

RESEARCH PROGRAM: Climate, environment and health (SG-CEH)

Policy Brief | Project SG-CEH-06

Ayllu Resilience Mechanism to Address the Effects of Climate Change Through a Dialogue of Knowledge Between Local Wisdom and Innovative Technologies in Micaya, Bolivia

Country: Bolivia

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The challenge

In the high-Andean community of Micaya (La Paz, Bolivia), climate change has intensified frosts, droughts, and soil degradation, affecting agricultural production, food security, and the health of the population. These pressures result in poorly diversified diets, severe nutritional deficiencies (particularly of vitamin B12 and folate), the coexistence of overnutrition and undernutrition, and chronic exposure to pesticides, with evidence of genotoxic damage in a significant portion of the population. Vulnerability is exacerbated by structural limitations in access to health services, education, and sustainable livelihood alternatives.

What was done

- Implementation of community greenhouses and agroecological practices to address frost, drought, and soil degradation.
- Application of zeolites and organic fertilizers to improve agricultural productivity and reduce pesticide use.
- Comprehensive assessments of the population's health, nutrition, and genetic status (anthropometry, micronutrients, genotoxic damage).
- Development of cookbooks featuring Andean foods to diversify the local diet.
- Intercultural workshops and forums for knowledge exchange involving women, youth, local authorities, and health personnel.

Main findings

- More than 80% of the population had a vitamin B12 deficiency, and about 40% had a folate deficiency.
- About one-third of the participants showed evidence of genotoxic damage, with a higher prevalence among those exposed to pesticides.
- Local diets that are highly dependent on carbohydrates increase nutritional vulnerability.
- Agroecological practices increased vegetable production by approximately 30%, diversifying the diet.
- The dialogue between ancestral knowledge and science strengthened community acceptance of the interventions.

The approach

The project adopted a transdisciplinary and intercultural approach, based on a dialogue between the ancestral knowledge of the Ayllu and contemporary scientific and technological tools. Agroecological practices, innovative soil management technologies, and biomedical and nutritional assessments were integrated, with strong community participation, to strengthen climate, food, and health resilience at the local level.

Impact and application

- The project demonstrated that integrating science with local knowledge can generate effective and culturally relevant solutions to the impacts of climate change.
- Demonstration of an Ayllu resilience model that can be replicated in other high-Andean communities.
- Evidence for designing intersectoral public policies that integrate health, agriculture, nutrition, and climate adaptation.
- Inputs for government programs aimed at reducing malnutrition and exposure to pesticides.
- Strengthening of community self-management and the participation of women and local authorities in decision-making.

Key lessons

- Climate resilience is most effective when built from the ground up through local engagement and intercultural dialogue.
- Agroecological approaches can simultaneously improve production, nutrition, and health.
- Exposure to pesticides poses an underestimated health risk that requires urgent attention from public health and agricultural policymakers.
- The active participation of women and communities is essential for the sustainability and ownership of solutions.

Key message

Integrar saberes ancestrales y tecnologías agroecológicas en políticas públicas permite fortalecer la resiliencia climática, mejorar la nutrición y reducir riesgos sanitarios en comunidades rurales altoandinas, con soluciones culturalmente pertinentes, costo-efectivas y replicables a escala territorial.



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