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# Fairness and efficiency: a challenge for payment for environmental services in Asia<sup>1</sup>

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**Abstract.** Payment for environmental service (PES) is commonly defined as a market-based environmental policy instrument to efficiently achieve environmental protection. However, an increasing body of literature shows that the prescriptive conceptualization of PES cannot be easily generalized and implemented in practice and the commoditization of ecosystem services is problematic and may be unfair. To investigate the underlying causes, this study combined a quantitative and qualitative research approach using case studies in Indonesia, the Philippines and Nepal. The empirical observations on emerging PES-mechanisms in the Asian case studies show that interdependency of fairness and efficiency should be the main consideration in designing and implementing a PES scheme in developing countries.

**Keywords:** Market-based, environmental policy, ecosystem services, environmental protection.

## Introduction

Asia's landscape, where most of its inhabitants depend on agriculture and natural resources for their livelihood, has an immense diversity of land-cover mosaics. This region offers many opportunities to explore interactions between environmental services (ES) and land use practices by its farmers. These farmers mostly act as land managers who have a meagre living in the upper watershed and at the forest boundary. These areas provide many valuable ES and at the same time are mostly under severe threat of degradation (MA 2005). Market imperfection and policy distortion that neglect the social and economic importance of ecosystems are claimed as root causes for environmental problems in Asia (Tomich *et al.* 2004; TEEB 2010)

The principle of market-based instruments is applied for capturing the financial value of ecosystem services through monetization and commoditization of ecosystem services (Gómez-Baggethun *et al.* 2010) of which payment for environmental services (PES) is an important component. Initial debates on PES focused on the quest of enhancing economic efficiency of conservation and enforcing markets to link supply and demand for ecosystem services. The main reason for the application of market-based instruments for ecosystem services is because the real value of ecosystem services to human wellbeing is not, or only partially included in market economics (De Groot 1992; Turner *et al.* 1994; Costanza *et al.* 1997). This situation refers to market failures, *i.e.* the failure of markets to reflect to full or true value of so-called free services such as pure water (without the need for purification) or pollination enhancing crop yields, and neglect to recognize negative effects of economic activities on environmental

public goods (*i.e.* so called negative externalities). The articulation of market forces in solving these negative externalities aims to transfer external values to local decision makers in providing such environmental services at the lowest possible social cost.

Effective legal structures with well-defined and enforceable policy rights can overcome the problems of market failures associated with environmental externalities (Coase 1960). Schemes with voluntary contracts as opposed to strict command-and-control instruments may better approximate social optimum and increase efficiency in generating environmental goods and services.

A valid line of argument on PES exists among scientists and practitioners that a PES instrument should not be burdened by additional social equity goals in achieving its environmental and cost-effectiveness goals of ES provisions. The question is what environmental integrity aspects can be segregated from social inequity issues? Nevertheless, recent literature discussed that the Coasean and pure market approach dominating the conceptualization of PES cannot be easily generalized and implemented in practice (Muradian *et al.* 2010).

Moreover, Kosoy and Corbera (2010) through the lens of "commodity fetishism" argued the commoditization of ecosystem services was problematic. Case studies in Latin America showed social values beyond merely financial payment induced participation in PES (Kosoy *et al.* 2007) and monetization of environmental services was mostly rejected by the PES recipients (Asquith *et al.* 2008). However, potential combination between equity and efficiency may be possible (Pascual *et al.* 2010). Thus, there is a clear need to adjust Coase's argument and

<sup>1</sup>This paper is a summary of main findings from: Leimona B (2011) Fairly efficient or efficiently fair: success factors and constraints of payment and reward schemes for environmental services in Asia. PhD Thesis. Wageningen University and Research. The Netherlands. <http://www.worldagroforestrycentre.org/sea/Publications/files/thesis/TD0166-11/TD0166-11-1.PDF>. Presented in the International Grassland Conference, Sydney, 16 September 2013.

incorporate context and perspective of local stakeholders. Especially, when PES schemes are applied in developing countries with skewed wealth distribution, contested property rights, low law enforcement and weak institutions (Neef and Thomas 2009).

