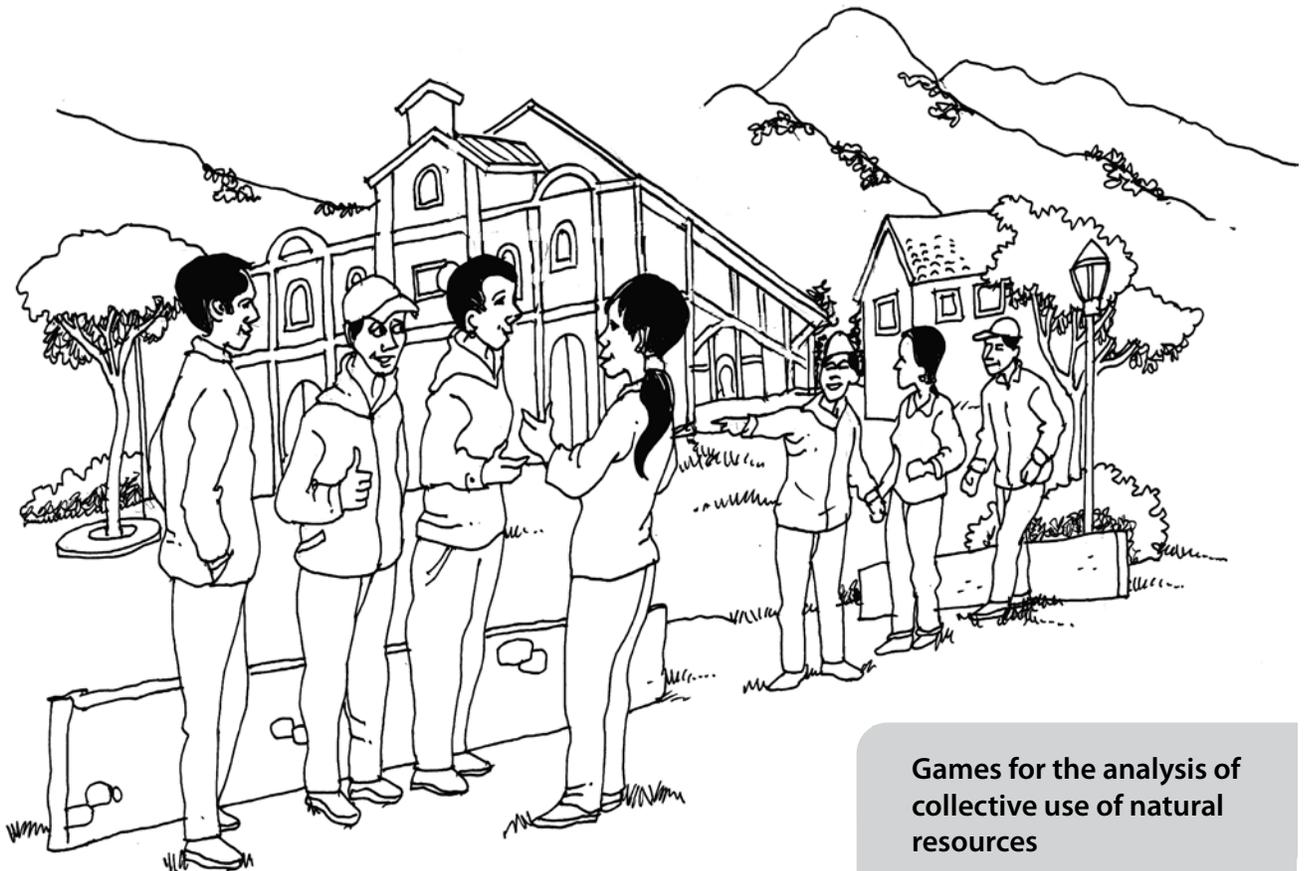


# Use of Games for Nurturing Upstream-Downstream Cooperation



**P**ayment for environmental services (PES) schemes are often designed with the twin objectives of nature conservation and added economic benefits to upland farmers whose activities have direct impact on the downstream population. The design of PES options is facilitated by simulation models such as SWAT and ECOSAUT. These tools help determine the best scenarios and areas with highest potential to deliver environmental services. However, the

**SWAT is a hydrologic modeling tool that is used for different land use scenarios vis-a-vis the hydrological features of the watershed.**

**ECOSAUT is a model used for valuation. it provides a socio-economic and environmental assessment of the land-use scenarios and alternatives.**

areas identified may not be where the poorest live. Moreover, rich farmers in both upstream and downstream areas, as well as other sectors downstream, may not agree to meet the added costs of PES. They may not see the value of investing in nature conservation without additional and direct returns. It is therefore important to effectively communicate to them how their support to upstream interventions will, in the long run, benefit them as well.

