EUROPEAN **POLICY** BRIEF



Adapting to environmental change in Latin America: Planning the future from the bottom-up

Policy implications of COMBIOSERVE, an EU-funded research project on community-based conservation in Latin America

Ongoing project

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INTRODUCTION

Effective adaptation: A continuous learning process

Adapting to climate change and other environmental and socioeconomic pressures is a key challenge for many rural societies in developing countries whose livelihoods are strongly dependent on agriculture and ecosystem services. When considering adaptation options, national strategies run the risk of underplaying rural people's experience and knowledge, risk perceptions, and the norms and values that may explain their preferred and possible adaptation choices. Furthermore, the dynamic nature of societies, ecosystems, and global change implies that adaptation policies should be opened to continuous learning, reflection, and innovation about any considered options and their correspondent mainstreaming.

COMBIOSERVE focuses on the dynamic aspects of communitybased conservation and the role that traditional ecological knowledge and institutions play in facilitating adaptive and effective sustainable natural resource management in selected rural communities of **Brazil**, **Bolivia**, and **Mexico**. Data collected through interviews, focus groups, surveys, land-use mapping, communityled biodiversity monitoring and scenario-based exercises constitute the basis for understanding local vulnerabilities and households' differentiated impacts of and adaptation responses to global change.

This policy brief reviews adaptation strategies in Latin America and highlights the extent to which such strategies consider multiple environmental and socio-economic shocks and perturbations, and incorporate scenarios as a tool for policy design. Subsequently, it discusses the role of bottom-up scenario exercises in devising specific policy programs that could contribute to reduce vulnerability and enhance adaptive capacity in rural contexts. Finally, it illustrates the latter point with the example of the COMBIOSERVE project.

EVIDENCE AND ANALYSIS

Adaptation strategies: What has been done in Latin America?

Over the last two decades, countries that have ratified the United Nations Framework Convention on Climate Change have fostered cooperative actions for climate change mitigation and adaptation, whilst accounting for national needs and circumstances regarding economic development and energy security. Many of these countries have elaborated National Communications that provide an overview of their policies and progress toward the ultimate goals of the Convention. Additionally, National Adaptation Programs of Action have been developed to identify adaptation priorities in least developed countries.

Most Latin American countries are still designing their national adaptation strategies. Countries with climate change national adaptation plans include **Bolivia**, the **Dominican Republic**, **Peru**, and **Uruguay** whereas **Brazil**, **El Salvador**, and **Nicaragua** have designed sectorial adaptation plans. **Mexico** has defined general policy prescriptions for adaptation in its 2013 Climate Change National Strategy, but sectorial adaptation plans are in preparation (see Table 1).

To design adaptation plans, many countries have relied on participatory processes involving consultations with a variety of social actors, ranging from local resource users to experts from nongovernmental organisations and scientists. Even though the Conference of the Parties in Cancun (COP16) affirmed that action on adaptation should be based on both available scientific and appropriate traditional knowledge, only **Bolivia**, the **Dominican Republic**, **Mexico**, and **Nicaragua** recognize the role that local or traditional ecological knowledge can play in guiding decision-making for adaptation.

Local or traditional ecological knowledge -a cumulative body of environmental knowledge, practices, and beliefs- underlies the adaptive capacity of many rural and indigenous communities that have historically conserved biodiversity while maintaining livelihoods and adjusting to perturbations. Local knowledge about the environment, however, tends to be ignored when planning adaptation at national level. Moreover, the involvement of rural communities in discussing possible futures according to their knowledge, needs, and aspirations remains limited. Instead, countries have relied on existing historical data and top-down scenario projections of temperature change, rainfall variability, and likelihood of extreme climate events to identify local to national adaptation policy options.

Adaptation options include a variety of programs to enhance coping and adaptive strategies across multiple sectors, such as the increased control of vector-borne diseases to lessen the impact of climate change on the tourism sector; the improvement of water harvesting infrastructure to guarantee water supply; the promotion of contour farming, organic fertilizers, reforestation on steep slopes, and the adoption of drought-tolerant agricultural varieties to adapt the agricultural sector to climate change, among others.

