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Fostering Transdisciplinary Research Through Citizen Science: The Project Val d'Hérens 1950/2050



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Interdisciplinary Centre
for Mountain Research

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Citizen science is considered beneficial in improving the dialogue between researchers and nonacademic stakeholders and in supporting the transformation of regions toward greater sustainability. In this article, we discuss the challenges and benefits of the citizen science project Val d'Hérens 1950/2050—Lives, Images and Practices of a Changing Territory, which involves researchers, artists, and inhabitants of a Swiss valley.

Introduction

The Interdisciplinary Centre for Mountain Research (CIRM) of the University of Lausanne (UNIL) in Switzerland was created in 2018 with 3 main objectives (Reynard et al 2020): (1) to develop a network of researchers carrying out disciplinary and interdisciplinary research on mountain issues (natural, social, economic, cultural, historical, etc), (2) to foster transdisciplinary research (ie projects oriented toward the expectations of mountain communities), and (3) to develop a program of outreach activities. The areas of activity mainly comprise 3 regions geographically close to UNIL: the Alps of Vaud, the Vaud Jura mountains, and the Alps of Valais.

Transdisciplinary research is a challenge for researchers because it involves interacting with stakeholders, such as policymakers, economic actors, and civil society, whose objectives are generally not oriented toward the research. Conversely, transdisciplinarity may lead to unexpected results precisely because of the interaction with stakeholders (Otero et al 2020), and this in turn can be the spark necessary to advance science. However, the needs of nonacademic stakeholders are often given insufficient consideration.

Citizen science is a way to develop dialogue between academic and nonacademic actors by involving inhabitants in the coproduction of knowledge (Pettibone et al 2018; Strasser et al 2019; Sauer mann et al 2020). In Val d'Hérens, UNIL set up the citizen science project Val d'Hérens 1950/2050—Lives, Images and Practices of a Changing Territory with the aim of exploring the potential of transdisciplinary research to transform mountain regions toward greater sustainability. In this MountainPlatform article, we summarize the aims and the organization of the project and discuss the challenges the researchers are facing.

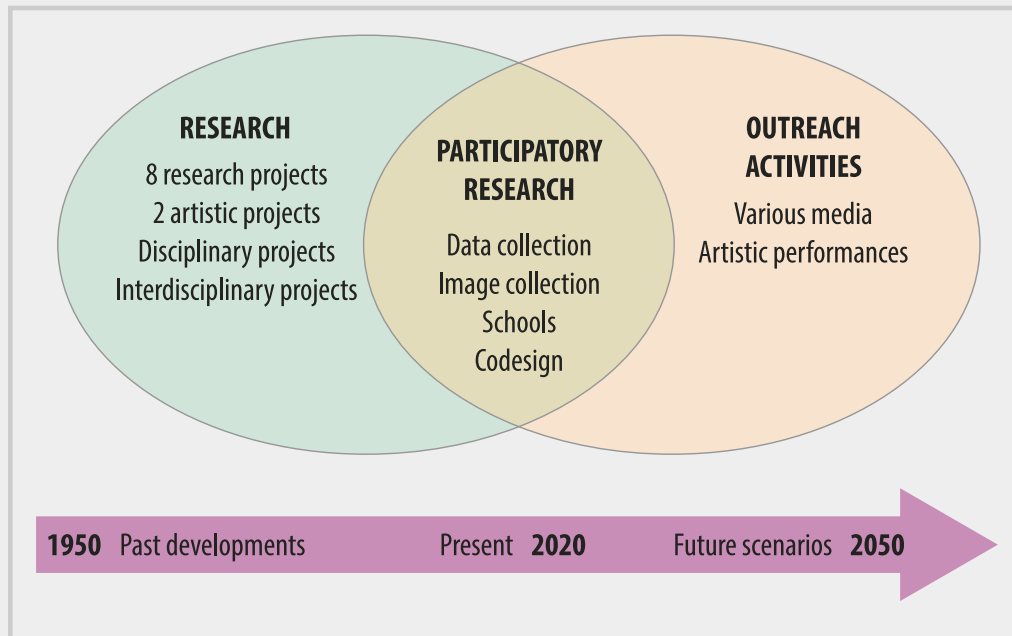
The citizen science project Val d'Hérens 1950/2050