Supported by global agreements, the solution of environmental problems in developing countries, specifically in Asia have to emphasize dual goals of poverty alleviation and environmental conservation (Tinbergen 1976; UN 1992). Payment for Environmental Services (PES) is one of the tools currently being tested and practiced globally to help achieve these goals (Muradian *et al.* 2010; Pascual *et al.* 2010; Van Noordwijk and Leimona 2010). The PES-concept was initially strictly defined as a market-based environmental policy instrument to achieve environmental protection in the most efficient way (Pagiola *et al.* 2005; Engel *et al.* 2008). This is based on the principle “you get what you pay” for positive effects on the flow of environmental services (Wunder, 2007). However, recent literature discussed that the Coasean and pure market approach dominating the conceptualization of PES cannot be easily generalized and implemented in practice (Muradian *et al.* 2010).

The conceptualization and analysis of PES in Asian countries is still limitedly analyzed how to balance between efficiency and fairness involved in changing current land use, socio-cultural values and behaviour of relevant stakeholders. Based on empirical research in Indonesia, Philippines and Nepal, this study aims to test the overarching hypothesis that without combining efficiency and fairness aspects, the PES concept will not provide sustainable solutions and its implementation may achieve neither an increase of ES provision nor livelihood enhancement.

This paper presents an analysis of practical applications of PES in Asian developing countries. It shows that in order for PES to achieve its dual goals, the emphasis to inclusion of both efficiency and fairness elements to all actors involved is essential. This study briefly describes the obstacles to, and conditions for, establishing PES in developing country contexts. The research investigated the need for broader categorization of PES conditionality and perspectives to meet imperfect conditions for applying strict ES market-based policies in developing countries. Observed imperfect conditions are among others: insecure property rights, high incidence of poverty, poor environmental governance, and high potential conflict in natural resource management. This paper suggests some solutions on how to design a pro-poor PES based on an analysis of circumstances where PES can contribute to income increment, observed preferred rewards and PES outcomes to ES providers. The findings also include the application of multiple ecological-knowledge to improve PES efficiency and fairness.

### **The context of Asian landscape and people**

In Asian rural areas, traditional land and resource management systems fail as population increases and miniaturization of land leads to overuse. Skewed land distribution often compels the poor to survive by cultivating marginal land – erosion-prone slopes and other

environmental problems. Without tenure, and often with only passing claims on the land they cultivate, the poor are less likely to make investments to protect natural resources (Brandon and Ramankutty 1993; Van Noordwijk *et al.* 2002). These socioeconomic conditions are apparent on research areas of this study.

The pilot sites where the author coordinated and conducted research for this study cover three countries (Indonesia, the Philippines and Nepal) and nine sites located in Southeast and South Asia (Fig. 1). Following the analysis of Hadi and van Noordwijk (2005), some combinations of agro ecological zones can be distinguished from these sites for analyzing potential establishment of rewards for environmental services (RES) through the interaction of tree-based and more intensive agriculture or urban land use system. For example, RES is potentially operational for watershed functions in Sumatra – Indonesia, Luzon and Mindanao – the Philippines, and some parts of South Asia, where lowland rice is located at the downstream of upland mosaic, forest, or tree-crop mixed, or in some parts of South Asia, where ‘highland mixed’ is located at the upstream of urbanized areas. Rewards for biodiversity conservation can occur where tree-crop or upland mosaic is located adjacent to forest threatened by further expansions of intensive anthropocentric land use.

Furthermore, the sites are action and learning sites of the Rewarding Upland Poor for Environmental Services (RUPES) project of World Agroforestry Centre (ICRAF) Southeast Asia Region, which are the pioneers of RES initiative in each of the three countries. Indonesia and the Philippines were selected to represent the Southeast Asia region, where natural resource management is growing in practice (CGIAR, 2011) and where ICRAF’s “sentinel landscapes” exist to provide collection of the long-term data sets and to test models. Nepal was included as a case study in South Asia, where collective action and social movement are relatively advanced, especially in its upland area. Figure 1 shows that analysis at local level was mostly conducted in Indonesia, while the case studies in the Philippines and Nepal provide lessons at the regional level.

