Scoping fiche

Topic: Resilience of cultural and natural heritage

Expert: Barbara Minguez Garcia, Disaster Risk Management and Cultural Heritage Specialist, World Bank Consultant

Table of Contents

Terminology and concepts[1]

Adaptation: in human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

Climate Change: refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use.

Cultural Heritage: relates to both tangible and intangible legacies, including artefacts, monuments, group of buildings and sites—archaeological and underwater—that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance, as well as practices, representations, expressions, knowledge, skills and instruments, and cultural spaces associated therewith that communities recognize as part of their identity.

Disaster: a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.

Disaster Risk Management: is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses. DRM actions can be distinguished between prospective, corrective, and compensatory, also called residual risk management.

Exposure: the situation of people, infrastructure, housing, production capacities and other human assets located in hazard-prone areas. In this case, it would be cultural heritage, including tangible and intangible.

Hazard: a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. They may be: **Natural -** associated with natural phenomena; **Anthropogenic** - induced by human activities and choices; **Socio-natural** - associated with a combination of natural/anthropogenic factors, including environmental degradation and climate change.

Mitigation: the lessening or minimizing of the adverse impacts of a hazardous event. The adverse impacts of hazards, in particular natural hazards, often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques and hazard-resistant construction as well as improved environmental and social policies and public awareness. It should be noted that, in climate change policy, "mitigation" is defined differently, and is the term used for the reduction of greenhouse gas emissions that are the source of climate change.

Mitigation vs Adaptation: in general, those terms are used different depending if the context is Disaster Risk Management or Climate Change. In the Climate Change context, usually thinking in the long term, *adaptation* refers to how to reduce the impacts of the effects of climate change (e.g. stronger storms in the future), while *mitigation* refers to reduce climate change per se (e.g. by

---

[1] Developed from different sources, including UNDRR, UNESCO, the Intergovernmental Panel on Climate Change (IPCC).

reducing the CO2 emissions). In the DRM context on the other hand, since it focuses on the concept of risk, it usually refers to reduce or mitigate it, more in the short term, while the concept of adaptation is less used.

Resilience: the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.

In reference to cultural heritage, since it is tightly connected to people, resilience is not only related to the protection of heritage assets from hazards, but also to the strengthening of the community or society that identifies with that culture, to be prepared to reduce risks for themselves and for their cultural heritage, and to recover from disasters in a resilient way.

Risk: the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability, and capacity.

It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors. The concept of social construction of risk plays an important role to estimate and reduce risk in local communities, highlighting the need to take into consideration their specific historical, socio-political and economic contexts.

Risk vs Disaster: natural hazards are inevitable events that might impact over exposed assets (human life, infrastructure, cultural heritage, etc.) that would have certain grade of vulnerability to those hazards; assessing them it is possible calculate the risk. Disasters are the results of those events negatively affecting the assets. By identifying the risk and implementing measures to reduce, mitigate or effectively response in case of emergency, disasters might be avoided or reduced. This is why the international community emphasizes that *disasters are not natural*, to foster DRM actions.

Vulnerability: the conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

1.1 Introduction and background information

The present research builds on the Orientation Paper's *Topic 5 – Resilience of Cultural and Natural Heritage*, which provides a good introduction to the topic. Aiming to help improving it and expanding the topic, this paper proposes some thoughts to be considered, and provides additional information on the state-of-the-art of the topic in the European context, as well as some suggestions to strengthen it.

In reference to the **Orientation Paper's Topic 5 – *Resilience of Cultural and Natural Heritage***:

- In terms of seeking resilience, it is important to **consider a broader definition of cultural heritage** that includes also movable and intangible cultural heritage, as presented in the Orientation Paper. The main reason is to provide all the possible variables to be taken into account during the development of disaster risk management (DRM) plans and strategies (either at national or local levels). For instance, disaster preparedness measures in museums need to consider objects and artefacts; and post-disaster recovery plans should include local community traditions and celebrations to help the social recovery.
  - o This is covered in the Orientation Paper (pag. 6), however, in Topic 5 the reference to just built and natural heritage might be confusing, since cultural heritage include more than just built assets. A possible definition could build on UNESCO's one: *cultural heritage relates to both tangible and intangible legacies, including artefacts, monuments, group of buildings and sites—archaeological and underwater—that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance, as well as practices, representations, expressions, knowledge, skills and instruments, and cultural spaces associated therewith that communities recognize as part of their identity*. Particularly in Europe, with so many kinds of cultural and natural heritage, it would be important to include a holistic definition aiming to reach different people to strengthen their resilience across the continent.

- Despite **climate change** being one of the main concerns, it could be helpful to briefly mention the hazards related to it (storms, drought, floods, coastal erosion…) together with the other hazards (geohazards such as earthquakes and landslides) that put at risk European cultural heritage. Likewise, as manmade threats, increasing urbanization and unsustainable tourism could be added to the list, since it is an important concern in some historic cities (e.g. Venice, Barcelona)[2].

- One of the main aspects to **strengthen resilience** is to **make people understand risk, mitigate it and be prepared in case of disaster**. As stated in the Orientation Paper, in the possible actions section (page 48): *hazards become disasters when they affect people who are not prepared to cope with those events*. Therefore, it would be highly recommended to avoid the adjective "natural" to accompany the term disaster, aiming to emphasize that **hazards are natural but disasters are not**, and preparedness is critical, particularly in the case of cultural heritage sites.

---

[2] As mentioned in the Orientation Paper, page 22: *The congestion of tourist flows exposes cultural and natural assets to conservation and protection issues and risks compromising both the residents' quality of life and the experience of tourists*.

- o This could seem merely anecdotic, but language is important in terms of creating awareness about risk and disasters. International campaigns have been recently launched, and several international institutions are joining and supporting this argument.

- Overall, maybe the **concept of resilience** could be better explained and connected to the cultural heritage field. So far, the references in the Orientation Paper Topic 5 are mainly related to environmental issues, but the concept of risk understanding and therefore risk reduction/mitigation (the base for creating resilience) is not developed. For example, community engagement through initiatives to protect their cultural heritage from disasters risk, helps strengthening people's resilience and therefore contribute to urban resilience.

As part of this *background information* section, it would be useful to include references to the European Commission initiatives and documents related to heritage in danger, such as the study published in March 2018: *Safeguarding Cultural Heritage from Natural and Man-Made Disasters. A comparative analysis of risk management in the EU* that aligned its recommendations with the four priorities of the Sendai Framework from Disaster Risk Reduction (more about in point 1.2 below): op.europa.eu/en/publication-detail/-/publication/8fe9ea60-4cea-11e8-be1d-01aa75ed71a1/language-en/format-PDF/source-71040971 and the CORDIS EU research results: *Heritage at Risk: EU research and innovation for a more resilient cultural heritage*, which includes some initiatives and results on the topic: cordis.europa.eu/article/id/400947-heritage-at-risk-eu-research-and-innovation-for-a-more-resilient-cultural-heritage. Also the 2018 **European Framework for Action on Cultural Heritage** and its *Pillar 3 Cultural Heritage for a Resilient Europe:* ec.europa.eu/culture/content/european-framework-action-cultural-heritage_en

Likewise, it would be worth to mention the Council's *EUR-OPA Major Hazards Agreement* section on **Cultural Heritage** and their initiatives to protect it against disasters by promoting risk culture and disaster resilience: www.coe.int/en/web/europarisks/cultural-heritage1.

