



BOOK OF ABSTRACT

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I. SESSION DESCRIPTION

ID: T14b

Ecosystem services and adaptation to global change

Hosts:

	Title	Name	Organisation	E-mail
Host:	Dr.	Matthew Colloff	Fenner School of Environment and Society, Australian National University	matthew.colloff@anu.edu.au
Co-host(s):		Sandra Lavorel, Bruno Locatelli, Berta Martín-Lopez		sandra.lavorel@univ-grenoble-alpes.fr; bruno.locatelli@cirad.fr; martinlo@leuphana.de

Abstract:

Uncertain, novel changes to social-ecological systems caused by climate change and other drivers mean that we can no longer assume the ecosystem services we currently depend on for livelihoods and wellbeing will be supplied in future. As ecosystems change, so do their ecosystem services; some current ones will decline and new ones appear as altered water balance, temperature regimes and land uses impact on ecosystems and societies. Governance systems are emerging to address these issues, but it will increasingly fall to those whose livelihoods are most impacted to develop options for adaptation. Both bottom-up and top-down approaches to operationalising adaptation are required, including how ecosystem services can be conceptualised and used.

The ecosystem services that can help people adapt to changes in social-ecological systems have been termed 'adaptation services'. This framing provides a way to bridge the gap between normative concepts of ecosystem services and the need for adaptation to global change. An ecosystem services perspective that is 'global change-ready' reveals ecosystem properties that provide benefits to people under global change and supports inclusive learning, co-production and implementation of adaptation strategies.

In this session the objective is to focus on how ecosystem services can be used in adaptation initiatives, including case studies on design and implementation; re-framing of governance



structures; co-production and learning; overcoming operational barriers to develop opportunities and mainstreaming adaptation services into policy and management. The objective of the session is congruent with the conference theme of 'Ecosystem services in a changing world: moving from theory to practice'.

Goals and objectives of the session:

The objective is to discuss how ecosystem services can be used in adaptation initiative and to invite participants in the audience to propose their own case studies for a discussion on ecosystem services and adaptation. Some participants will be invited to prepare case studies in advance; others may be spontaneous.

Planned output / Deliverables:

A summary of the case studies, main discussion points, and ideas for new research collaborations on ecosystem services and adaptation to global change.

A blog article for the conference website.

Networking, collaboration and co-production on Ecosystem services and adaptation to global change

Related to ESP Working Group/National Network:

[Thematic Working Groups: T14 – Application of ES in Planning & Management](#)



II. SESSION PROGRAM

Date of session: Tuesday, 16 October 2018

Time of session: 14:30 – 18:00

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
14:30–14:45	Matt	Colloff	Fenner School of Environment and Society, Australian National University	Nature's contributions to adaptation to climate change
14:45–15:00	Sandra	Lavorel	Laboratoire d'Ecologie Alpine, Grenoble, France	Nature's Contribution to Adaptation in the French Alps
15:00–15:15	Bruno	Locatelli	CIRAD–CIFOR, University of Montpellier	Ecosystem services for adaptation to climate change in mountains: Actors and worldviews
15:15–15:30	Sander	Jacobs	Research institute for nature and Forest INBO	Winter is coming: the fate of nature in Europe and Central Asia
15:30–15:45	Noelia	Zafra–Calvo	Basque Centre for Climate Change bc3	Acknowledging the multidimensional value of protected areas` contribution to people
15:45–16:00				Discussion
16:30–16:45	Giacomo	Fedele	Conservation International	Ecosystem services and transformative adaptation to



Time	First name	Surname	Organization	Title of presentation
				climate change
16:45–17:00	Paula	Harrison	Centre for Ecology & Hydrology	Evaluating the effectiveness of adaptation, mitigation and transformation pathways to high-end climate change for the balanced delivery of ecosystem services
17:00–17:15	Kevin	Thellmann	Institute of Agricultural Sciences in the Tropics and Subtropics (Hans–Ruthenberg–Institute), University of Hohenheim, Stuttgart, Germany	Assessing the efficiency of land use planning to preserve hydrological ecosystem services under scenarios of climate change in a mountainous watershed in Xishuangbanna, South–West China
17:15–17:30	Eliška	KrkoškaLorencová	Global Change Research Institute of the Czech Academy of Sciences	Stakeholder preferences for ecosystem–based adaptation measures in Czech cities
17:30–17:45	Johannes	Förster	Helmholtz Centre for Environmental Research – UFZ	Ecosystem–based adaptation in small island states: how an explicit focus on ‘ecosystem service opportunities’ can inform adaptation options



