

**ASISTENCIA A LOS PAÍSES ANDINOS EN LA REDUCCIÓN DE RIESGOS Y DESASTRES  
EN EL SECTOR AGROPECUARIO**

**POLICY BRIEF 2. SYNERGIES BETWEEN LOCAL GOVERNMENTS  
AND PRODUCERS' ORGANIZATIONS**

Climate, Energy and Tenure Division  
Natural Resources Management and Environment Department



## ASISTENCIA A LOS PAÍSES ANDINOS EN LA REDUCCIÓN DE RIESGOS Y DESASTRES EN EL SECTOR AGROPECUARIO

### POLICY BRIEF 2. SYNERGIES BETWEEN LOCAL GOVERNMENTS

# How can the synergies between local government institutions and producer organizations be strengthened within the framework of an NRM/DRM agenda in the context of climate change?

Small farmers find themselves in the front line of issues related to climate change; therefore, the adoption of modern sustainable agricultural practices requires reinforcing family and community institutions, resulting in the restoration of the Andean highlands and the prevention of hydro-meteorological emergencies. The traditional top-down process needs to encounter a bottom up approach, which develops and strengthens farmer organizations to empower poor smallholder farmers in order for them to be able to influence policy, budgetary decision-making and institutional processes. Rural producer organizations and particularly farm organizations can play a decisive role in constructing governance structures at all levels of government. A first step is, therefore, facilitating their transition from subsistence farming to commercial agriculture, including access to dynamic markets to expand and diversify farmers' funding base to support strategic programmes and enable their organizational long-term sustainability .



### Natural resource management and disaster risk management

Within the context of current climate change trends, natural resource management and disaster risk management are related. This is particularly so in the Andean highlands, where the delicate stability of the region is being seriously threatened by climate change local impacts, creating alarm for its rural populations.

### The Hyogo Framework for Action

The Hyogo Framework for Action (HFA) offers an excellent conceptual and normative framework for analysing this interrelationship and its effects on the vulnerable territories of the rural Andes.

The Framework is a document produced by the World Conference on Disaster Reduction aimed at building the resilience of nations and communities to disasters. The document recognizes the fact that disaster prevention is economically and logistically more viable than disaster relief and intervention. The document recommends that it is in every nation's interest to strengthen their strategies and capabilities to reduce the risk of disaster's rather than having to deal with their disastrous consequences.

In the section entitled "Reduce the Underlying Factors", the HFA focuses on three crucial areas where nations should concentrate their efforts to reduce or prevent potential disaster: environmental and natural resource management, social and economic development practices, and land-use planning.

Its main guiding criterion is that disaster prevention to increase the resilience of communities to prepare for and try to prevent natural disasters is more cost-effective than post-disaster intervention and it may lead to sustainable development.

### The tropical Andes rural landscape

While these changes are taking place at the national level, the social and economic conditions in most tropical Andean highlands are not so favourable. A worrisome trend is that, despite development processes elsewhere, most rural territories are still facing high levels of depopulation, a trend which endangers the possibility of a sustainable management of the natural landscape.

Poverty is the key driver of this exodus. Rural emigration tends to have negative impacts on the region's sustainability because: a) it reduces local human capital, draining rural communities of the entrepreneurship needed for innovative productive investments; ii) contributes to environmental degradation, favouring mismanagement of resources in rural areas; iii) contributes to the loss of indigenous knowledge and practices, including traditional agro-ecological appropriate productive systems; iv) weakens local social structures and households, leaving communities with the elderly and most disadvantaged sectors of the population. In most cases the end result is a slow-down or even regress in local economies, which frequently become unable to maintain their traditional productive infrastructure.

How to reverse this decline in conditions for the broad mass of rural communities? How can we anchor the rural working populations of the tropical Andes to their communities and create opportunities for the return of those who already departed? How to conserve the fragile ecosystems of these mountain systems, while also feeding their growing human populations?

To a large degree the solutions involve public policies that encourage the adoption of environmentally sustainable agricultural practices, which should be based on the achievement of high yields per hectare, supported by public investments in physical infrastructure to be built by local populations and institutional strengthening and/or innovations around the former.

