1. Background

This statement focuses on the resilience of cultural heritage to natural disasters. Man-made disasters are excluded from consideration, although the devastation they induce is often comparable or even greater than the effects of natural catastrophes, as shown by recent and less recent wars or terrorist attacks. However, as man-made disasters invariably have societal causes, responses to them need strategies distinct from those dealing with natural disasters and need to be addressed separately.

In spite of numerous declarations concerning the protection of cultural heritage (see Annex A), national governments have been slow in taking effective actions. This is of serious concern since the list of recent catastrophic events that have severely affected the cultural heritage worldwide is extensive. Cultural heritage has suffered from the devastating effects of earthquakes, floods, hurricanes, landslides, debris flows, volcanic eruptions, tsunamis and fires. Unfortunately, for the most part, little has been learnt from these catastrophic events. A striking example in this respect is the case of Florence; an assessment of an independent International Committee has ascertained that, after 50 years, insufficient action has been taken to reduce the risk that an event analogous to the 1966 floods would lead to a similar tragedy today.

This situation is likely to worsen, as the risk of natural disasters will increase due to climate change, sea level rise, urban development and population growth and their impact on ageing, culturally significant infrastructure.

2. Protecting cultural heritage: a special challenge

Cultural heritage can be better protected from natural hazards via the developments and practices in the general field of disaster risk reduction. Heritage conservation must therefore be integrated into existing disaster reduction policies. We note three key aspects of cultural heritage.

First, the willingness of people and governments to protect their cultural heritage derives from the unique aesthetic, historic, educational, social, symbolic, scientific, and spiritual values placed on tangible heritage, all of which add significantly to the economic value of these cultural assets. But those values, resources, and responsibilities for action, may be different at the local, national, and global levels.

Cultural heritage and natural resources share common challenges and concerns. For example, they both require careful management by present generations in order to assure access and enjoyment of these resources by future generations. There is a distinction between the two: damage to natural resources can sometimes be 'repaired' through human intervention (except in cases such as biodiversity), whilst cultural assets are unique and once lost they are lost forever. This 'uniqueness' should prompt national governments, international institutions and non-governmental institutions to address the special aspects of cultural heritage when seeking resilience to natural catastrophes.

Second, risk assessment for heritage sites, a prerequisite to devising appropriate strategies for disaster risk reduction, raises a number of issues, notably: what is the level of residual vulnerability that may be allowed when dealing with the protection of heritage sites and collections? What indicators of resilience ought to be employed when planning mitigation measures for a city of art, a monumental site or a museum? It is clearly difficult to value the non-market nature of many cultural heritage objects and to determine the replacement price for them, but measures should be further developed and the estimates obtained should inform the allocation of mitigation resources.

Third, technical and engineering efforts are needed to help historic buildings and heritage collections withstand the impact of major disasters: is such work economically feasible? Past and recent devastating earthquakes are dramatic examples of the immense effort required to protect the enormous and fragile artistic and architectural heritage of a great number of historic towns throughout the world.

In addition, measures and strategies for building resilience, for example urban planning regulations and structural measures for risk mitigation, must be designed to minimize impact on the authenticity and integrity of the cultural assets to be protected. This obvious constraint makes mitigation efforts even more challenging, especially when the heritage to be protected contributes to determining the risk that one seeks to mitigate: e.g. the risk of flooding is often increased by the presence of historical bridges which cannot be simply removed or significantly modified.

Effective pre-disaster planning should allow for the prompt intervention of experts following a major catastrophe. This action is most often crucial to allow for the stabilization and ultimate survival of masterpieces, as the great work of the Florence restoration community demonstrated in 1966.

[1] http://toscana.firenze2016.it/protection-of-florence-from-flooding-final-report-of-itsc/

However, providing assistance to people in urgent danger is the top priority that should never be postponed nor hindered by first aid to cultural assets.

3. General actions

Enhance public awareness

Public engagement with the significance and vulnerability of cultural heritage should be increased, especially within the younger generations, by enhancing educational efforts to instill a greater understanding of the unique values of cultural heritage as crucial elements of the identity of communities. Both the public and private sectors should be encouraged to embrace the responsibilities, shared with societies local and worldwide, to preserve tangible and intangible cultural heritage for future generations. This responsibility is reflected in the concept of intergenerational equity.

