

Lessons Learnt from the Bolivian Andes for Life in a Four-Degree-World

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Abstract

Despite the Paris Agreement of December 2015, which aims at limiting global temperature increase to below 2 °C, present emission levels would bring about a temperature rise of about 4 °C. Given that warming in the continent's interior and at higher altitudes is about double the global average, the Bolivian *Cordillera Real*, as well as the *Altiplano* region (including the metropolitan area of La Paz/EI Alto, Lake Titicaca and Lake Poopó further to the South) face the prospect of a temperature rise of between 7 and almost 10 °C by the end of this century.

Presently, the rapid melting of Bolivia's glaciers is the most visible sign of global warming, as can easily be assessed by photo comparison. However, the importance of vanishing glaciers for rural livelihoods in the high Andes is still not sufficiently appreciated.

Mountain socio-ecological systems are seldom recognized as such. Our studies on livestock herding and subsistence agriculture as well as about migration from mountain regions, indicate that climate change seldom acts single-handedly, but adds to other drivers such as rapid urbanization, mining or changes of commodity prices on the world market, as exemplified by the expansion and later stagnation of areas newly planted with quinoa.

The recognition of rural-urban linkages in terms of water availability has led the city of La Paz to explore the possibilities to form innovative partnerships with rural communities in mountain catchments, proposing the creation of a "Natural Conservation Space" in its rural Hampaturi district, an initiative that has encountered an unforeseen number of obstacles.