Table 1. Adaptation strategies, scenarios, and local participation in Latin American countries

Country	National Communi cations	Adaptation Strategy	Climate scenarios*	Participatory approaches	Inclusion of local knowledge
Argentina	1997, 2008	In prep.	IPCC MM5-CIMA Nuñez & Solman 2006	Not mentioned	Not mentioned
Bolivia	2000, 2009	2007, national	IPCC AIM	Design	Yes
Brazil	2004, 2010	2012, by sector	Eta-CPTEC Marengo et al. 2010	Not mentioned	Not mentioned
Chile	2000, 2011	In prep.	IPCC PRECIS U.of.C. 2006 ECLAC 2009	Not mentioned	Not mentioned
Colombia	2001, 2010	In prep.	GSM-MRI, PRECIS, WRF Ideam-Ruiz, 2010	Not mentioned	Not mentioned
Costa Rica	2000, 2009	In prep.	PRECIS IMN, 2009	Not mentioned	Not mentioned
Cuba	2001	In prep.	MAGICC, SCENGEN	Not mentioned	Not mentioned
Dominican Republic	2003, 2009	2008, national	PRECIS Herrera 2007	Implementation	Yes
Ecuador	2000, 2012	In prep.	PRECIS, ETA, TL95	Not mentioned	Not mentioned
El Salvador	2000	2012, by sector	IPCC MAGICC, SCENGEN Centella, 2008	Design and implementation	Not mentioned
Guatemala	2002	In prep.	IPCC MAGICC, SCENGEN Centella et al., 2008	Implementation	Not mentioned
Honduras	2000, 2012	In prep.	IPCC PRECIS	Implementation	Not mentioned
Mexico	1997, 2001, 2009, 2010, 2012	2013, national**	IPCC Cavazos, et al., 2013	Design	Yes
Nicaragua	2001, 2011	2013, by sector	PRECIS Marena 2008	Implementation	Yes
Panama	2001, 2012	In prep.	IPCC CATHALAC, 2009	Design	Not mentioned
Paraguay	2002, 2011	In prep.	IPCC PRECIS	Design	Not mentioned
Peru	2001, 2010	2009, national	CCSM, RAMS SENAMHI, 2009	Design	Not mentioned
Uruguay	1997, 2004, 2010	2004, national	IPCC PRECIS	Design and implementation	Not mentioned
Venezuela	2005	In prep.	IPCC MAGICC, SCENGEN	Not mentioned	Not mentioned

* We indicate the models used and/or the studies/articles used to inform the national communication and/or adaptation strategy.

** Sectorial adaptation plans are still in preparation.

Planning for adaptation in rural contexts: Why using bottom-up scenarios? A scenario is a plausible exploration of the future designed on the basis of a set of factors and dynamics that characterize a reality. A scenario is often accompanied by a **narrative** or **storyline** that describes its main characteristics. Variations in such characteristics can generate multiple storylines that can, in turn, be compared to explore scenario assumptions and related policy pathways. Scenarios are neither predictions nor forecasts, but tools to search potential implications of policies and actions. Thus, they can help to explore the future at multiple scales.

When accompanied by integrated assessment modelling, scenarios can result in, for example, hypothetical projections of greenhouse gas emissions, or of demographic, technological, socio-economic, and ecological changes at global level. Although the development of such scenarios would benefit from the collaboration of policy makers and civil society organisations, the reality is that scientists often develop them on the basis of large data sets and dynamic projections of ecosystems and societies.

Scenarios can also be co-developed between scientists, civil society organisations, and lay people through a process of joint data collection. These bottom-up (participatory) scenarios typically aim to discuss the future in concrete settings, for instance in a given territory or community, as they are developed to frame and understand local ecological and social dynamics drawing on both scientific and traditional knowledge. Such scenarios also aim to engage local people in thinking about and acting upon their own future.

