



Payment for Environmental Services (PES) in Nepal: Global Lessons, Local Reflections

Discussion Note

By Hemant R Ojha, Rajan Kotru, Dil R Khanal, Laxmi Bhatta and Gayatra Paudyal

January 2009

Kathmandu, Nepal

1. The Issue

In most situations, management actions of land managers create positive or negative benefits to others as well. For example, if a community clears forest in the mountains, people downstream are likely to suffer the increased risks of soil erosion. Likewise, if communities upstream protect forests and nurture ground vegetation, those in the downstream will benefit from reduced erosion and likely increase in dry season water flow. Until recently such services were both considered as “free goods” of nature and termed “externalists”. Land and landscape management policies have consistently ignored the externality issue, and as a result, have often failed to generate anticipated conservation and development benefits.

Nepal has made significant headways in landscape conservation and sustainable resource management through various community based forest management approaches, including community forestry. While community level governance of forest has improved, there is still a limited consideration of larger ecological system, ecosystem services and externalities. In the recent years, there is an increasing appreciation of the need for accounting ecosystem services generated by land management units such as community forests. An approach has been to institute some mechanisms for Payment for Environmental Services (PES) (see Box 1 for the conceptual definition widely in use). In both developed and developing countries, PES is being adopted as a means to reward upland land managers for ecosystem services generated. The idea is that the downstream beneficiaries – such as a hydro power company and municipality having drinking water projects - pay for the incremental efforts of the upstream land managers towards augmenting the flow and quality of ecosystem service such as water. This idea is being applied in the context of various ecosystem services such as carbon sequestration, watershed conservation, biodiversity, and eco-tourism.

Box 1: Definition of PES

A PES scheme is

1. A voluntary transaction where
2. A well-defined environmental service (or a land use likely to secure that service)
3. Is being “bought” by at least a buyer
4. From a (minimum of one) environmental service provider
5. If, and only if, the environmental service provider secures environmental service provision

Source: Wunder (2005)

Globally, a variety of PES schemes have emerged to address diverse contextual needs. Costa Rica is a world leader in implementing nation-wide PES programme. Other developing countries that are also benefiting from PES programmes are Mexico, China, the Philippines, Indonesia, and India.

These schemes vary from purely market based transactions to government-run public payment schemes (see Box 2). In Nepal, Kulekhani is projected as a successful pilot PES site where a portion of the revenues from the Nepal Electricity Corporation is channelled to reward upstream communities' watershed conservation activities. There are several other emerging initiatives in Nepal – such as financial rewards to communities in the buffer zone around national parks – which are not explicitly known as PES schemes and yet carry certain aspects of it.

Box 2: Types of PES Schemes

Four types of forestry-related PES

1. Public payment schemes to forest owners or managers in which the government is the main or only buyer (e.g national PES programme in Costa Rica, China and Mexico).
2. Trading between buyers and sellers of ecosystem services using “cap and trade” mechanism for allowable damage or deterioration as determined by the public regulation.
3. Private market based ideals in which beneficiaries of ecosystem services contract directly with service providers.
4. Eco-labelling or certification of forest or farm products in which consumers pay a ‘green premium’ to assure neutral or positive ecosystem impacts

Source: Richards and Jenkins (2007)

2. Review of PES Cases

A team of researchers from ForestAction and SNV Nepal reviewed global literature on PES, and found that a wide array of PES schemes exist in all the continents, but they do not necessarily fit into a single

theory of PES. Our impression is that PES is not a phenomenon of the western developed countries alone; there are equal possibilities for this approach in developing countries. If carefully facilitated, PES or incentives based mechanisms have the potential to contribute to poverty reduction as well, in addition to addressing the issue of environmental conservation. Examples of key PES modalities are given below.

