Adaptación al cambio climático
para el desarrollo local

SEVENTH FRAMEWORK PROGRAMME

CLIMATE CHANGE AND WATER: A KEY RELATIONSHIP FOR ADAPTATION

Key Messages

Climate change affects water supply from ecosystem services. This, in turn, affects the dynamics of local population groups that depend on these resources and the activities involving them.

The relationship between climate change and water is indivisible, making it necessary to take measures for sustainable management of the local territory and water resources.

Actors' involvement in adaptation to climate change is key in order to obtain a broader vision of local reality and thus develop comprehensive strategies for adaptation.

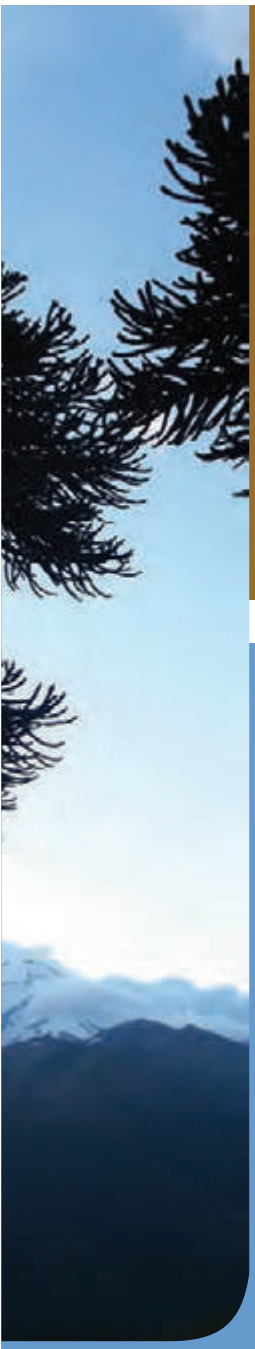
Adaptation measures based on ecosystem management with a watershed approach must ensure natural resource and biodiversity conservation, foster economic development and improve living conditions for watershed inhabitants, especially in regions highly vulnerable to climate change.

EcoAdapt seeks to generate attitude changes and influence key actors to these strategies for adaptation to climate change with social bases and solid techniques, in three Latin American territories.

Model Forest Araucarias del Alto Malleco

This document is based on studies conducted in the framework of the EcoAdapt project, which from 2012 to 2016, seeks to influence water management processes that contribute to local development and reducing people's vulnerability to climate change. It focuses on capacity-building with the territory's diverse actors. This document will highlight the relationship between climate change and water, and the importance of this relationship for adaptation to climate change with an ecosystem approach, in three Model Forests1 in Latin America: Chiquitano in Bolivia, Araucarias del Alto Malleco in Chile and Jujuy in Argentina.

1 A model forest is a platform for multi-stakeholder dialogue, based on the concept of sustainable human development, which aims for concerted land management planning.



RELATIONSHIP BETWEEN CLIMATE CHANGE AND WATER IN LATIN AMERICA

Climate change refers to abnormal weather variations such as heavy rains, prolonged droughts, and extreme temperatures, among others. These phenomena cause serious social and environmental changes, and major economic losses. The consequences of climate change more significantly affect the most vulnerable people and ecosystems.

Latin America has great climatic and ecosystem diversity due to its geographical configuration. Degradation of ecosystems in the region heightens vulnerability to climate changes, and water resources are highly sensitive to such changes.

The impact of climate change on the use and management of water in Latin America is reflected in the availability of the resource. Changes in the hydrological cycle and, more generally in the behavior of ecosystems have already been noted. Examples include receding snowcaps, the loss of topsoil due to frequent extreme events (rising sea level, flooding, and droughts), loss of human lives and increasing environmental refugees, as well as socio-economic problems reducing governments' capacity to serve vulnerable sectors. As a consequence, conflicts involving water use and access are expected to increase as availability of the resource decreases.

WHAT DO WE MEAN BY ADAPTATION?

As science understands climate change better, conceptualization of this problem includes not only the environmental dimension, but also the social, political, economic and cultural dimensions. Climate change affects food, water and human security on a local and global scale, and in the near future could threaten fundamental human rights (Necco 2012).

As defined by the Inter-governmental Panel on Climate Change (IPCC, 2007), adaptation is adjusting natural or human systems in response to current or expected climate stimuli or their impacts, to reduce the damage caused and enhance beneficial opportunities.

In countries whose economies depend significantly on natural resources, and where socio-economic conditions result in a major pressure on ecosystems and their operation, adaptation must identify, design and implement measures that are culturally appropriate, considering the vulnerability of population groups and ecosystems.