In terms of climate change, the publication *Cultural heritage facing climate change: experiences and ideas for resilience and adaptation* it is particularly relevant: www.coe.int/en/web/europarisks/publication-cultural-heritage-and-climate-change

1.2 Additional insights

Cultural and natural heritage are at the same time vulnerable to disasters and a source for resilience. Due to their particular characteristics—to be considered either tangible heritage, both movable and immovable, and intangible heritage, such as landscapes, celebrations and traditions; as well as their associated values: historic, religious, spiritual, architectonic, etc.—the process to reduce the risk and strengthen resilience is more complex than for other sectors. However, thanks to the connection between people and their heritage, it facilitates the process to engage local communities through a sense of identity and legacy, to protect their assets from disasters, for future generations. Likewise, traditional knowledge in many cultures is a source for resilience, for example adaptation solutions from ancient practices, such as earthen mounds that helped ancient Dutch settlers thrive in coastal flood zones (Derouin, 2019).

In order to strengthen the resilience of cultural and natural heritage it is critical to understand the risks they face. To align with the Disaster Risk Management (DRM) methodology and concepts, it can be helpful to use the definition of risk as a function of hazard x exposure x vulnerability. This would help understanding the process to reduce risk within the particular characteristics that heritage present. For example, in other sectors, such as transport or infrastructure, DRM specialists may recommend reducing the exposure of assets to natural hazards in order to reduce risk. When historic buildings or

monuments are the exposure, they can't be moved/rebuilt to avoid or mitigate those hazards, and therefore reducing vulnerability is the key to reduce risk. Figure 1 aims to illustrate this point.
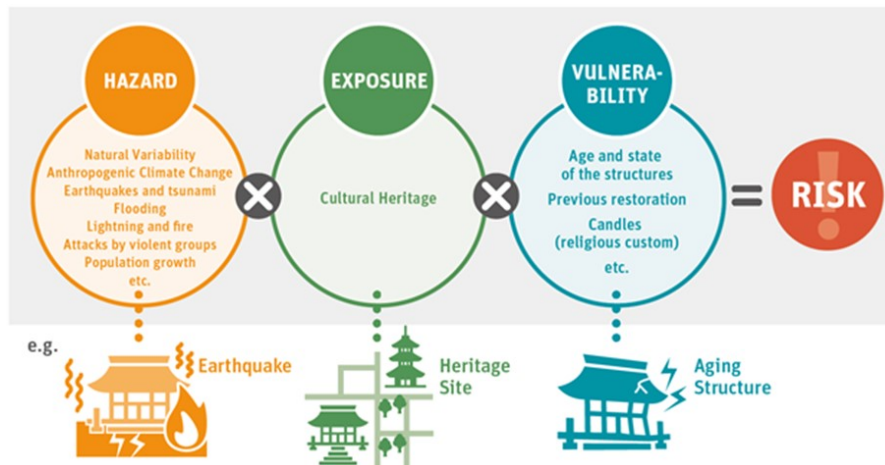

Fig. 1. Risk calculation for cultural heritage assets. Source: Newman, Minguez Garcia, Jain (2017). © World Bank

Assessing and reducing the specific vulnerabilities for each cultural heritage asset is critical to reduce risk. In this sense, it is important to differentiate hazard from risk to establish potential measures to reduce or mitigate and protect heritage. Many factors play a role in increasing vulnerability of heritage assets. In fact, there can be different kinds of vulnerability, including physical, social, and institutional. In this sense, it is also important to consider historical, economic, and socio-political factors that may influence risk. Fostering integrated vulnerability assessments for cultural heritage sites/assets would be a key Action.

The first step to protect cultural/natural heritage and strengthen resilience is, therefore, understanding risk. Heritage should be then included within all the DRM phases: **Pre-disaster**: risk assessment, risk reduction and mitigation, and preparedness; **during disaster**: emergency response and early recovery; and **post-disaster**: resilient recovery including the principle of building back better.

Pre-disaster:

At the global level, cultural heritage is progressively taking relevance in the DRM spheres. The **Sendai Framework for Disaster Risk Reduction 2015–2030** (SFDRR), which aims to achieve a substantial reduction of disaster risk, is including specifically cultural assets—unlike its predecessor the Hyogo Framework (2000-2015). It proposes the systematic evaluation and recording for disaster losses and impacts, including cultural heritage, under its priority 1. Likewise, under priority 3, aims to enhance the protection of cultural and collecting institutions and other sites of historical, cultural heritage and religious interest, and therefore, enhance cultural resilience of persons and communities www.unisdr.org/we/coordinate/sendai-framework

At the same time that the Partnership on Culture and Cultural Heritage aligns with the United Nations 2030 Agenda for Sustainable Development, it would be important to align with the SFDRR. In this regard, the above-mentioned comparative study developed in 2018 aligns its recommendations to the **SFDRR** four priorities:

          ☐ Priority 1. Understanding disaster risk;
          ☐ Priority 2. Strengthening disaster risk governance to manage disaster risk;
          ☐ Priority 3. Investing in disaster risk reduction for resilience;
          ☐ Priority 4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

During disaster:

Establishing strong preparedness measures and efficient emergency response protocols is critical to protect heritage. The connection between the different actors involved in an emergency, including the integration of heritage specialists together with Civil Protection and first responders trained to act on cultural heritage really can make a difference to safeguard it.

In this regard, a key reference is the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and its **First Aid to Cultural Heritage in Times of Crisis** methodology and trainings www.iccrom.org/publication/first-aid-cultural-heritage-times-crisis

Post-disaster:

The basic principle for post-disaster recovery is to use the opportunity to increase resilience by adding risk reduction measures in the process of reconstruction. This is known as the ***Build Back Better*** (BBB) principle[3]. Although it is usually associated to physical reconstruction—which in the case of built cultural heritage includes already the challenge of dealing with cultural values and the principles of integrity and authenticity—it also includes using the recovery process to gain a better understanding of the exposure and vulnerability situation, as well as analysing potential secondary hazards that may have worse impact on heritage structures, and creating risk awareness and improving emergency preparedness and response actions within the community.

The BBB concept is developed together with the integration of culture into post-crisis recovery, in the UNESCO-World Bank joint publication ***Culture in City Reconstruction and Recovery*** (CURE). The CURE Framework puts people and their cultures at the centre of the recovery process, connecting them with the places that strengthen their identities, and facilitating policies to implement resilient recovery measures that use culture as a tool for social recovery. The scope of the CURE approach is extended beyond the historic centres to the entire urban areas, aiming to use both tangible and intangible cultural heritage to connect people, places, and policies.

openknowledge.worldbank.org/bitstream/handle/10986/30733/9789231002885.pdf?sequence=11&isAllowed=y

Protection of cultural and natural heritage in the pandemic context.

