



REWARDS FOR USE OF AND SHARED
INVESTMENT IN PRO POOR
ENVIRONMENTAL SERVICES

CAN REWARDS FOR PROVIDING ENVIRONMENTAL SERVICES BENEFIT THE POOR?

Lessons from Asia

Rewards for environmental services (RES) link global priorities on poverty reduction and environmental sustainability and are designed to balance effectiveness and efficiency with fairness and pro-poor characteristics. This paper assesses some key issues associated with design and implementation of RES by developing and exploring two propositions related to conditions required for RES to effectively contribute to poverty alleviation, and to preferred forms of pro-poor mechanisms.



The concept of rewarding local people who protect the environment and the services provides links to two global priorities: to reduce poverty and to sustain the environment.

Pilot schemes based on the concept should ideally aim to balance effectiveness and efficiency with fairness and supporting poor people.

However, most tend to focus primarily on the efficiency of providing the environmental services and often neglect the local people involved in managing the natural resources, their livelihood strategies and the multi-dimensional nature of poverty.

Key findings

- Only under specific circumstances will actual cash payments to individual participants contribute substantially to alleviating poverty in communities that provide environmental services. A review of key ratios of relative numbers and wealth of service providers and beneficiaries supports this.
- Non-financial incentives to providers of environmental services will contribute to reducing poverty by linking the community to various types of capital (human, social, natural, physical and financial). Results from community focus groups support this.

Discussion

Increased global commitments to poverty alleviation and conservation (for example, Millennium Development Goals and Ecosystem Assessment and associated international agreements, such as the Convention on Biological Diversity) are encouraging scientists and policy makers to focus on balancing trade-offs between poverty and conservation.

The RUPES project set out to analyse if poverty was reduced through cash payments to individual environmental services' providers and to examine non-financial benefits received by communities engaging in such schemes.

We created a model of the income share of environmental services' payments value that demonstrated that such payments can only have a significant effect on rural income in upstream areas if the scheme

1. involved upstream providers with low population density and/or a small area relative to downstream beneficiaries who had relatively higher income than the upstream providers;
2. provided highly critical and non-substitutable environmental services that were substantial and worth buying;
3. was efficient and had low opportunity and transaction costs and downstream beneficiaries with high willingness and ability to pay.

We conducted an accompanying analysis of income and spatial data for agroecosystems that indicated that these conditions may be difficult to achieve given the population and income structures of downstream and upstream areas in Asia.

Although the Asian data shows upstream income levels tend to be lower than those in downstream/urban areas¹, the ratio between urban and rural income is still quite low (< 2).

In East Africa, where the highlands provide more profitable agricultural products, we noted that upstream income could even be somewhat higher than downstream/urban income².

We define 'environmental services' as the many benefits humans receive from natural and human-managed environments. These benefits include fresh air, clean drinking water, storage of carbon and waste decomposition. Local communities, particularly in upland areas, have often historically managed the natural environment in such a way that its services are protected.

The Rewarding Upland Poor for Environmental Services (RUPES) project aims to develop practical environmental services schemes that can be adapted to work in different countries with different circumstances. The goal is to integrate rewarding poor people for their work in protecting environmental services into development programs to alleviate rural poverty and protect the natural environment.

Action sites for testing the schemes

| Site | Environmental service | Current status |
|------------------------|--|--|
| Indonesia | | |
| Bungo | Jungle rubber for conservation of biodiversity and habitat | <ul style="list-style-type: none"> • Testing mini-hydropower as intermediate reward for biodiversity conservation • A private buyer (automotive wheel industry) showing interest in rubber for 'green' tyres |
| Singkarak | <ul style="list-style-type: none"> • Water quality for hydropower, native fish conservation and ecotourism • Carbon sequestration for voluntary markets under land rehabilitation activities | <ul style="list-style-type: none"> • Conservation fund from local government to revitalise organic coffee • Carbon market negotiated with private buyer (consumer goods' distributor) |
| Sumberjaya | <ul style="list-style-type: none"> • Water quality for hydropower • Watershed rehabilitation for the District Forestry Service | <ul style="list-style-type: none"> • Conditional tenure rewarded to farmer groups • Hydropower company royalty agreements signed for River Care groups |
| The Philippines | | |
| Bakun | Water quality for hydropower | Royalty agreements signed |
| Kalahan | Carbon sequestration under voluntary market | Carbon market initial agreement with private buyer (automotive industry) |
| Nepal | | |
| Kulekhani | Water quality for hydropower | Royalty agreements signed |