Reinforcing family and community institutions is directly linked to the restoration of the Andean highlands and to the prevention of hydro-meteorological emergencies. This is why it is so important to create new rural income opportunities in the Andean highlands.



### Including small farmers in local decision-making: its environmental importance

Small farmers find themselves in the front line of issues related to climate change. In most of the tropical world, it is small farmers who really maintain and develop agricultural diversity on their farms. This diversity has been developed in fields and gardens over millennia, and they continue to manage and develop it. Without their unrestricted participation in these activities, agricultural biodiversity, enhanced through the exchange of seeds and other planting material will continue to be eroded worldwide.

In order to address disaster risk management (*DRM*) and climate change adaptation (*CCA*), farmers need to be involved in the decision making process because they determine land use and land use change and the provision of certain environmental services. In the years to come, the additional stress imposed by climate change on farmers will require extraordinary adaptation. Thus, small farmers' role in attaining and restoring resilient biological and social systems has recently acquired a global and previously unexpected importance.



### Sustainable and unsustainable agricultural practices

How to compare agricultural systems? How to decide if a modern regenerative and low-input agriculture is superior to a conventional agriculture practice?

Sustainability is usually the criterion, although it is a complex and contested concept. To some authors it implies the long-term endurance of a practice (e.g. an agricultural system or technology). To others it implies not damaging or degrading the biophysical resilience of 'natural' and 'managed' ecosystems (i.e. environmental sustainability).

Having both meanings in mind, the point we want to stress here is that adopting regenerative and low-input agricultural practices substantial increases in yield are possible, even in currently unimproved or degraded areas, whilst at the same time protecting or even regenerating the environment. Appropriate technologies for sustainable agricultural intensification are already available. The crucial issues are basically related to the need for strengthening (or creating) formal and informal institutions, regulating markets, and enacting the policies that condition the incentives offered to farmers and their capacities to use those technologies.

Given this renewed institutional context, the adoption of sustainable agriculture intensification practices is possible. Following Reardon et al (1999), sustainable agricultural intensification is here defined by two criteria: (i) environmental: the adoption of a technology that protects and enhances the NR, maintaining or improving land productivity; and (ii) socio-economic: the adoption of a technology that helps farmers to achieve their production goals (e.g. food consumption and/or market-oriented agricultural production incomes). In most cases, satisfying these two criteria requires 'capital-led intensification', based on substantial use of non-labour inputs that enhance soil fertility (such as inorganic and organic fertilisers), and land and water conservation infrastructure increasing labour productivity (e.g. grass strips, anti-erosion ditches, hedgerows, bunds, and terraces). By contrast, unsustainable intensification processes occur when the farmers basically depend on non-qualified labour and/or increasing the use of natural resources to extend the production process. The point is that any increase in non-qualified labour use should be channelled towards increasing labour productivity, otherwise it will go towards either increasing natural resource use (e.g. deforestation) or towards unsustainable labour intensification (Reardon et al 1999).

Sustainable agricultural technologies, thus frequently suppose a thorough incorporation of natural processes such as nutrient cycling, nitrogen fixation, and pest-predator relationships into agricultural production processes, so ensuring profitable and efficient food production, as well as reducing the use of external and non-renewable inputs which may damage the environment or harm the farmers' and/or consumers' health. The final goal, therefore, is to minimize costs, allowing for greater productive use of local knowledge and practices in order to ensure the long-term sustainability of current production levels.

If this is complemented by an increased diversity of productive activities by the household, not only farm incomes may be increased, but also the impact of production practices on the environment may be reduced (Röling et al 1998).

A necessary condition for the adoption of these appropriate sustainable intensification technologies, however, is the previous development of local institutional arrangements that encourage local farmers to abandon their former unproductive and non-sustainable agriculture systems, thus strengthening rural population livelihoods.

Some of the case studies reported in this project, provide interesting examples of the inclusion of small farmers in local decision-making processes, and through this the development of sustainable agricultural systems.

