

Pro-Poor Payment for Environmental Services

Some Considerations

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Highlight

This policy brief discusses PES and considerations related to (1) the enabling conditions to implement a PES mechanism and (2) how the mechanism can be pro-poor. PES—an incentive-based approach that responds to demands for more direct, flexible, and voluntary conservation approaches—has raised interest in its potential to meet development objectives. Before considering how PES can be pro-poor, the brief discusses at least three prerequisites for implementing an effective PES mechanism. These include supportive intermediary organizations and supportive national conditions, such as policies that promote secure property rights, market exchange, and environmental conservation. The brief then goes on to survey some potential opportunities for pro-poor PES, and discusses constraints for the poor's participation and possible negative side-effects of PES programs on the poor. Recommendations are made for practitioners and governments on how to address such concerns. These include strengthening local institutions and conducting simple and rigorous monitoring methods in order to reduce transaction costs, and using land tenure as rewards to include poor people with insecure property rights and ensure their continued access to resources. Finally, the brief concludes by emphasizing the important role of government in promoting pro-poor PES mechanisms.

The Problem

An increased global awareness of the need to conserve environmental resources has led to the development of a number of natural resource management policies. These policies have been evolving with a growing understanding of contextual realities, such as the different socioeconomic problems in the developing world versus the developed world. Recently, there has been a shift away from rigid and top-down decision making towards more flexible and voluntary approaches.^{1,2} This shift is part of wider governance reform designed to increase the effectiveness of conservation efforts and the flow of more benefits to the communities. However, environmental degradation continues to occur at an alarming rate and results in benefit flows to local communities have been mixed. These trends have prompted calls for more direct and innovative solutions for environmental conservation.

Why Consider PES?

One response to these calls has been Payments for Environmental Services (PES). This is an approach where beneficiaries of environmental services make payments or provide other non-financial goods, such as market access, land security, public services, infrastructure, and capacity building, to those who secure the provision of such services. These payments can thus be broadly understood as rewards for providers of environmental services (ES). The ES involved are non-material, non-extractive benefits from natural resources, such as watershed protection, biodiversity conservation, and carbon sequestration, which includes avoided deforestation.

About this publication

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Nayakheda Village, South Rajasthan, India (Photo by: Rohit Jindal)

Recent Experience

The extent to which PES has been tried depends on what is meant by PES. Under a strict definition of PES, especially one that requires clear conditionality, recent programs may be seen as not *true* PES. There have been a number of projects, however, that take after the model of PES.

Case Study 1: CDM in A Luoi District, Vietnam

The Netherlands Development Organization (SNV) piloted a project that testing the application of Clean Development Mechanism (CDM) in A Luoi District, Vietnam, to co-finance a 5,000 ha reforestation project. The strict and extensive guidelines for CDM and its technical carbon accounting methods may pose a barrier for many poor villages, and intermediaries play an important role in helping to meet this conditionality criterion. However, the fact that these guidelines are strict and extensive has brought about a number of benefits for the poor villages in A Luoi in addition to economic gains for poor households. Additional benefits are:

- Issuance of land-rights to smallholders
- Financial transparency throughout the project
- Pressure for mixed species plantations
- Declared positive contribution to the environment and socio-economic situation of stakeholders
- Better monitoring and mapping of plantations

There are several reasons why PES is being considered as a promising approach for environmental conservation. Its market-based nature promises certain appealing features. Because PES is designed to be a contract agreed upon by ES providers and beneficiaries, it is intended to be direct, voluntary, and flexible. It is also designed to generate its own financing, as beneficiaries are to make ongoing

payments from their own funds. These payments are to be conditional on the actual deliverance of environmental services, which demands real environmental results.³

These features contrast with those of some other conservation approaches. PES is generally more direct than approaches like integrated conservation and development projects (ICDPs)—which aim to indirectly promote conservation and explicitly combine conservation and development goals⁴—or communicative instruments, which use communication to advocate certain types of environmentally positive behavior.² PES is also generally more flexible than approaches such as command-and-control systems or other protected area schemes.

It is important to note, however, that PES does not have to be a stand-alone replacement for such approaches, but may complement or enhance them. For example, the carbon case study shows how PES can work when joined with a regulatory approach. Hybrid approaches may also result by combining concepts from PES and from other models.

Under what conditions is a PES likely to work?