Despite current limitations on data, we recommend this simple model as a useful tool for initial diagnosis to determine the feasibility of implementing a rewards for environmental services' scheme. Accurate diagnosis during very early stages can help avoid useless investment and over-expectations about the role of such schemes in alleviating poverty.

The various environmental services' rewards initiatives in Asia we analysed were quite heterogeneous in their types of poverty, landscape characteristics and environmental services provided. They also differed in their socio-cultural backgrounds, and in their modes for involvement of local communities. This reinforced the view that each site needs a localised design for pro-poor environmental services' rewards schemes that take into account their specific local conditions, as well as the dominant types of landscapes and the particular environmental services that are most important locally.

We also assessed people's perspectives on what factors contributed to their poverty, in the context of developing such schemes. The results can help portray social, economic and institutional dimensions of the local situation that need to be acknowledged when designing schemes. One particularly important design aspect is to identify rewards that match people's needs and expectations.

We discovered that rewards in the form of human, social and physical capital—what are often referred to as non-financial incentives—were very often the most preferred and also most possible types. Benefits can be channelled to a community as a whole and not just to the poor. Investment in specific assets and infrastructure, such as schools and health centres, or strengthening human capital with



A model of rewards for environmental services' value as fraction of upstream income

We developed two propositions related to the effectiveness of financial rewards in alleviating poverty.

Proposition 1: Only under *specific circumstances* will cash incentives contribute *substantially* to increasing disposable income and thus poverty alleviation of environmental services' providers.

Proposition 2: Indirect non-financial benefits for communities contribute to reducing poverty by linking the community (both participants and non-participants) to *access* to critical forms of capital, including human, social/political, natural, physical (for example, infrastructure) and financial (for example, microcredit).

We explored these propositions at two levels: 1) a model of the potential magnitude of financial payments and their relevance for upstream income (Proposition 1); and 2) analysis of findings from focus groups at six action research sites across Asia in order to capture stakeholders' perceptions of poverty, constraints faced by environmental services' providers, and preferred types of schemes (Proposition 2).

Assessment of proposition 1 requires estimates of the potential total value of financial transfers relative to current income of poor environmental services' providers. Given a total value, either a small group can benefit substantially or a large group marginally, but policy-relevant impact on rural poverty alleviation can only be expected if a large group can benefit at a daily income level that helps in meeting the USD 1 per person per day threshold (or its national poverty line equivalent).

In formulating estimates for a potential scheme we used an upstream/downstream terminology that can be taken literally in the case of watershed services and more abstractly in case of biodiversity or climate-change mitigation.

A scheme that is based on the willingness to pay of downstream beneficiaries can generate a total volume of payments TP_d (\$ day⁻¹):

$$TP_d = A_d P_d I_d \cdot \beta_d \quad (1)$$

where A_d = Area downstream (ha), P_d = population density downstream (ha⁻¹), I_d = per capita income downstream (\$ day⁻¹) and β_d = fraction of income that is potentially available for such payments. The per capita benefits, expressed as fraction of the upstream income that this can generate upstream (RP_u) are:

$$RP_u = TP_d \cdot (1 - T) \cdot (1 - \alpha_u) \cdot (A_u \cdot I_u \cdot P_u)^{-1} \quad (2)$$