The COVID-19 pandemic[4] created a new scenario, previously little explored, in terms of reducing risk and strengthening resilience to heritage in the course of a disease threat. This pandemic showed the need to be prepared for new challenges, including the cultural heritage sector.

Initial considerations may include:

- Risk assessment in heritage sites, including security and safety measures, closure protocols, in depth cleaning of surfaces and movable heritage, etc.
- Assessment of impact on intangible heritage, including practices and celebrations postponed or cancelled, alternative solutions, etc.
- Post-COVID impact assessment in heritage sites and tourism sector, including potential damage due to lack of maintenance, economic losses, etc.
- Recovery plan with focus on strengthening safety in heritage sites.
- Use of culture and cultural heritage, particularly intangible manifestations and traditions, as a source to help social recovery process, by strengthening identity and restoring dignity, and as a tool to share knowledge and create awareness (e.g. through songs, etc.).

Some international initiatives to quickly act on cultural heritage during the pandemic were developed and implemented, such as:

---

[3] Publication on Building Back Better: openknowledge.worldbank.org/bitstream/handle/10986/29867/127215.pdf
[4] https://www.who.int/emergencies/diseases/novel-coronavirus-2019

- UNESCO's monitoring of World Heritage site closures,[5] and organization of a meeting with over 130 Ministers and Vice-Ministers of Culture to discuss actions to bolster the cultural sector[6].
- ICCROM's initiative "**Heritage in Times of COVID**": https://www.iccrom.org/heritage-times-covid

1.3   Emerging evidence base

Some relevant initiatives, divided into European (including some already ended), Global (that could be of interest for European countries), and also not directly focused on resilience but connected with the protection of cultural and natural heritage (aiming to provide a broader vision), are listed below, as per 2020.

1.3.1   Mapping of existing initiatives, methods, practices and networks

<u>European</u>:

- European Commission – Cultural Heritage Initiatives: #7 - Heritage at risk ec.europa.eu/culture/content/heritage-risk_en to prevent the illicit trafficking of cultural goods, enhancing cooperation on risk management, and raising awareness.
    - o   Heritage at Risk: EU research and innovation for a more resilient cultural heritage cordis.europa.eu/article/id/400947-heritage-at-risk-eu-research-and-innovation-for-a-more-resilient-cultural-heritage
    - o   ERA-NET Plus on Cultural Heritage and Global Change Research: cordis.europa.eu/article/id/230161-cooperation-key-to-tackling-cultural-heritage-threats
- Council of Europe - EUR-OPA – Major Hazards – Topic: Cultural Heritage www.coe.int/en/web/europarisks/cultural-heritage1
    - o   Publication - *Cultural heritage facing climate change: experiences and ideas for resilience and adaptation* – 2018 www.coe.int/en/web/europarisks/publication-cultural-heritage-and-climate-change
    - o   Culture and Cultural Heritage: newsroom - Faro Convention topical series www.coe.int/en/web/culture-and-heritage/-/faro-convention-topical-series
    - o   Faro Convention Action Plan www.coe.int/en/web/culture-and-heritage/faro-action-plan
    - o   Culture and Cultural Heritage Division takes part in the conference "Rebound after the drama: heritage and resilience" on January 29, 2020 www.coe.int/en/web/culture-and-heritage/-/culture-and-cultural-heritage-division-takes-part-in-the-conference-rebound-after-the-drama-heritage-and-resilience-
- CUEBC - European University Centre for Cultural Heritage europa-projects.ext.coe.int/en/centre/21-european-university-centre-for-cultural-heritage.html
- COPERNICUS Service in Support to EU External Action – Cultural Heritage sea.security.copernicus.eu/domains/cultural-heritage/ The Copernicus SEA can assess potential damage to cultural heritage sites over areas of conflict inaccessible to the international community and provides supplemental information when access is possible.
- CLIMATE FOR CULTURE www.climateforculture.eu/index.php?inhalt=home is investigating the potential impact of climate change on Europe's cultural heritage assets – particularly on historic buildings and their interiors.
- PROCULTHER – Protecting Cultural Heritage from the Consequences of Disasters www.proculther.eu/ Placing cultural heritage protection at the top of national civil protection

[5] https://en.unesco.org/covid19/cultureresponse/monitoring-world-heritage-site-closures?fbclid=IwAR1RNai3YTrFB-imw_EjM9UDMtXcIO5gnKTb2-Zm6Vn2rAgM5-SxxLGxaoc

[6] https://en.unesco.org/news/more-130-ministers-call-support-culture-sector-covid-19-crisis-response

agendas in European countries and making cultural heritage protection a multi-sectoral and multi-stakeholder issue.

- STORM - Safeguarding Cultural Heritage through Technical and Organisational Resources Management www.storm-project.eu/ provides critical decision-making tools to all European Cultural Heritage stakeholders charged to face climate change and natural hazards. The project improves existing processes related to three identified areas: Prevention, Intervention and Policies, planning and processes.
- PROMEDHE - Protecting Mediterranean Cultural Heritage During Disasters www.montesca.eu/promedhe/ The project, funded by the European Commission, involves the Civil Protection Authorities of Italy, Israel, Jordan, Palestine and Cyprus. Objectives: contributing to the increase of dialogue and exchanges between Cyprus, Israel, Italy, Jordan, Palestine and other EU member states on disaster management, in order to reinforce collaboration among their national civil protection authorities; and developing tools and assets to improve cultural heritage safeguard by creating national pools of experts able to work jointly at both national and regional level.
- HERACLES - Heritage Resilience against Climate Events on Site www.heracles-project.eu/ design, validate and promote responsive systems/solutions for effective resilience of CH against climate change effects.
- PROTHEGO: Protection of European Cultural Heritage from Geo-Hazards www.prothego.eu/home.html aims to make an innovative contribution towards the analysis of geohazards in areas of cultural heritage in Europe.
- RESCULT - Increasing Resilience of Cultural heritage: a supporting decision tool for the safeguarding of cultural assets. www.rescult-project.eu/
  - Final presentation (2018) www.rescult-project.eu/site/assets/files/1015/rescult_project_-_global_presentation_version_24_october_2018.pdf
  - EID - European Interoperable Database www.rescult-project.eu/european-interoperable-database/
- iRESIST+ - innovative seismic and energy retrofitting of the existing building stock ec.europa.eu/jrc/en/research-topic/improving-safety-construction/i-resist-plus Replacing existing buildings is prohibitively expensive or not allowed for historical heritage buildings and would have a significant societal and environmental impact. The innovation aims to develop a solution integrating advanced materials for the simultaneous seismic and energy retrofitting of the European building stock.
- CLIMA - Cultural Landscape Risk Identification, Management and Assessment www.clima-project.eu/ explores how webGIS and remote sensing can be useful tools to monitor, protect and manage Archaeological landscapes from environmental risks.
- HEAT - Heritage and Threat ccrs.ku.dk/research/centres-and-projects/heat/ systematic analysis of threat to and through heritage in different geo-cultural locations.