The results from the global scoping study of Compensation and Rewards for Environmental Services⁵ (see *Further Reading* below) suggested at least three prerequisites for an effective PES mechanism.

1. Effective supply and demand for PES mechanism

Local conditions of effective supply and demand for a PES mechanism

mediate relations between the service providers and beneficiaries.

a) *Availability of market opportunity.*

A PES project can be approached in two different ways: on the supply side, by targeting certain service providers in relation to its environmental services; on the demand side, by targeting areas where environmental problems and willing buyers exist. The results from the scoping study show that demand for ES is a more important condition for operational PES at local and national levels. That is, it is easier to implement a PES project when there is a clear demand by buyers for a mechanism to ensure contractual agreement between ES providers as sellers and beneficiaries as buyers. Despite this, many current PES contracts are still ad-hoc and do not ensure the delivery of environmental services (see next point).

b) *Adequate spatial and temporal scales for delivering environmental services.*

To ensure the effectiveness of conservation efforts, PES projects should cover a significant area and should consider the time lag between conservation activities and their outcomes. For example, in watershed cases, to effectively address the sedimentation problem, a project should cover all erosion hotspots or sources within the watershed. A partial remedy in sub-watershed areas might not result in the desired effect of reducing sedimentation enough to meet the requirements of the beneficiaries. A time lag therefore exists between the conservation activities and the anticipated environmental benefits.⁶ This effectively means that the PES contract should span an

appropriate time scale to meet the delayed downstream impact.

Most existing PES schemes operate in relatively small catchment areas occupied by small numbers of farmers and are based largely on short term contracts. Schemes under public funding might be able to overcome these problems and provide more sustainable mechanisms. However, many schemes under the public fund still rely on ad-hoc agreements between local communities and government agencies. Legalized agreements and internalizing the implementing and monitoring agencies under the government structure will help the continuity of these public-fund PES schemes.

2. Supportive national and international conditions

Considering that PES is a relatively new approach in developing countries, it is even more critical that the enabling conditions to support its implementation are in place. Countries that have most consistently embraced security of property rights, market exchange, and environmental conservation are also most likely to be able to effectively implement PES arrangements.

Government support of the mechanisms themselves is important. The conditional land tenure as ES reward in Indonesia showed that the active support of local government at all levels, starting from the field extension officers up to the Head of District, provided enabling conditions for scaling up the scheme and enhancing trust and social bridging capital between community and government.

A PES program can also be combined with certain national and international agreements and be more robust due to a supportive regulatory environment. Existing forestry initiatives, such as government-supported reforestation programs, may be a good basis for adapting PES programs. The experience of the A Luoi in North Central Vietnam, for instance shows how a reforestation program can become the basis for a CDM-like project. In Indonesia, forestry laws, combined with a decree from the Ministry of Forestry, have authorized community forest permits since 2000. These regulations were conducive to the implementation of the conditional land tenure scheme, which can be seen as a form of PES that uses secure tenure rather than direct cash payments as a reward.

3. Support by credible intermediary organizations

Intermediary organizations in most cases assist in the research, monitoring, and evaluation important to justify the establishment, implementation, and continued operation of public PES schemes. These activities are particularly important for both

Case Study 2: Sumberjaya Watershed, Indonesia

RUPES has piloted two projects in the Sumberjaya watershed in Indonesia that involves establishing payment schemes for hydropower companies and government officials who benefit from the clean water delivered by upland people. The first PES mechanism involves land tenure for farmers that is conditional on their maintenance of the forests and specified land practices. In the second PES mechanism, which is still being set up, a program called RiverCare has established a set of criteria and indicators to assess the sediment reductions in the river due to the upland people's land practices and uses technical monitoring methods. By the end of the contract period, RiverCare hopes to have a clear product to offer the hydroelectricity company.

scaling up and scaling out the mechanisms. This is especially true because PES is still a relatively new approach and many potential buyers are still unwilling to pay. Intermediary organizations can help to raise awareness about the link between providers' activities and environmental services, thereby raising willingness to pay. The importance of these organizations'



Sumberjaya, Lampung, Indonesia (Photo by: Aunul Fauzi)

