



Harvesting quinoa diversity with Payment for Agrobiodiversity Conservation Services

Bioversity International cultivates incentives for farmers to use and conserve diversity

Although it was domesticated some 3,000 years ago, quinoa is one of those foods that, until recently, was practically unknown outside of the high Andes. Today, anyone who keeps up with the latest trends in healthy eating knows about the nutritious properties of this superfood. It provided sustenance to pre-Colombian populations and, millennia later, was declared a perfect food for astronauts by the US National Aeronautics and Space Administration (NASA). Now rediscovered and respected for its nutritious properties, contribution to a healthy diet and found on high-end restaurant menus around the world, the UN has proclaimed 2013 as the International Year of Quinoa. With all of this new-found global appetite for quinoa, farmers have benefited from rising prices, yet only a few quinoa varieties have been associated with the boom. It turns out that farmers are increasingly abandoning many of their traditional local varieties, replacing them with those that have export markets. That is why Bioversity International and its partners chose to pilot a programme in this area, in order to explore whether offering in-kind community-level incentives would encourage farmers to continue growing a number of increasingly threatened local varieties. Known as 'Payments for Agrobiodiversity Conservation Services' (PACS), this initiative is helping to protect the future of quinoa biodiversity and providing a model for application to the world's many other threatened crop species and varieties to prevent further loss of diversity.

Although quinoa prices have tripled in recent years, increasing the incomes of smallholder farmers in the Bolivian Andes who were able to export their crops, there has also been another side to the story. While the Western media often argued that the higher prices were making quinoa too expensive for many local people to buy, thereby making their diets poorer and reducing their food security, it actually turns out that many Bolivian quinoa farmers are now better off, able to consume more quinoa and purchase other foods with their increased incomes. Even Bolivian consumers are eating more quinoa. Instead, the real concern, reported mainly in the Latin American press, has been the environmental impact of the quinoa boom.

Increased demand has resulted in an expansion of land areas dedicated to quinoa production, resulting in reduced soil fertility and increased erosion. It also

has led to social conflicts over access to community lands. Furthermore, another little considered issue – especially disturbing to researchers at Bioversity International – concerns the fact that the market seeks only a few commercially-favoured varieties, thus displacing a wide range of other traditional quinoa varieties that are critical for ensuring resilient production systems and the ability to adapt to future climate change and emerging pest and disease risks.

Of course, having a high-value export crop is certainly positive for smallholder farmers who live at altitudes above 3,800 meters in the Andes, but Bioversity International's goal is to seek 'expansion without extinction'. Therefore, to find a solution to support the farmers and still conserve diversity, Bioversity International and its partners looked toward the concept of Payment for Ecosystem Services (PES).

PES is a widely applied conservation approach through which incentives are offered to farmers or landowners to encourage them to manage their land in a way that provides ecological services – such as setting aside agricultural land in order to conserve wild biodiversity or encouraging farmers who live in hilly areas to maintain watersheds and thus protect the water quality of those who live downstream. The question was whether this same kind of approach could be built upon to encourage conservation of biodiversity on farm, much of which is increasingly threatened, such as many of the traditional varieties of quinoa.

Farmers accept Bioversity International's offer to conserve threatened quinoa varieties

As a pilot project, Bioversity International and its partners approached 39 community groups in Bolivia and Peru and asked if they would be interested in participating in a conservation programme for four to five different threatened quinoa varieties in each country; 25 groups said yes. With that kind of interest, researchers continued to the next step of quantifying the costs of biodiversity conservation. Instead of offering a specific payment, the project adopted a competitive tender approach, asking the groups to submit offers, stating which of the threatened varieties they were willing to plant, on how large an area, how many farmers would be involved and also, what kind of in-kind reward they would need. While the rewards requested were not unexpected – e.g. farm inputs, school supplies, construction materials – bid offers varied widely, implying that some conservation service providers are more economical to work with, permitting more to be conserved for any given conservation budget. As a result, the initiative signed contracts for the 2010-2011 agricultural season with 12 community groups based on the offers received.

Adding up the cost of conservation in the field

As the first season grew to a close, with results measured, Bioversity International had its answer. The cost of the PACS-supported planting of threatened quinoa variety averaged only about US\$ 150 per hectare in Bolivia but up to US\$ 2,400 in Peru where farm areas are much smaller and labour costs higher. The farmers were happy with their yields, in some cases deciding to keep 30% as seed for the

next season, with many vowing to keep the seeds after the project ended. Hence, annual interventions may not even be necessary.

Although this limited budget, one-season pilot project has not really protected quinoa diversity on a significant scale, it has given researchers data that indicates that PES concepts can be built upon and applied to agricultural biodiversity in a way that is quite cost-effective. In fact, the work has been used as a learning module at Cornell University as part of their Conservation Bridge programme. Bioversity International is moving ahead to refine the PACS approach further, addressing how to determine when a variety is threatened, which of the many threatened varieties should be prioritized for conservation, how to monitor the impact of PACS interventions and how to finance such interventions. With regard to the latter, an exploration of mechanisms through which quinoa-related environmental service beneficiaries and purchasers could become investors in its conservation and sustainable use is being undertaken. Such mechanisms could include eco-labelling, biodiversity offsets and other regulatory obligations, public procurement programmes, corporate social responsibility initiatives and the development of cultural tourism infrastructure, as well as direct support from governments and foundations. But in the meantime, participating farmers in Peru and Bolivia are already benefitting from their provision of a conservation service of importance to wider society and have supported the development of a new tool for the conservation of agricultural biodiversity.

Partners and Donors

Partners:

- Centro de Investigación de Recursos Naturales y Medio Ambiente (CIRNMA), Peru
- Fundación PROINPA, Bolivia
- University of Cambridge, UK

Donors:

- The CGIAR System-wide Programme on Collective Action and Property Rights (CAPRI)
- The Syngenta Foundation for Sustainable Agriculture

Links

[Economics of agricultural biodiversity conservation and use](#)

Publications

Narloch, U., Pascual, U. and Drucker A.G. 2013. **How to achieve fairness in payments for ecosystem services? Insights from agrobiodiversity conservation auctions.** Land Use Policy 35:107-118.

Narloch, U., Drucker A.G. and Pascual, U. 2011. **Payments for agrobiodiversity conservation services (PACS) for sustained on-farm utilization of plant and animal genetic resources.** Ecological Economics 70(11): 1837-1845.

Narloch, U., Pascual, U. and Drucker A.G. 2011. **Cost-effectiveness targeting under multiple conservation goals and equity considerations in the Andes.** Environmental Conservation 38(4): 417-425

Drucker, A.G., Padulosi, S. and Jager, M. 2013. **No free lunches: PES and the funding of agricultural biodiversity conservation - Insights from a competitive tender for quinoa-related conservation services in Bolivia and Peru.** FAO.



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