Most of the sites focus on rewards for watershed services under private and public schemes (Table 1). Two of pilot sites (Singkarak, Indonesia and Kalahan, the Philippines) are testing the voluntary carbon market and one of the sites (Bungo, Indonesia) is seeking opportunities for eco-certification scheme of rubber agroforestry. The stages of implementations are also various, ranging from initial development of RES, where the intermediary partners are conducting scoping studies on biophysical and socioeconomic aspects of the pilot, to mature schemes, where contractual agreements have been signed and schemes are ready to be scaled up.

### **Main findings**

*Broader categorization of conditionality of PES emphasizes interdependency between fairness and efficiency as opposed to a strict and prescriptive PES definition*

The current PES definition reflects the Coasean

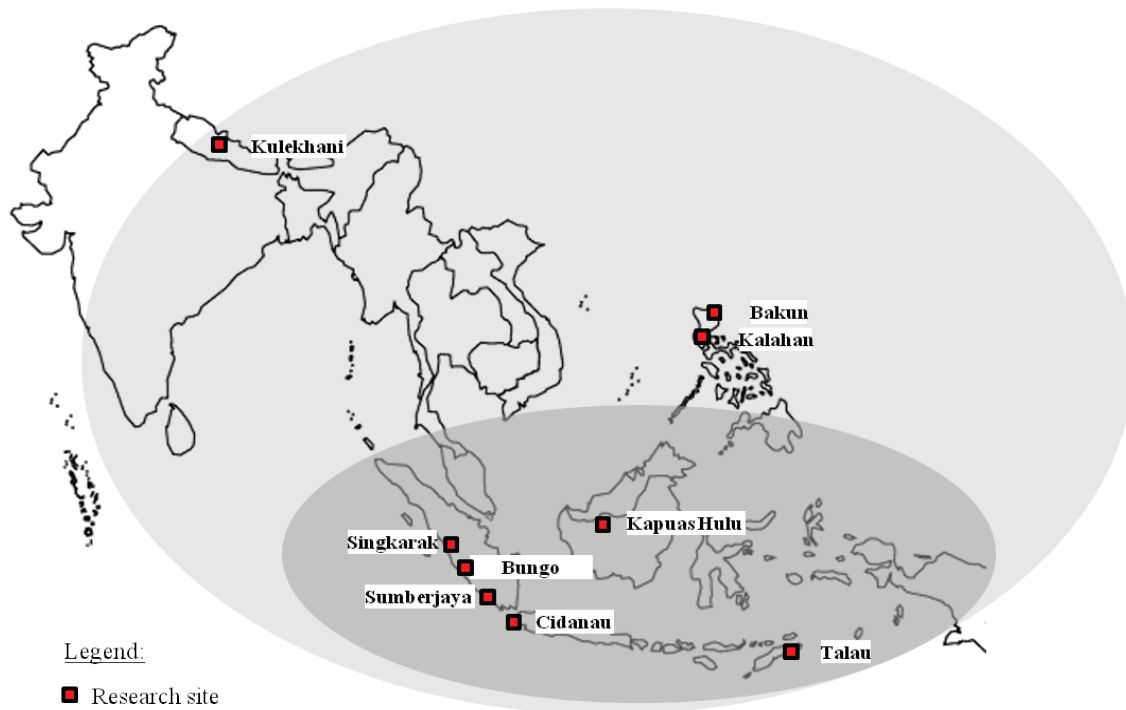


Figure 1. Research sites in Asia with pilot-level research conducted in Indonesia.

Table 1. Research sites and the status of the applied ‘rewards for environmental service’ scheme.