Ended:
- Climate for Culture (2009-2014) www.climateforculture.eu/
- Noah's Ark (2003-2007) - Global climate change impact on built heritage and cultural landscapes cordis.europa.eu/article/id/87840-preserving-the-future-of-cultural-heritage & cordis.europa.eu/docs/results/501/501837/124722791-6_en.pdf
- CHCFE - Cultural heritage counts for Europe blogs.encatc.org/culturalheritagecountsforeurope/
- SEERISK - Joint Disaster Management risk assessment and preparedness in the Danube macro-region www.seeriskproject.eu

- CERCMA – Cultural Environment as Resource in Climate Change Mitigation and Adaptation cercma.wordpress.com/

Global:
- Climate Heritage Network climateheritage.org/ is a voluntary, mutual support network of local, regional, national agencies, universities, organizations, etc., committed to aiding their communities in tackling climate change and achieving the ambitions of the Paris Agreement.
- CCHWG - ICOMOS Climate Change and Heritage Working Group www.icomos.org/en/what-we-do/disseminating-knowledge/icomos-working-groups?start=6

Indirectly connected to resilience:
- E-RIHS: European Research Infrastructure for Heritage Science www.e-rihs.eu/ delivers integrated access to expertise, data and technologies through a standardized approach, to integrate world-leading European facilities into an organisation with a clear identity and a strong cohesive role within the global heritage science community.
    - o IPERION CH www.iperionch.eu/ consortium that aims at establishing a unique European research infrastructure for restoration and conservation of Cultural Heritage.
    - o ARIADNEplus ariadne-infrastructure.eu/ integrates archaeological data infrastructures in Europe.
- ILUCIDARE is a European funded project which promotes heritage as a resource of innovation and international cooperation. ilucidare.eu/
- SMARTS - Smart Technology for Analysis and Monitoring of Cultural Heritage Materials cordis.europa.eu/project/id/708527
- HEREIN - European Cultural Heritage Information Network developed within the Council of Europe which brings together European public administrations in charge of national cultural heritage policies and strategies to form a unique co-operation network in the domain of Cultural Heritage. www.coe.int/en/web/herein-system/

Resilience and Disaster Risk Management:
- EUR-OPA Major Hazards Agreement - a tool for international cooperation - www.coe.int/en/web/europarisks/eur-opa-in-brief
    - o List of Specialised Centres: www.coe.int/en/web/europarisks/specialised-centres
    - o **CUEBC - European University Centre for Cultural Heritage** europa-projects.ext.coe.int/en/centre/21-european-university-centre-for-cultural-heritage.html
        - **-** Current Project: *Local knowledge and media to fight natural disasters* (LoKMeFiND) europa-projects.ext.coe.int/en/projet/21-14-local-knowledge-and-media-to-fight-natural-disasters-lokmefind.html
    - o CERU - European Centre on Urban Risks europa-projects.ext.coe.int/en/centre/28-european-centre-on-urban-risks.html
        - - Current Project: *Involving sales and tourism agents on earthquake and tsunami mitigation measures*: europa-projects.ext.coe.int/en/projet/28-62-involving-sales-and-tourism-agents-on-earthquake-and-tsunami-mitigation-measures.html
    - o ECBR - European Centre for Rehabilitation of Buildings europa-projects.ext.coe.int/en/centre/26-european-centre-for-rehabilitation-of-buildings.html

- Understanding Risk (UR) Regional Forum - EUROPE: INNOVATE FOR RESILIENCE understandrisk.org/event/ur-europe/ celebrated in Bucharest on 27 - 29 November 2019, included the session *Assessing and managing risk to cultural heritage: preserving the past for*

the future understandrisk.org/event-session/assessing-and-managing-risk-to-cultural-heritage-preserving-the-past-for-the-future/

1.3.2 Mapping of relevant EU policies/legislation/funding instruments
Some references as per 2020 are listed below, although further research/update is recommended.

- Making Europe resilient to climate change through adaptation - eur-lex.europa.eu/legal-content/EN/TXT/?uri=legissum:2001_6

- Recommendation CM/Rec(2018)3 of the Committee of Ministers to member States on cultural heritage facing climate change: increasing resilience and promoting adaptation (Adopted by the Committee of Ministers on 7 March 2018 at the 1309th meeting of the Ministers' Deputies) search.coe.int/cm/Pages/result_details.aspx?ObjectId=0900001680791160

- Recommendation: "Cultural Heritage Facing Climate Change: Increasing Resilience and Promoting Adaptation" Villa Rufolo, Ravello, Italy (18-19 May 2017) - The Committee of Ministers, under the terms of Article 15.b of the Statute of the Council of Europe (ETS No.1); Recommends that the governments of member States: a) Ensure the inclusion of cultural heritage in their policies and strategies for adaptation to climate change; and b) Consider assessing the economic value of cultural heritage lost to climate change. rm.coe.int/recommendation-offprints/16808b167b

- Report on the International Conference on Culture Against Disasters Protecting Cultural Landscapes as Prevention of Natural Disasters 28-29 September 2018 Ravello, Italy: rm.coe.int/report-on-the-international-conference-on-culture-against-disasters-pr/16808e5c3f

- Recommendation 2009 - 1 of the Committee of Permanent Correspondents, adopted at its 57th meeting in Dubrovnik, Croatia (15-16 October 2009), on Vulnerability of Cultural Heritage to Climate Change www.coe.int/t/dg4/majorhazards/ressources/recommendation/REC_2009_1_Vulnerability-CCtoCH_EN.pdf

- Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030. A disaster risk-informed approach for all EU policies ec.europa.eu/echo/sites/echo-site/files/1_en_document_travail_service_part1_v2.pdf Includes *Develop good practices on the integration of cultural heritage in the national disaster risk reduction strategies to be developed by EU Member States* as part of the Key Area 4.

- Flood-risk management in the EU - DIRECTIVE 2007/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2007 on the assessment and management of flood risks eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32007L0060

- European Forum for Disaster Risk Reduction (EFDRR) www.unisdr.org/conference/2018/efdrr#
  - EFDRR 2015-2020 ROADMAP Review www.preventionweb.net/files/57664_efdrrroadmapreview.pdf

- Steering Committee for Culture, Heritage and Landscape (CDCPP) www.coe.int/en/web/cdcpp-committee/home
  - SPECIAL FILE: Climate change and sustainable development as it relates to culture, heritage and landscape www.coe.int/en/web/cdcpp-committee/special-file-climate-change

- ICOMOS RESOLUTION 19GA 2017/30 - Mobilizing ICOMOS and the Cultural Heritage Community To Help Meet the Challenge of Climate Change rm.coe.int/resolution-19ga-2017-30-mobilizing-icomos-and-the-cultural-heritage-co/168098e211

Potential sources of funding*:*

This sub-topic could benefit from funding assigned to initiatives related to DRM and resilience, such as adaptation to climate change, risk financing mechanisms, emergency preparedness and response funds and support, post-disaster recovery funds, and so on, to be connected to culture.

