CHA-lle-NGES in an upland rural landscape.

Cultural responses to the impact of natural and anthropogenic risks on tangi-ble and intangible CH features.

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CO2 emissions from human activities are considered by the scientific community to be the main contributors to global warming. The combustion of coal, oil and gas, deforestation, intensive livestock farming, nitrogen fertilisers and fluorinated gases contribute to increasing environmental risk with dramatic economic, environmental, and social consequences. Among the most involved landscapes are the inner mountain areas, vulnerable spaces characterized by high biodiversity, the protection of which is necessary to contribute to the mitigation of the deleterious effects of climate change on natural habitats and ecosystems (Carrosi 2021; Carallo 2021). Furthermore, traditional knowledge in land use is fading and the rural CH is in danger. However, how aware are the local inhabitants of the level of vulnerability of their landscape? How much are they aware of the impact that climate change can have on tangible and intangible CH? Would they be willing to take direct measures to trigger resilience?

The paper illustrates the first results of the activities carried out within the project CHANGES -Protection and conservation of Cultural Heritage against climate changes, natural and anthropic risks (Next-generation EU framework).. Activities focus on the area of “Monti Lucretili”, a mountainous district NE of Tivoli (Rome) constituted by large, forested areas involved in a multivariate relationship with the anthropic activities. The area is marked by the presence of a widespread cultural heritage linked to the rural past and exposed to climate change, environmental and anthropogenic risks (De Angelis 1995; Bernardi¬ and Farinetti 2023). The

The main risks involved are:

- Natural risks: fire, landslides, weed vegetation

- Anthropogenic risks: negligent rehabilitation, abandonment and lack of maintenance, poor documentation or identification, demographic decline and ageing, loss of local and traditional knowledge, reforestation and agricultural land loss

- Climate change effects: speeding up erosion processes, rainfall increase, temperature changes, increased wetness

Usually, strategies for risk monitoring and mitigation interventions are implemented on individual artifacts, buildings or contexts (Pedersoli et al. 2016; Bonazza et al. 2019; Mascaraque et al. 2020). We are faced here, instead, with a widespread and fragile Cultural Heritage, which is little considered yet (Huang et al. 2010; Trovato et al. 2017; Cuca et al. 2018).

The study area is a marginal landscape marked by increasing depopulation and land abandonment, joined with a gradual disappearance of local knowledge linked to traditional rural and agro-pastoral

activities, which has caused serious consequences for intangible and tangible CH in terms of hydro-geological instability and degradation due to lack of maintenance and use, enhanced by the climate crisis (Figure 1 and Figure 2). The development of governance strategies and measures to prevent these phenomena requires a multi-scale, diachronic and participated approach based on the analysis of the deep historic stratification and on multifaceted fieldwork activities (CITiZAN; Jörn 2013; Paulina et al. 2016; Roger 2007), joint with forms of public engagement and citizen science. A team of archaeologists, geographers, geologists and botanists employs a participatory and inclusive P.A.R. (Partecipated Action Research) approach, to investigate the degree of perception and awareness of the risk local communities and their landscape heritage may incur to, and at the same time to identify new forms of cultural engagement, enhanced by the application of citizen science with the help of mobile technology, as a possible solution to the problem.

In particular, the paper will focus on:

-the preliminary results of a multitemporal analysis on the transformations of the forest coverage and soil management over the last century (on the basis of the analysis of ethnographical data and historical air photos) and earlier (on the basis of archival data, historical cartography and archaeological data) – see Figure 3 for an example – in considering the past and present changing vegetational landscape and terracing as major indicators of climate changes and anthropic hazards

-the results of the first monitoring of anthropogenic and natural risks, involving forms of citizen science and knowledge building, as long as the first results of an online survey which is being conducted with target the local inhabitants and potential stakeholders, to measure citizen engagement with the potential dangers to CH.

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