Val d'Hérens is a tributary valley of the Rhone River in the canton of Valais in the Swiss Alps. It is a typical Swiss alpine valley covering a range of elevations from 500 m to more than 4000 m. Its economy is based on 3 pillars: agriculture (cattle), tourism, and hydropower production. Recently, a residential economy has developed in the villages situated at low elevations. The valley has undergone major changes since World War II: strong agricultural decline and depopulation in some villages, building of huge hydropower infrastructures (Grande-Dixence), and winter tourism development. The valley has also missed some recent trends, in particular the creation of regional nature parks; an attempt to establish such a park in Val d'Hérens failed in 2011. The valley is facing several challenges related to climate change (permafrost and glacier melting, changes in water resources, changes in snowfall, snow trends, and natural hazards) and socioeconomic changes (residential economy, periurbanization, tourism, and energy transition).

The Val d'Hérens 1950/2050 project is being carried out jointly by CIRM and the Culture and Science Communication Department (SCMS) of UNIL. It combines research projects, participatory research, and outreach activities. It is divided into 2 phases: the first explores the past and the present, and the second is dedicated to the future development of the valley (Figure 1). The general objective is to answer the following question: What are the challenges of living in the mountains in the context of global changes?

Research projects

Research projects were proposed by researchers affiliated with CIRM. The aim was not to cover all characteristics of regional development but to explore some aspects based on the expertise of the researchers voluntarily involved in the Val d'Hérens 1950/2050 project. Eight topics are being studied: (1) socioeconomic evolution of the valley over a century, particularly tourist development and resource use;

FIGURE 1 Structure of the project.

(2) landscape evolution since the 1940s; (3) soundscape heritage in the valley; (4) the evolution of mountain hunting; (5) inhabitants' climate perception; (6) climate change impacts on mountaineering; (7) environmental factors influencing tree growth at the upper limit of the forest; and (8) heritage plants as witnesses of climate change. The disciplines currently involved are geography, history, anthropology, regional economy, geomorphology, biogeography, and biology. The number of projects is not closed: recently, a new project on place names was initiated. Parallel to the research projects, artistic projects are coordinated by SCMS. Two artistic residencies were organized in close collaboration with some of the research projects (forest limits and soundscape).

Participatory research

Participatory research aims to involve nonacademic people in the scientific process. To date, the Val d'Hérens 1950/2050 project has mainly involved citizens in the collection of data and historical images reflecting the evolution of the valley. In most research projects, researchers have interacted with local people who have contributed information (eg the socioeconomic change, climate perception, hunting, and heritage plants projects). The forest limits project has involved inhabitants in measuring tree growth in the field during annual campaigns (Figure 2). Collaboration with children and teachers in the secondary school and adult inhabitants in the valley has allowed the deployment of a network of temperature sensors that were built and installed at home by participants in several parts of the valley. These are useful for the climate perception and forest limits projects.

Challenges of citizen science and way forward

UNIL faced several challenges when implementing the project. First, the launch of the project was quite problematic: within the

FIGURE 2 Inhabitants and researchers on a joint field campaign to measure tree growth at the upper forest limit. (Photo by Séverine Trouilloud)

context of the coronavirus disease 2019 pandemic, it was difficult to involve people in social activities. However, it was a kind of fear of doing research, collaborating with researchers,

and producing scientific results that prevented people from engaging with the project. Fortunately, motivated citizens succeeded in involving other people and, after some months, created a local community supporting the project. Second, the project transformed the researchers. On one hand, collaboration with nonacademic stakeholders is destabilizing, because it pushes researchers outside their comfort zone. On the other hand, confronting researchers with real-life situations is beneficial. A third challenge was the depth of citizen involvement. In the first phase of the project (2021–2022), which aimed to reconstruct past trajectories, the research design was elaborated by the researchers only, whereas the local people were involved for certain specific tasks (eg collecting photos and collecting data in the field). The next phase (2023–2025), which will focus on scenarios for future development, will include citizens in the research design.

WEBSITES

Val d'Hérens 1950/2050—Vies, images et pratiques d'un territoire en mutation: <https://wp.unil.ch/herens/>

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