

**PROMOTING INNOVATION AND
GOOD PRACTICES:
STRENGTHENING THE CLIMATE
RESILIENCE OF FAMILY FARMING IN
THE ANDES**

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Authorship:

María Reneé Pinto
Regional Coordinator of the Resilient Andes Project

Maruja Gallardo
Project Coordinator in Peru

Osvaldo Limachi
Project Coordinator in Ecuador

Pamela Olmedo
Project Coordinator in Ecuador

Lenkiza Angulo
Regional Advisor

Edición:

José Pérez

Revision:

Marco Loma
Person Responsible for Follow-up and Monitoring

Frank Celi
Regional communicator

Design:

Sukini Design

The Andes Resilient to Climate Change project is a regional initiative promoted by the Climate, Disaster Risk Reduction and Environment Section of the Swiss Agency for Development and Cooperation (SDC), from the Lima Regional Hub, and implemented by the HELVETAS Swiss Intercooperation - Avina Foundation consortium in Peru, Ecuador and Bolivia.

A photograph of a smiling woman and a young child holding up a large harvest of root vegetables, including carrots and potatoes. The woman is wearing a patterned shawl. The background is a soft-focus field of similar crops.

PROMOTING INNOVATION AND GOOD PRACTICES:

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ADAPTING TO CLIMATE CHANGE IS NOT POSSIBLE WITHOUT APPROPRIATE TECHNOLOGIES AND GOOD PRACTICES. IN THE ANDES, SUSTAINABLE MANAGEMENT OF SOIL WATER AND VEGETATION, THE USE OF CLIMATE AND AGROCLIMATIC INFORMATION, RESILIENT INFRASTRUCTURE, AND ADAPTIVE AGRICULTURAL TECHNIQUES CAN MAKE ALL THE DIFFERENCE FOR FAMILY FARMING AND COMMUNITIES TO WITHSTAND EXTREME WEATHER EVENTS. BUT NONE OF THIS IS POSSIBLE WITHOUT THE KNOWLEDGE, EXPERIENCE AND COMMITMENT OF LOCAL COMMUNITIES WHO ARE THE KEY ACTORS IN BUILDING INNOVATIVE, EFFECTIVE AND CONTEXTUALIZED CLIMATE ADAPTATION SOLUTIONS.

ABOUT RESILIENT ANDES

It is a regional project that seeks to strengthen the resilience of family farming families, especially women and young people living in the Andes of Bolivia, Peru and Ecuador; so that they can adapt to the risks of an increasingly hostile climate context.

In 2024, it begins its second phase, based on the achievements and lessons learned previously. From support in the formulation of public policies, the recovery of ancestral knowledge, the scaling up of good adaptation practices and risk management in the perspective of resilient Andean family farming. With this, it contributes to improving production, entrepreneurship, water and food security, valuing the role of communities as guardians of the territory and the knowledge that sustains Andean life.

HOW DO WE WORK?

The project has a systemic approach and a facilitating role. It cooperates with public entities responsible for climate, agricultural, economic and social inclusion, and development planning policies, to generate an enabling environment for public services that strengthen the climate resilience of Andean Family Farming (AFA). In addition, it promotes alliances with the private sector, microfinance and solidarity banking actors, to develop financial products with criteria for adaptation to climate change.

It contributes with technical assistance, knowledge generation, innovation in services and strengthening climate management and governance. It also supports the measurement and progress in adaptation, in accordance with the Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs).

TECHNOLOGY AND GOOD PRACTICES TO FACE CLIMATE CHANGE

The Sixth Assessment Report of the

Intergovernmental Panel on Climate Change (IPCC) highlights the urgent need to address this problem through the implementation of appropriate technologies and good adaptation practices.

Technological innovation can improve the resilience of communities to adverse weather events. This includes water resource management, sustainable ecosystem management, building resilient infrastructure, and implementing adaptive agricultural techniques, among others, which are vital to ensure food security in vulnerable regions.