Case Study 3: Kulekhani Watershed, Nepal

The residents of Kulekhani watershed provide valuable environmental services to those downstream, as their land use practices influence the draining of a watershed to a reservoir supplying two hydroelectricity plants. RUPES helped to establish a PES scheme to reward these upland communities for supplying ES. The characteristics of suppliers, land tenure arrangements, and the existing policy framework determined the design of the PES mechanism and what kind of RUPES activities were needed to create conditions conducive to PES. The ES suppliers were smallholding farmers who cultivated community land and were usually unaware that their conservation efforts benefited external parties. Due to incidents from the past, many of them were suspicious of outsiders and had weak negotiation skills. RUPES launched activities to educate and empower these suppliers, and worked to bring them together and form community organizations. Considering the large number of sellers, suppliers opted for rewards in the form of conservation and development projects instead of cash payments.

role in current PES implementation is demonstrated in the case studies.

The potential for a pro-poor PES scheme

If the above conditions are met, and a PES mechanism has the potential to become operational, the next question is: how may the scheme be made pro-poor? Initially, PES was not primarily intended to reduce poverty but rather to more effectively and efficiently achieve conservation goals. In its development, PES has attracted interest in its potential to involve communities and be pro-poor. As many rural poor people are closely

connected to their resources and provide ES without compensation, PES programs have potential to contribute to poverty reduction. The main challenge is how the poor can be adequately recognized for their environmental stewardship and rewarded accordingly. Ideally, if they are paid for their stewardship under PES schemes, it is not impossible that PES can be a strong option for poverty reduction initiatives. Lessons from South and Central America show that PES schemes have allowed poor service providers—both participants and non-participants—to gain marginal benefits.^{7,8} Cases from Asia, as illustrated in the case studies, also indicate this potential.

There are a number of ways in which PES may benefit the poor. First, direct benefits may come through the actual payments or rewards that can be given to poor ES suppliers. The most obvious one is financial payments that increase income. This benefit is demonstrated in projects where carbon credits generated by two local groups in India and by villages in Vietnam provided additional income for local farmers. Payments or rewards can also be non-monetary and bring significant benefit for the poor. For example, a conditional land tenure scheme in Indonesia used secure tenure instead of cash payments as the reward for farmers.

Second, PES programs may bring about indirect benefits that reach the poor. Such benefits may reach both the participating and non-participating poor, including communities at large. These may include increased social capital and political voice as part of the contract negotiation process, or technical training required for certain projects. In the Kulekhani case in India, for example, the process of establishing a PES project increased

community organization and building of infrastructure.

Challenges and potential risks for pro-poor PES?

Some skeptics, however, see poverty reduction as an overly optimistic goal for PES, pointing to a number of potential risks. A major reason that PES has pro-poor potential is that many of the world's rural poor rely heavily on natural resources for their livelihoods and are thus involved in the stewardship that produces environmental services. But this resource dependence, and accompanying vulnerability to change in resource access and use, is also why there are concerns that PES may be harmful to the poor.ⁱ

To begin with, there are obstacles that may prevent the poor from participating in and meaningfully benefiting from PES schemes. There are also risks that PES programs themselves can have negative impacts on poor people, a significant impact being that their access to resources they need for their livelihood may be restricted. Considering the range of potential risks and opportunities (see “Further Reading” below), the results for the poor seem to largely depend on how the initiatives are designed and the context in which they are introduced.

A few of the major constraints for the poor are detailed further below, with suggestions on how some of them may be addressed.

ⁱ There is also concern by some that a pro-poor focus will hinder the effectiveness of PES as an environmental conservation tool. This issue is not discussed here, but is touched upon in *Insight* (see “Further Reading”) and in Wunder's “Nuts and Bolts” (see “References”).

1. Barriers to participation

This section discusses some of the barriers that may prevent the poor from participating in PES projects. Not only may exclusion of the poor result in a failure to capture pro-poor opportunities, but it may worsen the situation of the poor by further marginalizing them, widening the gap between the rich and the poor, and exacerbating the possible side-effects noted in the next section.

a. High transaction costs

Transaction costs are the financial and other costs involved in establishing and maintaining a PES scheme, including search and information costs, contracting, and monitoring costs. High transaction costs can hinder the introduction of PES to the poor.

How may transaction costs be reduced for the poor? One way is to *strengthen local institutions*, such as a community forum, which can efficiently represent the service providers in entering, negotiating, and implementing the schemes. Intermediaries can play important roles in capacity building through trainings, technical assistance, and cross-visits to sites implementing successful and operational schemes.

