

## ANDES MOUNTAINS AND HUMAN DIMENSIONS OF GLOBAL CHANGE: AN OVERVIEW

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### 1. Introduction

As the international community is gearing towards shifting values and attitudes making adjustments in trending environmental protection campaigns, the accepted paradigm points towards the need to minimize the impacts on mountain landscapes subjected to climate change due to global warming. Hitherto, research policy and the subsequent funding for proposals dealing with climate change have emphasized the physical dimension, mainly on the cryosphere with glacial retreat and glacier ablation, and on the hydrosphere with lack or rain-fed snow, erratic precipitation, diminishing water bodies and minimized aquifers. It is just recently, however, that the human dimension has been incorporated as a major pillar for our understanding of landscape change and the recent emphasis for funded research.

In the tropical mountain areas of the Americas, this social sciences approach to study climate change is particularly important, because of the ancient imprint on the land has often taken as an anecdotal outcome of sorts, whereby the use of different strategies, Andean communities have coped with changes in the land for many reasons, including climate change. The neoliberal policies that facilitated the opening of free market economies into once isolated mountain systems are being tested in scenarios of poverty, marginality and neglect. Andean communities are facing major changes, not only due to global climate change, but particularly because of the impact of globalization in their ways of life. Entire livelihoods are threatened with the

incorporation of new technologies; social arrangements for communal living are now obsolete, being replaced by the individuality of financial enterprises and for-profit companies that often mine the resources and the young people away from these mountain areas onto urban lowlands or flatlands, until depletion of the rich mountain resources forces them to depart completely, leaving a derelict landscape behind, with the elderly mountain people in it.

## 2. Methodology

In an effort to gauge the state of the knowledge generated from the social sciences around the general theme of Global Climate Change, an international meeting was organized by the Mountain Research Initiative (MRI) with headquarters in Switzerland, and hosted locally by the Argentinean institutes of IANIGLA and CRICYT, to gather people and institutions engaged in climate change research in mountain areas in the Americas. "*Climate Change: Organizing the Science for the American Cordillera*" (CONCORD) was held timely when researchers from almost every continent converged in Mendoza, Argentina, in April 2005 to analyze the *status quo* and to prepare possible avenues of future collaboration in relation to climate change research in the Western hemisphere. Within this international event, a workshop was organized to deal with the theme of Rural Transformation and Global Change that was held on Thursday, April 6, 2005. The goal of the workshop was to improve the capacity of human dimension scientists to advance global change research in the mountain regions of Latin America and to improve the impact of that science on governance towards mountain sustainable development. Some 30 people met in an evening session (Table 1) to increase communication among researchers, using Spanish as the lingua franca, despite being English the international language of science used in CONCORD. They also met to develop common research frameworks and to explore the possibility to increase funding opportunities to promote social sciences research into the rhetoric of climate change in the Americas.

Table 1. List of people attending the international programme of human dimension and global change in the Andes. Thursday 6 April 2006. IANIGLA. CRICYT, Mendoza, Argentina.

Tabla 1. Lista de los asistentes del programa internacional de la dimensión humana del cambio global en los Andes. Jueves 6 de Abril de 2.006. 6:30pm. IANIGLA Salón de Conferencias. CRICYT, Mendoza, Argentina.

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In a separate, parallel session, special attention was paid also to the Cordillera Transect Planning workshop. This workshop sought to incentivate the participation in the development of global change research programs in mountain Biosphere Reserves along the Cordillera, and especially to promote the integration of human dimensions research into those programs (Table 2). The current special issue of *Pirineos*, was designed specifically for the purpose of documenting the notable participation and salient conclusions of the workshop as well as to launch the regional network of the Americas Cordilleras Transect. Authors of papers compiled from the workshop and other colleagues of mountain research have happily enlisted their email address in the new ACT listserv, which was endorsed by InfoAndina and the Mountain Forum as a way to energize the options for the study of the Human Dimension in Global Climate Change processes in the Americas cordillera.

### 3. Results

This special issue of *Pirineos* deals with farmscape transformation and global change in the Andes. We emphasize *Farmscapes* because, as it is often the case, rural areas with deprived communities have always been

Table 2. New listserv for scientists studying climate change effects in the Americas cordillera.  
 Tabla 2. Nueva lista para los científicos que estudian los efectos del cambio climático en la cordillera americana.

<p>The <b>Americas Cordillera Transect (ACT)</b> is a research network with the goal of linking scientists, projects, and initiatives along the American Cordillera, and to further new research. The network includes people working in universities, governmental or non-governmental organizations and other centers of research directly related with studies of climate change and its effects on mountain ecosystems in our hemisphere.</p>
<p>The ACT provides exchange of information in a Newsflash (in Spanish and English), an Experts Database, the possibility of forging new international research partnerships along the American Cordillera, and can provide technical support for exemplary activities.</p>
<p>If you are interested, take a look at the products and tools of the Cordillera Transect:</p> <ul style="list-style-type: none"> <li>• Newsflash: <a href="http://mri.scnatweb.ch/content/view/172/67/">http://mri.scnatweb.ch/content/view/172/67/</a></li> <li>• Experts database: <a href="http://mri.scnatweb.ch/index.php/content/view/40/44/">http://mri.scnatweb.ch/index.php/content/view/40/44/</a></li> <li>• ACT website: <a href="http://mri.scnatweb.ch/content/category/3/45/67/">http://mri.scnatweb.ch/content/category/3/45/67/</a></li> <li>• Cordillera Forest Dynamics Network (CORFOR): <a href="http://www.corfor.com/">http://www.corfor.com/</a></li> </ul>
<p>Please send us any news on your latest ideas, proposals, projects, results, sites, networks, events, publications, funding opportunities, etc., that could be relevant to other scientists. We will include your contributions in the next Newsflash to be sent out by the end of each month.</p>
<p><b>Contacts:</b>                  re content, i.e. projects, proposals, collaborations:                  Dr. Fausto Sarmiento                  Associate Professor of Mountain Science                  Department of Geography, University of Georgia, Athens, GA. 30602. USA                  +1 706-542-1753 faustosarmiento (Skype)                  fsarmien@uga.edu  <a href="http://www.ggy.uga.edu/people/faculty/sarmiento.html">http://www.ggy.uga.edu/people/faculty/sarmiento.html</a></p> <p>re communications:                  Claudia Drexler                  Communication and Event Management                  The Mountain Research Initiative c/o Institute of Geography, University of Berne                  Erlachstrasse 9, Trakt 3 3012 Bern, Switzerland                  +41 (0) 31 631 51 41 claudiadrexler (Skype)                  drexler@giub.unibe.ch  <a href="http://www.mri.scnatweb.ch">http://www.mri.scnatweb.ch</a></p>

