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Risk assessment and vulnerability evaluation of cultural landscapes exposed to extreme events linked to climate change: the Wachau case study

Alessandro Sardella[1,2], Linda Canesi[3], Riccardo Cacciotti[4], Anna Kaiser[5], and Alessandra Bonazza[1]
[1]National Research Council of Italy, Institute of Atmospheric Sciences and Climate, Bologna, Italy, Italy (a.sardella@isac.cnr.it)
[2]Department of Physics and Earth Sciences, University of Ferrara, Ferrara, Italy
[3]Recent graduated in Science for Conservation-Restoration for Cultural Heritage. Master Degree at University of Bologna, Italy
[4]Institute of Theoretical and Applied Mechanics (ITAM), Czech Academy of Sciences, Prague, Czech Republic
[5]Center for Cultural Property Protection, University for Continuing Education Krems, Austria

It is widely recognized that climate change is creating continuous and new challenges for the protection and conservation of cultural heritage and it is foreseen that the frequency and intensity of extreme events such as heavy rain, flooding, prolonged drought periods, are likely to increase in the near and far future throughout Europe.

The present contribution aims to study the Wachau valley in Austria, taken as example of cultural terraced landscape exposed to climate change related challenges, and especially to its risk assessment and vulnerability evaluation. In order to do that, methodologies and tools developed within the Interreg Central Europe project STRENCH (STRENgthening resilience of Cultural Heritage at risk in a changing environment) were exploited, particularly the "Risk mapping tool for cultural heritage protection, WebGIS tool". Methodology for vulnerability ranking, time series based on earth observation data (e.g. Copernicus C3S reanalysis products) and future hazard maps at territorial level based on outputs from regional and global climate models (EURO Cordex experiment) available within the WebGIS Tool were mainly applied and exploited.

Outcomes include a numerical quantification of the vulnerability for two dry-stone wall terraced areas taken into consideration and climate projections of the changes of the extreme indices R20mm, R95pTOT and Rx5day with spatial resolution of 12x12 km for the near (2021-2050) and far (2071-2100) future, under stabilizing (RCP 4.5) and pessimistic (RCP 8.5) scenarios. A general increase of the three indices in the two investigated areas in the far future under the pessimistic scenario is foreseen, highlighting a high likelihood of heavy rain and flooding risk. The results obtained could therefore support policy and decision-makers in defining strategies for the protection of cultural heritage, assisting local stakeholders in improving their know-how on the process of defining priorities of intervention (preparedness / emergency / recovery).