- Through the EU funding programs, there could be an opportunity to connect cultural heritage initiatives with the EU Civil Protection Mechanism that helps to coordinate disaster preparedness and prevention activities of national authorities: ec.europa.eu/echo/what/civil-protection/mechanism_en

- LIFE programme, the EU's funding instrument for the environment and climate action, ec.europa.eu/easme/en/life could be also an opportunity for cultural heritage entities to connect with climate change.

- In terms of research, Horizon 2020 could be a way to provide funding to foster investigation and innovation to connect DRM and resilience solution to cultural and natural heritage. ec.europa.eu/research/environment/index.cfm?pg=cultural or through Environment & Climate Action ec.europa.eu/programmes/horizon2020/en/area/environment-climate-action

- It could also be worth to connect with mechanisms for recovery and disaster preparedness and explore their adaptation to cultural/natural heritage contexts, such as the RescEU: ec.europa.eu/commission/sites/beta-political/files/budget-may2018-civil-protection-mechanism_en_0.pdf

- Likewise, exploring **risk financing options/mechanisms** that could be applied to cultural heritage sites would be useful. E.g. the OECD provides guidance on the development of strategies for the financial management of disaster risks: www.oecd.org/daf/fin/insurance/disaster-risk-financing.htm

- Finally, national mechanisms to increase resilience from hazards, adaptable to heritage sites, as well as private insurance options, etc., that could be connected to heritage field, could also be explored.

Conclusions

The initiatives mentioned above reveal a great number of references, at both European and global levels, connecting cultural and natural heritage to disaster risk management, resilience, and climate change. This means it exists a lot of knowledge and experts on the topic.

Overall, for this paper's purpose, they could be divided according to their scope into global, European, and national/local. However, one of the most important findings from the research is that many of these projects don't seem isolated but part of collaborations.

Some potential suggestions to go in depth in this section would include:

- Systematizing the review of initiatives and projects and developing a database of all the activities and respective institutions working in such as projects;
- Creating a map of these activities and the interrelation between them;
- Establishing an information repository with the main results and data available;

- Identifying the main existing gaps on the topic and potential solutions.

1.4   Challenges and bottlenecks

Overall, the cultural heritage sector usually struggles with lack of funding in most countries, particularly in the context of recovery from disasters, where other sectors, such as infrastructure, transport, education, health, etc., are usually prioritized. Investments in disaster risk management are themselves challenging since some governments are reluctant to designate budget to preparedness measures for events that might not happen during their mandate. And it may be even more complicated when trying to connect it to cultural heritage, which usually is not a priority.

Additionally, this funding challenge may get worse in the post-COVID era, according to the economic crisis hitting countries and particularly with the hit on the tourism sector. It might be necessary to think out of the box and find alternative solutions to invest in cultural heritage, either looking for philanthropists or strengthening the sector around job creation or partnerships and collaborations between sectors.

Specifically for cultural heritage, another main problem is often the misunderstanding of what is considered heritage per se, since each country usually sets its own parameters to define it, and some traditions, vernacular architecture, etc., might be left out of the definition. In this regard, an important gap is the lack of inventories or databases of heritage assets in most of countries.

1.4.1.   Regulation

In general, cultural heritage and resilience often seem to go in parallel. Most policies and regulations related to culture focus on conservation practices and protection in general, lacking an understanding of the disaster risk situation the heritage might face. On the other hand, policies and regulations for disaster risk reduction, urban resilience and climate change, usually do not integrate culture or cultural heritage aspects, nor consider it as a sector to be taken into account to develop specific DRM plans or regulations.

However, this seems to be changing and some Cultural Policies include recommendations to protect heritage from disasters, particularly related to climate change, at the same time that cultural heritage is progressively integrated in some initiatives related to disaster risk and climate change[7]. There is still a lot of room for improvement, though, and coordination between different sectors should be encouraged—for instance, the Partnership could explore collaborations to integrate heritage in the European Civil Protection and Humanitarian Aid Operations[8], as well as foster cooperation between national agencies for culture, DRM/Civil Protection and humanitarian aid in European countries.

Following the guidance from UNESCO, cultural and natural heritage sites are encouraged to develop DRM plans and strategies to reduce and manage disaster risk, as part of their heritage management plans. UNESCO already developed a manual with principles, methodology and process for managing disaster risks at cultural and natural World Heritage properties: whc.unesco.org/en/managing-disaster-risks/. Establishing some rule or recommendation for European countries to promote the development of DRM plans in their heritage sites would help to strengthen resilience at local level.

---

[7] Some countries already have developed DRM plans for cultural heritage, such as Spain: sede.educacion.gob.es/publiventa/plan-nacional-de-emergencias-y-gestion-de-riesgos-en-patrimonio-cultural/patrimonio-historico-artistico/20705C and integrated risk prevention into cultural heritage, such as Italy: http://www.archivi.beniculturali.it/index.php/cosa-facciamo/tutela/item/1091-prevenzione-dei-rischi-e-reazione-alle-emergenze

[8] For example, on disaster preparedness initiatives: ec.europa.eu/echo/what/humanitarian-aid/disaster_preparedness_en

As mentioned, one of the main issues at national level to act over cultural heritage in case of disasters is the lack of inventories and also definition of what is considered heritage in a given country. In this sense, the Japanese model that is based in the designation of cultural properties into six different categories and levels, might be of help as an example to organize the heritage assets in a country to develop policies for maintenance, protection and also allocation of funding and investments for their preservation: www.bunka.go.jp/english/policy/cultural_properties/introduction/

1.4.2. Funding

The designation of funding to develop DRM plans and increase resilience for cultural and natural heritage sites seems an issue in most countries, since other priorities usually relegate culture. Usually there are not specific instruments designed to help countries to do so. In this sense, it is important to connect with other opportunities such as urban regeneration projects, to integrate resilience measures as part of them to ensure the protection of cultural heritage from disaster risk.

One of the main issues for the DRM sector is establishing the monetary value of heritage assets. In this regard, some initiatives are being developed (e.g.: Romão and Paupério, 2019) to establish an indicator to estimate economic losses from damaged cultural heritage assets affected by disasters. This kind of initiative could be encouraged and supported at European level to be standardized, shared and used in different countries to help establishing economic value of heritage for financing.

It would be good also to systematize/organize information about **international opportunities** to share with countries, national organizations and cultural heritage sites to help them prepare and response to disasters and crisis, such as the Prince Claus Fund and the Gerda Henkel Foundation, through their recent joint open call for *Emergency Preparedness for Cultural Heritage under Threat*: www.gerda-henkel-stiftung.de/en/call_emergency_preparedness_heritage?fbclid=IwAR0WrbH_zWD9B7Y1O0eSU_xdfHIujlxg1NBNZbkLjm-Xt0hmKw8a3e6HdVk
And the World Monument Funds (WMF) *Crisis Response Fund*: www.wmf.org/crisis-response-fund

1.4.3. Knowledge (base and knowledge exchange)

There have been and are several initiatives across Europe to connect cultural heritage to DRM, resilience and climate change adaptation. One of the main gaps might be the lack of connection between these similar initiatives that could help create synergies and collaborations through countries and institutions.