Adaptation of human systems requires a commitment of a series of stakeholders, who participate in and coordinate on different levels and sectors. It is fundamental to ascertain the vulnerability in persons, households and communities, and in their institutional, political, social and biophysical environment, to design models and scenarios for adaptation to climate change.

Local planning contributes to increasing resilience[2] to the impact of climate change, by ensuring that local authorities and stakeholders have shared capacities and responsibilities, to generate measures to prevent and adapt to this phenomenon.

Water is an essential element, with environmental, social, economic, political and cultural implications, requiring integrated management with a watershed approach, based on a common, holistic, long-term vision, and on constant inter-institutional collaboration. For this reason, adaptation to climate change through water management must be responsive to characteristics and issues at various territorial scales. The different levels and spheres of action must be coordinated through effective mechanisms among the diverse actors, following national water management policies and effective governance systems.

In summary, adaptation to climate change and improved water management are closely inter-related and complementary issues. Developing strategies to adapt with an ecosystem approach requires building capacities and reducing gaps between the scientific community, decision-makers and local stakeholders.

2 According to the IPCC definition (2008), the term "resilience" is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.

ADAPTATION TO CLIMATE CHANGE, LOCAL AND TERRITORIAL DEVELOPMENT

Properly designed adaptation strategies, policies and practices can increase the capacity of a society or community exposed to a hazard or threat, to cope with and recover from the effects of climate change. Communities are unique and are affected by climate change differently, so policies, strategies and plans for climate change adaptation and mitigation must be designed under development plans and also be grounded in knowledge elicited from communities by actively involving them in these processes (Andrade and Larco, 2012).

In early 2012, the EcoAdapt project (http://www.ecoadapt.eu/) began promoting experience exchange and lessons learned about climate change adaptation mechanisms and actions, with an emphasis on watersheds' ecosystem services, in three model forests in Latin America: Model Forest Chiquitano in Bolivia (MFC), Model Forest Jujuy in Argentina (MFJ) and Model Forest Araucarias del Alto Malleco in Chile (MFAAM). The project assessed their socio-institutional context in these three territories.


Model Forest Chiquitano

According to local actors' perception, in Model Forest Chiquitano, problems are currently related to water scarcity and quality. There is greater climate variability, drier, longer dry spells and lower amounts of rain. They feel that all of these elements directly affect water sources (Devisscher et al., 2013).

In Model Forest Araucarias del Alto Malleco, decreasing water quantity is already evident to local actors, but they do not yet consider it a problem. However, in the future they will very probably find inequality in water distribution worsen as water becomes scarcer due to climate changes. This perception about climate change and its impact on water resources also involves environmental, legal and institutional aspects (Vignola et al., 2013).

In Model Forest Jujuy, actors' perceptions focus on the future effects of climate change, linked to extreme events such as droughts and flooding. This territory currently has problems with erosion, deforestation and seasonal torrential rains (Coll Besa et al., 2013).

Local actors in the three Model Forests describe problems with water resource management.

To cope with climate variations and their effects, local actors take a series of actions to face this phenomenon and mitigate or adapt to its impacts. EcoAdapt has contributed through the development of research on possible scenarios to adapt to climate change with an ecosystem approach, to coordinate the findings of science with local knowledge and public policy decisions. Therefore, it promotes information and knowledge exchange, influencing water management so as to contribute to local development and reduce people's vulnerability to climate change.

The dialogue between local actors and scientists during the assessment process is vital in order to detect information needs and the relevance of experience exchange and local knowledge regarding climate change and water.

Through research and actions, EcoAdapt seeks to create a shared body of knowledge and commitment, as a basis for planning future climate change adaptation actions.

The opportunity provided by a research-action approach in this project allows a broader vision of local knowledge and of the issues in the territories studied, to be incorporated into the climate scenarios that will be the basis for then preparing and implementing adaptation plans. All activities planned on the local scale are grounded in exchange among local actors and scientists to validate the process technically and socially.

Adaptation based on Ecosystems (AbE) proposes an approach on ecosystem services as part of an integral strategy to help people adapt to the adverse effects of climate change. Sustainable management, conservation and restoration of ecosystems are part of an adaptation strategy taking into account the multiple social, economic and cultural co-benefits for local communities (Convention on Biological Diversity, COP 2010).