Agroecology and crop diversification are strategies that help farmers adapt to climate variations, while improving soil health and biodiversity. The involvement, knowledge and experience of local communities are essential to plan and develop effective and context-appropriate climate adaptation solutions. Training and



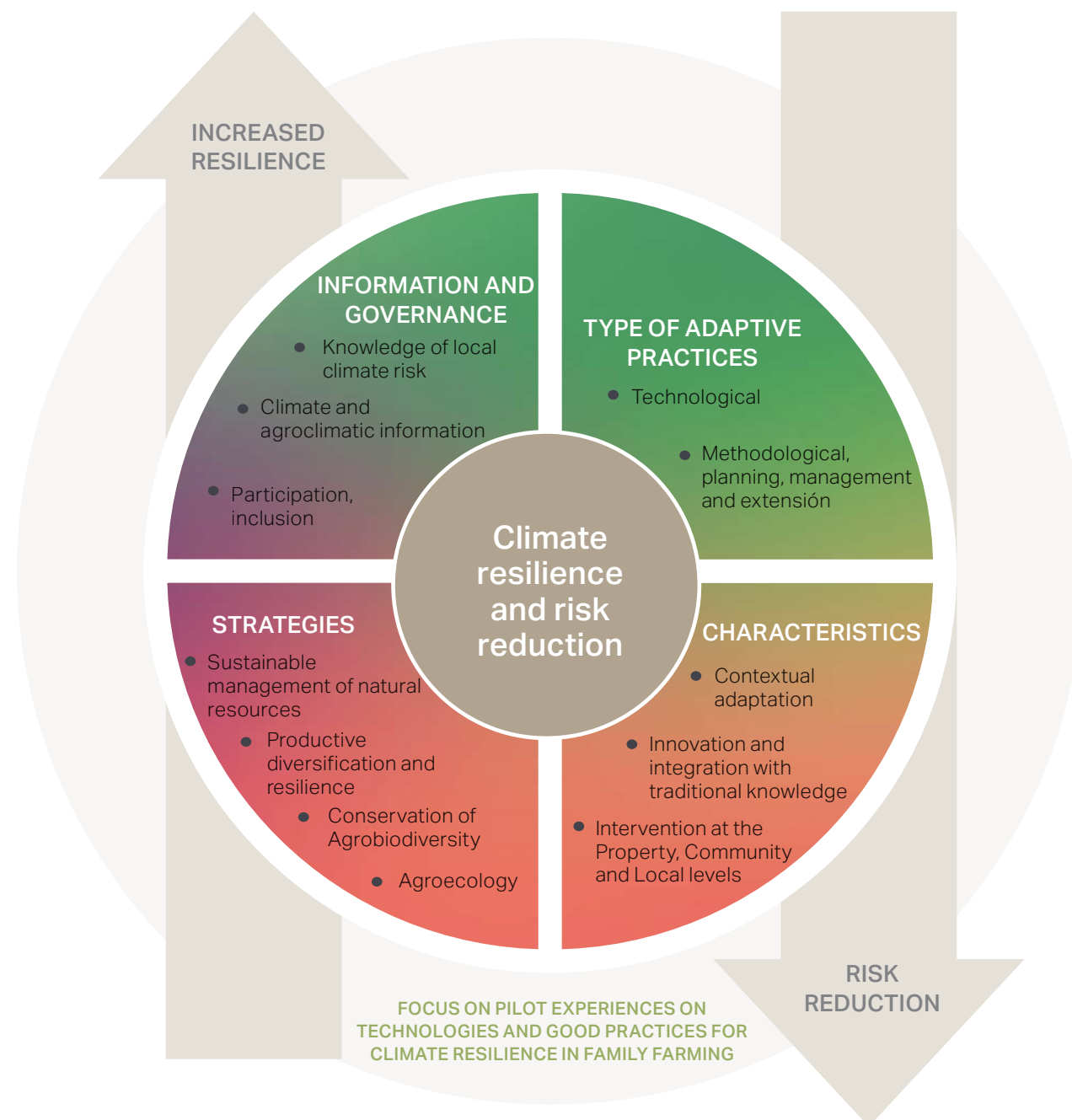
technical assistance also play a vital role in promoting sustainable practices among the population.

In short, the combination of innovative technologies and good adaptation practices is essential to increase the resilience of communities and ecosystems. A proactive and coordinated response to these challenges can be the key to ensuring a sustainable and resilient future in the face of a changing climate.

