

Many ecosystem services and few employment and marketing opportunities: the paradox of an Andean community in Peru

Results from a participatory assessment on conservation and development priorities of communities in Nor Yauyos, upper Cañete River.

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In 2010, the Ministry of Environment of Peru initiated a process to evaluate and design a Reward Mechanism for Water-Related Ecosystem Services (Mecanismo de Retribución por Servicios Ecosistémicos Hidrológicos (MRSEH)) in the Cañete River basin, of strategic importance for national agricultural development and the production of hydroelectric energy. The International Center for Tropical Agriculture (CIAT) has been supporting the design of the MRSEH and advised the formulation and discussion of the Law on Reward

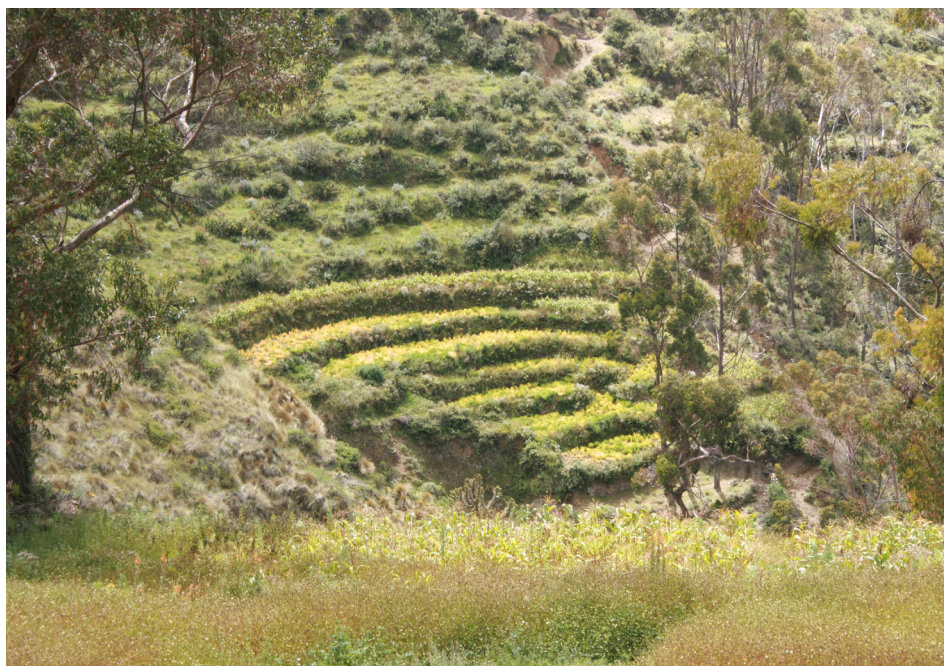
Mechanisms for Ecosystem Services, approved in 2014.

In 2015, CIAT researchers conducted a participatory assessment of conservation and development priorities of eight districts within the Nor Yauyos Cochas Landscape Reserve (Reserva Paisajística Nor Yauyos Cochas (RPNYC)) in the upper basin of the Cañete river, with the aim of supporting the targeting of interventions that would be financed by MRSEH. The districts of Alis, Carania, Huancaya, Laraos,

KEY MESSAGES

Initiatives for the conservation of hydrological services in the Cañete river basin should consider:

- The upper basin communities face problems of water and labor scarcity for agricultural activities, migration, progressive abandonment of agriculture, lack of marketing opportunities and degradation of natural pastures.
- Climate change appears to exacerbate these problems.
- It is necessary to incorporate the perspectives of community inhabitants, who propose solutions for the conservation of ecosystems and the maintenance of livelihoods within a protected area of strategic importance for the provision of ecosystem services and the conservation of high Andean biodiversity



Miraflores, Tanta, Tomas and Vitis, located in the RPNYC, were selected since they constitute the main provisioning areas for water availability in Cañete River basin.