## Communicating and getting people to work on the scenarios

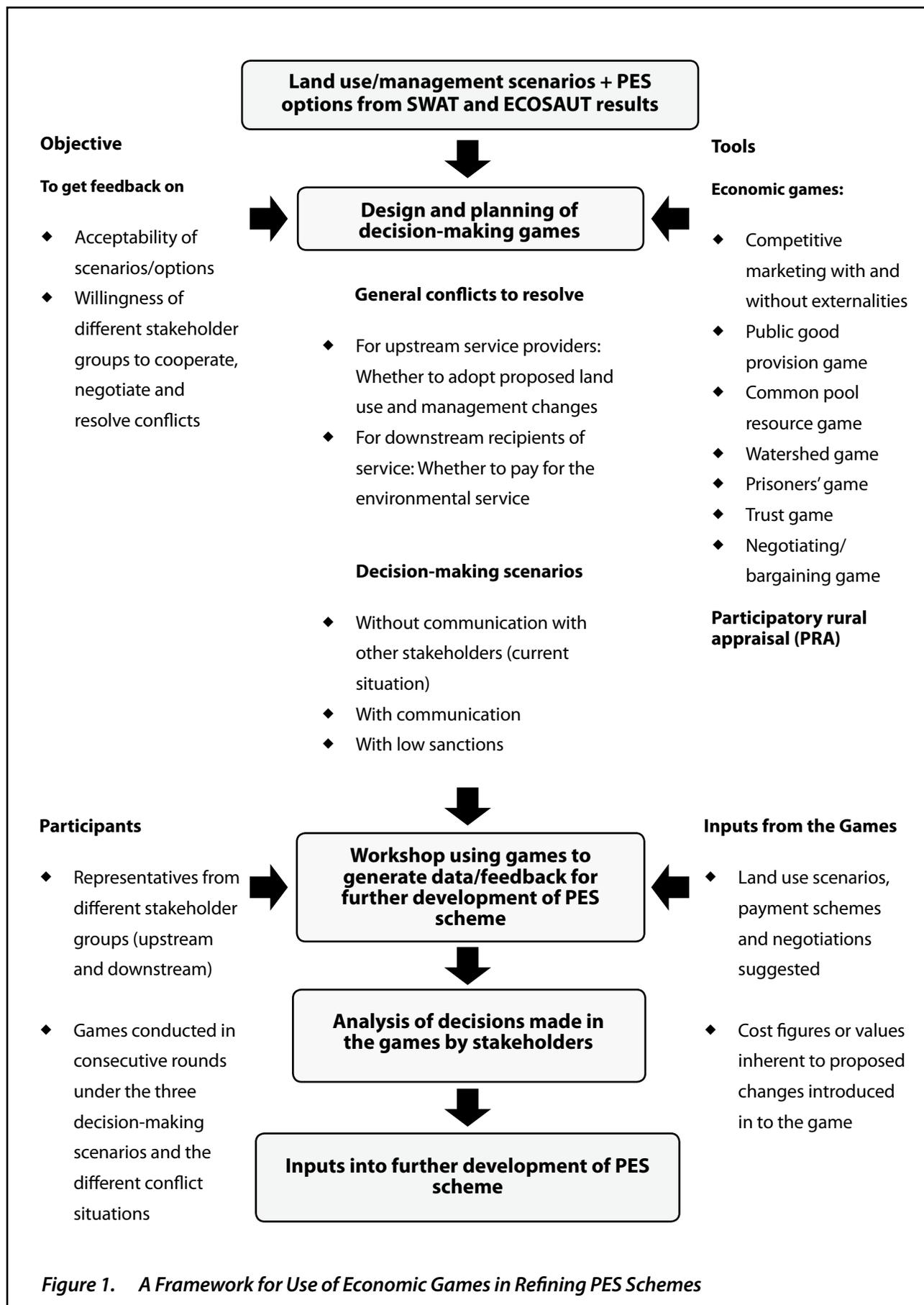
Computer-generated models may be technically-sound, but they will only contribute to the success of the PES schemes if people accept the recommendations. Different scenarios need to

be communicated to all stakeholder groups in a manner that is easily understood and appreciated and is non-threatening. Before finalizing any PES scheme, the communication strategy should ensure that the perspectives of both “environmental service providers” and those who will pay for the services are considered and secured their cooperation secured. In view of this, the CGIAR Challenge Program on Water and Food (CPWF) Environmental Services and Rural Development Project used economic games for exploring the willingness of service providers and beneficiaries to cooperate in developing and implementing socially acceptable PES schemes.

## Let the games begin

Results from SWAT and ECOSAUT simulation models are used as inputs into the decision-making games. The decision-making games evaluate stakeholders’ willingness to collaborate and negotiate amongst themselves and resolve





potential conflicts. The combined use of economic games and participatory rural appraisal (PRA) tools in simulation exercises of real-life problems (in a safe environment) is an innovative way to collect information about people's economic behavior when facing social or cooperation dilemmas (Lopez *et al.* n.d.).

