services and the Global Environment Facility

A STAP guideline document

This STAP guideline document provides guidance to the GEF Council, Secretariat, Evaluation Office, and implementing agencies on the development and evaluation of GEF investments in Payments for Environmental Services (PES) programs. The document comprises two reports: (1) a ten-page guidance paper that focuses on entry points for the GEF in PES financing and the key issues to consider in the design and selection of PES programs; and (2) a two-page summary paper of the evidence for PES effectiveness (with an accompanying on-line bibliography).

The first paper confirms that the financing of PES initiatives is consistent with the GEF's mandate to increase the supply of global environmental benefits. It notes, however, that the GEF is missing important opportunities in PES financing. The paper encourages the GEF to consider longer-term funding of PES payments ("If not the GEF, then whom?") and to reconsider the assumed causal mechanisms underlying its short-term funding. The paper notes that there are essentially three points of entry for GEF funding in PES programs and encourages each GEF proposal to clearly indicate which of the three points is being proposed and why. It also notes that benefit valuation exercises are neither critical nor desirable, but contract design issues (including the way in which the payments are set) are absolutely critical. STAP notes that the former are a component in most GEF PES proposals, and the latter are often absent or poorly addressed in GEF PES proposals. Finally, the paper highlights the difference between using PES as a financing tool and PES as a conservation investment, a distinction that is not well characterized in the GEF strategy and in GEF-funded PES initiatives. This paper was peer-reviewed by two external reviewers (anonymous to the authors).

The second paper highlights the barriers to PES effectiveness and how little is known about the effectiveness of current PES programs globally. Given the GEF is an important PES donor, the paper encourages the GEF to lead the effort to clarify the impact of PES and the conditions under which they work best. To do so will require small, but important, changes in the design of GEF-financed PES programs, which the paper describes. The STAP is ready to advise project proponents in incorporating these changes into the project designs. Finally, the paper encourages every GEF PES project to specify indicators that will permit one to evaluate the importance of the four main threats to PES effectiveness: (1) non-compliance; (2) poor administrative selection; (3) spatial demand spillovers; and (4) adverse self-selection.

Questions or comments related to the guideline document can be addressed to STAP member Paul Ferraro (pferraro@gsu.edu; 1-404-413-0201).

Payments for Environmental Service: Guidance Paper for the Scientific and Technical Advisory Panel (STAP)

By Sven Wunder¹ and Sheila Wertz-Kanounnikoff²

Summary of Policy Guidance

- Payments for Environmental Services (PES) represent a new paradigm of ‘conditional conservation’ that promises to be more efficient and equitable, and which can also help raise additional environmental funding. As such, PES are of interest to GEF’s mandate and the new Biodiversity Framework Strategy for GEF-4. In this paper, we provide a strategic analysis of scientific and global funding issues to guide GEF on how to use PES to effectively deliver global environmental benefits (GEBs).
- We define PES as voluntary, contingent transactions over a well-defined environmental service (ES). PES are best suited for promoting conservation on private lands, but can under certain conditions also be applied to public lands. Both user-financed and government-financed PES exist and there are options for GEF to invest in both.
- The GEF’s current focus is to fund short-term, start-up costs of PES interventions. However, most biodiversity degradation worldwide is due to permanent market failures that undervalue GEBs. Conservation faces ongoing opportunity costs and there are no quick fixes to make conservation privately more profitable than alternative GEBs-degrading land uses. Thus payments need to come from external sources like the GEF and need to be long-term. Only in exceptional cases, such as when high fixed start-up costs are key barriers to PES development, will short-term enabling investments effectively reverse degradation pressures.
- Among GEF’s mandate to deliver GEBs, funding for climate-change mitigation such as reduced emissions from deforestation and degradation (REDD) will become abundant, while funding for global biodiversity conservation will likely remain glaringly scarce. Most donors are reluctant to make direct, contingent, long-term payments for biodiversity conservation. The GEF is one of the very few windows for international biodiversity payments to procure GEBs. We thus recommend that the GEF should not be used just to fund capacity building and feasibility studies, but also to fund payments for environmental services. There are thus three potential points of entry:
 1. *Set up and pilot direct payments:* GEF should fund direct payments: a) in special cases when short-run payments are likely to shift land use, b) when tests of payment effectiveness can persuade pre-identified long-term ES buyers, or c) when long-term payments through trust funds are the most promising way to secure valuable biodiversity.
 2. *Co-finance multiple-service strategies:* GEF should continue to support government-financed multi-service PES, but try to leverage what emerges as ‘best PES practice’. Co-financing start-up costs in user-financed PES (piggy-backing) can deliver GEBs synergies, but combining this with explicit payments for GEBs to complement other flows of environmental service payments (layering) will yield better outcomes. Leveraging biodiversity considerations in REDD design will be particularly important.
 3. *Financing PES start-up costs:* GEF will sometimes have a rationale for subsidizing high PES start-up costs, but will need to carefully scrutinize the feasibility of PES proposals (in particular who will make recurrent payments), and assess if the start-up costs are truly the only binding constraint on project implementation.

Any GEF PES proposal should clearly indicate which of these three points of entry is being proposed and why.

¹ Center for International Forestry Research (CIFOR), Belém, Brazil; s.wunder@cgiar.org.

² Institut du Développement Durable et des Relations Internationales (IDDRI), Paris, France ; sheila.wertz@iddri.org.