1. Large-scale government-run PES Scheme - a case of China's Sloping Land Conservation Programme

China has adopted one of the world's largest PES initiatives in the watershed of Yangtze and Yellow river. Under the scheme, farmers are rewarded (with an annual USD 4.3m) when they set aside erosion-prone areas of their farmland in critical areas of the watershed of Yangtze and Yellow river (also known as Huanghe river). Soil erosion is a major problem in the river basin, with an estimated 2 to 4 million tons of silt released into Yangtze and Yellow Rivers each year, of which 65% is estimated to come from sloping cropland. The stated environmental goals of the programme is to reduce water and soil erosion and increase China's forest cover and area by retiring steeply sloping and marginal lands from agricultural production.

The government has plans to convert around 14.67 million ha of cropland to forests by 2010 (4.4 million of which is on land with slopes $> 25^{\circ}$), and has a "soft" goal of afforesting a roughly equal area of barren mountainous wasteland. A total of 15 million farmers entered the program in the first four years, with estimated some 40-60 million rural households participating upon completion. Currently, the programme is being implemented in more than 2000 counties across 25 provinces. Key actors include:

- Central government is the buyer (of a public scheme).
- Rural households are sellers.
- Local government (County, township and village) serve as the mediators, and bear the onus of actual implementation.

2. Comprehensive PES programme with strong national institutional and legal framework – the case of Costa Rica's National PES programme

Costa Rica has Government-led national PES programme that rewards forest owners for the protection of watershed, carbon sequestration, and conservation of biodiversity and landscape beauty. Forest Law 1996 specifically defines these key environmental services and provides a basis for establishing contracts with land managers. Funding to cover the rewards is derived from fuel tax (3.5% for PES programme), increased participation of hydro-electric companies, and newly approved water tax. The PES programme is managed by National Forest Fund (FONAFIFO in Spanish abbreviation) – a semi governmental organization with three natural resource related ministries and the private sector. FONAFIFO develops and markets a variety of PES contracts – such as carbon (certifiable tradable offsets – CTO), agroforestry contracts, regeneration contracts, through which upstream land managers receive rewards from the users of environmental services. Initially the law allowed only the holders of formal land titles, but customary land owners also rewarded in the later stage.

3. Downstream city paying for improved water quality – the case of Sukhomajiri, India (Chandigarh)

The scheme emerged from the recognition of the classic problem of land degradation, forest clearance, open grazing and poverty in the upstream areas of Sukhomajiri lake, which is the source of drinking water in Chandigarh. A Government intermediary called CSWCRTI constructed soil conservation structures that, apart from reducing siltation of the lake, also stored rainwater for irrigation for the upstream village (purchased with water rights and later user fees). Other in-kind compensation was organized to provide additional incentives for villagers to give up free grazing and tree felling in the hills. Following the PES scheme, the upstream villagers refrained from allowing their animals to graze on the watershed hills. Compensation includes access to other pasture areas, construction of rainwater dam that improved water supply in the village as well as reduced siltation of the lake. Tangible results were achieved as a result of the scheme: siltation in Sukna lake reduced by 95% with an avoided costs for the city of Chandigarh of USD 200,000 annually.

4. Small-scale, inter-village PES scheme – the case of Kuhan village in India (Himanchal Pradesh)

This is a small PES case involving two villages, one as buyers and the other as providers of watershed services. In 199x, 2005 The two upstream and downstream villages signed an agreement to create and protect a dam across a small stream that was a source of erosion, silt and floods. The downstream

village provided rewards in cash and in-kind. The upland residents ceased grazing to protect the dam. They protected grazing area for eight years. The downstream village (Kuhan) provided 320 saplings, and the upstream village (Oach Kalan) dug pits & planted. They together built 9 brush-wood check dams by sharing labour & material.

5. Rewarding agroforestry systems for watershed conservation: the case of Sumberjaya, Western Sumatra) Indonesia

Increasing commercial market for coffee created incentives for farmers in the upstream areas to convert traditional agroforestry to coffee farming. This created threat to the watershed that served a downstream hydropower. Research conducted by World Agroforestry Centre demonstrated coffee based agroforestry as being watershed friendly practice. Rewards for such models of agroforestry were provided. Two forms of rewards were offered: first, conditional tenure (5 to 25 years) – if 400 trees per hectare are planted along with coffee; second, farmers were organised into RiverCare group and receive incentives for reductions in sediment load (initially covered by RUPES programme but later being transferred to the hydropower company).