These local institutions can also help with another way to reduce transaction costs by *capturing local knowledge*. All stakeholders—the service providers, beneficiaries, and intermediaries—should agree on the problems and threats causing the decrease of environmental services as well as the potential activities to reduce and avoid these problems and threats. Capturing the perspective of the local community and policymakers based on their local knowledge can reduce transaction costs, especially in information costs since many

potential solutions have been familiar and well-established in communities. This process includes incorporating the perceptions of the upland and lowland communities on how PES can improve their conditions.

Transaction costs are proportionally higher for small landholders and may discourage dealing with them versus large landowners. *Collective bargaining and contracting* can help avoid the costs of setting multiple and complex contracts. The carbon trading case in India shows that aggregating carbon credits from individual farmers through local organizations and selling them in one lot can potentially reduce transaction costs. Strong social cohesion and socialization efforts from intermediaries are prerequisites.

Another major transaction cost is for monitoring and verification costs. Introducing simple technologies to the poor that are relatively inexpensive, easy to use, and provide relatively rigorous data in monitoring can help them *conduct simple environmental outcome monitoring*. These monitoring efforts can be conducted by training village-based volunteers, such as the River Care group in the Sumberjaya case.

Case Study 4: Bhoj Wetlands and Kuan, India

Winrock International and other organizations worked to develop incentive-based mechanisms for watershed services and improved livelihoods in two sites in India: the Bhoj wetlands catchment around Bhopal city and the Kuan micro-catchment in Himachal Pradesh. The Bhoj experiment involved connecting upland catchment farmers to downstream city water users and helping them transition to organic farming practices that would be wetland friendly. The incentives for the poor farmers include access to technical knowledge, compensation for loss in the transition years, access to markets, and group formation and joint activities. In the Kuan case, where upland residents ceased grazing to protect a dam, both buyers and providers are villages. Payments were both cash and in-kind, and villages worked together to monitor effects. Pro-poor impacts have been observed, such as increased harvests, building of infrastructure, greater community organization, and more.

b. High investment costs

In addition to high transaction costs, many PES programs may require high investments costs in order to carry out the land-use changes required by PES agreements. Taking on the changes



Kulekhani, Nepal (Photo by: Shyam Upadhyaya)

Case Study 5: Trading Carbon from Forests in India

Tree Planting Program (TIST), an organization in India has sold carbon sequestration credits in international voluntary markets. The lesson encouraged the two other local organizations, Seva Mandir (SM) and Foundation for Ecological Security (FES) to sell credits from community forestry projects in such markets, like the Chicago Climate Exchange (CCX). The additional income from the sale of carbon credits have the potential to extend local conservation efforts, reduce livelihood pressure on forests, and provide sustenance needs of many poor families. Fulfilling this potential requires policymakers and various carbon players to make conscious efforts to elicit participation from the poor. This also requires changes in carbon accounting as well as innovations that can reduce transaction costs. Institutions such as farmers' cooperatives and NGO-led federations can further ensure that carbon payments are channeled to the poor.

may require sacrificing part of one's regular income, and investing in necessary equipment or technologies. It may also take some time before sellers see any tangible benefits. The poor may not be able to afford such costs, especially if they are not paid for a significant period of time.

Credit schemes can potentially help the poor deal with high investment costs, though this is still unavailable in many rural areas of developing countries. Another way to possibly address this constraint is for PES programs to *adapt their payment schedules* so that the payments are front-loaded, or to make initial payments for the environmental services that already have been and are being provided.⁹

As with transaction costs, the burden of investment costs can be

spread over a larger number of people if the PES program engages *with an entire community or a cooperative*.

c. Uncertain property rights

Many poor people do not own the land they live on or use. This insecure tenure may prevent them from participating in PES schemes, as many programs involve the exchange of private property and services and require enforceable property rights.

If PES projects are not limited to those with clear property rights and have *more flexible requirements*, more poor may be able to participate. The Kulekhani case suggests that it is possible to develop a PES mechanism as long as communities have some users' rights over natural resources. *Long-term leases* from local governments can also help avoid these problems. Formalization of land tenure can become both a byproduct of PES and a PES reward.