Site	Started in	Main ES	Scheme	Status
<i>Indonesia</i>				
Singkarak, West Sumatra	2002	Watershed services	Distribution of royalty of a parastatal hydroelectric power (HEP) company	Ad-hoc share of royalty
Bungo, Jambi	2002	Agrobiodiversity conservation of jungle rubber	Financial payment from an international carbon broker	Agreed 10 year contract in total 49 hectares
Sumberjaya, Lampung	2002	Watershed services, mainly sedimentation reduction	Financial payment from a philanthropic scheme	Ad-hoc reward of a micro hydro
Cidanau, West Java	2001	Watershed services for domestic and industrial demands	Eco-certification for jungle rubber	Scoping elements for RES development
Kapuas Hulu, West Kalimantan	2008	Watershed services for a district water company	‘Conditional CSR’ from a parastatal HEP company	Agreed 1 year contract and scaled up to other sites
Talau, East Nusa Tenggara	2008	Watershed services for a district water company	‘Conditional CSR’ from a water company	Agreed 5 year-contracts in xx villages
<i>The Philippines</i>				
Bakun	2004	Watershed services for private HEPs	Earmark payment from water bill	Scoping elements for RES development
Kalahan	2002	Carbon sequestration (voluntary)	Earmark payment from water bill	Scoping elements for RES development
<i>Nepal</i>				
Kulekhani	2002	Watershed services for a private HEP	Distribution of HEP’s royalty to community	Agreed share of royalty

conceptualization of PES *i.e.* efficiency gains may be achieved independent of the allocation of property rights (Bulte *et al.* 2008; Zilberman *et al.* 2008; Neef and Thomas 2009; Muradian *et al.* 2010). The concept also disregards equity issues since the aggregate gains and losses by different economic agents is more important than how they are distributed in society (Pascual *et al.* 2010). The ideal PES schemes based on environmental and cost efficiency

principle should “integrate environmental services<sup>2</sup> into markets, and should be like any other market transaction” (Farley and Costanza 2010). Further, the inclusion of a poverty alleviation goal might reduce economic efficiency of the scheme (Pagiola *et al.* 2005; Wunder *et al.* 2008).

<sup>2</sup> In their article, Farley and Costanza (2010) used the term “ecosystem services” rather than “environmental services”.

Practices in developing countries mostly rule out PES if this definition is strictly applied as a market-based or commoditized ES.

Our case studies proved that precondition for the Coasean conceptualization of PES could not be met. The reasons, among others, were lack of data and capability to measure, map, model, value and monitor ecosystem services at multiple scales; unclear property rights; lack of sustainable funding; and close links between poverty and environmental degradation. In addition to that, the Asian cases mostly placed ES providers as more marginalized community group with low formal education background and lack of access to information and justice. Our result aligned with the Heredia Declaration of Payments for Ecosystem Services introduced by an article by Farley and Costanza (2010). The article concluded that payment do not require commodification, however, shared responsibility is needed to provide and protect ecosystem services.

Analysis of global PES schemes as part of our study, including our case studies showed that strict conditionality of PES mostly did not exist. Therefore, we recognized that in practice, conditionality of PES contracts is stratified ranging from ES contracts that link tangible benefits for the ES providers by the actual enhanced delivery of ES (level I), maintenance of agro-ecosystems in a desirable state (level II), performance agreed actions to enhance ES (level III), development and implementation of management plans to enhance ES with respect for local sovereignty in conserving the environment for both local and external benefits (level IV). This stratification contributes to bringing the theory of PES conditionality closer to practice (van Noordwijk and Leimona 2010).

Based on these levels of conditionality and recognition of PES practices in Asia, we offer three distinct perspectives of PES. Those are commoditization of ES, compensation for opportunities skipped/forgone and co-investment in environmental stewardship. *Commoditization of ES* operates at conditionality level I with no explicit poverty targets. *Compensation for opportunities skipped/forgone* is when land users are paid for accepting restrictions on their use of land and has conditionality at level II or III. *Co-investment in environmental stewardship* is where PES contracts between ES providers and buyers are flexible with broad sanction and monitoring requirements. Mutual trust is strong.