6. Rewarding the upland poor for sustainable management of watershed – the case of Bakun watershed, Phillipines

The scheme involves payment by hydro-electric company to upland indigenous communities. The company directly pays the communities (not through local government), who have undertaken a wide range of sustainable development activities in the watershed area of Bakun - road construction, interest-free loans, health services, and more. PES 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.

7. Local government rewarding upland communities for watershed conservation through hydro-power revenues – the case of Kulekhani, Nepal

Kulekhani ydropower reservoir has the watershed area of 12500 ha, with 53% forest, and 45,000 people. Study by Winrock/RUPES showed that forest conservation (after community forestry) has

reduced sedimentation and increased dry-season flow. The study showed that forest cover declined between 1978 and 1992, but by 2001 it increased, when community forestry groups became fully functional. District Development Committee (DDC) (Makwanpur) has created Environment Management Special Fund (EMSF) which receives 20% of the royalty received by the DDC amounting to about USD 50,000. This fund supported upstream groups in undertaking development and conservation activities of local people's choice. But since there is no legal provision guaranteeing the rights of upstream communities over the water based economic activity downstream, people outside of the Kulekhani watershed have also lodged their claims over the fund supplied by Nepal Electricity Authority. Currently there the DDC has failed to provide the rewards to upstream groups due to such conflicting claims.

8. A private drinking water company organizes PES to protect water quality – the case of Vittel, France

In this case, a private mineral water company called Vittel Water pays for the upstream farmers who have agreed to resort to organic farming. Water comes from a 6,000 ha aquifer 80m below ground and is lifted naturally to the surface through a natural geological fault. In order to address the risk of nitrate contamination caused by agricultural intensification in the aquifer, the world leader in the mineral water bottling business is financing farmers in the catchments to change their farming practices and technology. It took ten years of participatory research and negotiation. The compensation package to farmers include:

- Subsidy of about 200 EUR/ha/yr for 5 years - as a guarantee of income during transition
- Up to EUR 150,000 per farm to cover equipment and building improvement
- Free technical assistance

As a result of the scheme, all 26 farms adopted the new system, 1700 ha of maize eliminated, 92% of the basin protected. Average farm size also increased to 150 ha, and the number of farms reduced from 37 to 26. Contracts are generally for 30 year. Payments are made to individual farm which is not conditional to individual farm performance as it was found difficult to establish. But contracts are differentiated according to the cost structure and the location of the farm. Although the scheme involved significant amount of rewards, analysts say the primary reason for success is not financial – but trust, negotiation, and awareness.

3. Global Lessons

The review of PES cases show that PES can be effective for both **environmental conservation and poverty reduction**, but should not be considered as a panacea. A number of specific lessons and insights are identified:

1. PES initiatives should be organized in **phases or sub-programmes**, moving from simple to complex processes. Working in small pilot sites with diverse socio-economic and ecosystem specificities can generate critical mass of change agents, necessary evidence and insights, and policy lessons. **Bundling of multiple PES services**, particularly at the landscape level, enhances the level of benefits and motivation.
2. **Analysis of linkages** between land-use practices and the production of environmental services (such as hydrology, carbon) is important for agreement but difficult to ascertain. The level of analysis should increase along with the process of negotiation between upstream and downstream groups.
3. PES is not just about transferring money. Efforts should be made to **Combine market with state regulations and civil society** facilitation to develop a comprehensive system of institution, resource management and economic flows. It is important to **link PES** with regulation, public investment, zoning, tenure, community ownership, and participation.
4. It is often essential to **subsidize** start up costs for PES as there is established market to facilitate this. Sometimes, it may be useful to **create endowment fund** to ensure payment beyond the first time establishment of plantation.
5. It is important to institute mechanisms for **continuous monitoring** of the effects of land management strategies against the baseline of key success indicators.
6. It is important to create **stronger negotiation position of local community**, especially when the buyers are big companies or public institutions. If negotiation processes are well designed, along with empowerment activities, PES can augment the **voice of the poor**.
7. **Facilitator** input is crucial, including in negotiation and development of local champions
8. PES mechanism indeed **increases the user-base** of watershed (even in upstream areas), and high moral value of local payment than donor or government funding. Exchange visits and field trips are useful in developing understanding between upstream and downstream groups.
9. To be successful, PES requires both **decentralization and local empowerment**. For full fledged PES programme, it is important to build the institutional capacity at the **national level**, with a focus on