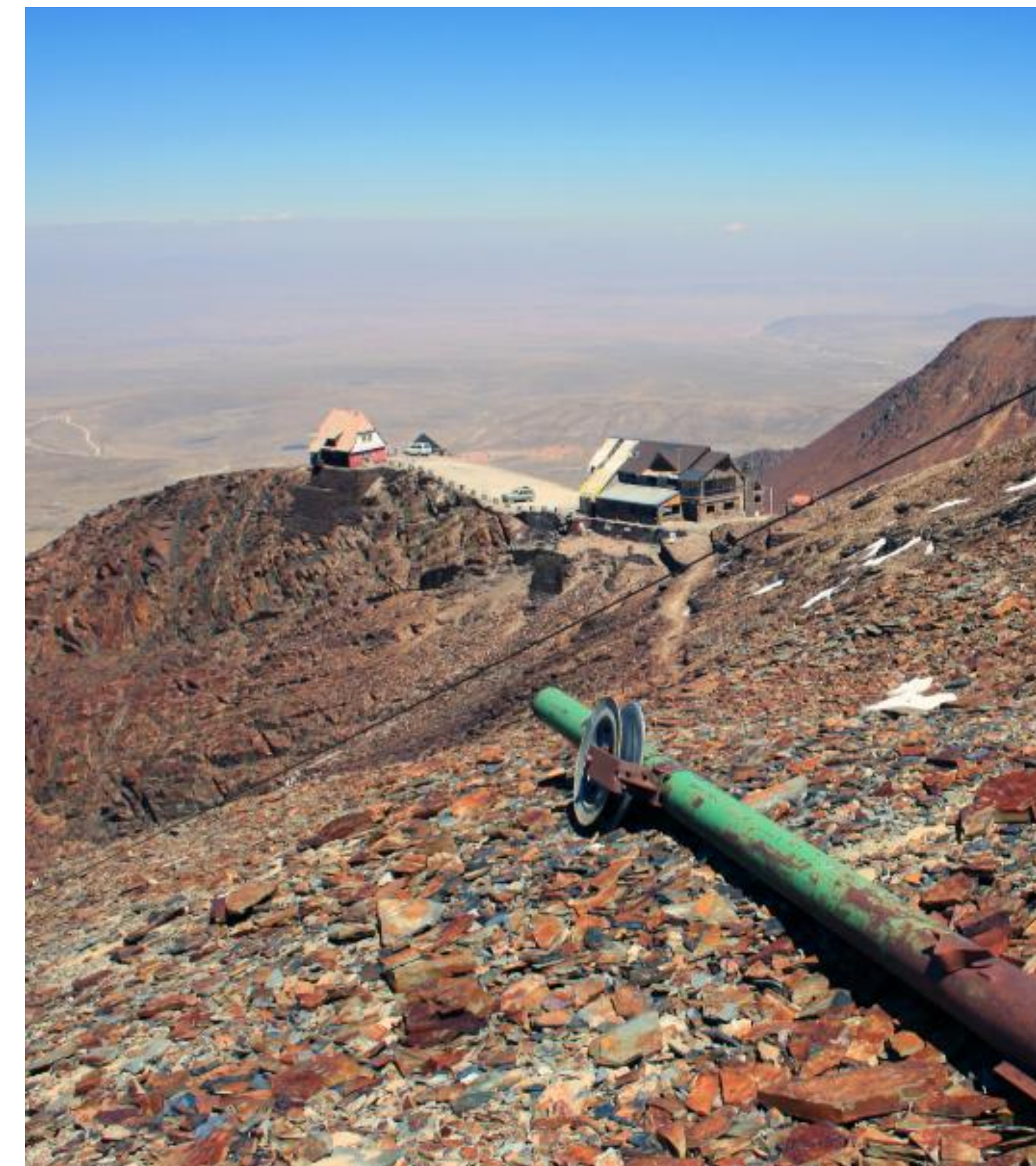


Photo 1. Chacaltaya – "World's highest ski slope with a lift" without its glacier (Dirk Hoffmann, 2012)

Bolivia in a 4° C World

The prospect of a possible rise of global mean temperature by 4° C, which for our study region, the Northern *Altiplano*, *Cordillera Real*, Lake Titicaca and the metropolitan area of La Paz/EI Alto in the Bolivian highlands, translates to a local temperature rise of between 7 and 10° C by 2100, forces us to envisage a future that until very recently would have seemed absolutely improbable, but seems to becoming a harsh reality.

It is within the framework of global concern regarding the impact of climate change, that we have developed socio-political scenarios for two different time horizons: 2030 (our time) and 2060 (the time of our children and grandchildren).

In conclusion, the findings of our study "Socio-political scenarios for the years 2030 and 2060 in the Bolivian *Altiplano* in a Four-Degree-World" show that the consequences of climate change in the region under investigation, as a result of a 4° C increase in global mean temperature, will be harmful and disruptive in 2030, and devastating in 2060, unless there are significant changes in the predominant environmental, social, economic and political trends in the region, in the country as a whole, as well as worldwide.

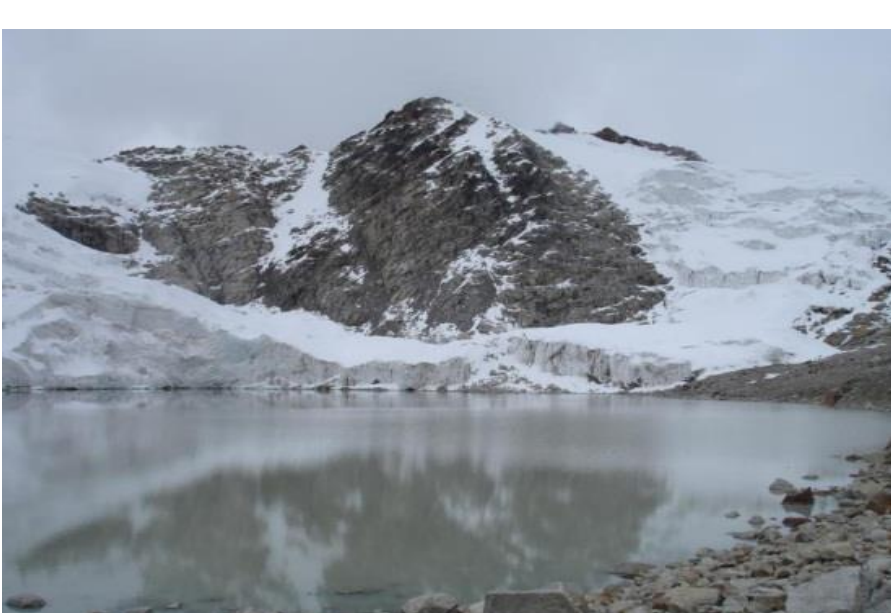


Photo 2. Culin Thoyo glacier in 2007 (Dirk Hoffmann)