where A_u = Area upstream, P_u = population density upstream, I_u = per capita income upstream, T = fraction of downstream payments that is needed to cover the transaction costs and α_u = fraction of what the upstream population receives that is offsetting the opportunity costs of alternative land uses that might generate more income but provide less environmental services. By combining equations (1) and (2) we obtain:

$$RP_u = (A_d A_u^{-1}) (I_d I_u^{-1}) (P_d P_u^{-1}) \beta_d (1 - \alpha_u) \cdot (1 - T) \quad (3)$$

which expresses the per capita benefits in terms of a number of dimensionless ratios: area, population density, income, willingness to pay by downstream beneficiaries, transaction costs and offset-fraction. RP_u may have to be a 'significant' fraction of upstream income before upstream land users will take notice of the opportunity and respond.

As a criterion for use in exploring Proposition 1, we tentatively postulate a modest target of 5% of current average annual disposable income of upstream rural households as a meaningful contribution to poverty reduction. Analysis of existing data can provide the ratios of downstream/upstream population densities, the areas involved and the relative income levels.

Local perspectives of factors contributing to poverty

| Capital | Bungo (Indonesia) | Singkarak (Indonesia) | Sumberjaya (Indonesia) | Bakun (Philippines) | Kalahan (Philippines) | Kulekhani (Nepal) |
|------------------|--|---|---|--|---|--|
| Financial | <ul style="list-style-type: none"> • Low income • Lack of financial investment | <ul style="list-style-type: none"> • Low income • Lack of financial investment | <ul style="list-style-type: none"> • Low income • Lack of financial investment | <ul style="list-style-type: none"> • Low income • Lack of financial investment | <ul style="list-style-type: none"> • Low income • No financial planning • No savings | <ul style="list-style-type: none"> • Low income • Low prices of farm products |
| Physical | Poor roads | Not mentioned | <ul style="list-style-type: none"> • Poor living conditions • Poor access to road | <ul style="list-style-type: none"> • Poor living conditions | <ul style="list-style-type: none"> • Lack of farm irrigation and inputs (fertiliser, quality seed) • Poor living conditions • Poor roads | <ul style="list-style-type: none"> • No access to market • Small number of livestock • Poor living conditions • Poor access to roads |
| Human | <ul style="list-style-type: none"> • Lack of knowledge • Laziness • Lack of future planning | <ul style="list-style-type: none"> • Low education level • Lack of creativity • Poor health services | <ul style="list-style-type: none"> • Low education level • Poor nutrition • Unmotivated • No access to job market • Children • Poor health services • Laziness | <ul style="list-style-type: none"> • Low education level • Poor access to education and bad working attitude | <ul style="list-style-type: none"> • Low education level • Laziness • Poor health services | <ul style="list-style-type: none"> • Low education level • No access to job market • Insecure food supply • Large family size |
| Natural | <ul style="list-style-type: none"> • Small land size • Pests and disease of rubber plantation | Not mentioned | No access to good quality land | Small land size | Small land size | Small land size |
| Social | Not mentioned | Insecure land tenure | Low social participation | Not mentioned | Not mentioned | Not mentioned |

skills not available locally can create forms of co-investment and mutual responsibility among sellers, buyers and government units with compatible mandates.

This supported our second proposition about how non-financial incentives can make important marginal contributions to local livelihoods. This was especially clear in the case of conditional land tenure in Sumberjaya.

While results showed substantial variation among communities at different sites, some general similarities existed.

Sumberjaya

About 40 percent of this 45,000 hectare watershed is protected forest. It has a history of conflict, including forced evictions that caused relationships to deteriorate rapidly between local people and government. The RUPES Sumberjaya project facilitated conditional tenure agreements for community-based forest management. Under this approach, the government acknowledged that properly managed agroforests can bring the same watershed benefits as natural forests. In exchange for secure land tenure, farmers promised to conserve existing patches of natural forest and to use good management practices.

