There are currently 16 PES initiatives in diverse Peruvian watersheds, out of which only 4 are at an early implementation stage.

Financial, institutional and legal bottlenecks slow down the advancement of all these initiatives towards effective operationalization. The Canete basin case is the official pilot case of Peru where the Ministry of Environment and its partners are proposing solutions to those bottlenecks.

These solutions are expected to be applicable to the other initiatives and are aimed to contribute to sustainable and transparent PES schemes in Peru.

Rewarding water-related ecosystem services in the Canete Basin, Peru

Overview

In 2010, the Peruvian Ministry for the Environment (MINAM, its Spanish acronym) initiated jointly with a set of partners a project to evaluate and design a PES scheme in the Cañete River watershed. In this basin, the highest demand for water resources is concentrated in the lower watershed. Of the consumptive uses, in order of priority by magnitude of volume consumed, the following stand out: agriculture, population consumption (drinking water), and mining. In contrast, non-consumptive uses include consumption for energy purposes (hydroelectricity), shrimp farming, and tourism and recreation.

The causal relationship between the upper watershed's ecosystems and the provision of water for different activities downstream, the heterogeneity in terms of ES beneficiaries and the size of the watershed, led to MINAM selecting the Cañete River watershed to evaluate the feasibility and promotion of implementing a scheme that had originally been regarded as payments for environmental services. MINAM expects that final arrangements of this scheme will provide insights for the implementation of about 16 other PES initiatives in the country that still are not fully operating.