2. Possible negative side-effects

In addition to the possibility of excluding the poor from PES programs, potential negative effects of the PES programs themselves must be considered. Many of these effects stem from the reliance of the poor on natural resources. These impacts may be on both participating and non-participating poor.

a. Loss of security/control of land

As previously mentioned, many poor people do not have secure tenure to the land that they rely on for their livelihoods. In addition, if PES projects increase the value of the land and incentive to take control of it, the powerful elite may take hold of the land and marginalize the poor. Again, long-

term leases from local governments for those who have traditionally used the land can help.

b. Restricted resource access

PES programs may require land use change and restrict access to resources. Non-participating poor who depend on common land may be especially affected since they would not receive payments through the PES program to offset their losses.

Restricted resource use could lead to food insecurity. Many smallholders meet their food requirements from their farms and local forests, but tree-based landscapes are usually demanded for any PES project to increase watershed functions, carbon sequestration, and most biodiversity conservation (see case studies). The Indian carbon market case responds to this concern by *promoting carbon sequestration primarily on marginal and low-productivity lands*. For watershed and biodiversity cases, food insecurity can be avoided by *applying agroforestry systems*: combining food crops and trees in the same landscape, and implementing soil and water conservation techniques on farmlands.

Potential roles for governments

For PES schemes to be sustainable, governments can play a number of roles in capitalizing on PES opportunities. Governments are potential buyers, and have been playing this role in a number of PES initiatives. Governments can also be potential facilitators in bringing together buyers and sellers. This intermediary role has often been played by NGOs, but government agencies, especially those dealing at the community level, can play a larger role in this area. Finally,

governments can help make PES a more feasible option by supporting research and pilot projects, and also by working to overcome legal and policy barriers that PES mechanisms may face.

Throughout these activities, it is important that governments are attentive to the risks and opportunities PES schemes may present for the poor. Research and policies should aim to address the barriers to meaningful participation by the poor, as outlined above. Governments can also take measures to minimize or prevent harm from PES programs to both participating and non-participating poor. A key area for action is land tenure and resource access for the poor.

In taking these steps, stronger coordination within government may be needed across departments. To engage with communities, cross-scale coordination—national with local authorities, for example—is also valuable in setting up PES mechanisms. Such collaboration can also be helpful in having PES complement other natural resource management initiatives, like community forestry programs.

Conclusion

PES mechanisms show some potential for contributing to environmental conservation and poverty reduction goals. However, further research, analysis, and field practice must be done to explore and assess this potential. Initial work reveals some important considerations both in making PES mechanisms operational and pro-poor. Many challenges remain, and multiple sectors, including government, private enterprises, and international organizations, have important roles to play in addressing them.

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Further Reading

For further information on the scoping study, see CRES Working Paper: <http://www.worldagroforestrycentre.org/cres/>

For further reading on the case studies, see Insight: Notes from the Field, Issue 2. RECOFTC. Available at: <http://www.recoftc.org/site/index.php?id=537>

For further reading on risks and opportunities for the poor presented by PES, see the forthcoming paper: Lee, Erica and Sango Mahanty. "Payments for Environmental Services and Poverty Reduction: Risks and Opportunities." RECOFTC.

Case Study 6: Bakun Watershed, Philippines

RUPES has worked in the Bakun Watershed in the Philippines to establish a relationship between the indigenous community and the downstream users of watershed services. Payments from the hydroelectric companies to the upland people have helped in the development of Bakun through road construction, interest-free loans, health services, and more. Project implementers worked to increase the capacity of the Bakun people to produce and market ES, and develop understanding of the environmental functioning that integrates indigenous and scientific knowledge. One feature of the project that addresses poverty is the decision-making power of the Bakun people in maintaining the integrity and suitability of their watersheds. Further pro-poor mechanisms that project implementers wish to see developed in the future include: voluntary benefits provided by the hydroelectric company being channeled directly to the Bakun farmers instead of through the local government, and more allocation of the budget towards development and livelihood projects, rather than the current focus on construction projects.