I. Background

1. The purpose of this paper is to provide the GEF strategic advice on payments for environmental services (PES). Specifically, we: (i) assess which GEF investments in PES are most likely to generate global environmental benefits (GEBs), and (ii) outline the implicit assumptions in each of these main “entry points” for GEF investments. Our assessment and advice are based upon a literature review and own international PES expertise, including vis-à-vis GEF’s mandate.³

2. PES represent a new paradigm of ‘conditional conservation.’ They can also raise additional funds for securing local and global environmental benefits. PES belong to the larger generic family of conditional cash transfers, which are generating encouraging results in other sectors, such as education or post-war resettlement. PES initiatives explicitly compensate rural land stewards for the losses that set-aside conservation and sustainable land use may impose upon them. Thus, although the evidence of their social impacts to date is limited, PES may be a conservation model that is more likely to alleviate poverty than most traditional GEF projects. While a few PES programs have existed for a couple of decades, most are recent, and as yet little scrutinized in terms of environmental and socioeconomic impacts. Preliminary empirical evidence suggests mixed success, with failures likely associated with shortcomings in early-stage design and implementation – especially in large-scale public schemes – rather than in the underlying PES concept.⁴ More generalized lessons about PES design and implementation are beginning to emerge.⁵

3. PES are relevant to the strategic programs of the GEF-4 Biodiversity Focal Area Strategy: (1) Strategic Program 1 (“Sustainable Financing of Protected Area Systems at the National Level) of Strategic Objective 1 (“To Catalyze Sustainability of Protected Area Systems”); and (2) Strategic Program 5 (“Fostering Markets for Biodiversity Goods and Services”) of Strategic Objective 2 (“To Mainstream Biodiversity in Production Landscapes/Seascapes and Sectors”).⁶ PES are also relevant to the Climate Change and Land Degradation focal areas, as well as the Sustainable Forest Management (SFM) program and the new *Tropical Forest Account for World’s last great tropical forests*, launched at the UNFCCC COP-13 in Bali 2007, to cost-effectively stop deforestation in 17 tropical, highly-forest countries.⁷

4. PES investments by the GEF are currently constrained by (i) a small budget, (ii) short-term planning horizons (five-year replenishment and project cycle), (iii) a resource allocation framework defining where, for what and how much money can be invested, and (iv) a culture of acting as a traditional project-supporting donor rather than as a procurer of global public goods. While some of these are inescapable GEF framework conditions, others mainly represent inertia of institutional thinking that we will scrutinize critically in the following text.

³ See R.Nasi, J.J.Campos and S.Wunder 2002. “Forest ecosystem services – can they pay our way out of deforestation?”, Paper prepared for GEF-UNFF II (New York), Forest Roundtable, 11 March,

⁴ Efficiency seems to differ according to the scale of the PES program. Some small, user-financed schemes appear to be quite efficient in influencing land use and environmental service delivery. For instance, see two decentralized schemes in Ecuador (Wunder S. and M. Alban, 2008, “Decentralized payments for environmental services: The cases of Pinampiro and PROFAFOR in Ecuador”, *Ecological Economics* 65: 685-698) and the case of Vittel’s watershed-scheme in France (Perrot-Maitre D., 2006, “The Vittel payments for ecosystem services: a “perfect” PES case?” IIED and DFID, www.iied.org/NR/forestry/documents/Vittelpaymentsforecosystemservices.pdf). Correspondingly, recent empirical evidence suggests that some national-level schemes such as in Costa Rica (e.g. J Robalino, A Pfaff, GA Sánchez-Azofeifa 2007 “Deforestation impacts of environmental services payments: Costa Rica’s PSA program 2000-2005”, Sierra, R and E. Russman 2006 “On the efficiency of environmental service payments: A forest conservation assessment in the Osa Peninsula, Costa Rica”, *Ecological Economics* 59: 131-141) or Mexico (e.g. Muñoz-Piña C., Guevara A., Torres J.M. and J. Braña, 2008, “Paying for the hydrological services of Mexico’s forests: analysis, negotiations and results, *Ecological Economics* 65: 725-736) are insufficiently targeted in their design to consistently achieve the desired incremental land-use effects on a significant scale.

⁵ See Special Issue of *Ecological Economics*, vol.13, no.3, April 2008 – including the summary article (Wunder et al. 2008).

⁶ GEF, 2007, Focal Area Strategies and Strategic Programming for GEF-4, June 2007.

⁷ See www.gefweb.org/interior.aspx?id=20130.

5. In their review of GEF-supported PES programs, Gutman and Davidson (2007) *inter alia* recommended that the GEF: (i) restrain from being the principal buyer of environmental services (ES), due to post-project payment disruptions; (ii) enhance private-sector participation in PES, especially ES buyers; (iii) upscale PES schemes to increase country-wide impacts, (iv) expand PES investments beyond Latin America, (v) mainstream biodiversity into production landscapes through certification, “greening” of agricultural subsidies, financing both land/landscape restoration and financing activity-reducing conservation, and (vi) combine PES biodiversity goals with other internationally agreed objectives (e.g. Millennium Development Goals, climate-change mitigation, etc.).⁸ We will return to these recommendations below.

II. PES definition

6. The operational guidelines of the GEF contain no clear definition of PES. In their review of GEF’s PES portfolio, Gutman and Davidson (2007:6) stress that “neither the GEF nor its implementing agencies [...have] guidelines stating when a project should be considered a PES project”. Such a definitional vacuum runs the risk of generating considerable conceptual confusion. Since PES is currently fashionable among international donors, proponents have every incentive ‘to sell old wine on new bottles’, i.e. to declare any proposed economic incentive under the label of PES, in order to jump on the donor bandwagon. While academic definitional debates can be prolonged and enervating, the use of an explicit, simple, concise definition of PES in the context of GEF finance is therefore highly recommended.