In the context of community-based natural resource management and conservation, **bottom-up (participatory) scenarios can be useful tools** to:

- Learn about local environmental change and socio-economic shocks;
- Check for and rectify practices that may be leading to resource degradation and increased households' vulnerability;
- Evaluate response options by discussing opportunities and constraints for adaptation with local resource managers; and
- Create the right conditions for adaptive action based on local values and preferences.

The United Nations Framework Convention on Climate Change through the Cancun Adaptation Framework (2010, <u>https://unfccc.int/adaptation/items/5852.php</u>) highlights the need to engage stakeholders in sharing knowledge on actions for adaptation and in undertaking and supporting all adaptation activities. Policy makers and researchers can thus use bottom-up scenarios to foster mutual learning on the dynamics of rural communities and their environment, and to collectively discuss the implications of different development and conservation pathways. Bottom-up scenarios can also be useful to develop inclusive policy programs that account for local ecological knowledge, circumstances, and needs. How to develop and conduct bottom-up scenarios in rural contexts? Bottom-up (participatory) scenarios have been used to explore water management, agriculture, forestry and land-use trends across regional and local settings around the world. Recently they have also been used to explore vulnerability and adaptation options. While there is not a universal methodology to develop these exercises, the research steps adopted in COMBIOSERVE to co-develop bottom-up scenarios in selected sites of **Brazil**, **Bolivia**, and **Mexico** are (Figure 1):

Step 1: Group discussions and in-depth interviews with selected informants to identify the environmental history of the community and to select the most relevant shocks for livelihoods, both now and in the past;

Step 2: Surveys and interviews with a representative sample of households to document livelihood assets and activities, to identify vulnerability patterns and indicators, to analyse coping and adaptive responses to change, and to understand the role of institutions - including conservation rules- in influencing environmental change and households' adaptive capacity;

Step 3: Collection of historical climate and land-use data from official sources, such as nearby meteorological stations and satellite images;

Step 4: Development of community land-use maps to understand landscape and ecological change at community level, and to discuss perceived causes and effects of such change with local actors;

Step 5: Workshops with local informants and scientists to identify realistic scenarios for the communities' future, on the basis of projected climate variability and documented trends in ecosystems, and on the social dimensions of households and communities;

Step 6: Development of community-based focus groups targeted at distinct household categories (e.g. from more to less vulnerable groups) to gather perceptions on the likely effects of each scenario for their livelihoods, and the most preferred option; to identify the extent to which local people consider such scenarios unrealistic, probable or very probable; and to define a set of policy options that may support a transition toward the most preferred scenario.



Figure 1. COMBIOSERVE research steps and outcomes when constructing bottom-up (participatory) scenarios



Table 2. Identifiedperturbations inCOMBIOSERVE sites

	Climatic	Economic	Political
Jaqueira (Brazil)	None identified	Tourism influx	Land recognition
Pé do Monte (Brazil)	None identified	Tourism influx	Land recognition Conservation rules
Alto Colorado (Bolivia)	Extreme rainfall	Illegal logging Development projects	Land occupation Conservation rules
San Luis Chico (Bolivia)	Extreme rainfall	Illegal logging Development projects	Land occupation Conservation rules
Once de Mayo (Mexico)	Rainfall variability	Cash crop prices shocks	Conservation rules
El Sacrificio (Mexico)	Rainfall variability	Cash crop prices shocks	Land recognition Conservation rules

COMBIOSERVE has identified **climatic**, **economic**, **and political perturbations** through the development of historical community timelines (Table 2). Political and economic shocks are perceived as more relevant than environmental hazards. These perturbations are entry points for the design of the scenarios.

