

Adapting to Climate Change: The Cordillera Experience

By Roberto Sandoval, Jr.¹ and Stephan Baas²

The manifestations of climate change are now felt by many, especially by upland farmers whose agricultural production is vulnerable to the increasingly unpredictable weather conditions. Although the local communities in the Cordillera region have been able to maintain a sustainable relationship with the resources through their indigenous knowledge and practices, climate change has severely affected the region's agriculture sector. As such, climate change adaptation (CCA) measures in agriculture were developed in Benguet and Ifugao provinces in the Cordillera. Using the participatory action research approach, local stakeholders were capacitated as they were able to identify and enhance their own sustainable agricultural practices and combine these with knowledge-based technologies that are adaptive to climate change. Accordingly, expanding and mainstreaming these CCA agricultural measures would help improve the capacity of the country's farmers in facing the threats of climate change.

The Cordillera mountain region in the Philippines is home to a significant portion of the country's remaining forests and biodiversity. It is also the headwater of the nine major river systems that provide irrigation to the rice-producing areas in Luzon.

The frequent and intense occurrences of climate-induced natural disasters have affected the region's farmers, including those in the nearby lowland provinces. Climate change has escalated the uncertainties in the region's agricultural production as the increased occurrence, intensity, and length of rainfall events—which consequently increase erosion rates, trigger landslides, and make certain crops susceptible to diseases—have impacted crop production in the region, particularly during the crops' critical growth stages.

In the province of Benguet, a vegetable-based agriculture area in the Cordillera Autonomous Region (CAR), problems include soil nutrient depletion, vulnerability to landslides, and crop failure due to more extreme temperatures. On the other hand, the Ifugao province is also vulnerable to landslides and experiences irregular rainfall, longer dry spells, and intense typhoons which have made rice production difficult for the farmers.



Photo by Veronica Antonio | Courtesy of FAO

A farmer-cooperator in Alfonso Lista, Ifugao Province inspects one of the season-responsive crops planted in her garden. Her farm is also a demonstration site for the good practice climate change adaptation option on riverbank rehabilitation and represents a maize-vegetable-fish integrated food system.

Homestead gardening is an important component of integrated food systems. It also promotes women participation, improves farm household nutrition, and augments household income. Although not generally designed for profit, homestead gardening can hedge for sudden price fluctuations and serve as an alternative source of cash or food during natural calamities and/or crop failure.

Community-Based Climate Change Adaptation in Contiguous Agricultural Ecosystems in Benguet and Ifugao

The project “Enhanced Climate Change Adaptation Capacity of Communities in Contiguous Fragile Ecosystems in the Cordilleras,” an undertaking by the Philippine Department of Agriculture (DA) and the Food and Agriculture Organization (FAO) of the United Nations, aimed to address farmers’ vulnerability to climate change by enhancing the capacities of local stakeholders through demonstration of good practice options in the Cordillera provinces of Benguet and Ifugao that improve local coping mechanisms to climate change impacts.

These good practice options for climate change adaptation (CCA) pertain to the indigenous and/or new potential location-specific agricultural practices that could increase farmers’ climate resilience and better prepare them for climate change-induced droughts, floods, pest and diseases, and other hazards. The CCA options in the project include those activities in forest enrichment, crop production, livestock production, water management, and alternative livelihood options, which have the potential to be scaled up and mainstreamed at the national level.

Accordingly, the potential CCA options were selected based on the following criteria:

- Increased climate resilience
- Socioeconomic efficiency
- Positive environmental impact
- Sustainability
- Social and cultural acceptance
- Potential for upscaling
- Immediate impact or response to urgent needs
- Promotion of participation and equal access to men/women

Good practices, if combined with science and/or knowledge-based technologies, would help farmers to become resilient in their farming strategies. As such, field demonstrations tests were implemented on the identified CCA options to determine how these measures can be used to develop a climate change adaptation strategy for the Cordillera region, and possibly for the whole country. Specifically, they were tested for **technological suitability, environmental efficiency and effectiveness, and sociocultural and economic acceptability.**



A project beneficiary in Kiangan, Ifugao shows the coffee trees planted under the Forest Enrichment good practice CCA option. Arabica coffee seedlings were planted beneath pine/alnus trees. Alnus trees are nitrogen-fixing trees and are helpful for the growth of coffee. This CCA option helps protect slopes, optimizes forest areas, and serves as a source of additional income.

The CCA options were then summarized in terms of their ability to address slow-onset climate change impact, reduce the risk and impact of climate variability and extreme weather events (and other hazards), and enhance livelihood security.

