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Social relevance of the problem

CULTURAL heritage is a social value of the first order. Its study, protection and the proposal of sustainable solutions for its management constitute some of the most important challenges that our society has to face; as noted, among others, by the Faro Convention and the 2017 recommendation of the Committee of Ministers of the European Union (EU) on a common European data space for cultural heritage.

Threats to cultural heritage have two main origins: on the one hand, the direct effects of human activity in an industrialised and globalised world (e.g., urbanisation, large infrastructures, and intensive economic exploitation of natural resources); on the other hand, environmental agents and the effects of climate change on landscapes and cultural elements (e.g., relative sea level rise or extreme weather events).



Islote de la Cantera, Nueva Tabarca, partially flooded by the rising sea level (18th century mining works). / ANDRÉS DÍEZ HERRERO

Because of its social importance, cultural heritage has progressively become part of international discussions on the impact and effects of climate change. This is due, above all, to the growing awareness of its vulnerability and the irreversible consequences of its alteration and destruction for present-day human societies, as it is a non-renewable resource. These consequences include:

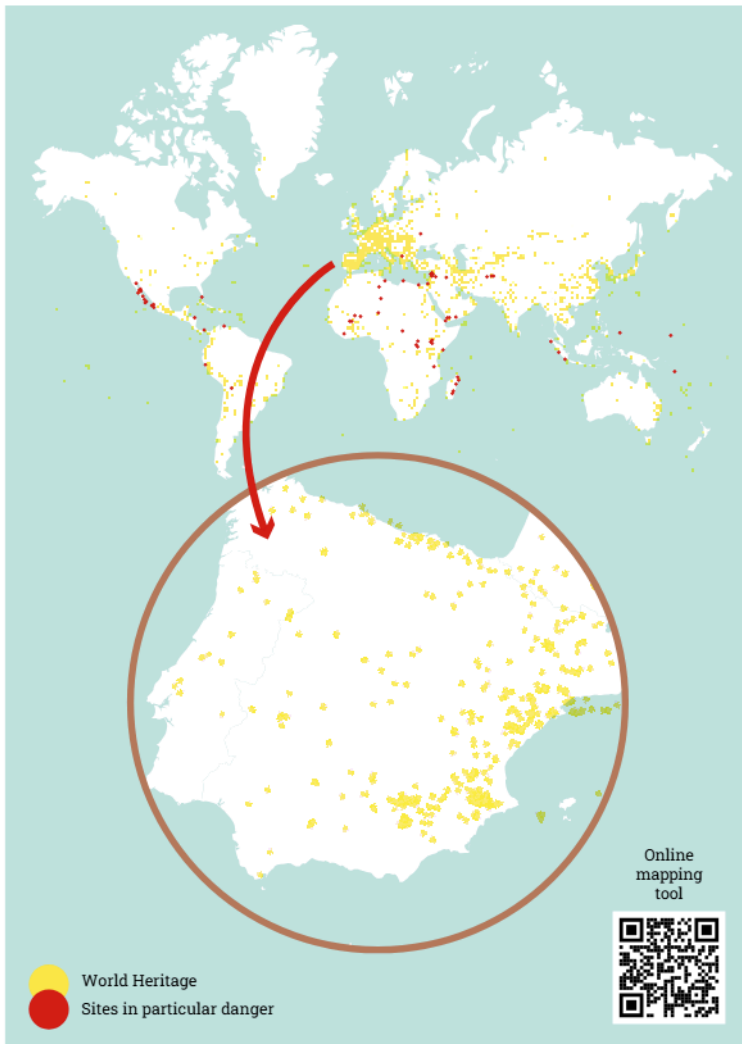
- The loss of social values, of traditional knowledge and uses, and of the capacity to learn from the past.
- The undermining of the sense of a collective identity and of belonging to a community.
- The negative impact on understanding others and its importance in education and social policies (e.g., integration and migration).
- The impact of the loss of heritage as a territorial economic resource.