7. We define PES as (i) voluntary, (ii) contingent transactions between (iii) at least one seller and (iv) one buyer (v) over a well-defined ES, or a land use likely to secure that service.⁹ This simple five-criteria definition, based on the theoretical PES literature¹⁰ can serve as a ‘lens’ or ‘template’ through which specific proposals are evaluated by the degree to which they adhere to a PES prototype or model. The core emphasis lies in criterion (ii): conditional, *quid pro quo* transactions where payments are made if and only if the agreed-upon ES are provided. While PES can also be about raising ES user payments for conservation (a feature that tends to make PES more efficient), spending revenues for directly ‘buying conservation’ is the most innovative feature of PES.

III. PES scope

8. Both user-financed and government-financed PES exist, and GEF has invested in both types. The former are typically smaller (e.g. at the watershed scale), more focused in their interventions (e.g. target zones and differential PES rates), more conditional, and thus ultimately more efficient in delivering ES. Government-financed PES (e.g. the Costa Rican PSA or the Mexican PSAH programs) overall tend to be more diffuse (less targeted, uniform payments, sometimes slack monitoring and sanction systems), and are often hijacked by other political agendas (e.g. poverty alleviation, electoral support, or regional development). This typically makes the latter less efficient in achieving environmental targets. However, government-financed PES operate at larger scales and are often the only mechanism for financing environmental outcomes whose values are diffusely spread across large numbers of people (e.g., biodiversity conservation, endangered species).

⁸ See Gutman P. and S. Davidson, 2007, “The Global Environmental Facility and Payments for Ecosystem Services - A review of current initiatives and recommendations for future PES support by GEF and FAO programs”, UN Food and Agricultural Organization - FAO, *PESAL Papers Series* No. 1, Rome.

⁹ See Wunder S., 2007, “The efficiency of payments for environmental services in tropical conservation”, *Conservation Biology* 21(1): 48-58.

¹⁰ See notably Simpson R. and R.A. Sedjo, 1996, “Paying for the conservation of endangered ecosystems: a comparison of direct and indirect approaches”, *Environment and Development Economics* 1: 241-257; Ferraro P.J. and R. Simpson, 2002, “The cost-effectiveness of conservation payments”, *Land Economics* 78(3):339-252; Ferraro P.J. and A. Kiss, 2002, “Direct payments to conserve biodiversity”, *Science* 29:1718-1719.

Moreover, they can be cost-effective due to administrative economies of scale and can be made more efficient through improvements in targeting rules and contract designs.

9. Using PES in a government-managed protected area (PA) context could be appropriate in certain conditions, but special care is needed. In private, community and indigenous reserves, land-use choices are typically legally less constrained, so PES can be applied in order to affect voluntary resource-management choices. Public protected areas, however, are predominantly already under stricter legal protection, which in principle renders PES obsolete. Payments in public PAs could be appropriate in the following special cases: (a) in ‘sustainable-use’ PAs where a range of legal or tolerated land-use options exist (pilot PES do exist in such settings)¹¹; (b) when PAs have been declared ‘on top of’ previous private or communal landholdings, or (c) when the command-and-control potential *de facto* is near zero (“paper parks”). However, even under these circumstances perverse incentives from payments in a PA context can potentially arise. For instance, the action of paying illegal squatters not to deforest can create both a fairness dilemma (angering those already abiding the law), perverse reward claims (inducing the expectation that any avoided illegal activity merits compensation) and demographic ‘magnet’ effects (payments attract still more squatters). Using PES as a mean to raise new revenues for PA management may be an option, but it falls short of the original PES idea of compensating service providers who bear the costs of conservation. While command-and-control tools and PES can in many cases be favorably combined (as they have been in GEF-supported PES programs),¹² the use of PES in PAs needs thorough consideration and particularly careful design.

10. One PES context in which PAs are likely to play a role is in international PES systems, such as a REDD compensation system in which carbon buyers remunerate nation states conditionally for reducing deforestation rates below a historical baseline. Recipient nations may pass on part of the REDD receipts to landowners through on-the-ground PES schemes, but another part may be used to finance improved command-and-control systems, including improved PA management.

11. PES are particularly well-suited to address hard trade-offs between conservation and development. Most biodiversity degradation worldwide is linked to permanent externalities, i.e. to persistent market failures undervaluing GEBs. At both local and national levels, quick fixes rarely can make conservation privately more profitable than alternative GEBs-degrading land uses.¹³ The implicit win-win assumption behind GEF’s “*incremental cost*” philosophy to biodiversity conservation thus rests on shaky ground: in-country GEF project proponents tend to use pre-existing (non-additional) resources as fictitious counterpart funds, and national development policies dominated by economic line ministries and business interests pursue actions that conflict with GEF’s GEBs objectives. These actions undermine the efficiency of GEF interventions. Countries will thus often accept low payments for non-additional actions covered up as GEBs. GEF finance may often have to be more substantial to become effective. This somewhat pessimistic diagnosis has two implications.

12. First, payments for the conservation of GEBs will almost always (and fully) need to come from external sources, especially in the poorest countries where GEBs-led conservation tends to produce low synergies with national development priorities. Second, the time scale for GEBs payments will need to be long-term. The main problem conservation faces globally is its ongoing opportunity costs. Only in exceptional cases, such as when high fixed start-up costs are key barriers to PES development, will short-term enabling investments effectively reverse degradation pressures. In

¹¹ An example is the new *Bolsa Floresta* program in Amazonas state (Brazil) where residents of protected areas are paid conditionally to keep deforestation minimal.

¹² For instance, in Costa Rica’s PSA program, conservation-enrolled landholders are paid on the condition of not deforesting, in spite of the fact that deforestation is also legally prohibited.