disconnected and disenfranchised from the globalization dialogue. Most capital cities and major urban centers of the Andean countries reflect already the same type of constraints that most western societies have in the global North; so, it is about the bucolic, even idyllic, agricultural and livestock places that are kept away from urbanization in the South. We also emphasize *Transformation* because it is not just any change, abrupt as it may be. In the

Andes, paucity of change reflective of environmental conditions, is lesser than the one actually observed in distant communities, once isolated and marginalized, now interconnected and changed already because of the human agency. For some scholars, change is nothing new in the Andes. For others, climate change has happened already and the forecasts of eventual scenarios given by global models are examples of things to come elsewhere. Yet for others, the resilience of Andean communities has been tested as desertification advances in the highlands, creating and molding an Andean identity in mountain peoples associated with life at the edge of changing landscapes.

This special issue on *Farmscape Transformation and Global Change in the Andes*, starts with a review of the socio-economic strategies in the agricultural areas, where vulnerability could be extreme; the presence of mechanisms to cope with change increases the resilience and favors the adaptability of the rural communities facing uncertainty and environmental stochasticity. Christoph STADEL, a reknown cultural geographer from the University of Salzburg, Austria, introduces us to the meaning of being effective with struggles of competing forces for globalization in the era of change and to the intricate relations for cultural survival of "the" Andean. Second, a case study of the documented disappearing glacier of Mama Cotacachi volcano in the Ecuadorian Andes presented by the scholar of Montology, Robert RHODES, from the University of Georgia, allows for the realization that ethnoecological research should also be considered when dealing with climate change. Bringing the examples of change to a more localized scale, the case of Tucumán is presented by ecologist Juan GONZALEZ *et al.*, from the Fundación Miguel Lillo and the University of Tucumán, Argentina; they indicate with a critical view on the extent of the damage of the forest conversion to pastures and agriculture, the important reassessment needed for establishing mountain protected areas as a safety niche for future climate change impact on the biota. Then, a study of environmental conflict and the challenges and opportunities that farmscape transformation entails for highland areas, political scientist Jeff PUGH, from the International Center for Environmental Mediation and Peaceful Conflict Resolution (CEMPROC) in Quito and John Hopkins University, allows us to categorize the impacts and measure them within diagrams of flow about the levels of engagement of landscape transformation, using case studies of the Imbabura and Napo provinces of Ecuador. An analysis of the consequences of glacier retreat on altiplano communities, is given by geographer Dirk HOFMAN, from the Mountain Institute in Bolivia, as for the registration of the disappearance of glaciers once emblematic that are no longer visible, and how this affects the nearby communities. Then, ecologist Lylieth VARELA, from the University of

Cauca, Colombia, argues for the argument that Andean balds are indeed anthropogenic landscapes, and her recommendations for using this fact to revisit management strategies and conservation priorities are presented as a way to bridge science and society within ethnoecological parameters in the changing landscapes of the northern Andes. Following the debate on pasture and grasslands in Colombia, the contribution of ecologists Karina YAGER *et al.*, from Yale University documents, with experimental evidence and anecdotal information, the impact of climate change on grazing in the area of the Sajama volcano and the Sajama National Park in Bolivia. We conclude with a contribution of agricultural economist Alejandro LEON, from the Universidad de Chile, Santiago, on changes associated with climate in the drier mountains of Norte Chico because of the macroeconomic and irrigation policies and the implications and repercussions of water trends in the area versus the wider scheme of economic advancement of Chile.

#### 4. Conclusion

Therefore, by using rural spaces in the critical identity of Andean communities, the building of the research agenda for the Andes mountains in global change, and for the entire Americas cordillera transect, the authors portray a call for action, not only from the physical geography side of the problem of weather and climate, but also and most importantly, from the human geography side of a larger problematique of equity, environmental justice and sustainability related to climate change in the Andes.

With the publication of this special issue, the authors and the guest editor invite colleagues dealing with Andean studies, to consider joining the effort of developing a larger, more stronger network of researchers and practitioners of Montology, as it relates to the themes of climate change in the Andes, from the perspective of the social sciences, and becoming effective in advancing the Global Change in Mountain Regions (GLOCHAMORE) Strategy developed by the Mountain Research Initiative (MRI). Those interested in joining the effort are invited to contact the guest editor [fsarmien@uga.edu](mailto:fsarmien@uga.edu) and to visit <http://mri.org> for further information.

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