Our case studies also observed that there are opportunities for phased strategies. After creating, for example, a basis of respect and relationship through the *co-investment* paradigm, there may be more space for specific follow-ups in the *commoditization* paradigm for actual delivery of ES to meet conservation and ES additional objectives, *i.e.* a PES scheme is additional whereas the scheme increases environmental services compared to baselines without a PES scheme.

*In order to be pro-poor, a PES has to adapt to the local conditions, including in designing types, forms and expected level of rewards*

The case studies of PES in Asia experienced shifting perspectives: from legitimating cost-efficient and effective

natural resource management outcomes to concerns about fairness in design and benefit distribution of the scheme. Monetization and commoditization of ES through PES can create technical problems in addressing both efficiency and fairness outcomes; it also raises ethical arguments by obscuring cultural, political and social relationships in an environmental service generation (Kosoy and Corbera 2010).

We analyzed the contribution of actual cash for individual ES providers from beneficiaries to poverty alleviation and proved that such a design has to attentively consider some key ratios of relative numbers of service providers and beneficiaries, and their income per capita measures (Leimona *et al.* 2009). In this case, the analysis of income and spatial data on Indonesian agro-ecosystems indicated that a modest increased target of 5% of annual disposable income of upstream rural household may be difficult to be achieved given the population and income structure of downstream and upstream areas in Asia.

Identifying rewards that match with people's needs and expectations, is one particularly important aspect of pro-poor RES approaches. The findings from focus group discussions at the different sites suggest that there is a substantial variation among communities concerning poverty concepts and reward preferences. This provides important insights into the various dimensions that well-targeted reward schemes need to address. Our analysis concluded that rewards in the forms of human capital, social capital and physical capital – or what are often referred to as non-financial incentives – are very often the most preferred and possible types of rewards. Public social investments, such as education and health services (*i.e.* human capital), good road conditions (*i.e.* physical capital), security of land tenure, recognition as environmental champion and trust from government to maintain intact environment (*i.e.* social capital). In industrialized country, these public investment are part of government's responsibility, however they are lacking in our case studies. These aspects combined with high social cohesion that defies the concept of free-rider (*i.e.* we don't mind our neighbour enjoying our rewards from maintaining good ES and we prefer everybody is happy) support the preference of non-financial reward.

*Initial investment in achieving a shared understanding of multiple ecological knowledge in providing and managing ES increases efficiency and fairness of PES scheme*

One of the main problems of a PES scheme is that there are widely held assumptions between changes in land cover and environmental service (ES) provision. The proposed solutions of environmental problems, including decrease of ES provisions, are mostly based on the relative merits of reforestation emphasizing that ES is provided only by natural forest but not by other land uses. Furthermore, standardized solution to natural resource management refers to narrowly defined land-rehabilitation projects by, for example, planting trees and not considering other landscape management techniques, such as constructing simple sedimentation retainer along riparian zone.

In natural resource management, different stakeholders may in fact have opposite interests in utilizing a landscape. From the policy perspective, agroforestry-mosaic landscapes as found in many Asian countries, can offer great opportunity for combining economic and environment targets. In these landscapes, farmers combine elements of the natural forest that provide environmental services with trees for productive purposes and intensive food cropping systems (Van Noordwijk *et al.* 2002). Yet, potential ES buyers and policy makers in general sometimes fail recognizing these agroforestry systems. As the agricultural landscapes, for example, may not meet the legal definitions of “forest” or be in conflict with the existing land-use regulation system and policies – even though the land practices can provide some ES at similar level to forest ecosystems can.