¹³ This is in particular true for ‘activity-restricting’ conservation of natural ecosystems. In contrast, in the case of ‘activity-promoting’ interventions of environmental restoration in already degraded areas, more win-win synergies between conservation and economic development can typically be found (see e.g. McNeely and Scherr, 2003 *Ecoagriculture: Strategies to feed the world and save wild biodiversity*, Washington DC: Island Press).

fact, most proposals that promise to ‘solve the conservation problem’ within a five-year project horizon may sound attractive on paper, but rest on wishful thinking and will eventually fail.

13. Funding for climate-change mitigation through REDD will probably become abundant, following the recent UNFCCC endorsement of REDD in Bali. Conversely, funding for global biodiversity conservation will likely remain glaringly scarce because, among other reasons, bilateral donors will increasingly prioritize climate-change mitigation and adaptation. In turn, there seems little need for the GEF to provide PES start-up or running support for climate change mitigation, other than as a collateral benefit. Biodiversity funding from bilateral and multilateral sources has already declined sharply in recent years – much more so than the simultaneous expansion in corporate funding.¹⁴

14. GEF represents one of the very few windows for international biodiversity payments. Many bilateral donors finance capacity building, but almost none pay for direct PES. Most donors are reluctant to make direct, contingent, ‘business-like’ long-term payments for biodiversity conservation, in part due to their short time horizon¹⁵, but such payments are critical for long-term supply of GEBs. More fundamentally, most biodiversity benefits are being provided as global non-excludable benefits, thus representing strong intrinsic motives for free-riding and underpayment. GEF should recognize its important niche role in procuring GEBs, and redistribute some of the eggs it has put in the ‘enabling project’ basket. The current GEF structure (with a five-year replenishment and project cycle) is ill-g geared for long-term payments, but trust funds can, and have, been created. Even in the absence of trust funds, portfolio diversification options exist (see below) and GEF implementing agencies (UNEP, UNDP, World Bank) can complement capacities to engage in each of the entry points identified.

15. Current GEF projects linked to PES are concentrated in Latin America and forest ecosystems. A more balanced geographical portfolio could consider PES investments in other regions of the world (Africa, Asia). Although some countries may be perceived high risk investment countries due to governance shortcomings, we argue that PES can function in low-governance contexts provided de-facto property rights are clear and an agreement can be reached between service providers and service beneficiaries (see also the aforementioned case for PES investments in government-managed protected areas). PES has even the potential to improve governance structures through for example emerging demands for land title clarifications, negotiation processes, and effective monitoring and control institutions.¹⁶ A more balanced ecosystem portfolio is justified not only by the global importance of biodiversity from other ecosystems (wetlands, marine environments), but also for strategic reasons as most existing PES schemes in developing countries focus on forests. Similar to REDD investments (see below), the GEF could introduce biodiversity considerations in the design of PES schemes that cater to other environmental services, notably water services.

IV. Set up and finance direct payments for GEBs

16. In its constraints to set up and fund direct payments, the GEF is not fundamentally different from bilateral donors: the budget for PES type of investments is small, time horizons are restricted by five-year project cycles, and the institutional culture is project-oriented. There are possibilities to partly overcome these constraints (see below). In the medium run, it is important for the GEF to

¹⁴ See Molnar, A., S. Scherr, and A. Khare. 2003. *Who conserves the world's forests? A new assessment of conservation and investment trends*. Ecoagriculture Partners, Washington, D.C., USA.

¹⁵ For an Indonesia-specific analysis of in-vain efforts to find donors for a proposed biodiversity PES scheme, see S. Wunder, B. Campbell, P.H.G. Frost, R. Iwan, J.A. Sayer & L. Wollenberg 2008b. “When donors get cold feet: The community conservation concession in Setulang (Kalimantan, Indonesia) that never happened”, *Ecology and Society*, 13(1): 12; URL: <http://www.ecologyandsociety.org/vol13/iss1/art12/>

¹⁶ See Rosa H., S. Kandel and L. Dimas 2003. *Compensation for environmental services and rural communities* (pp. 78). PRISMA, San Salvador.

increasingly assume the responsibility to procure GEBs. Otherwise, GEF interventions will gradually become anachronistic vis-à-vis its GEBs mandate. While some environmental benefits can be secured through strategies of multiple ES financing (Section IV) and through investments in start-up costs (including investments in PES implementing institutions such as Costa Rica's FONAFIFO), picking these low-hanging fruits is bound to be insufficient: a lot of valuable biodiversity on private lands can only be conserved through continuous performance payments for biodiversity conservation. GEF is one of the few intergovernmental actors that would be suited to pick up this challenge.

17. Some of the larger players among the non-governmental international conservation organizations (the so-called BINGOs) have recognized this point. They are raising corporate funds to build biodiversity trust funds, the periodical financial return of which can pay for PES payments to landowners and other recurrent costs – in principle, forever.¹⁷ With the currently low real financial rates of return, a large frontloaded principal is needed to make this strategy work. The GEF could collaborate more with the BINGOs to achieve conservation objectives. However, in doing so, the GEF might also find a couple of constraints. On one hand, some of the GEF's donors are bound to be skeptical about (some of) the BINGOs for what they perceive as insufficiently people-oriented conservation strategies. Conversely, the fundraising machines of the BINGOs often target private or corporate biodiversity interests, where singular attribution becomes a key success factor, leading them to perhaps favor "go it alone" strategies over participation in large-scale consortia with the GEF and others. In any case, the GEF should seek more dialogue with the BINGOs to learn from their emerging hands-on experiences with biodiversity payments.¹⁸

18. Even with the aforementioned short-run framework conditions and constraints, the GEF can (and should) set up and finance short-term pilot payments in two special cases: (a) when fixed costs prevent landowners from changing towards ES-friendly land uses, and thus short-run payments assumedly suffice to catalyze the desired land use change (e.g. aforementioned GEF-funded RISEMP project in Nicaragua, Colombia and Costa Rica), and (b) when pre-identified ES users are seriously considering long-term payments, and could be persuaded by a demonstration of the effectiveness of payments in a pilot program.¹⁹ In both cases, teaming up with learning institutions (and building in proper evaluation components) is highly desirable to produce badly needed practical lessons on PES design. In the medium run, one of the objectives must also be 'to educate biodiversity donors' to try out new strategies. Well-documented pilots (such as RISEMP) can be a powerful tool in that respect.