Keywords: global change adaptation , ecosystem service model , participatory research , adaptation pathway , mountain socio–ecosystem

8. *Type of submission:* **Abstract**

T. Thematic Working Group sessions: T14b Ecosystem services and adaptation to global change

Ecosystem services for adaptation to climate change in mountains: Actors and worldviews

First author: Bruno Locatelli

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Nature-based solutions are receiving increasing attention in the water management sector. There is a growing interest and awareness of the value of managing, conserving and restoring ecosystems for their role in regulating water and protecting watersheds. In the Peruvian mountains, some adaptation projects and programs emphasize nature-based solutions but face multiple challenges, for example the lack of knowledge on the effectiveness of such solutions and the diverging opinions on their relevance among decision-makers. In those projects, stakeholders have diverse interests in the implementation of nature-based solutions, in part because of their different interactions with ecosystem services. Using mixed methods, this study analyses options for adaptation and water management in the Andes in Peru. We propose a critical analysis of decision contexts on adaptation and water management and the implications of adaptation options on ecosystem services and equity. We identify different doctrines and preferences for technological or ecosystem-based options and relate them to stakeholder worldviews. The contrasting discourses on whether adaptation should be based on ecosystems or infrastructure can be associated with different conceptions of equity and different opinions on the role of government, communities and the private sector in water management. We also explore whether some options are favoured by decision rules and power relations. Analysing the interactions between stakeholders and ecosystem services and understanding the trade-offs between ecosystem services can help explain the different positions in favour or against nature-based solutions. This research highlights the importance of power relationships in adaptation decision-making, as such relationships favour the values and knowledge of some stakeholders and give priority of their preferred adaptation options.

Keywords: adaptation to climate change, water management, stakeholders, power, equity

Ecosystem services for adaptation to climate change in mountains: Actors and worldviews

Bruno Locatelli




Photo: Huascarán 6768 masl (B. Locatelli)



Climate variability and change

Photo: Ampay (B. Locatelli)

Photo: B. Locatelli 



Water security

Photo: Abancay (B. Locatelli)