Expected rewards

| Capital | Bungo | Singkarak | Sumberjaya | Bakun | Kalahan | Kulekhani |
|-----------------------------|---|--|---|--|---|---|
| Financial | Not mentioned | Not mentioned | Cash | Not mentioned | Financial assistance | Not mentioned |
| Non-direct financial | Cooperative for credit access | Reduction in electricity bill | <ul style="list-style-type: none"> • Access to soft loans • Forming of a farmers' cooperative | Reduction in electricity bill | Access to soft loan | Reduction in electricity bill |
| Physical | <ul style="list-style-type: none"> • Micro-hydropower • Supply of rubber seedlings • Road infrastructure • Integrated pest management tools | <ul style="list-style-type: none"> • Farming tools • Road infrastructure | Road infrastructure | Road infrastructure | <ul style="list-style-type: none"> • Road infrastructure • Access to market | <ul style="list-style-type: none"> • Road infrastructure • Access to market |
| Human | Training and cross-site visits | Training in alternative small business | <ul style="list-style-type: none"> • Agricultural extension • Information on agricultural technology • Access to labour market | <ul style="list-style-type: none"> • Health services • Access to labour market • Educational services • Training in alternative small business | Public services | Training in alternative small business e.g. ecotourism management and non-timber forest products |
| Natural | Not mentioned | Not mentioned | Not mentioned | Not mentioned | Not mentioned | Not mentioned |
| Social | Recognition as environmental champion | Recognition as environmental champion | Community forest permit | Security of land tenure | Trust from government (to maintain good environment) | Recognition as environmental champion |

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In the case of human capital, for example, lack of knowledge and access to higher education were the most important aspects that people at sites in all types of landscapes perceived as poverty related. Lack of human capital mainly limited opportunities for better jobs. Access to health services was also an important problem, especially in Kulekhani, Sumberjaya and Bungo. With the exceptions of Singkarak and Sumberjaya, access to education was limited to elementary level and drop-out rates were high. The situation was worse in Kulekhani, with less than 50% adult literacy.

Compared to other sites, the need for physical and financial capital was the highest in Kalahan, where all land is either remote core forest or conservation forest. Communities in Kalahan used poorly maintained

roads that were often inaccessible during the rainy season. The nearest market for upstream communities in Kalahan was about 11-24 km distant, depending on road conditions, whereas it was 1-5 km at the other sites.

Although people in all types of landscapes had low income, they rated financial capital as being only moderately associated with poverty. People had access to credit from various sources, both formal (bank credit, local cooperatives, microcredit) and informal (relatives, friends, middle-men). Trends toward increasing levels of consumptive credit with high interest rates were associated with changing lifestyles.

Moreover, literature on collective action in natural resource management indicates that the

social capital of community members influences the magnitude of transaction costs. Higher levels of social cohesion and trust within the community and its external links are associated with lower transaction costs. This suggests that investments that provide non-financial benefits to communities, such as strengthening social capital, can help reduce overall costs of implementation.

Among the various stages of development of environmental services' rewards schemes, constraints faced by communities at the stages of 'stakeholder analysis' and especially 'negotiation' seem to be the most important initial hurdles for communities in all types of landscapes.