V. Co-finance PES for multiple services

19. Conservation typically provides a series of simultaneous ES. Hence, securing payments for various ES from their respective beneficiaries (e.g. carbon buyers and water users) can help make conservation economically viable. Conceptually, three main variants of joint financing for multiple

¹⁷ Examples are Conservation International with their conservation concessions (now broadened to 'conservation incentive agreements' in the Conservation Stewardship Program), and the Global Conservation Fund (GCF), both providing continuous, conditional biodiversity payments.

¹⁸ Milne, S. and E. Niessen 2008 "Direct payments for biodiversity conservation in developing countries: insights from experience" submitted to *Oryx*, May.

¹⁹ As an applied example supported by CIFOR, the NGO Fundación Cordillera Tropical in Cuenca (S Ecuador) has come a long way in setting up a 'layered' watershed and biodiversity protection scheme in the lower Paute watershed. A dialogue with the main targeted buyer -- a large hydro-electrical producer -- is in an advanced stage. But neither this buyer nor other potential ES buyers have been willing so far to match significant institutional start-up costs with resources for pilot payments. Yet, without piloting the scheme, the PES cannot be well-designed. This is one practical example of where GEF provided pilot payments could make a huge difference – not only for the specific scheme, but by the power of example for the entire Andean region.

ES can be distinguished:²⁰ (i) *bundling* - the same single user buys multiple ES from the same plot (this is the case of most government-financed, but also some user-financed PES);²¹ (ii) *layering* - multiple buyers of separate ES jointly finance start-up and recurrent costs of ES provision from the same plot (e.g. the Noel Kempff project in Bolivia exploiting carbon-biodiversity synergies);²² (iii) *piggy-backing* - biodiversity investors co-finance PES start-up, but rely for subsequent recurrent payment costs on payment vehicles based on other ES.²³

20. Which of these options would be the most promising avenue for GEF financing? The *bundling* option is most relevant for investments in government-financed schemes. The GEF should continue to support government-financed PES, such as in Costa Rica and Mexico, including feeding resources into trust funds for long-term funding (thus circumventing its own limitations in terms of short payment horizons). Co-financing trust funds for improved biodiversity outcomes is indeed compatible with the current “incremental cost” approach of the GEF. The size of government-financed schemes provides an opportunity for larger impact scale and cost-efficiency, provided the design of the program is reasonably targeted.

21. However, while there is still an ongoing debate around the decade of experiences with the Costa Rican PSA, some evidence is emerging that this and other government-financed schemes are not as efficient as they could be in terms of providing additional environmental services. This is because those schemes, for learning motives as well as political reasons, have been quite far from what is now emerging as ‘best PES practice’: differentiated payments, spatial targeting, high conditionality, only limited side-objectives, etc. The GEF should thus not necessarily provide *en-bloc* unconditional support to these schemes, but take advantage of its financing weight and of recent research findings to tie its support to program reforms that would bring these schemes closer to what can be assumed to be ‘best practice’. The GEF should also consider spatial earmarking of funding to specific biodiversity priority areas under the umbrella of national programs (as has been done in Costa Rica).

22. *Layering* and *piggy-backing* options are typically more relevant for user-financed PES programs. Current limitations in GEF payment horizons would seem to favor piggy-backing over layering. Indeed, the GEF should continue to engage in co-financing privately-negotiated PES, such as for watershed protection (e.g. Espirito Santo project), to pool resources and yield GEBs outcomes by ‘piggy-backing’ on continuous domestic payment vehicles. However, in comparison to layered schemes, piggy-backing (point-wise, start-up) interventions are in general likely to produce inferior GEBs outcomes. ES users who are making recurrent payments will maintain leverage over conservation priorities only as long as they have the power to stop payments if they do not get conservation value for their money. Research indicates that, while conservation yields many ES, the spatial ‘hot spots’ and suggested priority interventions for maximizing service provisions can differ

²⁰ See Engel, S., Pagiola, S. and S. Wunder, 2008, Designing payments for environmental services in theory and practice: An overview of the issues, *Ecological Economics* 13(3); Wunder S. and S. Wertz-Kanounnikoff, in press, “Payments for ecosystem services: a new way of conserving biodiversity in forests”, *Journal for Sustainable Forestry*, accepted.

²¹ As for government-financed PES using ‘bundling’ strategies, the Costa Rican PSA e.g. remunerates landholders for the provision of four different services: carbon storage and sequestration, watershed protection, biodiversity conservation and the protection of landscape beauty. In the user-financed watershed PES scheme in Zapalinamé (Mexico), municipal water users have accepted to pay a premium for also protecting priority biodiversity areas (Wunder & Wertz-Kanounnikoff, in press, op.cit.). The strategy behind the World Bank’s BioCarbon Fund is to sell ‘golden carbon’ (climate-change mitigation combined with biodiversity co-benefits), but actual willingness to pay a premium has been disappointingly low (B. Bosquet, pers. comm., 2007).

²² Another functioning example of a layered PES scheme is the combined watershed and biodiversity protection scheme in Los Negros, also Bolivia (see N. Asquith, M.T. Vargas & S. Wunder 2008. “Selling two environmental services: In-kind payments for bird habitat and watershed protection in Los Negros, Bolivia”, *Ecological Economics*, (13:3).