monitoring and enforcement.

10. Watershed PES work best when there is perceived **scarcity** of clean water, and water users have the capacity to pay (e.g urban citizens, companies). **Also, existing institutions** of buyers and sellers are important base for PES processes.
11. **Policy and regulatory framework** - Except in a few countries (such as Costa Rica), there is no PES specific law. Yet, intermediaries and development organizations have facilitated PES innovations across a variety of regulatory situations. It is important for facilitators to demonstrate that PES works on the ground before a concrete policy proposal is developed.

The global lessons support that it is important to follow a action-research oriented and step-by-step approach to mainstreaming PES schemes in natural resource management. These steps can be conceptualised as:

- a) **Scoping**: review of international experience and undertaking site visits and interactions with local stakeholders at national as well as local level where potential piloting is being considered.
- b) **Piloting**: undertaking action research and facilitation of PES processes in a small number of sites.
- c) **Policy mainstreaming**: informing policy communities on the potential, challenges and possible directions through documentation, communication, site based workshops, and the media.
- d) **Wider upscaling**: institution of incentives and removal of constraints for the uptake of PES lessons, as well as horizontal scaling out through extension processes and the media.
- e) **Monitoring**, review, reflections and on-going revision as part of the collaborative learning process.

4. Reflections from a Scoping Exercise in Nepal

The idea of scoping is to explore the possibilities of applying PES concepts in a specific locality. ForestAction-SNV recently undertook a scoping exercise during August–September 2008 that entailed exploring the perceptions and expectations of local stakeholders in relation to the issues of regulating and managing ecosystem services. Site visits and stakeholder interactions were done in five sample sites - Lotharkhola subwatershed in eastern Chitwan, CFUGs network around Hetauda municipality, Pithuwa-Jutpani drinking water project in central Chitwan, groundwater use around Simara area of Bara district, and Kulekhani watershed in Makawanpur. The field study revealed several interesting observations.

Watershed stakeholders are currently divided into different institutional segments (VDC, municipality, districts, upstream groups, downstream groups etc). “Yes”, replied a local political leader in Bharatpur, “One of our senior leaders had indeed presented the idea to go upstream and to help the farmers to adopt soil conserving and income raising farming and agro-forestry techniques”. The speaker was responding to our query of whether there had been any discussion in the past about finding solutions to the downstream flood in eastern Chitwan by addressing land use and socio-economic issues in the upstream. He added “but that idea did not go further as there were too few to appreciate such a time-taking solution”. The Lothar watershed continues to suffer from the lack of institutional linkages between the upstream and the downstream areas. More recently, stone crushing companies have come to the scene, with license to mine stones along the river bed. This has added one more actor in the upstream, partly because of the growing demand for construction materials in India and partly because of liberal strategy of Nepal government in the environment sector.

In the same Lothar Khola watershed, another form of environment cost of the current management system can be found on the issue of Rhino habitat – in this case a negative biodiversity service. The flood from Lothar and to some extent from other tributaries of Rapti are destroying the swampy areas where the one-horned rhino resides. As the assistant warden explain responding to our query, “the flood if just up to a level to retain the roots of grass is OK but many times the entire grasses are eroded away, resulting in the loss of grassland for the rhino”. He appreciates that to protect rhino habitat, it is essential to prevent flood. But when asked whether the Chitwan National Park has any plan to do so, he replied “the upstream areas are outside of the buffer zone. Within buffer zone, we can do. For example, we provide compensation to the private land scoured away by the river”. It appears that the geographic concept of buffer zone is not enough; National Park (through buffer zone council) compensates the effects of floods downstream, but does not reward conservation activities upstream Lothar Khola.