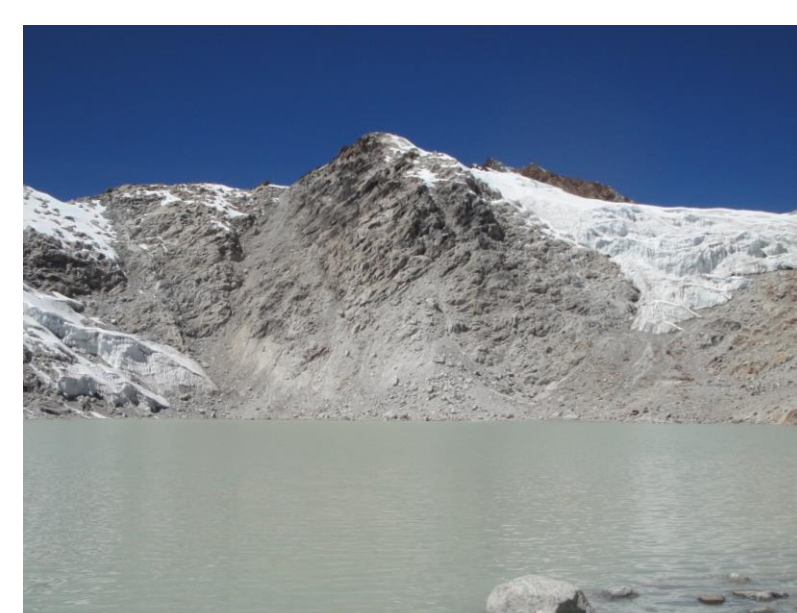


Photo 3. Culin Thoyo glacier in 2012 (Dirk Hoffmann)

Climate Change Adaptation

The main finding from our study of Bolivian experiences in climate change adaptation in the the *Altiplano norte* region and *Beni* department is that climate change adaptation in Bolivia is still in its early stages, and there is no generalized appreciation that adaptation will constitute a priority over the next couple of decades.

A second finding is that there exists an enormous lack of information and knowledge on climate change and its impacts, as well as on possible adaptation measures, which seriously limits the design and implementation of respective initiatives.

Bolivia still does not count with a national climate change policy, but there is a process under way towards its formulation led by the Plurinational Authority of Mother Earth.

Mountain Family Farming

Farmers' strategies to cope with global change in the Tuni Condoriri region still employ traditional patterns of risk management. Different altitudinal belts are used for herding and for growing a diversity of crops, thus minimizing the risk of total failure.

Employment in urban areas and in the mining sector has enabled families to follow a new strategy, with individual members of extended families pursuing different economic activities at different times of the year. This further diversifies risks and opportunities, reducing dependence on local and non-predictable factors such as weather and climate, while increasing dependence on non-farm economies of regional and global scope.

La Paz without Water

Bolivia's seat of government, La Paz – a city of almost one million – receives much of its drinking water from the nearby mountains, where a number of reservoirs capture mostly rain-water and some glacier run-off. The effects of climate change, a growing population, as well as management deficiencies are threatening the sustainability or the supply.

In order to guarantee the future of its water sources, La Paz's autonomous municipal government has started to draft a management plan with the participation of local people for the "Natural Conservation Space Hampaturi".

The urgency to effectively protect the upper watersheds was highlighted in November 2016, when the onset of the rainy season began later than expected and reservoirs started running dry, leaving a good part of the city without running water for weeks.

Conclusions

Taken together, these – and other – examples from Bolivia's mountain regions show that adaptation to climate change is still in its early stages and not being pursued in a planned fashion.

A systematic analysis of existing adaptation activities constitutes an urgent task, in order to permit mountain communities to prepare for hitherto unknown changes in their natural environment, and thus to allow the persistence of mountain culture as a specific expression of life in a distinct socio-ecological system.

References

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Photo 4. Local workshop participants at Chuñawi (Dirk Hoffmann)