Specifically, the assessment aimed at:

- Identifying the priorities of the communities in terms of interventions that would reward the conservation of natural resources in the upper Cañete River Basin through the MRSEH.
- Understanding the feasibility, according to preferences broken down by gender, of the interventions that the MRSEH could support.
- Providing qualitative data to develop scenarios to assess the potential impacts of Rewards for Ecosystem Services (RES) focused on development or conservation interventions.

To this end eight participatory workshops were conducted, along with key informant interviews in the eight selected districts. A total of 102 villagers participated, with an average of 10 to 15 villagers per workshop. Each workshop was divided in three exercises. The first two exercises, which were conducted in mixed focus groups of men and women, aimed to capture local views on well-being

and livelihoods, as well as to discuss land use and natural resources. The third exercise was carried out dividing participants into two separate groups of men and women, in order to identify any gender differences in preferences and prioritization of conservation and development interventions. The following paragraphs summarize the main results of the workshops.

A WIDE USE OF ECOSYSTEMS

Workshop participants identified ten natural areas they use and from which they derive numerous ecosystem services. These areas include natural pastures, irrigated land, rain-fed land, lagoons, wetlands, springs, native forests and cultivated forests.

Natural pastures are found above 3000 meters, in the Puna ecosystem. These are important for livestock, which is one of the main economic activities in the upper basin, especially cattle, sheep and Andean camelids (alpacas and llamas). These areas are used not only for grazing, but also for the many medicinal plants that can be found.

All communities except Tanta, Carania and Tomas, emphasized that natural pastures are degraded. They recognize that overgrazing is the main problem, due to lack of suitable pasture and increased number of animals. Degradation is a serious problem especially in areas with harsh topography such as the community Alis, where accessible pasturelands are limited. The increase of plants toxic for cattle, such as garbanzo (*Astragalus* sp.), and weeds, along with shorter and more intense rainy seasons are also affecting the quality of natural pasture.

Irrigated land includes crops and cultivated pastures, and is usually found in fields close to the villages. These areas are threatened by new pests, especially weeds that are particularly difficult to remove. In addition, people mentioned that the use of fertilizers is insufficient or inadequate, water for irrigation is scarce, and irrigation canals are deficient. The lack of a market for crops produced is further mentioned as an issue that discourages agricultural production.

Rainfed lands are mostly Aishas, or Inca platforms, that provide roots and tubers such as potatoes, mashua, oca, olluco; cereals and grains such as maize, barley, wheat or quinoa; legumes such as peas, lupine (tarwi) and beans. In some communities villagers collect from these areas firewood, timber such as the native lloque (*Kageneckia* sp.), and medicinal plants. Rainfed lands are being progressively abandoned, according to participants largely because of labor scarcity due to migration of young people, or because people look for alternative employment. The variability and unpredictability of rainfall and poor soils represent another important issue for the development of agriculture.

The communities have identified the existence of many lagoons, from which they benefit or derive provisioning services. One of the main problems identified with these areas is the poor state of infrastructure such as dams and reservoirs causing water seepage.



Villagers mention the decline of fish, mainly trout, due to overfishing, but also to the activities of private companies (such as pollution of water sources by legal and illegal mining activities, dams and human made changes in the water stream).

Participants recognized wetlands (peat-bogs) as fundamental as grazing areas and water supplies. These represent grazing areas for cattle, sheep and Andean camelids, especially during the dry months. They recognized that wetlands are threatened by declining water availability, related to melting glaciers, more intense summers and overgrazing. The presence of the alicuya (*Fasciola hepatica*) represents a major threat to the animals.

Participants also identified numerous springs and rivers. The rivers are used for trout fishing, as well as to collect medicinal and edible plants from their shores. The River Tomas is considered degraded by villagers, who blame the Yauricocha mine tailings. The Cañete River in Huancaya, had its flow altered by the creation of a reservoir from the private company Celepsa in Tanta, which according to participants, caused a decrease in trout population and biodiversity around the shores, because of the continuous strong stream. In other rivers, the decline of wild animals that once populated their banks, the decrease of frogs and trouts, and the increasing number of flies, are being also related by the communities on pollution and overfishing.