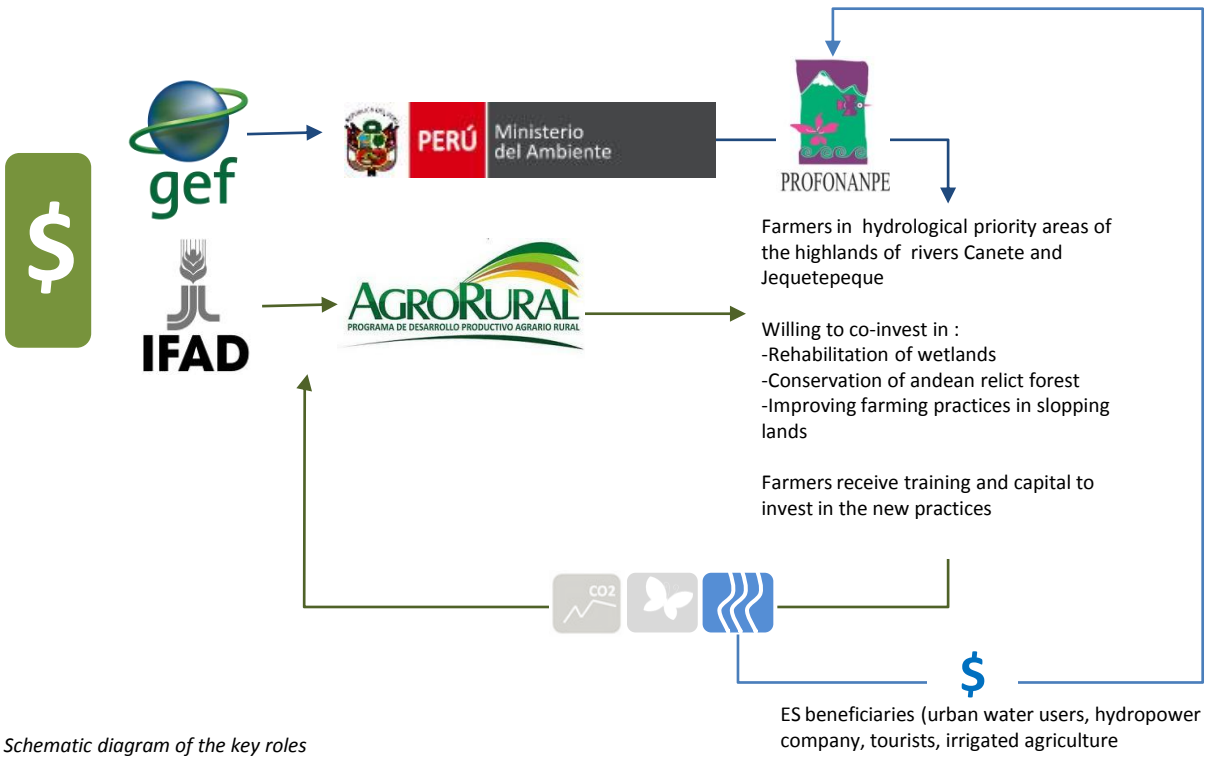


Figure 1: Schematic diagram of the key roles

Rewarding hydrological environmental services

Usually, when thinking of a PES scheme, the first question is what environmental service is to be paid for, and what else would be provided through the payment. In this watershed, although it is clear that the Hydrological Environmental Services (HES) is to be paid for, a PES scheme was proposed for maintaining HESs that are already provided for and which are seen as being threatened by activities such as livestock production in high-Andean ecosystems. That is, the scheme would seek the principal of precaution by paying for the conservation of these ecosystems.

At the same time, the scheme seeks to pay for the benefits that are already captured in the lower watershed because of a more-than-adequate provision of HESs from the upper watershed. This reasoning, validated through the principal beneficiaries of the watershed, led to denominating the scheme as *rewards for ecosystem services*, leading towards an equitable distribution of benefits from ecosystem services throughout the watershed. At the same time, a vision of the watershed will be promoted to the actors, and interaction between them encouraged.

In certain studies and cases (see Quintero (Eds), (2010), the traditional concept of PES was modified precisely because of multiple situations where a benefit already being provided must be recognized. Under this context, most of the cases have appealed to the precautionary principle in order to full fill one of the PES traditional criteria: additionality. However, CIAT has found, based on commentary at local consultations, that claiming for ES recognition is ultimately an equity call from the poor located in ES provision areas to the productive sectors that benefits from these ESs. This unqueal distribution of ES benefits generates a discomfort between watershed actors. In the case, the current distribution of economic benefits derived from the HHhe HESs must be balanced, and HESs conserved.

Therefore, payment form should be considered compensation –since the proposed changes will not likely reduce current revenues generated in WES-provider areas. Instead it should be viewed as a **reward** to those already providing a valued service. Additionally, such a payment form would help ensure the continued good practice in the long-term and encourage improvements, where needed, to further increase the standard of WES-delivery.

In parallel to the design of the Canete RES scheme, MINAM has worked on a proposal of law to promote RES mechanisms [2]. The proposal recognizes the legitimacy of these mechanisms that since they are not currently mentioned in the legislation, they are not being promoted by local and regional authorities, civil society, and non-governmental organizations. The proposed law also mentions the possibility of public entities (e.g. local governments, public water supply companies) to invest in these schemes which is currently an important bottleneck that impede the financial participation of the public sector in the RES schemes.

Lessons in objectives and definitions of a RES scheme gave rise to lessons in practice and the identification of legal bottlenecks. These findings were taken into account in redacting the law proposal (box 1). A part from this, CIAT-CPWF project has initiated jointly with IICA, an analysis about the bottlenecks that 17 RES initiatives in Peru are facing when reach the implementation phase. These include institutional, legal, technical and social bottlenecks. It is expected that findings from this analysis will feed into the creation of rules and regulations of the proposed law for promoting RES schemes in the country.

The Canete case started on March 2010, and is currently finalizing institutional arrangements for implementing the RES fund. However, in Peru there are earlier initiatives upon which the Canete case is built. These are mainly the Moyobamba PES case (the only one implemented in the country) and the Jequetepeque PES case (partially implemented).