²³ Many watershed schemes use piggybacking, and various BINGOs have created their own “environmental service programs” to employ these synergies. The Nature Conservancy (TNC) currently seeks to replicate the FONAG model being piloted in Quito (Ecuador), where water-user payments co-finance upstream protected area management. However, the FONAG case is a ‘supply-side PES’ only, because no conditional payments to landowners are made.

a lot.²⁴ As an ES buyer, you get what you pay for. Although piggy-backing saves on recurrent costs, the chosen areas, actions, and benefits may turn out to be only second- or third-best, compared to a layered scheme where the provision of GEBs was explicitly being paid for.

23. As the financial mechanism of the UNFCCC, the GEF may be expected to engage in REDD-related activities, which are an example of multiple-service co-financing. Because REDD payments aim to permit more cost-effective emissions reductions, substantial financial flows are expected to be mobilized for the protection of forest stocks in developing countries. Although relatively strong natural synergies exist between biodiversity and carbon-stock protection, the extent of these synergies depend on “where” and “how” REDD activities are conducted. GEF financing could leverage improved biodiversity outcomes via at least two approaches: (i) by directing some REDD investments to high-priority, high-threat biodiversity areas (biodiversity hotspots, ecological corridors, PA buffer zones); and (ii) by promoting biodiversity considerations in REDD design, e.g. in sustainable forest management plans to avoid edge effects or adverse production activities in ecologically sensitive areas. For instance, forest dwellers – even if compensated for not deforesting anymore – could turn to other income possibilities such as hunting bush meat or exploiting valuable plant species. While the overall natural forest cover (and carbon stocks) remains intact, biodiversity could be degrading. GEF financing should complement REDD finance to promote explicit biodiversity considerations in the design and implementation of REDD activities. In doing so, it could build upon existing experiences such as the Carbon Community for Biodiversity Standards (CCBS)²⁵.

24. Layered schemes to complement REDD finance will offer more leverage than piggy-backing schemes. The GEF could provide initial short-term payments (par. 18) or consider long-term payments via sustainable financing mechanisms (e.g. GEF-led trust funds). Short-term payments can piggy-back on carbon finance to direct REDD payments towards biodiversity objectives (e.g. in location choices or in sustainable land use planning), as pursued in the Ulu Masen Ecosystem project in Aceh, Indonesia.²⁶ Long-term payments can yield greater biodiversity outcomes by financing recurrent costs of securing biodiversity conservation. Long-term payments can be secured through endowment funds which are either set up by the GEF or which the GEF contributes to. Examples of biodiversity conservation services that require long-term funding include annual biodiversity monitoring, buffer zone management around animal habitats in logging concession areas, or forest rangers controlling for bush meat hunting and illegal extraction of fire wood and threatened species. While REDD monitoring and control can rely to a large extent on remote sensing technology, biodiversity conservation objectives require more costly field-based monitoring and control measures. One example of a layered PES scheme (REDD/biodiversity) is the Andasibe-Mantadia Biodiversity Corridor Project in Madagascar, where carbon emission reductions are purchased by the BioCarbon Fund whereas biodiversity interests are financed by the Third Environment Program of Madagascar, with the support from Conservation International.²⁷

²⁴ See Chan K.M.A., Shaw M.R., Cameron D.R., Underwood E.C., and Daily G.C. (2006) Conservation planning for ecosystem services. *PLoS Biology*, 4(11): e379. DOI: 10.1371/journal.pbio.0040379, or T.Wünscher, S.Engel & S.Wunder 2008. “Spatial targeting of payments for environmental services: a tool for boosting conservation benefits, *Ecological Economics* (13:3).

²⁵ These standards are elaborated by the Carbon Community for Biodiversity Alliance (CCBA) – see <http://www.climate-standards.org/>.

²⁶ See Aceh (The Provincial Government of Nanggroe Aceh Darussalam), Fauna & Flora International, and Carbon Conservation Pty. Ltd., 2007, “Reducing Carbon Emissions from Deforestation in the Ulu Masen Ecosystem, Aceh, Indonesia – A Triple Benefit Project Design Note for CCBA Audit”, project document, 2 November (www.climatestandards.org/projects/files/Ulu_Masen_CCBA_Project_Design_Nov1.pdf).

²⁷ BioCarbon Fund 2007 (<http://carbonfinance.org/docs/BioCFBooklet.pdf>).

VI. Reconsidering capacity-building investments for PES start-up

25. High human and institutional capacities can be key requirements for effective PES design and implementation. With the GEF's current focus on short-term investments, capacity building arguably comes out as the most-favored investment. However, a focus on capacity building is misguided: in its drive to provide project-supporting investments, the GEF risks financing a lot of consultants to design PES schemes that will never see the light of the day because key attributes – especially the identification of likely ES buyers -- are not present. Hence, capacity-building investments need to be realistic, strategic, and tailored to the specific case.

26. For example, economic valuation studies may be useful, especially for evaluating user-payment potential²⁸, but are not a precondition for PES implementation. In many cases, ES buyers and sellers will negotiate 'the right price' for a PES deal among themselves, without the need for economists to intervene. Among GEBs, for intangible benefits of biodiversity conservation (e.g. option and existence values), prices are lacking and underlying quantities (i.e. biophysical linkages) tend to be uncertain. Here, economic valuation cannot deliver reliable estimates. Often those ES that humanity 'values' most are also the hardest ones to express in monetary terms. In practice, whether government or user-financed, almost all PES rates are set according to (implicit or explicit) estimates of ES providers' conservation opportunity costs, rather than according to computed ES values. Based on contract theory from the economics literature, this emphasis on opportunity costs rather than service values is appropriate.²⁹ Thus calculating more sophisticated, spatially explicit estimates of opportunity costs, and combining these estimates with biophysical ES targets and threat estimates, represents a much higher PES research priority than attempting to place monetary values on ES. Similarly, including from the outset explicit evaluation criteria in PES design (e.g. through control groups, such as in GEF's RISEMP project)³⁰ are needed to enable GEF and other practitioners to solidly assess which design options for PES (and any other conservation interventions) are most efficient.³¹ Proper design for empirically testing effectiveness is thus much more fertile ground for informing Economic valuation seems to have passed a threshold of maturity where more of the same research seldom makes a real difference for decision making.