The creation of the Allin Cápac Ecological Farmer Association within a project to reduce poverty and prevent natural disasters in the Vinchos district, of the Ayacucho Department (Perú), empowered the small farmers of two local communities, who as a result were able to participate in the municipality's Participatory Budget (PB) mechanisms, obtaining funds to restore their ancient system of terrace cultivation. A clear example of the link created between a civil society organisation and a local government within a project combining aspects of NRM/DRM, agricultural development and empowerment of rural local communities.

A case which also is an example of the adoption by these farmers a sustainable agricultural diversification strategy, which includes an intensification of the soil use, plus the protection of natural ecosystems (via orchard nursery, crops oriented towards domestic consumption, fodder cultivation, harvest and post harvest, management of organic waste, protecting zones). The end result has been the resilience of the local family farms, by increasing their access to market niches in which they still exhibit comparative advantage. In addition, and as a result of these renewed farm practices, these farmers have been able to enhance their biophysical environment through practices such as the restoration of ancient Andean terraces and the construction of infiltration ditches, plus the adoption of modern techniques such as sprinkle irrigation and crop nurseries. The end result has been increasing yields and developing new venues to access to differentiated and high value niche markets (e.g. organic products), thus creating incentives for new employment opportunities within their communities, and even developing incentives for the return of those who have already emigrated.



The process of adoption of modern sustainable agricultural practices requires, however, a fundamental change in the learning processes. In traditional research and extension systems, agricultural technology development and transfer tended to be largely based on a vertical top-down approach with information that views agricultural researchers, extension agents, and farmers as separate agents, with weak or even non-existent links.

The Farmer Field Schools (FFS) and the Farmer First approach, by contrast, are modern group learning approach to build knowledge and capacity among farmers, and to enable them diagnose their problems, identify specific solutions appropriate to their local conditions, and implement them with or without additional support from outside agents.

In the Peruvian Vinchos district of the Ayacucho department, the FFS approach adopted by COPUCNA (the Council of Camelid Livestock Producer Organisation) has also the merit of creating the necessary synergy between the so-called 'traditional' (ancestral) practices of these high Andean farmers and 'modern' (scientific) knowledge and technical practices, adapting them to the conditions these Andean farmers face within the context of current climate change challenges.



### **Including small farmers in local decision-making: its institutional importance**

Rural producer organizations, and particularly farm organizations (e.g. agricultural marketing cooperatives, local self-help groups, credit unions, networks and strategic alliances, etc.), can play a decisive role in constructing governance structures at all levels of government.

Developing and strengthening farmer organizations is thus a necessary step for empowering poor smallholder farmers in order for them to be able to influence policy, budgetary decision-making and institutional processes.

Empowerment is therefore a *sine qua non* condition to any strategy that moves away from former patron-client relationships and benevolence models of food aid so small farmers gain leverage in the municipal structure, influencing both local public policy and budgetary and institutional process.

### How are farmers involved? How is the synergy created between local governments and farmers' organizations for managing natural resources and disasters?

But how to strengthen the political voice of small farmers in policy decision making and implementation processes directly related to issues such as farming practices, and indirectly to NRM and DRM?

Given the conditions of poverty and social exclusion that many farm communities have historically faced in most rural tropical Andean territories, food security still has to be the priority. But small-scale agriculture, which supports the livelihoods of the majority of the rural poor, is currently facing rapid changes in agricultural and food markets, with implications for their capacity to sustain their livelihood strategies. Through their integration within dynamic markets, small farmers can be included and improve their living conditions.



#### From subsistence to market orientation

A first step is, thus, facilitating their transition from subsistence farming to commercial agriculture. Access to dynamic markets expand and diversify the farmers' funding base to support strategic programmes and enable their organisational long-term sustainability. Yet, how to create incentives for innovative behaviours? How to design an appropriate commercial strategy for local products?

At community level, the key determinant is a strong physical connection to markets. Good road access to nearby rural towns and cities being paramount. Once road access is available to formerly remote communities, rapid insertion into market dynamics takes place. Access to new technologies that increase basic food crops yields also lead to the release of land resources that were formerly required for guaranteeing food security. Although the domestic orientation of these these food crops may be retained, whereas surpluses may be now provide for additional cash earnings.