Adaptation plans

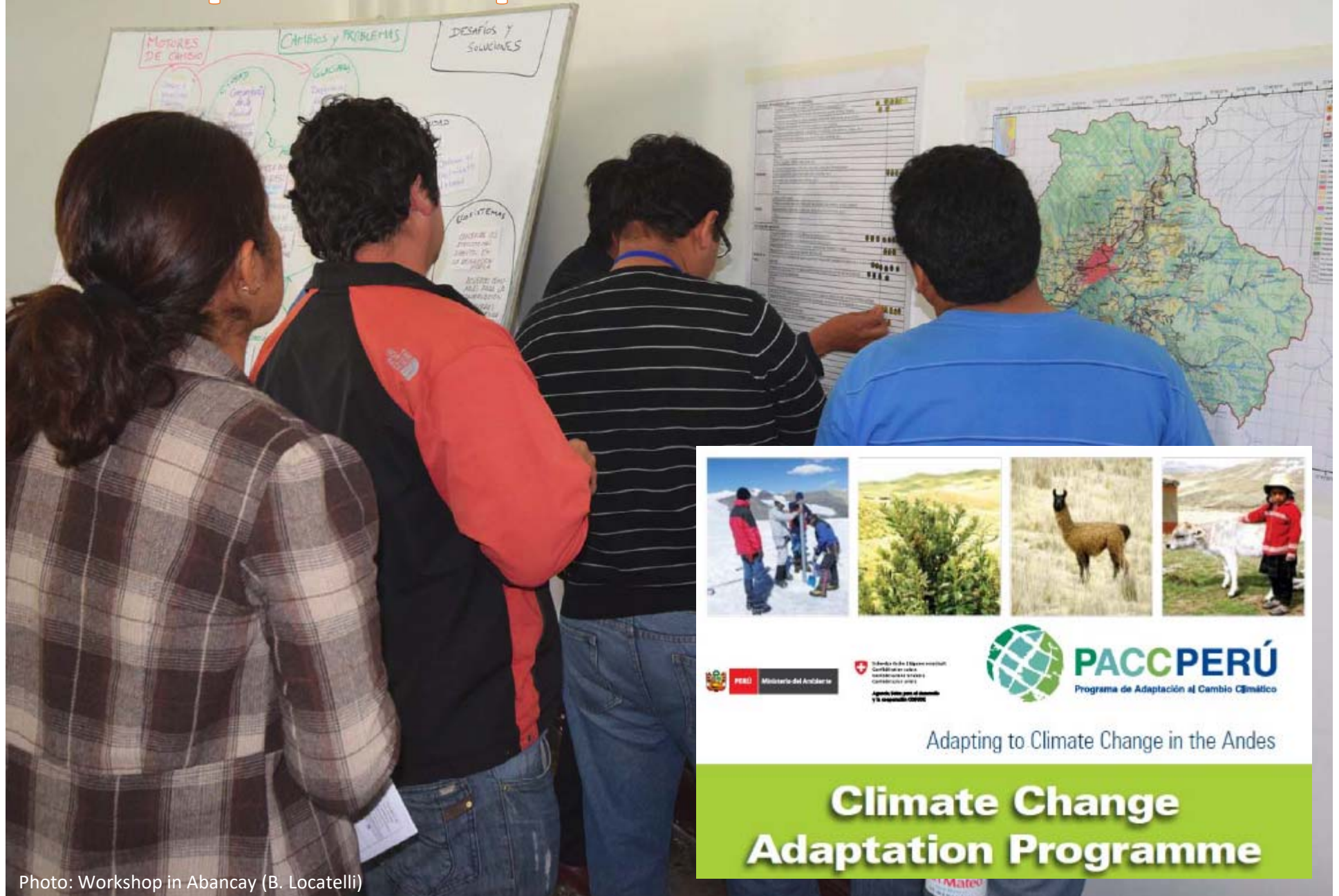






Photo: Workshop in Abancay (B. Locatelli)



 **PERÚ** Ministerio del Ambiente

 Instituto Nacional de Glaciares y Nieve
Centro de Estudios y Monitoreo de Glaciares y Nieve
Agencia para el desarrollo y la adaptación climática

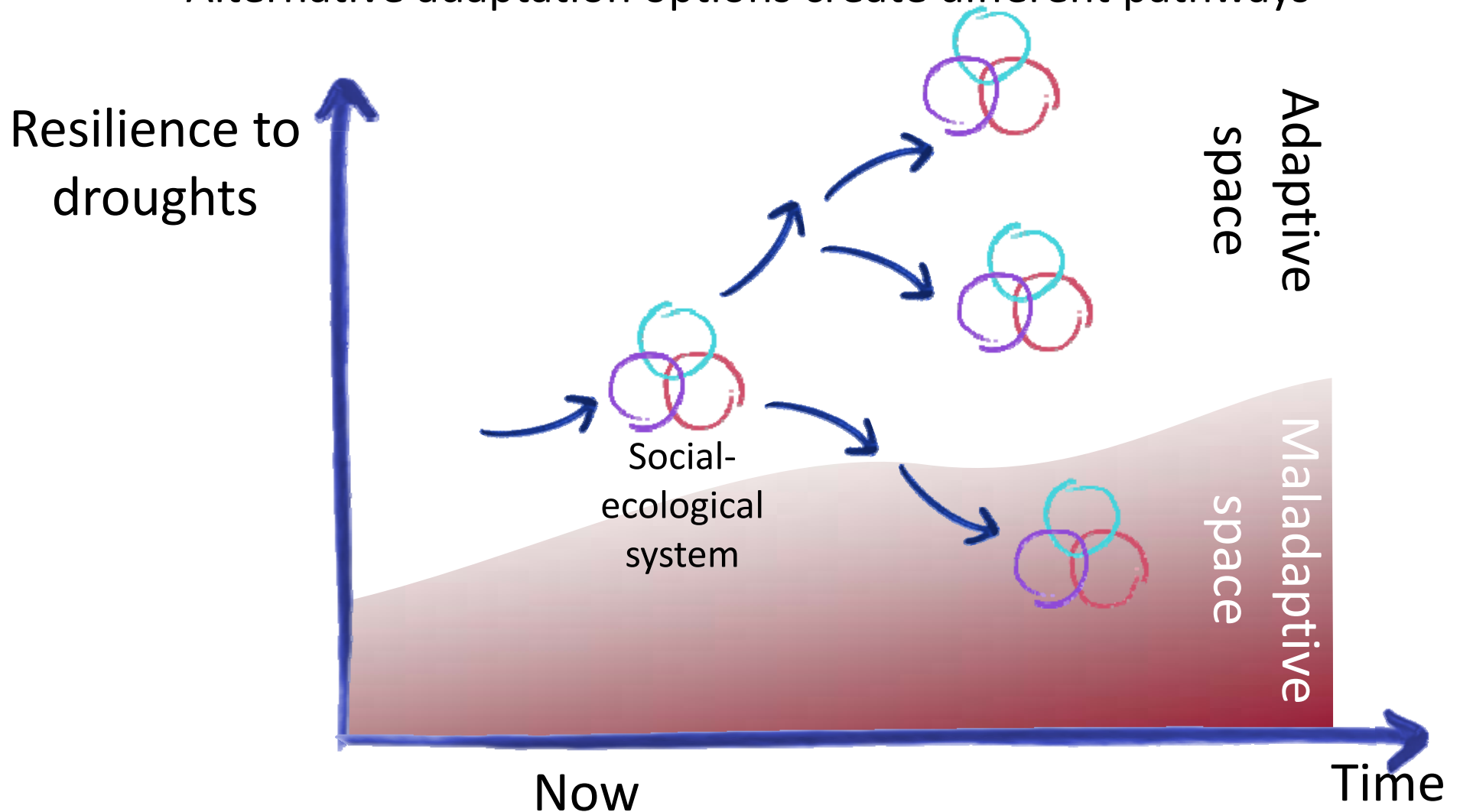
 **PACCPERÚ**
Programa de Adaptación al Cambio Climático