Native forests, where the dominant species are the queñual (*Polylepis* sp.) and lloque, are a resource mostly considered well preserved by the commoners. Trees are primarily used for firewood and timber, but in small quantities. In addition, some people collect medicinal plants. In several workshops it was mentioned that due to the creation of the protected area (RPNYC) firewood collection is more orderly, and that firewood consumption has decreased anyway by the introduction of gas for cooking.

Finally, in some communities cultivated plantations of pines and eucalypts can be found, mainly for the marketing of wood, timber and mushrooms.

CURRENT ISSUES

In the past, breeding of Andean camelids was the main activity of the inhabitants of the area, but it has been declining in favor of cattle and sheep, due to management and marketing issues. According to participants, the condition of wetlands and natural pastures has been affected by overgrazing and changes in climatic conditions. They perceive that frost and high temperatures are more intense and longer, and glaciers have retreated, while the rainy season arrives later and is shorter. They also notice an increase in invasive plants that cause animal diseases.

Changing weather conditions, including increased rainfall variability, are considered one of the factors that discourage farmers to engage in agriculture.

Lagoons and rivers have undergone changes due to decreased presence of native fish, frogs, and algae, which participants relate to El Niño phenomena, temperature increases, and human actions, such as overfishing and pollution. The communities repeatedly expressed the need to hold private companies accountable for their environmental impacts and to fulfill their commitments to the communities, but also the need for communities to have legal protection. They also called for an independent assessment of water pollution and a truly participatory water quality monitoring. Water appears as a priority issue for the people of the upper basin. Workshop participants repeatedly mentioned the possibility to build reservoirs and irrigation canals, improving and expanding existing ones, supporting communities with tools, labor and technical assistance to implement adequate maintenance of ancestral irrigation canals and other existing water infrastructure in the area.

A major concern is the conservation of grazing areas. The communities would like to improve the condition of pastures, build reservoirs and irrigation canals and implement livestock management rules that ensure the conservation of natural pastures. The intervention preferred by community members is to implement fences and animal rotational systems, but the main constraints are the costs of materials, lack of training, lack of formal rules of rotation for all users of the fences and the creation of awareness of the consequences of environmental degradation. A successful example in this direction is the EbA Mountain project in Miraflores and Vitis, which has helped create greater local knowledge and awareness of the causes of degradation of natural resources. In some communities it was also suggested to fence wetlands and plant native species to improve water retention and availability.

LACK OF GENERATIONAL TURNOVER AND MARKETING CHANNELS THREATEN AGROBIODIVERSITY

Young people from the communities are migrating to cities or search employment in local transportation and tourism services. The consequent shortage of labor affects not only agriculture, but also reduces the availability of people for faenas, local systems of collective work, for example for harvesting or maintenance of irrigation canals and streets. The result is a gradual abandonment of agricultural land and loss of agricultural biodiversity, ancestral knowledge and traditional practices.

In search of local solutions, the prioritization exercises show the priority of communities to be linked to markets, which requires strengthening marketing channels, fostering producer associations, improving production to generate value addition to local products. Participants put forward a market vision that includes organic products, not just

as raw inputs but also processed, to give impetus to local activities.

Women participants emphasized the need to install infrastructure for livestock such as sheds for shearing and slaughterhouses. They also mentioned the need to promote crafts with capacity building in better textiles-finishing, the production of dairy products adequate to market standards, the creation of associations for small livestock rearing, and the creation of products derived from medicinal plants.

The recovery of Inca platforms, which is a priority action lines of the management of the landscape reserve, could be linked to production of certified Andean crops with added value. There are examples of organic certification and processing of Andean tubers and grains in the communities, which they would like to revive, but marketing channels are absent.

An interesting proposal from participants is to create producer associations gathering farmers from various communities to ensure adequate supply of agricultural

products and economic power in the negotiation of supply contracts. This action would go hand in hand with the recovery of Inca platforms and irrigation canals to increase production.