CONTRIBUTION OF RESILIENT ANDES IN STRENGTHENING TECHNOLOGIES AND GOOD PRACTICES FOR CLIMATE RESILIENCE

Andes Resilientes, in collaboration with its counterparts in Bolivia, Ecuador and Peru, has supported the capitalization of knowledge on technologies and good practices that contribute to the climate resilience of Andean

family farming, documented by previous projects, and also in the development of pilot experiences in each country, to gather evidence on their effectiveness and promote their expansion and scaling.



According to their nature, they are:

- Good (hard) technological practices for the management and conservation of resources (water, soil and vegetation), aimed at improving water availability and efficient use of water for irrigation, risk reduction and improvement of agricultural production yields, productive diversification, agroecological production, in-situ conservation and sustainable use of Andean agrobiodiversity.
- Good (soft) management practices for the planning-management of water protection areas and agrobiodiversity areas, generation, dissemination and use of agroclimatic information for productive decision-making and risk reduction, certification of agroecological production, associative marketing and alternative marketing circuits, as well as inclusive methodologies for rural extension.

Depending on their scope, these are good practices applied both at the farm or family production unit level, as well as at the community and/or local level.

The results and lessons learned from these experiences have led in many cases to the development of methodological guides for the dissemination, replication and scaling up of these actions; as is the case in Bolivia, with the Strategy for Scaling Up Agroecological Technological Innovations Resilient to Climate Change for the production of Native Potatoes, prepared in coordination with the Ministry of Rural Development and Lands (MDRyT); in Ecuador, the Methodological Guide for the Formulation of Technical Plans for the Management of Water Protection Areas, formulated in coordination with the Ministry of the Environment, Water and Ecological Transition (MAATE); in Peru, with the Guidelines for the Formulation of Investment Projects in the Typology of Sowing and Harvesting of Water of the Ministry of Agrarian Development and Irrigation (MIDAGRI).

CLIMATE RESILIENCE IN THE ANDES: EXPERIENCES OF INNOVATION AND GOOD PRACTICE

FAMILY PRODUCTIVE DIVERSIFICATION TO IMPROVE CLIMATE RESILIENCE OF PEASANT COMMUNITIES IN COCHABAMBA, BOLIVIA

The pilot experience was developed between May 2021 and April 2024 with producer organizations from the municipalities of Colomi and Morochata, located in the inter-Andean valleys of the department of Cochabamba. It was implemented in partnership with the PROINPA Foundation and was accompanied by municipal technicians. Its objective was to promote the adoption of agroecological technologies and innovations for the production of native potatoes and productive diversification through agroecological gardens with vegetables, as a measure of adaptation to climate change. The application of three technologies was prioritized: certified seed, use of bio-inputs and technified irrigation. The measure also sought to reduce the high dependence of the family economy on the monoculture of "commercial" potatoes through diversification towards the cultivation of vegetables.



PROCESS FOLLOWED

"Model plots" of vegetables and native potatoes were installed, in charge of producers chosen by the beneficiary families, for practical training, and as a reference for the replication of the other families in their own plots.

Bioactivation plants were implemented, two in Morochata and one in Colomi, with easily accessible and low-cost materials, to train in the local production of bioinputs (biofertilizers and biocontrollers of foliar diseases), thus facilitating their access and use. Producers learned that it is possible to produce up to 180 liters of bioinputs in 4 days for use in up to 90 hectares of crops.

The experience was strengthened with the organic certification PGS (Participatory Guarantee Systems) of their production, facilitated by the Unidad de Coordinación del Consejo Nacional de Producción Ecológica (UC-CNAPE) of the Ministerio de Desarrollo Rural y Tierras (MDRyT), in coordination with the two municipal governments, where the producers managed to obtain the green or transition GSP, which certifies the organic production of their entire production system. in this case native potatoes and vegetables. The accompaniment of the UC-CNAPE allowed its application and its effectiveness in reducing losses due to climatic factors (frosts, droughts and hailstorms, mainly) to be verified in situ.

INNOVATION

The incorporation and use of the three technologies (certified seed, bio-inputs and technified irrigation) is a new factor in the local environment, which provides added value, improving production processes, and producing clear economic, environmental and social benefits.

