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Dynamic Geodiversity, Geosystem Services, and Sustainable Development: Insights from Sesia Val Grande UNESCO Global Geopark

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Human activities and global factors have caused imbalances in mountain regions, leading to significant changes in these environments. One of the most visible impacts of rising temperatures is the melting of glaciers, which causes changes in the pressure on adjacent slopes and increases their instability, leading to mass movements (Chiarle et al., 2021). Other notable effects include the degradation of permafrost and increased erosion in previously glaciated areas (Savi et al., 2021). These changes affect the prevalence of natural hazards and result in the loss of geodiversity and ecosystem services, making it necessary to develop new conservation strategies to protect mountain regions and their geoheritage.

To understand the impact of climate change and human activity on geoheritage and on the benefits that geodiversity provides to society, we conducted a study in the Alagna Valsesia municipality, a high-elevation mountain area in the Sesia Val Grande UGGp. We mapped geodiversity in that area using GIS data following a quali-quantitative approach. Then we identified geosites and evaluated their value to show their potential. We also assessed various abiotic ecosystem services, including regulating, provisioning, knowledge, cultural, and supporting services, and mapped them analysing the evolutionary relationship between humans and nature. By evaluating global drivers of change, we were able to understand the impact of these changes on identified services and to highlight the need for strong planning and management strategies for the Sesia Val Grande UGGp and for the sustainable development of vulnerable mountain regions.

This approach helps us to understand the natural and human-induced threats to geodiversity and enables us to understand the importance of considering geoheritage in planning and management to promote sustainable development actions.

References

Chiarle M, Geertsema M, Mortara G, Clague JJ. 2021. Relations between climate change and mass movement: Perspectives from the Canadian Cordillera and the European Alps. *Global and Planetary Change* **202**: 103499;

Savi S, Comiti F, Strecker MR. 2021. Pronounced increase in slope instability linked to global warming: A case study from the eastern European Alps. *Earth Surface Processes and Landforms* **46** : 1328–1347. DOI: 10.1002/ESP.5100