But also analyzing the good practices already attempted by some Andean peasant communities adopting sustainable farming practices, connecting to dynamic markets, and successfully managing climate change variability, and then bringing the lessons learned from these cases into the wider policy and institutional debate is the main objective of this document.

The adoption of modern sustainable agro-ecological practices (e.g. drip irrigation and micro irrigation systems, soil fertilization with organic manure, production of food for domestic use in home orchards, etc.) and the renewal of practices which were formerly sustainable but later on abandoned due to changing conditions (e.g. pre-Hispanic terrace rehabilitation, construction of water infiltration ditches, insect repellent plants, re-evaluation of native Andean crops, etc.), while fostered the resilience of family farms and provided access to new dynamic market niches, also are related to successful strategies for managing disasters (protection against soil erosion and soil recuperation, prevention of hydro-meteorological emergencies. The end result being: fixing the productive population to the land, while finding new employment opportunities for those who already left.

## Potato crop cultivation in Taqanas and Canchones in Bolivia

The case study that supports this good practice is the community of Jacho Suyu Pakajaqi in the province of Pacajes at the department of La Paz, Bolivia. In the Bolivian highlands, each year communities have to face three major environmental risks: drought, soil erosion due to heavy rains, and frost. Hail used to be an occasional problem; however, its occurrence has been escalating. Climate change is not considered to be the causal factor of these phenomena, although their frequency and magnitude are greater than ever. This has a negative impact on the community, which often leads to food insecurity.

### Description

Potato cultivation in *taqanas* and *canchones* are traditional practices which date back to the pre-Inca period of Tiwanajotas (750-1200 AD). The *taqana* is a growing practice aimed at adaptation to steep slopes, in which embankments are built to protect soils from erosion. By placing rocks and digging furrows along the side of the slope, it is possible to recreate small terraces with arable areas of 2-5 square meters. *Taqanas* differ from large-scale terraces in their irregular distribution on the slope.

In *taqanas*, potato production is subject to crop rotation every 15 years. After each harvest, farmers "wrap the ground to take care of it", i.e. cornering the floor to the wall of rocks so that the rain does not erode it. *Taqanas* lessen erosion and, at the same time, they make possible the absorption of rainfall and soil moisture retention, resulting in higher yields.

*Canchones*, on the other hand, are slots enclosed by mud walls which are built close to the house. In these small areas, kitchen leftovers and livestock waste are deposited alternating periods of fertilizing and rest. In a typical *canchón*, the ground is used as stockyard for about four years, then it lies fallow through the fifth year, and potato is grown during the sixth year. Along with proper hilling, the aim of this practice is to increase crop resistance to stress caused either by frost or as a result of fertilization.

The role of two major local institutions is worth mentioning: family and community. On the one hand, families pass on knowledge about seeds and their cultivation from generation to generation. As a result, the use of more than twenty varieties of potato in the *taqanas* performs important functions for the protection of genetic biodiversity: it prevents losses resulting from weather disasters and controls weeds, pests and diseases. On the other hand, the organization of farmers in communities also plays an important role as most of the tasks required for soil preparation would be virtually impossible to carry out individually. Both institutions contribute to the development of a food production system that takes into account the sustainability of soil while mitigating weather impact and reducing the vulnerability of potato crops. All of these ensure food security of households in the community.



### Lessons Learned

The survival of these practices demonstrates their resilience and their effectiveness as strategies to mitigate weather impact inherent to the climate of the Andean highlands. It is remarkable how the knowledge of these risk management practices is basically based on two ancestral institutions: the family and the community. The family because it is through the transmission of knowledge from generation to generation that formerly sustainable practices are implemented and adapted to modern conditions. The community because it is through the way rural communities enforce the rules for accessing and managing natural resources and organizing collective works that a sustainable management of natural resources is achieved. In other words, this shows that institutional strengthening, risk mitigation practices, and improved production methods should be promoted simultaneously, providing an interdisciplinary solution to current issues and problems.