Another novel factor was the introduction of Participatory Guarantee Systems, an alternative, local and more accessible form of organic certification for small producers. This is managed by the communities themselves, together with the municipalities, which opened up opportunities for them to access differentiated markets, gave confidence to consumers and strengthened local knowledge and organization. The experience has managed to configure a strategy for the agroecological and resilient production of native potatoes and vegetables, which has been assimilated by different programs implemented by the MDRyT for its expansion.

RESULTS

The results obtained in the model plots and their comparison with control plots, allowed us to verify that these practices increase yields and help to reduce losses, compared to traditional production. Despite having gone through agricultural years with complications, first due to drought and then intense rains, producers obtained reasonable yields in native potato production, fluctuating between 7.5 and 14.9 t/ha in Colomi and from 6.4 to 20.5 t/ha in Morochata, due to the innovations adopted, in contrast to the losses suffered by producers in the region (between 40 and 60% of production).

The quantitative and qualitative analysis of the effects in the two municipalities showed relevant positive effects. Before the intervention, the sustainable development indices were 0.33, and after the intervention

they rose to 0.75 in Colomi and 0.56 in Morochata. The cost-benefit ratio was positive, with a value of Bs 1.68. That is to say, for every Bs 1 invested, Bs 0.68 of net social benefit was obtained.

The benefits achieved were not only economic, since the use of the three technologies (certified seeds, bio-inputs and sprinkler irrigation), improved crop productivity; there were also environmental benefits, since sprinkler irrigation prevents water losses; and finally a social benefit, with the strengthening of local capacities, the improvement of the autonomy and skills of families to make appropriate decisions for climate-resilient production (which species to grow, when, how much, and what measures to adopt).

REPLICABILITY

These good practices were replicated and adapted by producer families in the Bolivian highlands, in the municipality of Escoma in the department of La Paz, with advice from the PROSUCO entity. The UC-CNAPE of the MDRyT has been promoting processes of replication and adaptation of agroecological certification protocols, through participatory guarantee systems, in other types of

crops and other environmental contexts. The learnings have led to the design of a Strategy for the Scaling of Agroecological Technological Innovations Resilient to Climate Change for the production of Native Potatoes, produced by the Andes Resilient and Native Potato Projects, with the PROINPA Foundation in 2023.



TOWARDS A PARTICIPATORY METHODOLOGY OF RURAL EXTENSION IN ECUADOR

To strengthen rural extension actions and services for the climate resilience of peasant family farmers, the Andes Resilientes project, in coordination with the Ministry of Agriculture and Livestock (Ministerio de Agricultura y Ganadería - MAG) and in coordination with the Ministry of the Environment, Water and Ecological Transition (Ministerio del Ambiente, Agua y Transición Ecológica - MAATE), carried out in 2021 a diagnosis and mapping of entities that develop rural extension in 4 provinces of Ecuador: Cotopaxi, Chimborazo, Bolívar and Azuay. 22 organizations were identified (including Foundations, NGOs, Civil Society Organizations and International Cooperation).

In 2022, a thematic strengthening process of these entities was supported, mainly focused

on: climate action, youth and intersectionality and rural women; who formed a network of rural extension actors in the territory, to meet the need for articulation, dialogue and mutual collaboration with the base communities, to respond to their demands with concrete solutions.

With this background, between 2023 and 2024, a practical experience was developed to link rural extension entities with grassroots rural organizations, in a joint effort to co-create and implement a pilot methodology for rural extension, which articulates supply and demand of knowledge and technologies, to close gaps in capacity development. in order to guarantee resilient family farming in the territories.

ACTIONS TAKEN

Key criteria were established to select the rural organization with a representative base and that could express the demands of the populations, a selection that fell to the Organization of Peasant Women Sowing Hope (Organización de Mujeres Campesinas Sembrando Esperanza- OMICSE) of the province of Cotopaxi, which brings together more than 200 families from 15 communities. Each of the organizations is chaired by a woman representative who expresses interest and commitment to get involved in the joint development of the experience.

With the 15 leading presidents of the OMICSE organizations, the identification of technical assistance needs was carried out. At the same time, links were established with entities that offer rural extension services within the province, to learn about their work experience and identify synergies and possibilities for collaboration.

From the contrast between demand and supply, the proposal for action based on family gardens and the production of organic fertilizers was identified as a priority to strengthen the food security of families, the resilience of their production and thus complement their income.

