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Source: Mountain Research and Development, 40(2)

Published By: International Mountain Society

URL: <https://doi.org/10.1659/MRD-JOURNAL-D-20-00051.1>

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The Interdisciplinary Centre for Mountain Research (CIRM): Fostering Transdisciplinarity for Transformation Research in Mountains

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Mountain regions face important environmental and socioeconomic challenges. They are strongly affected by global warming, and their main economic sectors (agriculture, energy production, and tourism) strive to adapt to this and other global changes. Moreover, in a context of economic globalization, the constraints inherent to mountain regions (slope, isolation, and marginalization) make them uncompetitive in comparison with lowland or coastal regions. To address these issues in an inter- and transdisciplinary manner, and from a perspective of transformation research, the University of Lausanne, Switzerland, has created the Interdisciplinary Centre for Mountain Research, which this article presents.

Introduction

Global scientific interest in mountain research has developed since the 18th century and was reinforced in the 1970s within the framework of the United Nations Educational, Scientific and Cultural Organization's Man and the Biosphere program. As a result, many specialized research centers (Burnham 2005; Price 2011) were added to historical institutes for research and training on mountains (eg in Europe, the Institute of Alpine Geography in Grenoble and specialized institutes at the Universities of Innsbruck, Bern, and Milan) and to high-altitude observatories (such as the Davos Institute for Snow and Avalanche Research, the Jungfrauoch Astronomical Observatory in Switzerland, and the Capanna Osservatorio Regina Margherita on Monte Rosa in Italy). These structures, both academic and associative, have contributed to the development of international research networks, such as the International Scientific Committee for Alpine Research, the Mountain Research Initiative, the International Mountain Society (IMS), the International Centre for Integrated Mountain Development, and the Consortium for the Sustainable Development of the Andean Ecoregion, with the objectives of promoting research for sustainable development in mountains and sharing these findings with policymakers. Building on its long tradition of research in the European Alps, the University of Lausanne (UNIL) inaugurated the

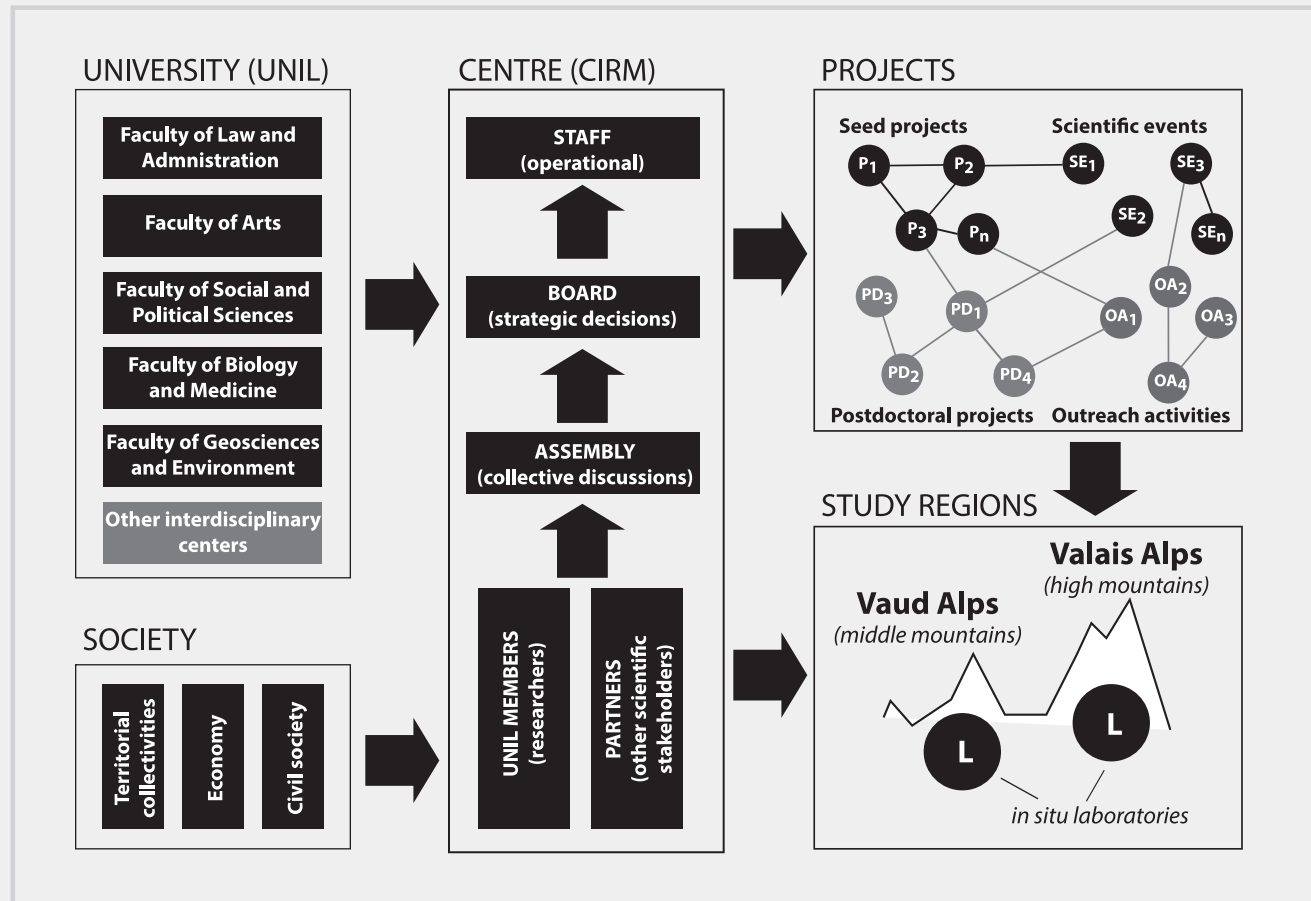
Interdisciplinary Centre for Mountain Research (CIRM) in November 2018. In 2020, it became a member of the IMS. This article describes the motivations behind its creation and the center's organization and objectives.