POLICY IMPLICATIONS AND RECOMMENDATIONS

Incorporate scenarios of future social-ecological change as tools for the design of adaptation policies to understand communities' vulnerability and enhance resilience

- Support the analysis of multiple perturbations from a system perspective to design potentially successful adaptation strategies that go beyond climate-related considerations and that reach local, regional and national administrative levels;
- Promote research about social perceptions of past and present social-ecological change and accompanying risks, so local needs can be included into adaptation strategies;
- Contemplate local ecological knowledge and practices as reported by communities in the design and implementation of adaptation activities and strategies in order to increase their legitimacy and effectiveness;
- Consider the potential role of local institutions in enhancing or undermining adaptive capacity and buffering against social and ecological shocks;
- Adopt bottom-up (participatory) scenario-based planning tools that can empower local stakeholders and facilitate the discussion of the social, cultural, economic, and environmental factors influencing stakeholders' vulnerability to design locally acceptable adaptation actions;
- Combine participatory methods and climate change modelling in the development of future development scenarios;
- Mainstream bottom-up scenario planning tools into policymaking, scientific enquiry, and development practice to facilitate knowledge sharing across multiple actors and to foster mutual learning on global change and adaptation responses.

RESEARCH PARAMETERS

Objectives	COMBIOSERVE (Assessing the effectiveness of community-based management strategies for biocultural diversity conservation) is a collaborative project involving European and Latin American research institutions, civil society organizations, and indigenous communities that seeks to identify the conditions and principles of successful community-based conservation initiatives in selected locations in Brazil , Bolivia , and Mexico .
	The main objectives of the project are to:
	 Develop, through participatory and interactive research, new scientific knowledge on the current effectiveness of community- based conservation strategies in promoting local resilience to global environmental change;
	 Collaborate with civil society organizations and local people in order to foster a process of co-enquiry and mutual learning;
	 Contribute to public debates on the definition and effectiveness of community-based natural resource management for biodiversity conservation.
Methodology	The project relies on multi-disciplinary and participatory methods that have been co-developed by the consortium's research institutions and civil society organisations, with the informed consent of local communities. These methods include:
	 Community-based biological monitoring to assess current biodiversity outcomes of community conservation efforts;
	 Participatory mapping to assess land use/land cover change, local landscape perception, and socio-environmental conflicts;
	 Empirical assessment of the social conditions for community- based management to analyse common property management rules, cooperation, and enforcement mechanisms;
	 Use of a participatory resilience approach to examine historical, present, and future communities' adaptive capacity to social- ecological change;
	 Implementation of methodological protocols for community- based research to scale up and consolidate the project findings and to empower communities to do their own research; and
	 Dissemination through tools, including posters and videos, to transfer the results to local participants and to support them in enhancing their ability to resolve environmental challenges.
	The COMBIOSERVE team will transfer the results to other civil society organisations and research centres and will disseminate findings to policy makers.

PROJECT IDENTITY

Coordinator	Dr. Christian Vogl University of Natural Resources and Life Sciences, Austria – BOKU
Consortium	Dr. Gary J. Martin (co-coordinator), Global Diversity Foundation, United Kingdom
	Dr. Esteve Corbera, Universitat Autònoma de Barcelona, Spain
	Dr. Jetske Bouma, VU University Amsterdam, The Netherlands
	Dr. Luciana Porter-Bolland, Instituto de Ecología, Mexico
	Dr. Fábio Bandeira , Universidade Estadual de Feira de Santana, Brazil
	Dr. Susana Arrazola, Universidad Mayor de San Simón, Bolivia
	Mr. Albert M. Chan , Consejo Regional Indígena y Popular de X´pujil, Mexico
	Ms. Sarah Miranda , Associação Nacional de Ação Indigenista, Brazil
	Dr. Tomas Huanca , Centro Boliviano de Desarrollo y de Investigación Socio Integral, Bolivia
EU contact	Ugo Guarnacci. Email: ugo.guarnacci@ec.europa.eu
Funding scheme	European Union 7 th Framework Programme, Research for the benefit of CSOs, Theme: ENV.2011.4.2.3-1 Community based management of environmental challenges.
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Budget	EC Contribution: 1,897,883.40 €
Website	www.combioserve.org
For more information	Contact Dr. Isabel Ruiz-Mallén. Email: isabel.ruiz@uab.cat
Further reading	Ravera, F., et al. 2011. Envisioning Adaptive Strategies to Change: Participatory Scenarios for Agropastoral Semiarid Systems in Nicaragua. <i>Ecology and Society</i> 16(1):20. [online] URL: http://www.ecologyandsociety.org/vol16/iss1/art20/