The budget to support the provision of gardens in all communities and families was

insufficient for the inclusion of all women in the organization so as not to damage OMICSE's organizational processes. Thus, it was decided to concentrate cooperation on the production of organic fertilizers, such as Super Magro type liquid fertilizer, adapted to the local reality. Each president received materials to make fertilizer tanks through collective work or "minga".

Field workshops were held in each community. The first fertilizer tanks had direct technical assistance from the project and extension entities. From the third, and to promote appropriation, the presidents of the organizations played an active role in the dissemination of this knowledge among the families participating in the workshops; while the project and the entities assumed a role of observation and support.

More than 90 families participated in the training processes, and a total of 15 fertilizer tanks with a capacity of 3000 L were developed, one in each community.

The action also involved an active and participatory process of reflection on OMICSE's needs and opportunities for work, and the development of proposals that would strengthen its bases; among them, the exchange of experiences and learning about market opportunities and the development of entrepreneurship, which materialized with the visit to the Central Committee of Women of the Union of Peasant and Indigenous Organizations of Cotacachi (UNORCAC), which has among its achievements the establishment of an agroecological market in the city of Cotacachi; as well as the acquisition and use of oat seeds to improve or restore pastures, distributed among all the women of the communities represented.

RESULTS

The action has contributed to strengthening OMICSE's capacities to identify and agree on collective needs and demands, in addition to building proposals for development and climate resilience with a territorial vision for the communities and families that make it up.

Similarly, the development of capacities to establish an autonomous relationship with extension service providers. The capacities for dialogue between the entities that supported the experience have also been strengthened, as well as the adaptation of their services to the particular needs and demands of the organizations, promoting mutual collaboration.

INNOVATION AND REPLICABILITY

The experience has provided participatory, pedagogical and inclusive forms of rural extension, of co-creation between social organizations and entities that provide technical assistance to peasant family farming, and that can be integrated into the development and strengthening of these services by public and private entities.

LIVING ROOTS OF THE ANDES: IN SITU CONSERVATION IN THE CUYOCUYO AGROBIODIVERSITY ZONE IN PUNO, PERU

The in-situ conservation and sustainable use of agrobiodiversity based on traditional practices and knowledge is part of Peru's NDC adaptation commitments for the agricultural sector. Its compliance is the responsibility of the Ministry of Agrarian Development and Irrigation (Ministerio de Desarrollo Agrario y Riego - MIDAGRI), and the National Institute of Agrarian Innovation (Instituto Nacional de Innovación Agraria - INIA), dependent on that sector, in coordination with subnational bodies.

This action, in addition to favoring agricultural biodiversity, has an important social, economic and cultural role in the country, being a life insurance against uncertain scenarios such as climate change. Because of its importance for food security and adaptation to climate change, the project has provided systematic technical assistance in this action, at the request of these institutions.

Between 2021-2022, she cooperated with INIA in the design and institutionalization of technical tools to recognize, plan, and manage the conservation of Agrobiodiversity Zones (ABDZ) and in promoting their application by local indigenous organizations.

The ABDZs are geographical spaces with a wealth of native, cultural and ecological agrobiodiversity, in which indigenous peoples, through their cultural traditions and in confluence with biological, environmental and socio-economic elements; develop, manage and conserve the genetic resources of native agrobiodiversity in their fields and in adjacent ecosystems.

To promote progress and learning in the management of the ZABDs, which would strengthen the tools available in order to scale up these actions, between 2023-2024, the Andes Resilientes project, in partnership with the Wildlife Conservation Society and with the support of INIA, supported the institutions and communities that make up the ABDZ Andenes de Cuyocuyo, in the Puno region.

Thus, a pilot experience was developed for the formulation of the management plan for this ABDZ, the implementation of in-situ conservation actions of agrobiodiversity and a process of analysis and discussion was initiated on mechanisms of remuneration to farmers and communities, in recognition of their work in conserving the country's agricultural genetic heritage. which is an incentive for the continuity of these actions.