## Agro-forestry systems in Perú

The case studies of Jullicunca and Cuyuni, high Andean communities in the department of Cusco (Peru), are a good illustration of a good practice related to the small farmers' adoption of modern agro-forestry systems through the support provided by a national public entity (PRONAMACHS), the municipal government, and their link to rural community organisations. In the area called Quechua, between 2,300 and 3,500 m, there is a prevalence of small-scale plots (500 to 2,000 m<sup>2</sup>) cultivated without legal ownership. They are usually planted with potatoes for consumption and seed production. In contrast, in the area known as Jalca (between 3,500 and 4,100 m) grazing areas prevail. They are used for the production of cattle, sheep, alpacas and llamas. Even though cultivated areas tend to be smaller at this altitude due to frosts, we found some Andean annual crops (e.g. potatoes, beans, *oca*, *tarwi*, etc.). However, there are also forests dedicated to agroforestry management. These forests hold native

### Description

Over the last three years, Conservationist Committees sponsored by the National Program of Watershed Management and Soil Conservation (PRONAMACHS, currently AGRORURAL) with support from FAO and WFP have implemented a set of programs and activities with the goal of adopting agroforestry systems adapted to the conditions of these ecosystems. Among them: (a) training through workshops, courses and demonstrations for the implementation of new technologies; (b) setting up seed nurseries; (c) planting crops for domestic consumption (potatoes, *oca*, beans, corn and vegetables); (d) taking advantage of alleys between rows of trees and shrubs to ensure the availability of moisture; (e) planting native and imported species of forage crops (e.g. clover, rye grass, alfalfa, eucalyptus, etc.); (f) promoting harvest and post-harvest activities; (g) aiming to the certification of forestry products; (h) fostering compost through organic waste management; (i) setting up protection and conservation zones, usually in vulnerable areas near watercourses; and, (j) burning vegetable waste to prevent fires and protect soils and wildlife.

One of the key success factors of these programs is that they are supported by local governments. This facilitates access to budgetary resources — including those from the participatory budget— and provides a link between civil society organizations and government.



### Lessons Learned

Climate change has become increasingly obvious over the last decade. In the Andean region it has expressed itself through prolonged droughts and heavy rains that erode the soil. The best way to deal with these antagonistic phenomena is to protect the soil vegetation cover, which acts as a sponge that absorbs moisture from rain and reduces the kinetic force of its impact on the ground, thus cutting back potential erosion.

Communities are better positioned than any other agent to ensure protection of the soil vegetation cover. An adequate vegetation cover reflects a healthy watershed management. It guarantees soil's water absorption, which will end up feeding the flow of rivers. Additionally, it becomes part of pastures eaten by animals and serves as raw material to build their shelters. Finally, an adequate vegetation cover enhances the landscape, which at the same time improves the local population's self-esteem. It creates opportunities for tourism, which becomes a potential source of income for these communities.

In order to start the recovery of the vegetation cover, it is necessary to strengthen local institutions. It is only through full participation of all the community members that damage to the vegetation cover could be avoided.

Agro-forestry systems —due to their characteristic diversification of production, sustainable intensification of land use, and protection of natural ecosystems— fulfill important functions for the sustainability of family farms. They also help ensure the communities' livelihood strategies, food security, and access to markets niches where small producers still have a comparative advantage.

As a final point, agro-forestry systems —as the ones shown in this case study— are successful strategies for disaster management. They involve reforestation practices inhibiting phenomena such as erosion, landslides and mudslides. At the same time they protect biodiversity. That is why a strategy for the recovery of the Andean highlands and prevention of hydro-meteorological emergencies is directly associated to the links that the productive population still living in the area has with its own communities. It also has a direct association with the ability to generate new employment and income opportunities for those who already left these communities.

## Sustainable management of Lizards in Bolivia

The municipality of Loreto, in the department of Beni, Amazonian region of Bolivia, has about 44 communities only accessible by river. One of these communities, a village named after the municipality, is located 54 kilometers from the city of Trinidad and is the only one connected by land to the rest of the country.