Capacity Development Strategies and Approaches

To enhance the capacities in climate change adaptation of the local stakeholders in the two provinces, capacity building programs were implemented with particular focus on four thematic areas, namely:

1. Increased knowledge on climate change, its impacts and adaptation options;
2. Enhanced planning capacity for adaptation interventions at the local government unit (LGU) and DA-CAR level;
3. Enhanced data management for climate change monitoring and planning; and
4. Enhanced local capacities for farm-level implementation of climate change adaptation options.

Likewise, the following development strategies and approaches were used in the capacity building program:

1. **Promoting learning by doing.** The participatory action research approach employed in the project played a major role in the identification of good practice options for climate change adaptation. As such, the farmer-cooperators learned through the field-testing of climate change adaptation options, and allowed farmer-cooperators and technical experts to share their experiences and expertise.
2. **Capacitating local actors to plan and implement climate change adaptation interventions.** The provincial level e-learning trainings enabled participants to differentiate planned adaptation from coping, and showed them how to design adaptation interventions based on observed and expected climate variability and change, and ecosystem dynamics. Meanwhile, the agricultural technicians learned proper interviewing techniques and how to produce a comprehensive farm household profile. The agricultural technicians also took part in the

biophysical assessment activities where they learned to apply simplified vegetation sampling techniques and GPS-assisted demo-site/farm perimeter and slope profiling.

3. **Enhancing partnering capacities for climate change adaptation.**

The establishment of the automatic weather station prompted collaborations among the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA), LGU, and DA. Likewise, the project's different sub-components commissioned the help of different state universities and colleges, which paved the way for increased interactions among DA, PAGASA, and the LGU. At the DA-CAR, meanwhile, the formation of a regional team resulted in a team of climate change experts who benefitted as trainees as well as trainers. Accordingly, DA-CAR now has a Climate Change Office.

4. **Gender Considerations.**

A healthy gender mix was observed in all activities, in which about 45 percent of the training participants were female. At the community level or *barangay* level trainings, 50 percent of the participants were female, whereas the higher level (regional, provincial, municipal) had 33 percent female participation. Several women cooperators were also

at the forefront of the pilot demonstrations. Their farm households served as ideal models for healthy and equitable male and female farming relations.

Women played a key role in the formation of informal safety nets and in ensuring food security at the farm household level. In particular, the women carried out various activities such as homestead gardening, setting-up of orchards, and others, which helped increase their ability to adapt to the risks posed by environmental and economic shocks.

Selected Good Practice Options for Climate Change Adaptation

In Benguet, the following are the identified good agricultural practices:

- Seed potato production in a greenhouse
- Integrating lemon in vegetable farms for slope protection
- Soil fertility improvement through composting
- Planting of heavy rainfall-tolerant crop varieties
- Small irrigation facilities to support vegetable production
- Forest enrichment by planting fruit and forest trees and fallow cropping after rice



Photo by Elisia Allis | Courtesy of FAO

Female farmer-cooperators from Tuba, Benguet now benefit from additional income through the planting of resistant/sturdy crops such as ginger, and through fallow cropping, garlic after rice. Apart from providing additional income, planting garlic during the fallow period helps break disease and pest cycles.



In Ifugao, the good practice options recommended for replication include:

- Community nursery for indigenous fruit trees
- Early transplanting of *tinawon* rice
- Planting of coffee, rambutan, and pomelo for forest enrichment and slope protection
- Integration of vegetables in rice production
- Homestead gardening
- Riverbank rehabilitation by planting bamboos
- Planting alternative crops in the abandoned rice fields

Lessons Learned

With climate change considerably impacting agriculture, institutionalizing and mainstreaming CCA measures in agriculture is critical for sustainable development. Local and national governments must be exposed and made to understand the risks of climate change such that adaptation options are included in the government's regular activities and governance, particularly in the planning and financing of programs.

Accordingly, the following key lessons learned in the Cordillera experience must be taken into account to effectively mainstream CCA measures in agriculture:

1. Farmers, as gatekeepers of natural resources, must be at the center of CCA.
2. Participatory action research is an effective way to initiate local adaptation processes. However, it takes time to make everybody understand that the adaptation learning process is as important as the technologies and practices recommended.
3. The sensitization of local government executives was instrumental in creating an enabling environment for implementing local CCA processes.
4. Local, participatory vulnerability assessments are critical for targeted adaptation and are also a good venue for community mobilization. These can be complemented with scientific modeling tools if data availability shows robust results.
5. Setting up proper monitoring and evaluation system is challenging, but is essential for systematic learning and a performance evaluation that goes beyond economic yields.
6. Existing policies and development instruments can serve as important entry points for institutionalizing CCA.

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