Likewise, another usual gap is also the disconnection between universities/academics and institutions/practitioners. Particularly in Europe there are many universities and researchers developing studies and investigations that connect heritage with DRM disciplines, either connected to climate change, geohazards, etc. Making these studies available for practitioners and fostering cooperation between academia and professionals in the field would make a significant improvement in the development and implementation of projects and programs to increase resilience of heritage.

Building on the suggestion for *peer-learning activities* and *trainings for local city experts* (Orientation Paper, page 59) a possible solution would be fostering the knowledge exchange between European countries and institutions (e.g. the Italian Firefighters have specific trained teams to act on cultural heritage; and also the previously mentioned ICCROM, based in Rome, which offers several courses and trainings).

Another gap is the lack of knowledge exchange on hazards data and risk to cultural heritage between countries. Fostering cross-border cooperation to identify risk and response to disasters, by

establishing a network of European first-aiders to cultural heritage in times of crisis could be a solution.

To strengthen resilience of cultural and natural heritage, a suggestion would be to foster connection and collaboration with initiatives and innovative programs for DRM and climate change to integrate heritage components on them, such as:

- Connecting with the Joint Research Centre (JRC) (European Commission's science and knowledge service to provide independent scientific advice and support to EU policy) in order to get access to research on DRM, Climate Change and related/useful topics: ec.europa.eu/jrc/en/research-topic/disaster-risk-management - ec.europa.eu/jrc/en/research-topics?page=2

- Connecting Cultural Heritage initiatives with the **Copernicus Emergency Management Service** (Copernicus EMS) that provides timely and accurate geo-spatial information derived from satellite remote sensing and completed by available in situ or open data sources to actors involved in DRM, emergency situations, and humanitarian crises www.copernicus.eu/en/services/emergency - taking advantage of the *Copernicus Service in Support to EU External Action – Cultural Heritage* sea.security.copernicus.eu/domains/cultural-heritage/.

- Considering that researchers within the EU-funded SmARTS project have developed low-cost, easy-to-use devices for mapping, monitoring and analysing the surfaces of historical and archaeological artefacts cordis.europa.eu/article/id/229915-getting-smart-about-cultural-heritageand could be connected to DRM and climate change initiatives.

- Connecting with disaster preparedness, as mentioned: ec.europa.eu/echo/what/humanitarian-aid/disaster_preparedness_en to foster cooperation and aiming to integrate, for instance, cultural and natural heritage in their *Disaster Risk Reduction - Thematic Policy Document*: ec.europa.eu/echo/files/policies/prevention_preparedness/DRR_thematic_policy_doc.pdf

1.5. Assessment on Proposal of Actions described in the Orientation Plan

In reference to **Resilience of cultural and natural heritage**, the Orientation Paper presents (page 97) the main challenges as: (1) *need to safeguard the heritage from possible damage*; (2) *to improve the quality of cultural heritage and open/green spaces*; and (3) *to contribute to urban resilience by supporting new quality areas and projects that do not add pressures or constitute potential threats to the environment*. In this regard, it could be useful to develop the Topic 5 section more aligned to those challenges, and provide specific solutions about 1) how to safeguard heritage from natural and manmade hazards (e.g. fostering the establishment of DRM measures in heritage sites); 2) how to invest in conservation, maintenance and urban regeneration that promotes resilience (e.g. integrating risk assessment studies in urban and heritage management plans); 3) how to increase urban resilience through cultural and natural heritage areas (e.g. engaging communities and understanding the risk faced by their heritage and learning how to act in case of emergency to protect it as well as themselves, through trainings including DRM and heritage specialists, etc.).

There were six possible actions described in the Orientation Paper for this topic. They are listed below including review, comments, and suggestions. However, those are just initial ideas based on earlier stages of the work, since efforts to develop a new set of actions are currently ongoing.

➢ *Strengthening disaster preparedness and establishing a risk and heritage management, since natural or manmade hazards become disasters when they affect people who are not prepared*

to cope with those events. Relevant supra-national, national, regional and local institutions in the field of disaster and heritage management must be networked and should work closely together.
The underlined sentence is critical, as I have referred previously. The first step would be to assess the risk by assessing hazards, exposure and vulnerability of the heritage assets; after that, risk mitigation and emergency preparedness measures could be design and implemented. Collaboration between agencies or institutions is absolutely crucial to develop DRM plans for heritage sites, or include DRM measures into the heritage management plans.

➢ *Raising risk awareness and preparedness by establishing a risk communication between experts and local communities using different modes of communication (i.e. real-time exchange of information by new media, brochures, public briefings)*.

This is also key, and it should be part of the first step mentioned above, to be connected to the risk understanding and assessment. Risk communication and community engagement is absolutely necessary to develop effective preparedness measures. Early warning systems have been proven very useful to alert populations. Likewise, a well-trained and prepared community could act quickly to save and protect cultural heritage in case of emergency.

➢ *Protecting the cultural heritage from climate change and manmade factors by strengthening the participation and identification of the local communities. Managing authorities should therefore create identities for public spaces and allow people to take care of them personally (e.g. in the context of pilot projects)*.

This is connected to the previous points. Climate Change accelerates and increases some hazards and it is fundamental to take it into account. However, communities should be ready to act in the different situations that could happen in their territory, either if they are climate related, geohazards, or human threats.

➢ *Increasing the resilience of cities, notably by supporting cities dealing with integrated climate protection programmes (e.g. by exploring bio-architecture possibilities, which means designing and reconstructing buildings in an eco-friendly manner)*.

Contributing to urban resilience is one of the objectives of strengthening the resilience of cultural and natural heritage. Again, while climate change is critical, other hazards should not be excluded. This action might extend the concept of culture to the entire city, as the mentioned CURE framework did. That way, the initiatives to develop resilience, both to climate change and other urban hazards, would include the whole city understood as a cultural environment, to be preserved emphasizing the identity of the citizens.

➢ *Developing urban agricultural sites, which focuses on rehabilitating periphery historical sites through food production in cities (i.e. productive green infrastructures, urban orchards). This will allow the partners to explore why urban agriculture should be part of sustainable urban planning in the future*.

The development of agricultural sites within a city might be an interesting option to explore. In some way, this might be connected to the nature-based solution practices developed to strengthen resilience in many different contexts. That would definitely contribute to increase resilience in a sustainable and green way.

➢ *Identifying, evaluating and monitoring risks threatening the built and natural cultural heritage. Firstly, hazards and risk factors that have the potential to endanger heritage sites must be identified. Secondly, data on risks associated with those hazards must be gathered and analysed. Thirdly, strategies for mitigating risks at heritage sites have to be developed. For example, an analysis of the main tourist/culture areas to map their resilience; specific*

emergency/evacuation plans for the most crowded areas; and multilingual information on the action to be taken in case of disasters.