The appreciation of the various quantitative environmental service indicators probably differs by stakeholder group. To ensure an established PES, we need to understand these ES indicators from the perspective of both upstream and downstream local communities, general public and policy makers, and ecological modeller or hydrologist – who are involved in a PES scheme (Farida *et al.* 2005; Jeanes *et al.* 2006). The multiple ecological knowledge approach applied in this study is to clarify expectations from all relevant actors, avoid unrealistic targets for the quality of watershed services, help define conditionality of RES and offer appropriate monitoring procedures. However, our case studies also showed that the availability of information is only a prerequisite for increasing the quality and sustainability of PES schemes. Interviews with practitioners in this study found that the factors influencing the design and implementation of PES programs are varied and beyond the availability of multi-perception knowledge and scientific data. The issue of strategic use of information, a discrepancy between scale in the provision of environmental services and its investment, and the vested interests of intermediaries and donors deter the optimal use of such multiple knowledge analysis in designing and implementing rewards for watershed schemes.

#### *A sustainable livelihood framework enables broader analysis of local perspectives on PES by encompassing various types of capitals*

Poverty, defined simply as inadequacy of income is still fairly common in the literature on human deprivation. However, this view has to capture the understanding that income influences people’s life style and in the end contributes to impoverishment of the lives they lead (Sen 2000). The perspectives on poverty inescapably surpass the notion of welfare utility and encompass a broader range of capabilities (Kahneman *et al.* 1997; Sen 1999; Wegner and Pascual 2011), including the capabilities of pursuing individual happiness (Frey and Stutzer 2002). Therefore, increasing evidence and theory of plural dimensions of human well being (Wegner and Pascual 2011) support the perspective of multidimensional poverty in analysing local perspectives on PES outcomes.

Our study on local perspectives on PES outcomes

showed that benefits were mostly non-financial, including expanded social networks with external stakeholders, knowledge and capacity of the community and small-scale public infrastructure investments. Direct financial benefits were limited. We presume the non-financial benefits combined with recognition from the governments and external stakeholders can well increase farmers’ commitment to the scheme. When financial payment is given, it is important to adjust the value of new contracts so the farmers can cover their true opportunity cost if the funds from the buyer allow that. However, findings in other PES sites in Asia revealed that most of the scheme cannot cover farmers’ true opportunity cost because of limited funds of buyers (Leimona *et al.* 2009).

Although the PES scheme did not drastically change the livelihoods of participants, linkages with external stakeholders were creating opportunities for participants to diversify or capture greater value from their income sources. Our case study showed that exposure to these partners also increased the participants’ knowledge of conservation, their skills to manage a farmers’ organization, and helped to build networks to improve their businesses and implementation of the PES scheme. It also highlights the need for awareness of the social dynamics between participants and non-participants and design benefit packages to minimize community level conflict. Literature on PES mentions that conditional monetary PES forming extrinsic motivation might crowd out intrinsic motivation of people to do something right for societies (Farley and Costanza 2010). Experiences from the behavioural economics and psychology fields show that even simple reminders to money made people perform independently and socially insensitively. Further, experiments showed that people might commit more efforts in exchange for no payment, such as in a social market where reciprocity is expected, rather than they expend when they receive low payment, such as underpayment in a monetary market (Heyman and Ariely 2004; Ariely 2009).

## **Conclusions**

This study aimed to contribute to the knowledge base on how to balance efficiency and fairness of PES schemes in Asia through analyses of several case studies. The main conclusions are summarised below.

First, the empirical observations on emerging PES-mechanisms in the Asian case studies indicate that the performance of PES to achieve and balance efficiency and fairness is strongly influenced by complex behaviour and decision making at the individual level. These behaviours at individual levels are not only limited to ES providers as the main actors of PES but also beneficiaries, intermediaries, and supporters of PES (*e.g.* governments and international agents). Motivations of stakeholders, their perceptions, power relations and political interest towards PES can further shape the design and implementation of PES. A language of co-investment in environmental stewardship may be more conducive to the type of respect, mutual accountability and commitment to sustainable development that is desired.

Second, non-financial payment has to be considered as

an important incentive for ES providers. Such payments have weaknesses, such as giving indirect benefits to ES providers, which reduces the effectiveness of the payment and can trigger free-riders and patronizing effects. Nevertheless, in-kind reward is often the most feasible transfer because the budget for PES from ES beneficiaries is typically small and cannot cover the full opportunity costs of the providers. Moreover, in-kind reward avoids neglecting non-participants and aligns with social cohesiveness characterizing rural communities in most developing countries.