Although not all communities at RUPES' action sites have

Constraints by development stages in environmental services' rewards schemes

- (a) *Scoping*. This stage clarifies links between land management by environmental services' providers and the services that are actually provided. Intermediaries and buyers target areas considered to be hotspots. This spatial specificity may not coincide with areas where the poor live³ and the poor may be excluded from such schemes because they may not qualify as providers. Even when the poor are legitimate providers, they usually own limited land. Most services (and payments) are based on particular land use at a given spatial scale. As smallholders, the poorer members of a community will receive smaller proportions of benefits than their better-off neighbours with larger landholdings. Moreover, schemes require long-term investment in order to achieve significant environmental impacts, so where land tenure is insecure, it may be difficult to attain these types of investments⁴.
- (b) *Stakeholder analysis of key actors*. Problems at this stage appear similar to those in the first stage, especially regarding inclusion versus exclusion of the poor.
- (c) *Negotiations between sellers and buyers*. Insecure land tenure can become a constraint for environmental services' sellers when negotiating with buyers. It can undermine the legitimacy of sellers and limit their access to financial services needed to conduct activities required by the contractual agreement. And since poor people usually have less power in negotiation, there are risks that their voices will be neglected or undermined during contract formulation.
- (d) *Implementation problems in reaching the poor*. Four types of negative outcomes may be associated with implementation: (1) the scheme may provide incentives for powerful groups to take control of currently marginal lands⁵; (2) livelihoods of the landless may be negatively affected if conditions limit their access to forested land⁶, especially where the landless are women or herders whose livelihoods depend on gathering non-timber forest products, but who do not participate in the scheme; (3) farm labourers may lose their jobs when land-use practices promoted by the scheme have much lower labour intensity⁴; and (4) since most schemes are area-based, there is an obvious risk the local distribution of rewards may further enhance existing disparities in wealth.

reached the 'implementation and monitoring' stage, communities at sites dominated by remote core forest and conservation forest seem to be particularly concerned about monitoring of services like biodiversity and carbon sequestration.

Furthermore, any conditional environmental services' scheme must ensure transparency about when rewards can be granted or not. When designing a scheme, solving local problems about voluntary participation and conditionality

can help make the whole process more effective.

Beyond that, the roles of intermediaries and buyers are also very important in ensuring that the scheme is realistic and pro-poor.

Overall, it seemed that the criteria 'voluntary' and 'conditional' for establishing rewards for environmental services are the most important issue for local communities.

Under our theoretical framework, 'voluntary' refers to involvement based on free choice by each community rather than their being the object of regulation. This relates to all levels of decision making: internally within communities; and externally in their relationships with intermediaries and buyers.



Four critical aspects of environmental services schemes

Realistic: A scheme should reduce threats to environmental services; to do so, benefits gained by both sellers and buyers need to be tangible and sustainable. For intermediaries, there must be sufficient values accruing from the services to support development of the scheme's mechanisms.

Conditional: A scheme should connect environmental services with the reward in a manner that ensures transparency of when rewards can be granted or not.

Voluntary: A scheme is voluntary when providers have free of involvement or not. Both buyers and sellers voluntarily agree on contractual matters.

Pro-poor: A scheme is positively biased towards the poor.

Limitations

We limited our study to action research sites that were selected from a larger set of candidates on the basis of expectations that all essential requirements for a scheme could be met. Thus, these sites may not necessarily represent the broader conditions of all upstream areas in the region. However, our results can still contribute to debates related to fairness and efficiency in providing rewards for environmental services in Asia.

Authors

Beria Leimona (l.beria@cgiar.org)

Laxman Joshi (l.joshi@icimod.org)

Meine van Noordwijk (m.vannoordwijk@cgiar.org)

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The RUPES Project:

RUPES aims to work with both potential users and producers of environmental services to find conditions for positive incentives that are voluntary (within the existing regulatory framework), realistic (aligned with real opportunity costs and real benefits) and conditional (linked to different level of conditionality in providing environmental services), while reducing important dimensions of poverty in upland areas. At each of the RUPES sites, local institutions partner with the World Agroforestry Centre (ICRAF) to implement action research aimed at developing effective reward mechanisms in the local context. The sites are in China, India, Indonesia, Nepal, the Philippines and Vietnam. National policy dialogues are aimed at making policy frameworks more conducive to positive incentives. RUPES is financially supported by the International Fund for Agricultural Development and various other donors.

RUPES Program
World Agroforestry Centre
ICRAF Southeast Asia Regional Office
Jl. CIFOR Situ Gede, Sindang Barang, Bogor 16115
PO Box 161, Bogor 16001, Indonesia
Tel: +62 251 8625 415; Fax: +62 251 8625 416
Email: rupes@cgiar.org
<http://rupes.worldagroforestry.org/>



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