[1] Quintero, M, ed. 2010. Servicios ambientales hidrológicos en la región andina. Estado del conocimiento, la acción y la política para asegurar su provisión mediante esquemas de pago por servicios ambientales. Lima, IEP; CONDESAN. (Agua y Sociedad, 12; Serie Panorama Andino, 1)

[2] Conceptually, the definition of PES was adjusted to a transfer of resources among social actors to create incentives for aligning individual and collective decisions on land use, with a social interest in the management of hydric resources (Muradian et al. 2010). In other words, the social actors share costs and benefits to maintain or improve the provision of HESs.
Under these terms, these schemes contribute towards an equitable redistribution of the benefits associated with the provision of an HES. Due to this reasoning is that PES schemes were renamed and are now referred as Rewards for Ecosystem Services by MINAM (RES schemes).

The providers of watershed environmental services

The principal sources of surface water in the central and upper reaches of the watershed are precipitation, thawing of glaciers or snow caps, small natural lakes, and springs. Currently, 11 of the 17 snow caps existing in 1962 are still extant.

At least 203 small lakes are scattered throughout the Cañete River's nine subwatersheds. The most important of them in terms of size and storage capacity are found in the Tanta subwatershed. These sources of water, particularly those that are permanent the year round, are located in the upper watershed, which corresponds principally to the following ecosystems: high Andean scrublands, Andean wetlands, relict Andean forests, and some brushwood (MINAM 2012). A significant proportion of these ecosystems form part of the Nor Yauyos-Cochas Landscape Reserve, which encompasses about 23% of the Cañete watershed.

The functioning of the ecosystems in the upper Cañete watershed provides two principal hydro-environmental services (HESs): *water yield* and *all-year availability of water*, generating benefits for different sectors. Any alteration to these HESs will essentially and negatively affect various actors downstream, in the central and lower watershed. Contrasting with many other watersheds on the Peruvian coast, the Cañete River does not totally dry up; its historical, average, annual flow is 52.09 m^3/s. This is a result of the streamflow regulation of the watershed due mainly to the role of high Andean ecosystems retaining water and releasing it gradually.

In order to prioritize what are the specific areas in the upper watershed that need to be targeted for allocation ES rewards in order to ensure the ES provision, it was implemented a hydrological study. The highest production of water was located in the Districts of Huancaya, Tomás, Vitis, Miraflores, Alis, Laraos, Tanta, Carania, Yauyos, and Huantán. The contribution of these districts was equivalent to about 60.3% of the total simulated flow in the watershed. Although a large part of these areas was found within the Nor Yauyos-Cochas Reserve, another significant part lay outside that area of environmental protection. **This imposes variations in terms of the contracts to be negotiated with respective land managers.**

Most of the targeted areas are receiving pressure of incrementing cattle grazing and as such are threatened by the compaction of soil that leads to the deterioration of water retention and an increment in soil erosion and runoff. It is expected that the management of these grasslands would be improved with RES investments. Also in some areas with relict Andean forests, the RES would ensure its conservation and restoration where needed. As fast as the deglaciation process in high Andean mountains occurs due to climate change, it is imperative to foreseen institutional and technical mechanisms to ensure that natural grasslands do not lose their capacity to store water in their soils.

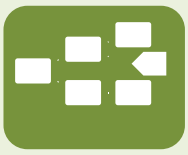
The RES scheme as it is currently designed would be targeting its investment in the HES providing units identified via hydrological modeling and in implementing conservation and restoration activities in native grasslands and Andean forests, and in sustainable productive activities to enable local communities, to improve their livelihoods while committed with the conservation of the area.

Degrading native pastures will need to be rehabilitated via better forage management practices; disturbed wetlands will be better managed to ensure their functioning at regulating stream flows; the maintenance of well conserved native grasslands, wetlands and Andean forests will be guaranteed; and some sustainable businesses will be supported to farmers as a way to rewarding them for the conservation of upper watershed ecosystem.

In these ES priority areas, there are around 1450 families settled and grouped in farmers communities (an officially recognized form of organization in rural areas).

The RES scheme is expected to enter into agreement with these families.

The terms of the contract would need to vary depending on whether or not these families are legally located within the reserve.



Ownership

The Canete case started on March 2010, and is currently finalizing institutional arrangements for implementing the RES fund.