27. Specifically, the GEF should avoid making large capacity-building investments in broad-based actions (e.g., international conferences, training courses, global PES syntheses, institution-building exercises, scoping and valuation studies, etc.). Bilateral donors amply finance these needs already. Rather, the GEF should emphasize targeted investments that enable tangible PES proposals to overcome binding barriers at specific sites. These barriers may be economic (e.g. buyer identification), informational (e.g. scientific ES syntheses) or institutional (e.g. contract negotiation).³² The emerging empirical evidence indicates that PES start-up transaction costs could be relatively large in comparison to the annual operating transaction costs.³³

28. How can the GEF distinguish promising capacity-building investments from money thrown after hopeless PES cases? First, a basic assessment of the soundness of the PES case is needed, which will involve questions such as: Are the targeted service users credible as prospective buyers?

²⁸ See e.g. Lambert A. (2007) "Can payments for ecosystem services projects' help fight poverty and conserve biodiversity? Taking stock of the issue", Guidelines for development co-operation agencies (unpublished report).

²⁹ Ferraro P.J. (2008), "Asymmetric information and contract design for payments for environmental services, *Ecological Economics* 65: 811-22.

³⁰ See for example Pagiola S., Agostini P., Gobbi J., de Haan C., Ibrahim M., Murgueitio E., Ramírez E., Rosales M. and J.P. Ruíz, 2004, "Paying for biodiversity conservation services in agricultural landscapes", *Environment Department Paper 96*, Environmental Economics Series, World Bank, Washington D.C.

³¹ Ferraro, P., and Pattanayak, S., 2006. Money for nothing? A call for empirical evaluation of biodiversity conservation investments. *PLoS Biology*, 4(4):e105.

³² See Wunder S., 2008, "Under what conditions will payments for environmental services emerge and function?", paper presented at the workshop on Economics and Conservation in the Tropics: A Strategy Dialogue, San Francisco, 31 January – 1 February.

³³ See Wunder S., Engel S. and Pagiola S. (2008) Taking stock: a comparative analysis of payments for environmental services programs in developed and developing countries. *Ecological Economics*, 65, 834-52

Are they sufficiently organized internally to act together? Is their willingness to pay sufficient to pay for the ES providers' aggregate opportunity costs? Do the prospective ES providers effectively control access to the land and resources, or is tenure and access chaotic (overlapping land claims, frequent invasions, etc.), making land stewards unreliable service suppliers? Is there sufficient trust established between buyers and sellers – or if not, could this realistically be remedied in the short term? Can a reliable intermediary be identified to act as an honest broker between buyers and sellers? Has a proper land-use monitoring and sanctioning system been envisaged? To the extent that from the outset the majority of these questions are answered in the negative, it is probably not a PES proposal that is worthwhile to pursue.

29. Second, can the identified obstacles be realistically solved through investments? For instance, proper buyer-search processes make sense most of all for watershed PES, because convincing domestic buyers may be more time-consuming, and the biophysical science behind linking land-use changes to ES provision may need more careful scrutiny.³⁴ A recent Danida-financed watershed PES program, implemented by CARE, WWF and IIED, seems to have taken an appropriate approach: each case project was given a phase of 18 months for 'business-case preparation', after which only the convincing cases were prepared for full PES implementation.³⁵ GEF co-investments in watershed PES will make sense only when there is a significant synergy and spatial overlap between watershed and biodiversity conservation actions.

30. The frontloaded nature of most PES transaction costs provides a natural argument for targeted PES start-up subsidies, but the GEF should be careful to not slip into broad-based capacity building spending, and should carefully screen the realism of PES proposals. A desk appraisal of a short concept note may alone be insufficient to make that qualitative assessment. For instance, if the land-tenure scenario presents minor overlaps and ambiguities, GEF-financed negotiation processes might overcome that obstacle. But if potential ES providers are in open internal conflict, or if they are gradually being displaced by a sustained stream of immigrants, then the preconditions for PES simply cannot be met. If the basics are in order, GEF co-investments in rapid ES appraisals, contract negotiations, opportunity-costs studies, and monitoring and sanctioning system development are often justified. However, credible evidence is needed that these obstacles are indeed case-specific binding constraints that currently prevent PES development.

³⁴ In principle, this could apply to landscape-beauty services, too, but that market is generally much more restricted.

³⁵ For project details, see http://assets.panda.org/downloads/factsheet_pes_english.pdf

The State of the Evidence Base: Payments for Environmental Services³⁶

by Paul J. Ferraro, GEF-STAP

Summary. Payments for Environmental Services (PES) are increasingly popular because of their perceived simplicity and cost-effectiveness in comparison to alternative conservation interventions. They also are seen as a way to generate conservation financing from new sources. Theory, however, suggests that PES could generate few or no environmental benefits. Thus whether current PES initiatives are successful in delivering conservation outcomes cost-effectively is an empirical question. Unfortunately, the empirical evidence is weak, with few studies designed to identify the effects of PES, particularly in low and middle income nations. The few studies that exist show little or no environmental impact from PES. Published estimates of socioeconomic impact are non-existent. The weak evidence base implies that the GEF should ensure that agencies and partners are designing PES projects with the intention of evaluating their impacts on environmental and socioeconomic outcomes.