Bakun, The Philippines (Photo by: Grace Villamor)

RUPES - ICRAF SEA

Rewarding Upland Poor for Environmental Services (RUPES) is a program coordinated by ICRAF Southeast Asia (ICRAF SEA). The Program aims at enhancing the livelihoods and reducing poverty of the upland poor while supporting environmental conservation on biodiversity protection, watershed management, carbon sequestration and landscape beauty at local and global levels. RUPES is hosted by ICRAF's South East Asia Office and has research sites in Indonesia, Nepal and Philippines. <http://www.worldagroforestrycentre.org/sea/Networks/RUPES/index.asp>

RECOFTC

Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC) is an international not-for-profit organization based in Bangkok, Thailand, that supports community forestry and community-based natural resource management. RECOFTC receives core funding from the Swedish International Development Cooperation Agency (Sida), the Swiss Agency for Development and Cooperation (SDC), and the Norwegian Ministry of Foreign Affairs. Through strategic partnerships and collaboration with governmental and non-governmental institutions, programs, projects, and networks, RECOFTC aims to enhance capacity at all levels and promote constructive multi-stakeholder dialogues and interactions to ensure equitable and sustainable management of forest resources. Website: <http://www.recoftc.org>

SNV

SNV Netherlands Development Organisation is a Netherlands-based international NGO that delivers capacity-building advisory services to over 2,000 clients in 33 countries in Africa, Asia, Latin America, and the Balkans. In Asia, SNV provides capacity building services to government, non-government and private sector organisations in Nepal, Vietnam, Bhutan, Laos, Cambodia, and Bangladesh as well as to a number of regional organizations and networks. Our 150 advisors in Asia work with local actors, primarily those who operate at national and meso levels in strengthening their capacity to effectively realize poverty reduction and good governance. SNV aims to achieve development results in two areas: (1) Reducing extreme poverty by increasing production, employment and equitable income opportunities via our work in Smallholder Cash Crops, Pro-poor Sustainable Tourism, and Forest Products; (2) Improving the access, coverage and quality of basic services via our work in Water, Sanitation & Hygiene and Renewable Energy. Website: <http://www.snvworld.org>

The World Agroforestry Centre (ICRAF)

ICRAF is the international leader in the science and practice of integrating 'working trees' on small farms and in rural landscapes. ICRAF has invigorated the ancient practice of growing trees on farms, using innovative science for development to transform lives and landscapes. The World Agroforestry Centre is one of the 15 centres supported by the Consultative Group on International Agricultural Research (CGIAR). <http://www.worldagroforestry.org>

References

- 1 Jack BK, Kousky C, and Sims KRE (Forthcoming). 2007. Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms. Proceedings of the National Academy of Sciences.
- 2 Swallow B, Kallesoe M, Iftikhar U, van Noordwijk M, Bracer C, Scherr S, Raju KV, Poats S, Duraiappah A, Ochieng B, Mallee H and Rumley R. 2007. Compensation and Rewards for Environmental Services in the Developing World: Framing Pan-Tropical Analysis and Comparison. ICRAF Working Paper no. 32:56p.
- 3 van Noordwijk M, Leimona B, Emerton L, Tomich TP, Velarde SJ, Kallesoe M, Sekher M and Swallow BM. 2007. Criteria and indicators for environmental service compensation and reward mechanisms: realistic, voluntary, conditional and pro-poor. ICRAF Working Paper no 37:61 p.
- 4 Wunder S. Payment for Environmental Services: Nuts and bolts. CIFOR Occasional Paper No. 42. Bogor: CIFOR.
- 5 Swallow B, Leimona B, Yatich T, Velarde SJ and Puttaswamaiah S. 2007. The conditions for effective mechanisms of compensation and rewards for environmental services. ICRAF Working Paper no 38:32 p.
- 6 Dillaha T. 2007. Monitoring Changes in Hydrologic Response Due to Land Management Changes at the Watershed Scale: Time Lag and Other Issues. A presentation at Global Event on Payment/Reward for Environmental Services, Lombok 21-26 January 2007. <http://www.worldagroforestry.org/sea/portals/2/lombok/material/presentation/Day1/session2/TheoDillaha.pdf>
- 7 Grieg-Gran M, Porras I and Wunder S. 2005. How Can Market Mechanisms for Forest Environmental Services Help the Poor? Preliminary Lessons from Latin America. Elsevier. 33(9). p:1511-1527
- 8 Pagiola S, Arcenas A, Platais G. 2005. Can Payments for Environmental Services Help Reduce Poverty? An Exploration of the Issues and the Evidence to Date from Latin America. Elsevier. 33(2):P.237-253
- 9 Pagiola S, Arcenas A, and Platais A. 2005. Can payments for environmental services help reduce poverty? An exploration of the issues and the evidence to date from Latin America. World Development, 33:237-253.

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