Following the organization of the disaster risk methodology this point would be in fact the first one to take into account, as mentioned before. Developing DRM plans for heritage sites would include: 1. Hazards, exposure and vulnerability studies and assessments, and therefore risk understanding, to be monitored and updated periodically, including analysing and sharing data; 2. Based on that, risk reduction and/or mitigation measures could be developed, as well as 3. Emergency preparedness and response protocols or strategies (including early warning systems, evacuation routes for people and for heritage, etc.), taking into account local populations, visitors and tourists and their specific needs, such as translations, graphics, or additional information displayed for people not familiar to the area; and 4. Resilient recovery plan to be ready technically and financially to act in case an inevitable disaster occurs. Comprehensive DRM plans are always recommended for cultural heritage sites.

The list of potential actions is quite comprehensive and includes many good ideas to strengthen the resilience of cultural and natural heritage through different approaches. Below there is a summary of the key proposals, including some reflections and suggestions about the organization of topics—to be considered that many are interrelated and connected:

- Technical actions: could include the specific initiatives/measures from the DRM field applied to heritage, to effectively strengthen resilience and reduce risk, such as: (i) develop or strengthen DRM plans/measures in heritage sites—including risk assessment, risk reduction, monitoring, preparedness emergency and response, and resilient recovery; (ii) develop guidelines or methodology to help cities to integrate DRM and cultural heritage; (iii) systematize data collection and foster the use of new technologies and innovation.

- Knowledge actions: focused on develop and share information, including (i) foster research and data collection in a systematic way, stored and available for users; (ii) establish indicators for climate change and disaster risk; (iii) compile lessons learned, best practices, and develop pilot projects; (iv) develop learning programs, knowledge exchanges, workshops, trainings; (v) develop risk awareness and communication campaigns.

- Collaboration/cooperation actions: to connect different sectors, professionals, and stakeholders across countries, including (i) establish a systematic/active network of professionals to foster collaborations; (ii) review/analyse current and past initiatives and programs, and create an online platform for knowledge exchange and interaction of professionals; (iii) connect European agencies with academia/universities and other relevant sectors; (iv) foster community engagement programs/activities.

- Environmental actions: designed to promote green initiatives linked to resilience, such as (i) foster sustainable and ecological urban regeneration projects, and nature-based solutions in heritage contexts; (ii) integrate climate change programs in cities; (iii) develop urban agriculture.

- Financial actions: to identify and establish funding resources for cultural heritage protection, by (i) exploring funding opportunities at European and national levels, as well as international opportunities to invest in DRM for cultural heritage, such as risk financing, insurance; (ii) seeking to establish a system to estimate economic value of cultural heritage; (iii) connecting with other sectors such as urban development/upgrading of public spaces to foster resilient heritage.

- Regulation actions: could help to identify legal frameworks for further action, through the (i) analysis of current regulations on climate change, DRM, and cultural heritage at European and national levels; (ii) development of European guidelines to establish cultural heritage inventories.

This list, of course, is not exhaustive, but just a suggestion to organize the potential actions into topics. However, they could be either divided or combined as the team consider better and more feasible to be effectively implemented.

1.6. Conclusions and recommendations

The proposed conclusions and recommendations for next steps are aligned to the Better Regulation, Better Funding or Better Knowledge[9] solutions and actions.

The topic **Resilience of Cultural and Natural Heritage** is already more developed in Europe than in many other parts of the world. As identified through this research, there are many initiatives, research, and good level of awareness, at least at institutional level. Improvements could be made to exchange knowledge and extend good practices and lessons learned through European countries to implement this practical approach to make heritage sites effectively resilient.

Some inputs for the Orientation Paper Topic 5 have been already mentioned in this research. They could be summarized as follows:
- Extending the concept of resilience from just the preservation of sustainable environment to the integration of risk reduction and disaster risk management (DRM) practice;
- Ensuring clarification of concepts and language, e.g.: integrating the definition of Hazard, Exposure, Vulnerability, Risk; and avoiding the use of the adjective "natural" to define disasters.
- Integrate a broader definition of cultural heritage to include intangible and tangible, both movable and immovable, emphasizing their associated values and particular characteristic, very relevant to differentiate from other sectors when developing DRM initiatives.
- Connecting with urban regeneration projects and programs to integrate risk reduction components, ensuring that cultural heritage is revitalized and preserved while strengthening its resilience.

  In this sense, it could be interesting to link with other topics to foster strengthening resilience in other opportunities—for instance, with the cultural and creative sectors (Topic 2, page 29) when mentions to *offer opportunities for the urban regeneration of many underutilised cultural heritage*

---

[9] As stated in the Pact of Amsterdam:

Better regulation: The Urban Agenda for the EU focuses on a more effective and coherent implementation of existing EU policies, legislation and instruments. Drawing on the general principles of better regulation, EU legislation should be designed so that it achieves the objectives at minimum cost without imposing unnecessary legislative burdens. In this sense the Urban Agenda for the EU will contribute to the Better Regulation Agenda. The Urban Agenda for the EU will not initiate new regulation, but will be regarded as an informal contribution to the design of future and revision of existing EU regulation, in order for it to better reflect urban needs, practices and responsibilities. It recognises the need to avoid potential bottlenecks and minimise administrative burdens for Urban Authorities.

Better funding: The Urban Agenda for the EU will contribute to identifying, supporting, integrating, and improving traditional, innovative and user-friendly sources of funding for Urban Areas at the relevant institutional level, including from European structural and investment funds (ESIF) (in accordance with the legal and institutional structures already in place) in view of achieving effective implementation of interventions in Urban Areas. The Urban Agenda for the EU will not create new or increased EU funding aimed at higher allocations for Urban Authorities. However, it will draw from and convey lessons learned on how to improve funding opportunities for Urban Authorities across all EU policies and instruments, including Cohesion Policy.

Better knowledge (base and knowledge exchange): The Urban Agenda for the EU will contribute to enhancing the knowledge base on urban issues and exchange of best practices and knowledge. Reliable data is important for portraying the diversity of structures and tasks of Urban Authorities, for evidence-based urban policymaking, as well as for providing tailor-made solutions to major challenges. Knowledge on how Urban Areas evolve is fragmented and successful experiences can be better exploited. Initiatives taken in this context will be in accordance with the relevant EU legislation on data protection, the reuse of public sector information and the promotion of big, linked and open data.

buildings (both publically and privately owned) could be an opportunity to ensure that the reuse of those buildings include a proper risk assessment and the consequent risk reduction measures.

- Referencing previous initiatives on resilient cultural heritage that could help to build definitions and paths to develop actions, as well as acknowledging DRM, resilience and climate change initiatives aiming to seek cooperation and knowledge exchange.