Theory. The theory of PES is simple: the quantity of biodiversity or environmental services supplied should increase if beneficiaries, or their representatives, pay for the cost of increasing the quantity supplied. This theory, however, is complicated by four potential threats to PES effectiveness: (1) non-compliance with contractual conditions; (2) poor administrative selection (i.e., contracts are offered to areas or individuals who are not in the best position to supply environmental services cost-effectively); (3) spatial demand spillovers (a.k.a., general equilibrium effects, or “leakage”) whereby protecting a resource in one location pushes pressure onto resources elsewhere;³⁷ and (4) adverse self-selection. The first three threats are common to most conservation interventions. Adverse self-selection, however, is unique to incentive programs and may constitute one of the largest threats to PES success. During any contract period, there are often people who would have supplied the contracted PES service or activity in the absence of a payment. This outcome is particularly likely in PES programs that pay individuals for not doing an activity, such as deforestation. People who would have engaged in the contracted activity without a payment are the most likely to participate in a PES program because they have the lowest opportunity costs. Differentiating these people from others whose behavior would be affected by PES is difficult because the actions someone would have taken in the absence of a payment is not known to the conservation payer. A poorly targeted PES program could thus end up paying largely for what would have happened anyway.

Empirical Analysis. This report focuses on analyses, qualitative or quantitative, that assess the degree to which changes in outcomes can be attributed to a PES program rather than to other factors. Such attribution requires knowing what outcomes would have looked like in the absence of the intervention. This counterfactual world can only be inferred indirectly through evaluation designs that control for confounding factors. The essence of counterfactual thinking is the elimination of plausible rival interpretations of observed outcomes. Many evaluations of PES programs simply characterize what can be observed (e.g., number of forested hectares under contract) without considering rival explanations for what can be observed. Below, only designs that explicitly examine and weigh alternative explanations are considered evidence. Only a few studies have such designs.³⁸

Evidence. Five studies examine Costa Rica’s PES program, which began in 1997. Each differs with respect to spatial and temporal scales and evaluation designs, but their conclusions are similar: three find no detectable changes in forest cover (Sanchez et al.; Pfaff et al.; Sierra and Russman) and two find small (<2% of forest area) changes (Robalino et al.; Sills et al. 2008). The absence of substantial effects on deforestation is partially due to poor administrative targeting and adverse self-selection. Sills et al. (1995) find that 51% of the contracted forests are on lands classified as low-value for agriculture, and another 20% are on lands with “strong limitation” for agriculture. Others find that participants are less likely to have grown crops before the program began, and more likely to live off-farm, to have off-farm income, to have more education, and to own larger farms with steeper slopes (Sills et al. 2008; Zbinden and Lee; Miranda et al.). These characteristics lower the risk of deforestation. A study in Mexico also finds that payments were concentrated on forests

³⁶ This report accompanies the Wunder and Wertz-Kanounnikoff (2008) PES Guidance Paper for STAP. The author thanks Juan Jose Miranda Montero for assistance in tracking down the relevant documents.

³⁷ Some PES programs pay for avoided ecosystem degradation or species abundance where degradation and species decline can be costly to reverse. Such programs may thus create an “option value” on resources not enrolled in the program. This value induces non-participants to protect their resources in order to preserve the option of receiving a payment in the future. Such a spillover extends the impact of a PES program, but can make evaluating the program more difficult.

³⁸ See <http://stapgef.unep.org/resources/sg/PES> for a full reference list of all studies reviewed for this document.

with low predicted risk of deforestation (Muñoz-Piña et al.). One study in Costa Rica (Sierra and Russman) finds suggestive evidence that PES may accelerate the exit from agriculture (and thus forest regrowth), but although this study uses non-participants as controls, it controls for only two observable differences between participants and non-participants that affect agricultural decisions. No published study conducts formal impact analysis on the socio-economic impacts of PES in a low or middle-income nation. In OECD nations, there is some evidence of positive environmental and socio-economic impacts from agri-environmental schemes that pay farmers to change land-use practices, but even here there are few quantitative evaluations (OECD; Sullivan et al.). Environmental impacts are more likely for these programs because they pay for activities that few landowners are currently doing, but adverse selection and poor administrative targeting can still lead to low cost-effectiveness. In the U.S. Conservation Reserve Program, environmental impacts have increased after improvements in administrative targeting and competitive bidding (the latter reduces the effects of adverse self-selection).

Implications for the GEF. PES has the potential to be an important tool in efforts to mainstream biodiversity conservation outside of protected areas, as well as to reduce emissions from deforestation and degradation (REDD). Nevertheless, we know little about how well PES works in practice and under what conditions or design features it works best. The evidence base for environmental investments is a global public good that is currently undersupplied. The GEF is an important PES investor and has a strong interest in catalyzing global conservation investments. The GEF is thus ideally positioned to lead the way in generating the PES evidence base. To do so, GEF PES projects will need to be designed explicitly to evaluate impacts. Key features of such a design include the use of comparison groups, which are selected to best represent how humans would have behaved or ecosystems would have fared in the absence of the PES initiative. Another key feature is that the selection criteria that determine which individuals, communities or regions experience PES interventions must have some elements that are uncorrelated with the environmental outcomes we intend to measure. A recent GEF proposal (UNEP) to use a randomized design to test the effectiveness of PES in Uganda has this feature, but other designs are also possible. Finally, all PES programs funded by the GEF must select indicators that are capable of revealing if any of the four barriers listed above are limiting the effectiveness of the PES program.

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