Adaptation based on Ecosystems (AbE) is a cost-effective solution to climate change. Some examples of this are (Girot, 2010):

- Diversifying agricultural systems and conserving agricultural diversity in landscapes, ensuring food supply despite climate change.
- Strategically managing forest ecosystems to limit the frequency and intensity of forest fires.
- Establishing and effectively managing protected areas to ensure ecosystem services contributing to resilience to climate change.
- Sustainable water management with a watershed approach, offering water storage and flow volume regulation services.

Model Forest Araucarias del Alto Malleco

WORKING TOWARDS CLIMATE CHANGE ADAPTATION IN THREE TERRITORIES

Model Forest Chiquitano in Bolivia. Integrated Management of the Zapocó watershed, in response to the effects of climate change

Integrated Watershed Management is a broad concept entailing a series of complementary actions such as identifying stakeholders and their relationships, uses of water, capacity-building and governance systems. It includes conserving ecosystems that supply water, such as paramos in the high-altitude watersheds storing and filtering water, or forests that regulate hydrological cycles (Devisscher et al., 2013).

Local actors express their interest and the need to form a Council or Steering Group to improve water management in the Zapocó watershed, on the basis of a shared vision. This Group will be key to developing climate change adaptation strategies (Devisscher et al., 2013).

Model Forest Araucarias del Alto Malleco. Water Code, access, availability and quality of water resources

Model Forest Araucarias del Alto Malleco is recognized in the localities of Lonquimay and Curacautín as the platform concentrating actors and involving them in water resource issues. An important finding in the socio-institutional assessment by EcoAdapt is the relationship of the existing problem between the Water Code and water access, availability, quality, use and management (Vignola et al., 2013).

One of the main difficulties regarding access to water is the legal framework. The Water Code establishes that users of underground or surface water must have water rights; however there are few cases that regularize water usage rights (Vignola et al., 2013).

The dynamics of this model forest, and the activities of EcoAdapt, emphasize actors interest in understanding and learning about climate change problems and their relationship with water resources, as well as the demand for involvement to discuss legislation about water (Vignola et al., 2013).

Model Forest Jujuy. Conserving the Perico – Manantiales watershed

The assessment revealed weaknesses in sustainable management of the watershed. In fact, the Diques area was declared a protected area, but there are problems with water use and pollution leading to various environmental, economic and social impacts (Coll Besa et al., 2013).

Local actors play a major role in these problems, as community sensitization processes on integrated management of the Los Pericos – Manantiales watershed are relevant. Links must be reinforced with a diverse range of stakeholders in the zone, promoting their active participation and interest in integrated watershed management, as an opportunity to develop collaborative, inter-disciplinary actions (Coll Besa et al., 2013).

Although climate change and water issues are addressed from diverse perspectives in each Model Forest, project progress to date has yielded key information on water resources management and use in all three territories. The information generated is an essential input for participatory design of adaptation scenarios and strategies from an ecosystem service approach. This represents a joint effort among local technicians, change agents, key actors and scientists.

Model Forest Jujuy

RECOMMENDATIONS TO STRENGTHEN THE RELATIONSHIP BETWEEN CLIMATE CHANGE AND WATER

- This relationship will help develop adaptation plans and actions and contribute effectively and holistically to reducing the vulnerability of people and ecosystems to the phenomenon of climate change, in addition to favoring water resource conservation.

- The impacts of climate change affect ecosystems, water resources and the most vulnerable people, making poverty reduction more complex.

- Loss of biodiversity resources threatens sustainable development. Therefore, national and local development policies must integrate management of ecosystems and adaptation to climate change, with an integrated, multi-sector approach to reduce risks and maximize the opportunities created by this phenomenon.

- Integrated management by watershed is an example of Adaptation based on Ecosystems (AbE), which implies, in addition to conserving ecosystems that supply water, social, economic, political and cultural dynamics.

- To develop adaptation strategies based on ecosystems, local communities and their experiences, as key stakeholders, must be included, with a preponderant role in decision-making.

- Institutional, inter-sector and territorial coordination in a watershed is essential to generate synergies and strengthen water governance for adaptation.

- Clear understanding about climate change, its impacts on local people and ecosystems requires technical expertise, timely information and effective participation by diverse stakeholders to contribute to policy-making on the basis of scientific evidence.

- Multiple experiences with adaptation are being pursued in local territories by local stakeholders, fostering coordination with local knowledge to complement the findings of scientific research.

Model Forest Jujuy

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Model Forest Chiquitano


Model Forest Chiquitano

The photographs are taken from the files of the EcoAdapt Project and from each model forest.

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Papel con certificación de manejo Responsable de Bosques

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