The lizard (*Caiman yacare*) is an Amazonian species considered by some as an 'opportunistic predator' whose preys vary as the predator grows and according to their availability in different seasons. Some authors state that this species generates positive environmental effects, maintaining the ecosystem's structure and functionality. Traditionally, lizard hunting by local people was aimed almost exclusively to the use of its fat —due to its supposed medicinal value. This hunting activity worked to the detriment of other commercial uses, generating tensions between private companies and indigenous and peasant communities.

### Description

In early 2006, a study on biodiversity and poverty selected the municipality of Loreto to implement a model with the purpose of increasing the economic benefits of local communities. This study, funded by the UNPD, aimed at accomplishing proper management of biodiversity in this Amazonian ecosystem. Thus, a project known as "Achieving Lizards' sustainable use through indigenous and rural-community ventures at the municipality of Loreto" came to light. The project developed the Lizard Management Plan to cover an area of 165,022 acres of the Loreto municipality, integrating the participation of 22 indigenous and peasant communities as well as some 30 cattle farms.

This management plan was run as a pilot test whose goal was the exploitation of the lizard through the collaboration of different local actors. It included institutional and policy support by the municipal government. The plan complies with the principles and criteria of bio-commerce, taking into account social, biological, economic and cultural factors in order to promote sustainable resource use.

A Lizard Management Committee was organized, with representation from all social organizations and municipal government. The committee was supported by both local breeders and the most skilled hunters.

As a result of the project, fresh or salted skins have been used either to be processed in tanneries or to be exported. Frozen meat exports, and its introduction to gourmet markets, have been put to test. To a large extent, the plan for the sustainable management of this resource has only been possible because of the agreement reached among livestock enterprises, indigenous communities, farmers and local institutions.

### Lessons Learned

This project for the sustainable management of the lizard provided a legal framework to introduce a previously marginalized social sector to the market, legitimizing an important strategy for generating income for the rural households in the area. It is, therefore, a case study showing that sustainable use of resources to promote economic recovery may work better than a ban. At the same time, sustainability of renewable resources of their habitat is ensured.

The project also demonstrates that it is possible to reach a consensus among stakeholders with different interests, thereby strengthening their organizations and social networks. The analysis of the positive impact of this case offers lessons for the legalization of other illicit crops and sustainable management of other wildlife species in vulnerable ecosystems.





### Policy Lessons

- In all these cases the support provided by municipal governments provided the link between local governments and civil society organizations
- Andean small farmers face difficulties to access markets due to: (a) the competition they face from both large scale producers (both nationals and foreigners) which are able to produce basic foodstuff at lower costs; and (b) to the increasing penetration of supermarkets which offer products at prices far below those which farmers may receive through their customary market networks. There are, however, some market niches for products such as camelids, quinoa, native potatoes, and local artworks in which small farmers still exhibit competitive advantage.
- The cases previously reported evidence that the adoption of modern agroecological practices, and their successful adaptation to local conditions, not only has increased physical yields, and raised the living standards of these communities, but also has created conditions to strengthen their collective entrepreneurial capacity, and even to access dynamic markets in much better conditions than before.
- It is of utmost importance to create new income opportunities with competitive salaries in the Andean highlands, because it helps anchoring the working populations to their communities and to create conditions for the return of those who already departed. In turn, both achievements tend to reinforce family and community institutions and are closely linked to the restoration of vulnerable landscapes and to the prevention of climate change emergencies.
- The methodological approach adopted by the Farmer Field Schools (*Escuelas de Campo* in Spanish), described above, were capable of generating synergy between the adoption of modern agro-ecological technologies and the traditional knowledge and practices of local farmers, engendering processes with important demonstration effects for the rest of the community.
- The new knowledge and practices adopted by the members of the Allin Cápac farmers organization have strengthened their capacity to address the increasing risks which current climate change conditions engender in the region, as well as the adoption of a better strategy for sustainably managing local natural resources.
- These case studies also illustrate the need for adopting a gradual approach, although with a long-term horizon, for achieving the programme's ambitious objectives. The legitimacy and long-term sustainability of the cognitive, value, and behavioural changes the approach adopted by the programme looks for can only be achieved by long-term strategies leading to increasing social cohesion and participation by all the community stakeholders.

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