CIRM is a 4-year pilot project driven by 3 motivating factors. (1) Mountain areas are experiencing intense changes related both to environmental and climatic factors (climate change and its regional impacts and pressures on biodiversity) and to social and economic trends. In Switzerland, for example, climate change and economic evolution are strongly affecting the 3 pillars of mountain economy: agriculture, tourism, and energy production. Such changes need to be addressed holistically, through innovative interdisciplinary research for sustainability. (2) UNIL, situated at the foot of the Swiss Alps, has a long tradition of research on mountains, in particular in geosciences, anthropology, history, and literature. Therefore, UNIL's researchers have strong expertise in mountain issues but are often isolated in their disciplines. There is a need to promote interdisciplinary dialogue on mountains as a common research object. (3) UNIL has developed an active internal policy to enhance outreach activities and to approach societal problems in an interdisciplinary way.

CIRM has 3 main missions. It aims at fostering (1) disciplinary and interdisciplinary research on mountain issues (natural, social, economic, cultural, historical, etc), (2) transdisciplinary research (ie the development of projects oriented toward the expectations of mountain communities), and (3) outreach activities. The center's activities are mostly concentrated in 2 regions that are geographically close to UNIL: the Alps of Vaud and the Alps of Valais, which form CIRM's research and outreach laboratories (Figure 1).

Organization

CIRM has 2 types of members (Figure 1). The UNIL members are researchers—professors, lecturers, postdoctoral researchers, and PhD students—attached to a faculty or

FIGURE 1 Organization (membership and structures), instruments (support for projects and events), and areas of action of CIRM.

directly to CIRM. The partners are institutions active in mountain matters that (1) have a scientific component (CIRM does not accept lobbies and nongovernmental organizations without such a component) and (2) conduct research or outreach activities in mountain areas, but not necessarily in the 2 study regions. As of May 2020, the center had 82 UNIL members and 14 partners, including research networks, applied research centers, museums, natural protected areas, and scientific societies.