This is therefore a global problem. However, it should be noted that these effects can have an uneven impact on cultural heritage depending on a number of factors, such as: the geographical and climatic characteristics of the different areas of the world; the political, legal, economic, and socio-cultural context of each region; the nature of the landscapes and cultural elements concerned; and the of heritage protection, education, and awareness policies.

According to the 2022 *White Paper II* of the International Council on Monuments and Sites (ICOMOS), since 1985, 89 World Heritage Sites have, been affected by climate change and have been included on the List of World Heritage in Danger; 22% of them are located in Europe. Of the 89 , currently around 50 are on the list.

With regard to the Mediterranean, according to the study "Climate Change Threats to Cultural and Natural Heritage UNESCO Sites in the Mediterranean", published in the journal *Environment, Development and Sustainability* in 2023, based on EURO-CORDEX simulations and IPCC (Intergovernmental Panel on Climate Change) emissions scenarios, most heritage sites are subject to an increase in threats from global warming and extreme phenomena. In the specific case of Spain, it will be particularly susceptible to the risk of extreme fires in its southern and central sectors. The report also highlights that regions south of the 40° N parallel will experience conditions typical of arid or semi-arid zones; that the number of days of extreme heat or precipitation

Figure 1 UNESCO map of World Heritage Sites



Source: Adapted from, Pasikowska-Schnass, M. (2024) The impact of climate change on cultural heritage. *EPRS. European Parliamentary Research Service*. Retrieved 17 December 2024, from [https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2024\)762282](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2024)762282)

per year will increase significantly; and that the sites at greatest risk are, in particular, those in coastal areas, issues aggravated by seismic risks. In some cases, there is a combination of confluent factors, with a multiplier effect due to climate change, inadequately planned urbanisation, and intensive exploitation of the environment and of certain resources.

An additional aspect with a high social impact is the realisation that it is not possible to protect all of the cultural heritage at risk. Many cultural elements disappear irreversibly today, sometimes before they can be studied by specialists and their existence brought to the attention of society. This is the case of certain archaeological remains located in particularly sensitive areas (such as coastal areas, unstable slopes or flood zones, subject to active erosive dynamics) that can be completely destroyed in a matter of hours, days or weeks. The time scale factor is relevant, as it is not always possible to identify a uniformity in the rate of alteration and destruction of cultural heritage, which makes case-by-case approaches necessary. Not all social agents—from administrations to the local community and the scientific community—accept in the same way the irreversibility of this destruction and the need to apply certain adaptive strategies. This leads to tensions and conflicts that can involve different sectors of society (for example, a local community refusing to relocate a property at risk of destruction, or the inability to adapt certain administrative procedures to speed up the urgent scientific study of a threatened heritage element).

Faced with this situation, a key element of reflection has to do with what we want to preserve and what we are able to preserve. Research must provide the necessary tools to identify, anticipate, analyse and prioritise the risks linked to cultural heritage and the actions that allow for its better understanding, preservation and dissemination.



The integration of heritage in the implementation of disaster risk reduction mechanisms is a reality that implies a remarkable amount of interdisciplinary research work, which, however, is still partially and incompletely addressed. The emergence of climate change means that the identification and documentation of heritage resources must be accompanied by risk studies, including complete and properly geo-referenced inventories, identification of hazards and their frequency, vulnerability analysis, adaptation and mitigation mechanisms, and post-disaster action protocols. Territorial contextualisation is therefore essential, as is the categorisation of the priority and severity of risks, according to the vulnerability and exposure of heritage resources.

There are also two fundamental reasons why the protection and management of cultural heritage in the face of climate change must be addressed in a decisive manner. On the one hand, the social importance of this heritage through the different values attributed to it. On the other hand, the active role it plays in addressing these challenges on the part of communities. This is therefore a global problem that affects society as a whole and requires dialogue between all sectors of society.