Third, the application of multiple ecological knowledge systems, *i.e.* local, public and scientific ecological knowledge can support the establishment of efficient and fair PES schemes. Clarifying problems in the provision of ES and recommending solutions at each spatial scale leads to more realistic expectations of all stakeholders in implementing PES schemes. The roles of each actor are then well-recognized and solutions based on local contexts rather than standardized ones lead to mutual responsibility among PES actors.

Fourth, the ES providers' decision making process in joining and implementing a PES contract is influenced by social and institutional factors beyond monetary values. However, rural communities are open to a market-based approach, harnessing competitiveness among its participants as long as the design of the market-based instrument is transparent and does not make them worse-off.

Fifth, evaluating an established PES using the sustainable livelihood framework can provide more complete insights on how PES makes actors involved better or worse-off. It also can more fairly evaluate project implementers, since a broader view of impacts are captured. Our case in Indonesia suggests that the role of the intermediary is very important and possibly dominant. An honest and trusted intermediary is thus one of the key factors to success of a PES scheme. It also highlights the need for awareness of the social dynamics between participants and non-participants and design benefit packages to minimize community level conflict.

Finally, interdependency of fairness and efficiency is the main consideration in designing and implementing a PES scheme in developing countries. Neither fairness nor efficiency alone should be the primary aim but an intermediate PES that is fairly efficient and efficiently fair may bridge the gap to the practical implementations of PES on the ground.

### **Synthesis and recommendations: integrating PES mechanisms into a wider concept of sustainable development**

As a relatively new concept, PES is facing challenges in its process of being adopted as an innovation. The initial theory of PES emphasized effectiveness of the scheme by maximizing ES provision in relation to the monetary value invested. In practice, PES often needs considering fairness aspects and respect for traditional practices of local communities. The difference between theory and implementation of PES schemes places this approach in balancing fairness and efficiency in PES designs and

implementations in a critical light.

Recognition of the range of PES approaches to provide incentives for enhancement of ES is needed rather than using "PES-like" terminology for partial matches with a theoretical framework. Such terminology may not reflect an optimal solution. A positive terminology for portraying PES in practices may avoid frustrations from practitioners, who might otherwise sense to be blamed for not meeting theoretical expectations.

A broader view of efficiency can be achieved if all potential win-win exchanges across actors and capital types have been identified, negotiated and implemented. An ideal PES scheme, in the perception of the external stakeholders, can efficiently produce the desired effects or result in ES increments with a minimum expenditure of time, effort, skill or money across the negotiation and implementation phases. An ideal PES scheme from a local perspective provides substantial net benefits after all transaction and opportunity costs have been accounted for. While the minimum condition for local stakeholders is that the scheme at least does not make them worse-off socially and economically, and the minimum condition for external stakeholders is to break-even with alternative options to secure the ES they depend on. These different perceptions and expectations on distribution of costs and benefits among relevant stakeholders should be reflected at each stage of PES development. A pro-poor PES scheme is feasible under some conditions but not under others, depending on the degree of space-time association (rather than causal relationship) of poverty and environmental degradation.

This study was limited to research sites that were selected from a larger set of candidates of PES implementation sites in Indonesia, the Philippines and Vietnam with the main results coming from the Indonesian case studies. Thus, these sites may not necessarily represent the broader conditions of all PES schemes in Asia. Nevertheless, methodologically, this study contributes to the introduction of a nested approach and assessment of people's perspective in identifying ES, PES supply costs, various types of ES rewards and livelihood outcomes of such schemes, and levelling expectations of all actors involved to avoid over expectations and perverse incentives. The study supports the argument to incorporate a more holistic livelihoods perspective in PES schemes and to combine efforts through moral persuasion, regulation and rewards or incentive approaches to modify local-resource-use decisions in the social, political and ecological realities of the Asian landscape.

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