Adapting to Climate Change in the Andes

**Climate Change
Adaptation Programme**

Adaptation pathways

Alternative adaptation options create different pathways



Colloff et al. 2017. An integrative research framework for enabling transformative adaptation. Environmental Science and Policy 68: 87-96

Nature-based

A wide-angle landscape photograph showing a deep, green valley. In the background, jagged, rocky mountain peaks rise against a clear blue sky with a few wispy clouds. The valley floor is covered in vibrant green grass and low-lying vegetation. Several dark spots, likely cows, are scattered across the grassy area. The steep slopes of the mountains are covered in dense green forest. In the immediate foreground, some out-of-focus green plants are visible.

Photo: Ampay
(B. Locatelli)

Technology-based



Photo: Rontococcha
(B. Locatelli)

Co-benefits



Photo: Cordillera Blanca
(B. Locatelli)

Equity



Photo: Rontococcha
(B. Locatelli)

Objective: To show that different adaptation options are related to different values, rules and knowledge



Site: Mariño
watershed, Peru

Three adaptation options

Human intervention,
Engineering

Technological
(dam)



Traditional
(micro reservoir)



Natural
(wetland)



Role of ecosystem
services

Methods

- Adaptation on the ground



- Participatory observations, stakeholder analysis, semi structured interviews (n=25), detailed analysis of 3 interventions

- Adaptation in people's minds



- Questionnaire (Q methodology with 43 statements), n=72
 - Support to adaptation options
 - Rules (governance and actors)
 - Knowledge (problems and solutions)
 - Values and worldviews

Methods: Values and worldviews

Ecological worldviews



New Ecological Paradigm Scale (Dunlap et al 2000) (e.g., "The earth is like a spaceship with very limited room and resources")



Andean views (e.g., "We must manage water with respect to Yakumana")

Cultural worldviews (Kahan et al 2007)



Egalitarian-Hierarchical (e.g. "Our society would be better with a more equal distribution of wealth")



Communitarian-Individualist (e.g., "People should be able to rely on the government for help when they need it", "Private profit is the main motive for hard work")



Results



- Adaptation on the ground

Technological
(dam)



Traditional
(micro reservoir)



Natural
(wetland)



Actors and
governance

Government,
private sector

Communities, NGOs

Government

Beneficiaries

Cities, large
irrigated fields

Diverse beneficiaries, including communities



- Adaptation in people's minds

- Support for one adaptation option is correlated to worldviews

Support to:

Technological
(dam)



Traditional
(micro reservoir)



Natural
(wetland)