Some of the institutional failures are because there is no policy at national and sub-national levels, and the absence of appropriate methodology to assess the services, estimate values and determine charges to pay the providers upstream. “Bring a policy and methodology, and we are ready to compensate upstream forest users to promote forest management practices that recharge the Bhavar area”, said the general manager of Hulas steel factory in Simra, Bara, recently in a meeting with us. We learnt that they use over 100,000 litres of water everyday. This could be one of the reasons why the neighbouring

farmers are going deeper to find ground water. Till date ground water has remained a free resource to extract, and no rewards exist for water recharging forest consideration.

Sometimes even when PES mechanisms are instituted, chances are high for greater conflicts over the distribution of environmental benefits. In Kulekhani, when some forms of PES was initiated by getting the electricity authority pay for the upstream communities through local government. After the upstream communities received their first instalment through environment funds of Makawanpur DDC in.....year? they are now facing conflict with the people from downstream well as neighbouring communities in the district who also lodged their claim for the benefit. The chair of upper catchment of Kulekhani reservoir said “the case has become *zig-zag* after people from below the dam and neighbouring VDCs applied for the same amount of fund as we received. The Local Development Officer is now saying that unless all of us settle the issue of sharing the money, he is not going to release our amount too”.

A more subtle opportunities for PES can be found in Hetauda where there are 13 CFUGs protecting forests and enhancing the scenic beauty of the municipality. People believe that water quality, and dry season flow of drinking water has improved along with the improvement of forests after CFUG began to protect them effectively. Our interaction with these CFUGs showed that till now they have not started to look act who is benefiting from the environmental services generated by their forests. Both municipality and DDC representatives appreciated that improved forest has a contribution to drinking water flow and greenery but they have not thought of seeking any rewards for these services.

From these field observations in the five sites several key insights can be drawn.

- People downstream strongly agree that they need to support upstream conservation activities. Business groups in Sauraha are also willing to contribute to upstream development and conservation, provided there is credible government machinery to implement the plan. Local leaders appreciate the idea of integrated river basin management to address the problems downstream.
- Stakeholders have already realised that they need to go beyond the boundaries of existing institutions, and talk to each other for collaborative actions. For instance, joint committee has been formed representing local government and line agencies of Chitwan and Makawanpur DDC to address flood.

- Local government agencies, such as DFCC of both Chitwan and Makawanpur, are willing to test the PES approach. Officials of Department of Soil Conservation are also willing to follow the river basin approach (there is already a new policy under discussion).
- A huge amount of money is being spent on downstream; there is a real possibility to divert some of this amount for long term solution of flood in the upstream areas, if appropriate intermediaries facilitate dialogues.

5. Way forward – Piloting and Knowledge Brokering

At the end of the scoping exercise, a workshop of local stakeholders was held on December 26 in which findings of the field observations as well as case studies review were shared. The workshop was actively participated by different government line agencies related to natural resource management, political party representatives, NGOs, bilateral projects, local governments and municipalities, upstream community groups and farmers, and forest user group representatives. In the workshop, key issues identified through the scoping exercise was shared, followed by the stakeholder inputs into the analysis of issues and identification of options. Based on the review of 10 cases worldwide, a presentation was also made to sensitise how PES related innovations are taking place worldwide. The workshop revealed that stakeholders are keen to proceed with PES process as a potential solution to watershed degradation problems and create livelihood opportunities for the poor. They realised how both upstream and downstream groups are losing when they act without institutional coordination, and also identified what opportunities exist to work collectively in the watershed basis. Some of the challenges identified are: absence of policy at national and sub-national levels, as well as the lack of an appropriate methodology to assess the services, estimate values and determine charges to pay the providers upstream.