The center is governed by 3 main bodies: the board, the assembly, and the staff (Figure 1). The board is the strategic body that makes all important decisions. It is chaired by the dean of the Faculty of Geosciences and Environment, to which CIRM is administratively linked, and it includes one academic representative per faculty involved (Geosciences and Environment, Arts, Social and Political Sciences, Law and Administration, Biology and Medicine), as well as political and associative representatives from the 2 study regions. Representatives of other interdisciplinary centers of UNIL are also invited; they have a voice but no vote. The board meets twice a year. The assembly comprises all members and partners of CIRM and meets once a year. Even though it does not have a decision-making role, it plays a crucial part in collecting and discussing the members' ideas and suggestions. The staff includes the center's employees in charge of specific sectors (administration, coordination, and communication). It is responsible for implementing the policy adopted by the board and for facilitating the implementation of the ideas expressed at the assembly.

The center has developed several instruments to foster disciplinary and interdisciplinary research with a view toward contributing to sustainable mountain development (Figure 1). Since its creation, CIRM has appointed 4 postdoctoral researchers (with a 2-year contract) based on a competitive call. The candidates had to propose a project coadvised by 2 professor members of CIRM, and the projects were selected by the board. The projects focus on the history of industrial pollution in Alpine valleys, ecological relationships between mountain rivers and lakes, processes of subglacial erosion, and impacts of climate change on the protective function of mountain forests. The researchers dedicate 10% of their working time to interdisciplinary activities (Figure 1). Interdisciplinary work and outreach activities are mainly promoted through (1) an annual call for members and partners to propose interdisciplinary projects for seed funding (4 projects supported in 2019 and 4 projects in 2020); (2) funds available to members and partner institutions for the organization of events (8 events supported in 2019 and 6 events in 2020, including academic conferences and workshops, as well as outreach activities); (3) a conference series titled *Montagne et Société* (Mountains and Society), targeting the population of the 2 study regions; (4) a research seminar series titled *Regards sur la Montagne* (Views on the Mountains) at the university, aimed at fostering interdisciplinary discussion on disciplinary research (speakers present their research to an audience of researchers from other disciplines). All these activities are partially interconnected to improve interdisciplinary and

FIGURE 2 Conference on permafrost-related risks in mountains organized by CIRM in the village of Evolène, 13 June 2019. (Photo by E. Reynard)



transdisciplinary dialogue (see Otero et al, submitted, for an in-depth evaluation).

Interdisciplinarity in action

After a year and a half of activity, we can make a first evaluation. One of the main objectives of CIRM is to strengthen inter- and transdisciplinary research on mountain issues. To this end, it has mobilized several means and resources (Otero et al, submitted). Postdoctoral researchers must dedicate part of their working time to interdisciplinary activities. The same applies to the beneficiaries of seed funding. The seminar series *Regards sur la Montagne* also aims to strengthen interdisciplinary dialogue. Transdisciplinarity is encouraged by the presence of 4 representatives from society on the center's board, by the codesigning of some of its seed projects, and through the implementation of numerous outreach activities in the study regions. The university operates in these mountain regions, which is particularly appreciated by their inhabitants and authorities (Figure 2).

Nevertheless, many challenges remain. The first one relates to the value ascribed to interdisciplinary work in the researchers' curriculum. Getting involved in interdisciplinary activities is enriching but also a risk, especially for young researchers, because most evaluations are based on their number of publications, which are usually disciplinary—the situation illustrated by the famous “publish or perish” maxim. As for transdisciplinary research, we have mainly worked in one direction (from university to society), even though some seed projects offer insights into how to integrate nonacademic stakeholders into research. In the near future, we need to find ways to better understand and consider the needs of mountain populations. Only then will CIRM be able to develop both analytical research on sustainability challenges in mountain regions and true transformation research that strengthens sustainability in a context of major environmental, economic, and societal change (Klein et al 2019).

ACKNOWLEDGMENTS

We thank the Rectorate of the UNIL and the Faculty of Geosciences and Environment for the strong financial and organizational support for CIRM. We also acknowledge the stakeholders who participated in our workshops and other activities; their contributions were essential for the development of CIRM and of this article.

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