Knowledge

Dams=good

Traditional reservoirs=good

Wetlands=good

Wetland degradation = no problem

Wetland degradation
=problem

Traditional reservoirs=bad

Options interact spatially

Dams=bad

Rules and
actors

Private sector

Communities

Public institutions

Values

Individualism

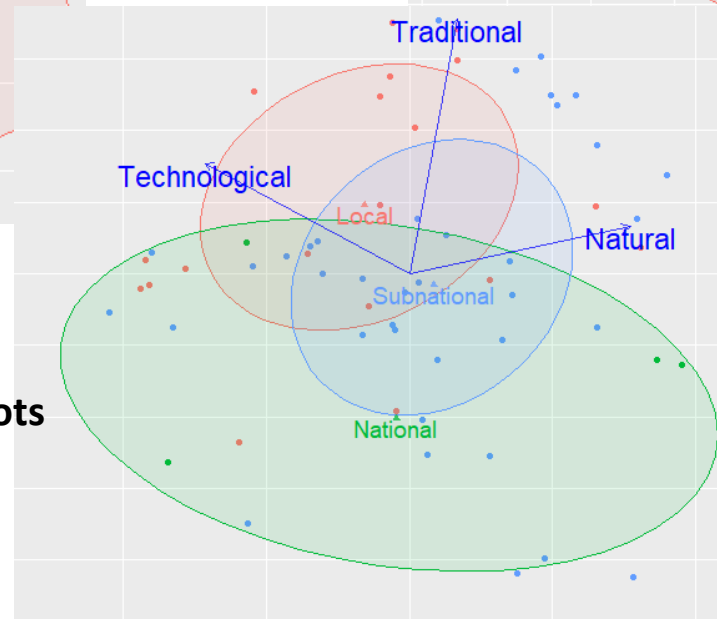
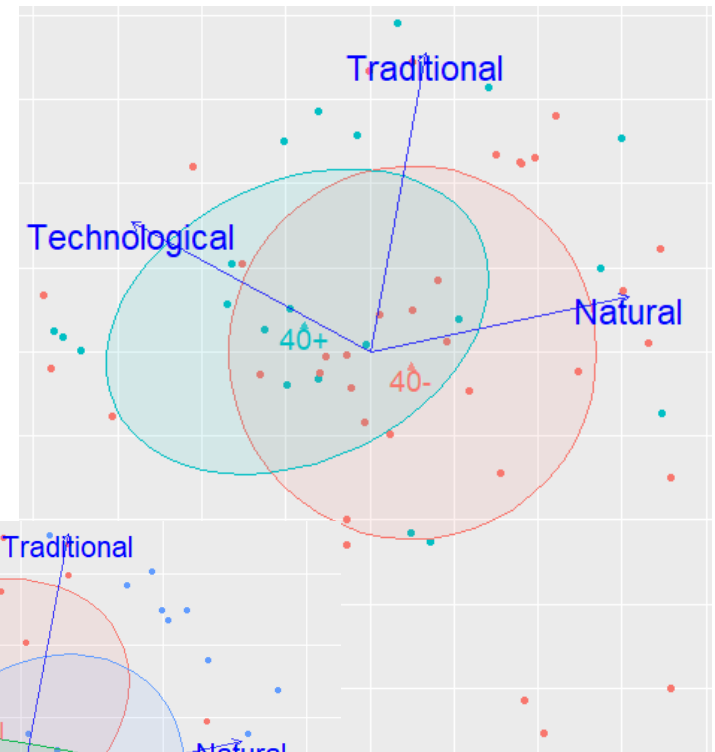
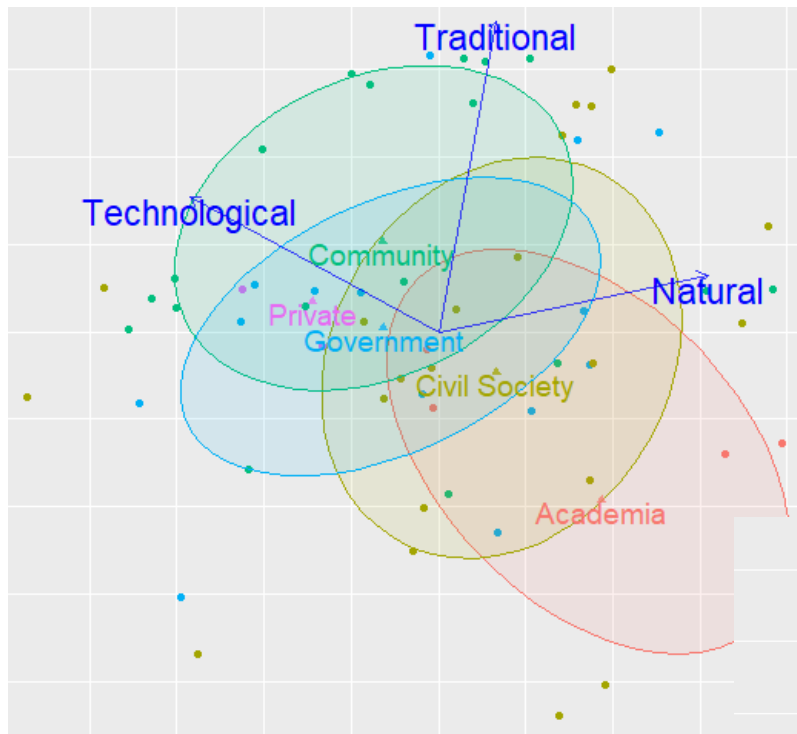
Communitarian