At the end of the workshop, participants identified the following courses of actions to be taken to integrate PES concerns in the management in NRM in Rapti and neighbouring areas:

1. More awareness raising activities are needed for local stakeholders to enable them to understand and participate in the process. Environmental services agendas should be promoted as a campaign.

2. Action research and analysis are needed to establish the level and type of environmental services provided by the upstream groups
3. Increased collaboration between different political and administrative units and organizations as well as other stakeholders to tackle the common problems of the watershed. At the local level, DDC or the federal states should take a lead in coordination at watershed level.
4. Planning and development should be undertaken on the basis of watershed, creating linkages between upstream and downstream groups
5. Based on the more analysis, stakeholder awareness and field based experience, national and sub-national policy frameworks and guidelines need to be developed. At district level, an environment management fund should be established for the management of environmental services. Guidelines should clearly link service, service providers and service buyers.
6. Management of environmental services should be poor-focussed and should provide opportunities to raise incomes to the poor.

Given that there is still limited experience with PES in Nepal, the next step is to learn from the ground level experience. The approach should be to draw from global lessons, pilot at the local level, and engage wider stakeholders including policy makers in the process. Nepal should develop its own approach drawing insights from the global lessons and working through local stakeholders in a participatory multi-stakeholder process at the site level.

A twin-track approach is recommended whereby concrete field based pilot actions are linked to national level policy debate in an on-going basis. Piloting can potentially allow stakeholders to test their own working assumptions and institutional and technical methodologies, and provides a platform for stakeholders to work together in an experimental mode, in a small scale but still sufficient to generate knowledge and insights for policy influence. To have significant policy influence, organizations interested in piloting should collaborate to ensure mutual learning and create wider evidential base to influence policy. Creating policy without enough field experience should be avoided.

Piloting may start with a key entry point environmental services, and then should proceed with bundling other environmental services. These pilot sites should be in different ecosystems specificities – in terms of eco-region as well as ecosystems types. We have identified several criteria which could be considered while selecting sites (Box 3).

Box 3. Criteria for site selection

1. Buyer attributes
 - a. Overall economic potential of downstream to pay for environmental services
 - b. Corporate environmental awareness
2. Supplier attributes
 - a. Poverty situation and potential for shift to alternative land management regimes
 - b. Presence of disadvantaged groups in the upstream communities
3. Enabling sub-national and sectoral policies
 - a. Land tenure of upstream land users relatively secure to claim and access payments or incentives
 - b. Policies of DDCs and VDCs and prior experience in NRM
 - c. Potential for policy linkages and dissemination
4. Environmental considerations
 - a. Perception of environmental crisis or some visible problems such as concerns for drinking water quality or sedimentation in irrigation canal
 - b. Nature and quality of available scientific evidence in relation to the problem
 - c. Corporate environmental awareness
5. Status of collective action and social capital
 - a. Functioning institutions of local land managers upstream
 - b. Functioning institutions of buyers of environmental services
 - c. Size of watershed and the potential of creating visible outcomes on ecological systems and income streams of providers
 - d. Transaction costs of interaction and negotiation
6. Local government and local politics
 - a. Awareness on prior experience of local political leaders on the issue
7. Possible intermediaries
 - a. Availability of empowerment services
 - b. Availability of enterprise services
 - c. Availability of watershed analysis and verification services

8. Market structure

- a. Potential for bundling various environmental services from the same land manager to create added incentives
 - b. Price structure and trends for the key substitutes of fuelwood, fodder and timber
9. Cultural and political tensions between upstream and downstream communities

A strong policy link can be established through the production and circulation of a PES Newsletter, knowledge brokering activities with national stakeholders and organizing annual sharing workshops at national levels. Field based actions should also be linked to district or sub-national deliberative processes and networks of stakeholders – such as local governments, government line agencies, NGOs and local political leaders.