However, economic analyses of the viability and profitability of these interventions is needed before implementation.

TOURISM, A SUSTAINABLE SOLUTION?

The communities believe that tourism is an opportunity to improve local livelihoods and reduce youth outmigration. However, the recent uncontrolled growth of tourism has not favored a socially and environmentally sustainable development of this activity. To tackle this issue, the RPNYC has included sustainable tourism as one of the action lines of the Master Plan 2015-2019. Workshop participants mentioned training tour operators and community members to provide quality tourism is a priority. The expansion of tourism also presents an opportunity to link it with sustainable livestock

management practices and recovery and valorization of Andean crops, but it requires an orderly integration of these areas as a system.

Participants mentioned that improved access to communities is also necessary, given that many roads are in poor condition, road signs are absent and sometimes wrong, not only to improve tourism but also market access, especially in areas as Miraflores, Carania, Vitis, Huancaya and Tanta.

CONCLUSIONS AND RECOMMENDATIONS FOR THE MRSEH

Our assessment shows that the eight districts face problems related to water supply for pastures, crops and livestock, labor shortages, progressive abandonment of agricultural land, decline of agricultural biodiversity and lack of market linkages. Therefore:

- Considering that the MRSEH seeks to preserve the availability of water for the middle and lower parts of



the basin, it is important to take into account the difficulties of water supply of the population in the upper river basin.

- Participants mentioned the need to link migrants from the communities with their homelands: for instance, support programs that link remittances to local economic activities or by encouraging them to return during times where agricultural activities are more labor intensive.
- The landscape reserve Master Plan includes activities to include conservation of agricultural biodiversity in the school curriculum, which is positive and relevant. It is also important to recover Inca platforms and irrigation canals to improve agricultural production.
- Care should be taken in implementing those interventions included in the Master Plan which are not considered viable in some communities. This is the case of increasing alpaca population in Alis, due to limited land availability, and Vitis, due to local preferences (especially of women) towards cattle.
- Another important element is to incentivize sustainable management practices in areas of private property, since in the workshops it was mentioned that it is more difficult to enforce obligations, even when

agreed collectively, as there are no formal rules and mechanisms to ensure compliance.

On the other hand, it is necessary to strengthen local capacity at the community level as well as participatory monitoring and follow up of the results of interventions that would be financed through the reward mechanism, even after completion. More sustainable projects would be attained by working as much as possible at the community level and not just with specific groups of people, so to ensure ownership of results and replicability. In particular, the integration of community presidents, the community board and communal decision mechanisms would help the community appropriate and internalize interventions, achieving greater sustainability and continuity.

Finally, it is important to emphasize that interventions carried out within the framework of rewards for ecosystem services should take into account the effects they may have on most vulnerable and poorest people in the communities, such as aged individuals lacking family or government support, or the unemployed, to avoid creating greater social inequalities. The classification of dimensions of well-being carried out with the communities during the workshops is a tool that can help identify the most vulnerable population groups in each community and prioritize interventions.

FURTHER READING

Blundo Canto et al. 2016. Prioridades de conservación y desarrollo en las comunidades de Nor Yauyos. Informe para el MRSEH de la cuenca del río Cañete. Centro Internacional de Agricultura Tropical

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The project team wishes to thank the National Service of Protected Natural Areas (SERNANP) and Nor Yauyos Cochas section (RPNYC) for their support during the implementation of the study.

ABOUT WLE

The CGIAR Research Program on Water, Land and Ecosystems (WLE) combines the resources of 11 CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO) and numerous national, regional and international partners to provide an integrated approach to natural resource management research. WLE promotes a new approach to sustainable intensification in which a healthy functioning ecosystem is seen as a prerequisite to agricultural development, resilience of food systems and human well-being. This program is led by the International Water Management Institute (IWMI), a member of the CGIAR Consortium and is supported by CGIAR, a global research partnership for a food secure future.

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