However, in Peru there are earlier initiatives upon which the Canete case is built. These are mainly the Moyobamba PES case (the only one implemented in the country) and three others (partially implemented).

Key partners and investors

This project is a MINAM initiative seen as an opportunity to set up a RSE scheme in a large basin where different type of actors, ES beneficiaries and providers co-exists, and there is a recognized importance of the HES by different productive sectors. Therefore, the Canete is a basin where diverse bottlenecks would need to be overcome to get different ES beneficiaries rewarding to ES providers through a trust fund. The funds will be invested in pre-agreed land management/use alternatives that ensure the provision of ES.

MINAM leads the initiative and as such articulates actions with other public and private actors during the design and the implementation phase in Canete. It is worth noting that this is the only case where the national authority is having this role. In other RES/PES initiatives in Peru, MINAM is only observing the process and the obstacles may be arising from it. In the design phase CIAT, CARE and WWF have strengthened the process with financial support as well as technical and scientific insights.

In 2010, the Peruvian Ministry for the Environment proposed Canete as their pilot case to set up a PES scheme. In that moment invited CIAT to participate in this process by providing assistance for assessment of HES. Also, WWF and CARE contributed with funds to finance a first general diagnostic of the basin and make initial consultancies on the possible PES scheme. In 2012, the International Fund for Agricultural Development (IFAD) has showed its interest in supporting MINAM in the implementation of RES schemes in Peru. MINAM proposed Cañete as one of the two watersheds where IFAD could support, with resources, the creation of two trust funds. For this, a project was developed with a multidisciplinary team brought together by IFAD and to which CIAT and FAO were invited.

Budget is around $1M for a trust fund plus ES beneficiaries contributions, and investment on early implementation of conservation measures that would add up around $1,2M. Also, an in-kind investment in agro-development will occur to be provided by another IFAD project in Peru.

The highest demand for water resources is concentrated in the lower watershed. Of the consumptive uses, in order of priority by magnitude of volume consumed, the following stand out: agriculture, population consumption (drinking water), and mining. In contrast, non-consumptive uses include consumption for energy purposes (hydroelectricity), shrimp farming, and tourism and recreation. Agriculture and population use in the lower watershed represent 86.6% of the watershed's total consumption (INRENA et al. 2001). In contrast, for non-consumptive use, hydroelectric energy stood out, with an annual water demand of 442.13 million cubic meters.

Users of subterranean water were also beneficiaries of these HESs, as the aquifer of the Cañete Valley is fed principally from water infiltrating into the upper watershed (humid zone) and also from riverbeds, unlined irrigation canals, and cropping areas (INRENA 2001). All these consumptive and non-consumptive water users benefit at the end of the all year availability of water in the basin result of good flow regulation. In this sense it is expected that all of them would participate in the trust fund, especially downstream farmers, urban dwellers and the hydropower company, who have already express their willingness in doing so.

Lessons Learned

The lack of recognition of PES schemes in the legislation: the legitimacy seems to be a bottleneck that holds local and regional authorities up in the promotion of these mechanisms. There is an absence in the legal framework regarding the possibility of using public or public-private funds in payments or rewards for ES. This results in a perceived legal-based risk by local governments if they allocate public funds to these schemes.

Since 2011, the Ministry of Environment of Peru (MINAM) has been actively leading conversations about how to develop laws which might catalyse the creation and management of Payment for Ecosystem Services (PES)-type schemes. As part of these discussions, MINAM met with some of its key partners in PES-type scheme development to discuss a draft-version of such a proposed Eco-System Services (ESS) Law.

Obstacles to allocate potable water users contributions in a RES scheme (in Peru): There are legal bottlenecks to collect contributions via water charges payment system and transfer this to a private-public fund (ie. RES Fund). Similar occurs with public funds coming from local governments.