Pursue research

Much effort is still required to reach a broad scientific consensus on appropriate procedures to map geophysical and weather related hazards and identify the catastrophic events to be considered at each specific site when implementing mitigation measures. International research networks and practitioner training programs should be enhanced. The development of appropriate damage mitigation measures, including traditional knowledge on disaster mitigation developed at the local level, through the long history of disasters, should then be focused upon if, or when, the hazards are defined. Dynamic (time-dependent) modelling is also needed to capture the impacts of ageing building stock and the repeated cycles of natural hazards such as floods, cyclones, earthquakes and tsunamis.

Establish and implement protocols

Protocols defining the appropriate measures to be implemented after a catastrophic event are crucial. These protocols should be updated periodically and approved by all the relevant institutions and agencies. They should be made available to the entity responsible for the coordination of rescue efforts. Affordable and effective mitigation steps available for any kind of cultural heritage should be widely shared and implemented.

4. Recommendations for decision makers

Acknowledge the uniqueness of cultural heritage

Governments and international institutions must be aware that the protection of cultural heritage, both tangible and intangible, from the impact of natural catastrophes requires greater and more focused attention in the near future. They should also acknowledge that heritage sites, historic urban fabrics and collections, deserve a special status, with a higher and more sophisticated level of protection than that assigned to common buildings and artifacts on display in those buildings.

Develop assessments, plans and protocols

The “Build Back Better” paradigm proposed in the Sendai Framework includes pre-disaster plans as well as post-event emergency phases to assure safe and timely recovery of damaged cultural assets. Once protocols are identified, their implementation will require trained emergency crews as well as sufficient human resources at the national level.

Support research and skills transfer at national and international level

Critical issues related to the protection of cultural heritage from natural hazards require additional research, which should be promoted and funded at both national and international levels. In addition to continued research efforts, it is essential to provide adequate support and funding to the major schools of conservation/restoration, where unique knowledge and skills are taught and handed down to new generations. These schools benefit from the interaction with advanced research centers where innovative technologies for the diagnosis, stabilization and treatment of damaged works are developed.

Pursue innovative participatory funding policies

Clear and preventive assessments of the social costs and benefits associated with risk-reducing investments (including social and economic costs of inaction) should be integrated into public policies and planning. Beyond traditional tax payer funded mechanisms, new funding streams related to social capital generation could be developed in favour of specific cultural projects. People and industries (e.g. tourism) could be actively involved in responsible decision making processes through appropriate funding schemes.

Enhance international cooperation

Consideration should be given to the establishment of an International Heritage Task Force to enhance the emergency response efforts of existing national

and international institutions.

Academies may play an important role in supporting all of the above recommendations by promoting the importance of peer-reviewed science, engineering and technology in risk mitigation; developing prediction and prevention activities; providing a continuing forum to discuss scientific developments; and providing multidisciplinary advice to professional heritage preservation bodies, government agencies and scientific institutions.

Annex A

The protection of cultural heritage has been the subject of general declarations issued by international institutions:

- the Hague Convention, adopted by UNESCO in 1954, aimed at protecting cultural heritage in the context of war;
- the Convention on the Protection, at a National Level, of the Cultural and Natural Heritage, adopted in 1972 by the General Conference of UNESCO, ratified by 192 states;
- the Sendai Framework for Disaster Risk Reduction 2015-2030, adopted in 2015 at the Third UN World Conference on Disaster Risk Reduction. The renewed international commitment to this framework included, for the first time, the protection of cultural heritage as a major objective.

Institutions have been established to protect cultural heritage from the damaging effects of natural disasters or other catastrophic events. In the USA, the Federal Emergency Management Agency (FEMA) and the Smithsonian Institution are currently co-sponsoring the Heritage Emergency National Task Force (HENTF), a partnership comprising 42 national service organizations and federal agencies. In 1997, ICOMOS, an International NGO dedicated towards the protection and management of cultural heritage, established the International Scientific Committee on Risk Preparedness (ICORP). ICOM is responsible for similar programs for museums and collections. In 1998 The International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) created by UNESCO, issued a Management Manual on Risk Preparedness for World Cultural Heritage. Blue Shield International (formerly the International Committee of the Blue Shield), coordinates preparations to respond to emergency situations as well as to provide post-crisis support. Finally, in 2006, the European Parliament issued the Report entitled Protecting the cultural heritage from natural disasters.

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