Hierarchical

Western view of nature

Andean view of nature

Support for adaptation options depends on stakeholder's institutions, scale and age



Principal Component Analysis (PCA) biplots

Dots = Stakeholders

Ellipses = Stakeholder groups

Arrows = Support to adaptation options

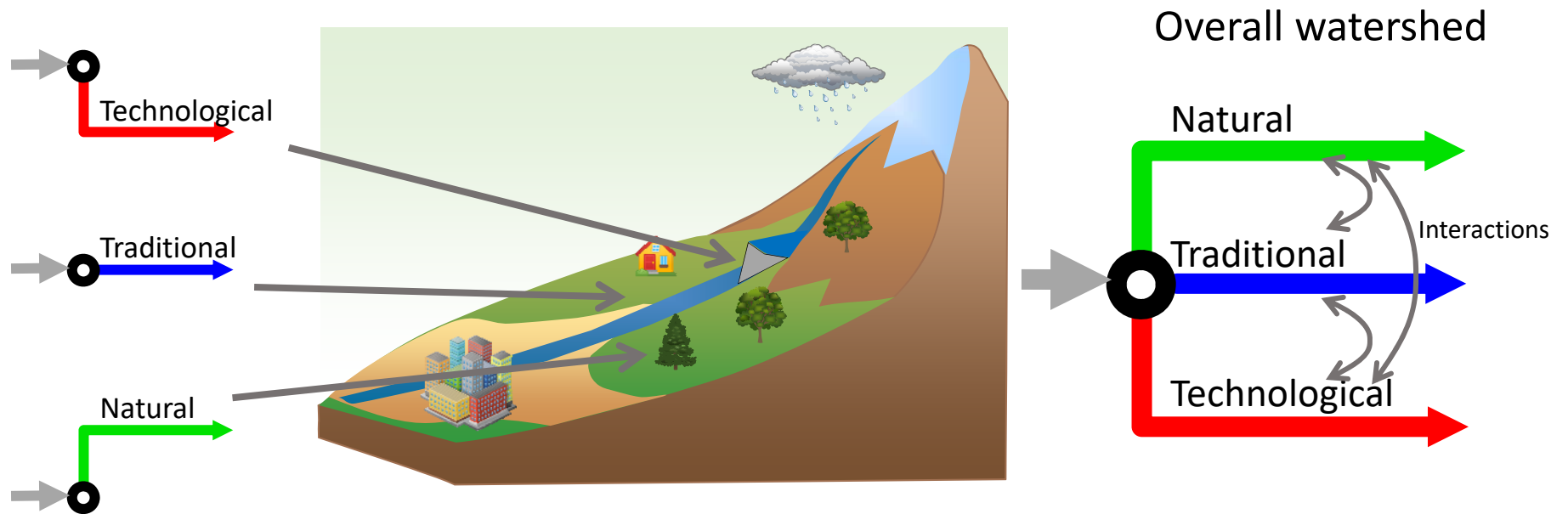
Discussion

- Adaptation options
 - are supported by different values and knowledge
 - lead to different pathways
- Power relationships
 - between actors
 - between sets of values and knowledge
- Decisions on adaptation may reinforce power
 - dominant actors favor the pathway corresponding to their values and knowledge and in which they will govern



Discussion

- Coexistence of different pathways over physical or social spaces
 - Interactions between them
 - Hybrid pathways





Thanks!

Photo: Yanama (B. Locatelli)