Conceptual approach: There is a gap between common used PES definition and the actual description of some PES-type schemes being designed and implemented. As explained above, the main motivation for initiating such initiatives in some cases is to protect currently delivered ES and to reward land managers for this. Equitable distribution of ecosystem benefits within a watershed and the need to guarantee the continuity in the provision of these benefits are at the end the main justifications for initiating these schemes. In other words, these schemes are not necessarily implemented to correct negative externalities.

Private sector participation:
From the ES beneficiaries' side: Ultimately, institutional arrangements to get privates contributions into a RES scheme are relatively easier than having public support, as long as there is willingness of private sector to participate. This is reflected in lesser legal bottlenecks and so, more advances towards implementation, in RES initiatives that involved irrigation systems or hydropower companies who can take independently a decision to participate or not in the ES Fund. Regarding negotiation with private sector, it has been shown useful for actors leading negotiation, the economic valuation studies. Their results provide reference values for negotiation and in Peru have helped to show how underestimate are current water users contributions oriented for watershed management and conservation –and then the need to increase via a RES scheme these contributions.

From ES providers' side: There are two aspects that would need to be refined prior to actual rewards disbursement. First, the details about land management alternatives to which some rewards/payments will be conditioned. This is especially important for areas were some type of recuperation is needed (e.g. Andean wetlands) and better management of grasslands needs to be implemented. Second, and due to the lack of land titles in some areas, it is needed a field recognition of who is actually having control on land and under what type of land tenure. Based on this contractual agreements would need to be shaped. Also this is important to ensure a proper baseline of land tenure in order to facilitate further monitoring regarding leakage and crowding in phenomena (already seen in the Moyobamba case where PES has incentivized new migration to watersheds).

Ownership

Public-Private

Rooting PES into policy and future outlook

Once legal bottlenecks to enable contributions from different ES beneficiaries and actors are overcome then an institutional arrangement to manage and govern the operation of the scheme would be of useful for other PES initiatives in the country that are still trapped in the institutional and legal puzzle of putting in place these mechanisms.

Lessons learnt from the Canete experience, and other such PES-type schemes initiatives, informed the discussions led by MINAM around the proposed new ESS Law. Some of the main components of the law are novel and are based on the conceptual approaches of the benefit-sharing mechanisms (BSMs) that the Law intends to promote. For instance, the wording of the proposed Law takes into consideration the sensitivities around BSMs. An example of this is that the Law refers to "Retribucion –in spanish" (that embeds both compensation and rewards) for Ecosystem Services (ESS) instead of utilizing the term 'PES'. This careful wording was chosen for two key reasons; firstly, to avoid scenarios whereby participants may misinterpret the concept of "payments" (this can undermine such schemes in a range of ways, for instance by creating tensions around financial gains and 'rights' etc.) and secondly, to ensure that economic rewards are provided not only for improving the delivery of an ES but also to reward for maintaining current levels of ESS provision.

The resultant clarity in the proposed Law's definition and concept will be vital for its acceptance amongst stakeholders. That is, to avoid scenarios (which have happened in the past) in which such schemes are confused with the commoditization of a natural resource, resulting in rejection of the approach. The proposed Law also incorporates sections devoted to avoiding the use of RSE mechanisms as a perverse incentive (i.e. for such actions as deforestation or degradation of areas that can be later recuperated/restored in order to claim rewards for improved ESS). It also includes provisions to address typical institutional and legal bottle necks encountered in water-related ESS.

With this new basis, for the implementation phase, there are more actors involved from the operational perspective of the RES Fund. It has been accepted that one of the national funds for managing conservation projects (ie. PROFONAMPE) would manage under given rules of operation, the RES trust fund. Funds are expected to come from ES beneficiaries and international cooperation (e.g. IFAD) interesting in supporting start up RES schemes.

The rules of operation will be negotiated and approved by consensus in a ad hoc basin committee where MINAM, the National Water Authority, the National Service of Protected Areas, the ES beneficiaries contributing to the fund (e.g. hydropower company, farmers from the downstream areas, water supply company or urban water users) and representatives of upper watershed communities will participate. This rules will be built upon previous efforts to target investment as explained before.

CGIAR Challenge Program on WATER & FOOD

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