The decision-making games are played by representatives from the upstream and downstream communities in the watershed area. Upstream players make the choice whether or not to change their current land-use scenarios or management practices; downstream players can provide payment to upstream players as an incentive for changes to land-use/management practices. Their decisions are examined under different scenarios:

- ◆ a scenario without communication between players/actors (which serves as baseline)
- ◆ a scenario of negotiation where the different players are allowed to discuss before making a decision
- ◆ a scenario where decisions are enforced by the application of penalties to players (who do not shift to better management practices or do not pay the service providers)

**The economic games provide answers to these questions:**

- ◆ Which stakeholder groups will continue with the same land management practices?
- ◆ Which will change their management practices?
- ◆ Which groups are willing to pay or compensate those making beneficial changes in their systems?

The results of the games allow one to analyze of the possibilities and limitations in resolving

cooperation-related conflicts and to establish to what extent reciprocity, trust, inequality and risk aversion can influence decisions in resolving environmental dilemmas (Cardenas and Ramos 2006). For details on the design and application of the games, see Estrada *et al.* (2009) and Lopez *et al.* n.d.).

## Experiences and findings in the use of economic games in the Andes

1. When people understand the relationship between land use and hydrological externalities such as quantity and quality of water flows, local agreements (as self-control mechanisms for implementing appropriate land uses) are easily reached.
2. Communities prefer to work with local organizations in managing economic resources because of the poor reputation of their local governments.
3. Farmers value employment generation for the landless and provision of materials for land use management more than monetary payments.
4. In one instance, economic games facilitated the creation of an inter-sectoral committee for promoting the establishment of a fund to pay for ecosystem services.
5. Involving the downstream wealthy farmers in the economic games was difficult. They own lands with good water allocation and therefore do not want to pay extra without

additional benefits to them. On the contrary, downstream small farmers participated in the economic games and showed willingness to compensate upstream farmers for their environmental services.

5. PES payments should not target individual farmers as service providers, but groups or communities to reduce transaction costs. This also ensures that the required threshold to achieve the desired impact from the service is met.

## Lessons from the games

The conduct of economic games offered very valuable insights and helped to recognize that

1. Willingness to cooperate is dependent on good communication between the parties. However, an investment is required to initiate and facilitate the dialogue process.
2. Command-and-control mechanisms such as laws and regulations may be the only way to make the wealthy downstream farmers adhere to PES schemes.
3. Identification of win-win technological alternatives to improve the environmental and economic performance of conventional agricultural systems is essential. This may accelerate the negotiation process by incorporating new incentives for farmers beyond mere payments for environmental services.
4. PES should consider non-monetary payments such as construction of schools and health centers and livelihood-training activities. These kinds of payment can have long-term benefits for the communities. The disadvantage is that the community members who are not benefiting from these non-monetary payments would not have the incentive to deliver a service.

## Recommendations for future economic games

Economic games have proven useful in understanding the conditions under which compensation for environmental services may be feasible.

This project has highlighted the fact that there is room for refinements in the games in order to ensure the participation of the wealthiest farmers in the games.

It is also useful to check on other stakeholders whose representation may have not been made explicit—e.g., women and children.

Adding reality to the games by using actual or factual figures instead of symbolic numbers can help to more accurately determine how willingness to pay for environmental services varies among different stakeholders.

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### Partner Organizations

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Centro Ecu mico de Promoci n y Acci n Social Centro (CEDEPAS), Peru  
Centro Internacional de Agricultura Tropical  
Consortio para el Desarrollo Sostenible de la Ecoregion Andina (CONDESAN), Peru  
Danish Institute for International Studies, Denmark  
Entidad Prestadora de Servicios de Saneamiento, Peru  
Farmer's Association of the Fuquene Watershed, Colombia  
Fundacion para el Desarrollo Sostenible Territorial, Colombia  
Programa de Manejo Integral de Cuencas, Bolivia  
Proyecto Especial Alto Mayo (PEAM), Peru  
Universidad de los Andes, Colombia  
Universidad Javeriana, Colombia

### Key Reference

Estrada, R.D., M. Quintero, A. Moreno and H.M. Ranvborg 2009. *Payment for environmental services as a mechanism for promoting rural development in the upper watersheds of the tropics*. CPWF Project Report. Colombo, Sri Lanka: CGIAR Challenge Program on Water and Food.  
<http://hdl.handle.net/10568/3907>

*Tags: PN22; Environmental Services and Rural Development*

### Other References

Cardenas, J.C. and P.A. Ramos 2006. *Manual e juegos economicos para el analisis del uso colectivo de los recursos naturales*. Lima Peru: International Potato Center.

Lopez, M.C., D. Maya and J.C. Cardenas n.d. *Experimental economics and participative methodologies: Looking for theoretical and methodological bridges to analyse collective action in common-use resources management*. Universidad Javeriana, Bogota, Colombia.