PROCESS FOLLOWED IN THE PILOT EXPERIENCE

The experience involved:

- ▶ Awareness and advice for the strengthening of local governance among the 6 communities that make up the ABDZ Andenes de Cuyocuyo, as well as local public and private institutions, for the formulation and implementation of the ABDZ management plan.
- ▶ Technical assistance in the formulation of the plan (definition of 5-year objectives, activities, managers, participants, and execution schedule).
- ▶ Technical and logistical support to execute prioritized activities:
- ▶ Implementation of 6 conservation demonstration plots, one in each community, for training and continuous production of seeds of existing and/or new varieties.
- ▶ Peasant schools for practical training according to the agricultural calendar and the phenology of the crops, in the 6 communities.
- ▶ Diversified food production of agrobiodiversity in family plots.
- ▶ Equipment of 2 communal banks for the conservation of seed varieties.
- ▶ Fairs for the intercommunal exchange of knowledge, agricultural practices and seeds of agrobiodiversity, to strengthen their traditional systems.
- ▶ Analysis and dialogue on mechanisms of remuneration to farmers and communities, for the in situ conservation of the genetic diversity of native crops in the ZABD, and the incentive for the continuity of such work. This dialogue involved representatives of the country's agro-biodiverse zones, public institutions, non-governmental and cooperation organizations linked to the management and conservation of agrobiodiversity.

RESULTS

The Management Plan of the ABDZ Andenes de Cuyocuyo has been implemented by a Management Committee made up of representatives of the 6 communities that make up the ZABD, and the public and private entities that participated in its formulation. It articulates a set of actions focused on: ensuring clean water for people, irrigation, pastures and animals; increase the production and quality of native crops for consumption and sale; to maintain the terraces (constructions of pre-Columbian origin, which, like wide steps, were worked in the Andean mountains to gain land in favor of agriculture) of the ZABD; recover and increase native crop varieties; improve the production of fiber, alpaca and llama meat; improve pastures and conserve wetlands; recover medicinal plants and give them added value; take care of forests and reforest with native trees; access to markets for native, processed or processed products; promote tourism and revalue the culture and customs of the communities.

Through intercommunal exchanges, more than 83 varieties of Andean tuber seeds, which were at risk of being lost, were recovered. The demonstration plots enabled the continuous production of seeds and managed to demonstrate that the productivity of native crops can be increased by at least 49% in relation to the average of the region.

The climatic events that harm these crops (frost, hailstorms, drought, winds, fogs and heavy rainfall) and the techniques used in each community to counteract them were identified.

Families and communities strengthened their capacities for the production of agrobiodiversity crops in diversified production systems, and improved agronomic practices on their own plots.

ELEMENTS OF INNOVATION

The application of rural extension methods that revalue traditional knowledge, integrating them in a pertinent way with modern knowledge and techniques, has made it possible to enhance the conservation of Andean agrobiodiversity.

Advance the vision that in situ conservation of agrobiodiversity, beyond the benefits it generates for farmers and communities that practice it, constitutes a public service work. This allows us to introduce the discussion on mechanisms of retribution for the benefit it brings to society by maintaining resources and genetic processes essential for food systems, and mitigating the impact of environmental fluctuations caused by climate change.

REPLICATION AND SCALING

This experience was a benchmark for the other 9 ABDZs recognized in Peru, and to advance public policies that give value to the in situ conservation of agrobiodiversity, beyond its market value, which is usually lower even than that of commercial varieties.

These are some of the mechanisms that reward the in situ conservation efforts of agrobiodiversity carried out by farming families and allow the expansion, scaling and sustainability of these actions.



National coordinators:

Peru: Maruja Gallardo

Tel. +51 1 444 0401 anexo 102

Email: Maruja.Gallardo@helvetas.org

Bolivia: Osvaldo Limachi

Tel. +591-(2) - 2794487 / 2790826

Email: Osvaldo.Limachi@helvetas.org

Ecuador: Pamela Olmedo

Tel. +593 99 871 2499

Email: pamela.olmedo@avina.net

Offices:

Perú/Regional: Av. Ricardo Palma 857,
Miraflores, Lima

Bolivia: C. Gabriel René Moreno N° 1367.
Building Taipi. Office 1. 2nd and 3rd floor.
San Miguel Urbanization, Block H. Calacoto
Zone, La Paz

Ecuador: Isabel La Católica N24-274 and,
Galavis corner, Quito 170143