Some suggestions to develop the paragraphs on Better Regulation, Better Funding and Better Knowledge for Topic 5 – Resilience of cultural and natural heritage (following the model of Topic 1), would include the following brainstorming ideas:

1. **Better regulation:**
   o Compiling and inter-connecting regulations on Cultural Heritage, Civil Protection, Climate Change, DRM and Environment, that may apply to the protection of cultural and natural heritage from either natural and man-made hazards, and the strengthening of resilience at the local and community level.
   o Enhancing interagency / interinstitutional collaborations, either from governments (e.g. DRM authorities, Civil Society, Cultural Offices, etc.) or non-governmental (such as NGOs, humanitarian sector, local experts, etc.) to connect professionals from different sectors and disciplines, aiming to promote knowledge exchange and sharing experiences, as well as organizing potential workshops and work groups to develop practical cooperation in the field to protect heritage;
   o Developing guidance or recommendations to emphasize the integration of culture and cultural heritage into existing DRM, climate change or environmental protocols, guidelines or regulations, aiming to mainstream the role of culture and heritage in creating resilience and helping communities to recover after disasters.
   o Fostering the development of DRM plans or strategies in European cultural and natural heritage sites, with a particular emphasis on emergency preparedness and response measures. Actions to be taken within these plans would include, but not limited to:
     ▪ Data collection (hazards maps, geology studies, weather and climate change studies, cultural heritage inventories, vulnerability assessments, etc.);
     ▪ Risk identification and risk assessment for cultural heritage, including intangible;
     ▪ Risk communication and risk awareness campaigns, community engagement activities and capacity building on creating resilience for cultural heritage;
     ▪ Risk reduction and risk mitigation measures, taking into consideration cultural values;
     ▪ Emergency preparedness and response protocols, including drills, activities and trainings for the local community, key actors and other stakeholders;
     ▪ Monitoring and periodic information updating;
     ▪ Development of resilient recovery plans, including financing mechanisms available to rapid access in case of disaster;
   o Integrating local communities into the decision process and establishment of the DRM plans for the heritage sites, providing trainings and information. In case of emergency they could be the first to act in order to protect their heritage.
   o Fostering the development of inventories of cultural assets in cities – including monuments, historic buildings (either secular or religious), collections such as libraries and museums, and intangible manifestations connected to tangible assets (such as celebrations in religious places, traditions, handcrafts, etc.);

2. **Better funding:**
   o Exploring opportunities from funding assigned to initiatives related to DRM, adaptation to climate change, emergency preparedness and response or post-disaster recovery funds, that can be connected or adapted to the culture sector or specific cultural heritage sites.
   o Providing incentives to develop DRM and resilience strategies in European heritage sites; connecting with the tourism sector through safety and security campaigns;
   o Seeking other mechanisms such as risk financing opportunities or private insurance to be adapted or applied to cultural and natural heritage sites in hazard-prone areas;
   o Identifying opportunities, either through international support or national programs, to allocate funding at national or municipal levels to help mainstreaming disaster risk reduction actions in historic cities or areas.
   o Creating opportunities for strengthening resilience through other projects and programs such as urban regeneration initiatives, environmental programs, etc. There could be an opportunity through Urban Development programs that focus on protecting cultural and natural heritage, to incentivize the inclusion of disaster risk measures to strengthen urban and social resilience.
   o Launching campaigns for innovation and youth engagement in developing solutions to protect heritage assets from hazards. Seeking and fostering also the opportunity to connect with creative industries, for example through art programs such as *Art of Resilience* www.artofresilience.art/. This also would help create risk awareness through innovative approaches to engage population.

3. **Better knowledge:**
   o Reviewing existing as well as past/ended programs and initiatives to identify potential reuse of useful and effective tools or studies than can be replicated in other cultural and natural heritage sites (e.g. *Climate for Culture* used several tools adaptable to heritage contexts)
   o Promoting a systemization of data collection and analysis regarding projects and programs on resilient cultural heritage, either ongoing and from the ones ended to review the results achieved, document lessons learned and best practices, and replicate in other potential cases of similar nature. A potential solution could be the creation of an online platform to compile all the information and references of programs and initiatives.
   o Establishing a European database on resilient cultural and natural heritage, to help countries assessing their heritage at risk, fostering knowledge exchange across boundaries and sharing best practices and solutions to strengthen resilience.
   o Identifying technical and innovative DRM, resilience and climate change initiatives to seek collaboration aiming to integrate cultural and natural heritage as part of their topics;
   o Fostering the use of tools such as Copernicus Service in Support to EU External Action – Cultural Heritage sea.security.copernicus.eu/domains/cultural-heritage/
   o Launching knowledge exchange programs between European cities or cultural heritage sites to share experiences and learning from each other.
   o Supporting the development of University programs and courses on DRM for Cultural and Natural Heritage fostering international exchange between European universities—such as the Erasmus program—including practices in heritage sites in different countries. Examples of this kind of courses can be found in Japan, for instance:
      - the Institute of Disaster Mitigation for Urban Cultural Heritage at Ritsumeikan University in Kyoto, holds the UNESCO Chair Programme on Cultural Heritage and Risk

Management, International Training Course (ITC) on Disaster Risk Management of Cultural Heritage www.r-dmuch.jp/en/project/itc.html

- the UNESCO Chair on Nature-Culture Linkages in Heritage Conservation at the University of Tsukuba organized the Capacity Building Workshop on Nature-Culture Linkages in Asia and the Pacific whc.unesco.org/en/events/1474/

o Enhancing the collaboration between academic researchers and professional / practitioners in the field, fostering the use of technology and innovative solutions (3D modelling, disruptive technologies, GIS, etc.) applied to the protection of heritage from disaster risk and climate change.

o Developing programs, workshops and trainings for citizen engagement across European countries to increase awareness and understand risk to cultural and natural heritage and learn how to act to protect it.

In conclusion, there are many initiatives and studies in Europe connecting cultural and natural heritage with resilience and climate change, and the number of researchers and specialists working in this area seems to be increasing. Likewise, the general awareness and interest in the topic at international level seems to be rising. This topic directly connects with urban development and environmental protectionThere is a huge potential to keep reinforcing and mainstreaming it inside the Urban Agenda, by establishing action plans and providing governments and authorities with guidelines to ensure that their cultural heritage sites and assets are protected from disasters risks.

Therefore, key actions for the Partnership on Culture and Cultural Heritage could be: **1. strengthening the communication and cooperation** between professionals/initiatives across European countries; **2. compiling data** from the different initiatives and programs—related to heritage as well as DRM, climate change, etc.—and making it available for users; **3. supporting the development of new initiatives**, pilot cases and studies, and documenting results and lessons learned in a systematic way, to be shared with other practitioners across Europe.

From a top down approach, helping organizing information, facilitating access to resources (either economic or technical assistance), and supporting the development of actions at local or site level (such as DRM plans for cultural heritage sites involving the community) would contribute to both urban and social resilience, becoming a bottom up approach and reinforcing the Urban Agenda for the European Union.

References and key Bibliography

Brimblecombe, P. & Grossi, C. & Harris, Ian. 2011. *Climate Change Critical to Cultural Heritage*. www.researchgate.net/publication/226219081_Climate_Change_Critical_to_Cultural_Heritage

Chapuis, M. (Ed.) 2009. *Preserving our heritage, improving our environment. Volume I. 20 years of EU research into cultural heritage*. Publications Office of the European Union www.heracles-project.eu/sites/default/files/pages/documents/1263282434_20years_cultural_heritage_vol1_en.pdf

Chechi, A. 2016. "Risks Relating to the Protection of Cultural Heritage: From Climate Change to Disasters," in *Miscenic*, E. and A. Raccah (eds.), Legal Risks in EU Law 199-224.

Daly, C. 2019. "Preliminary results from a legacy indicator tool for measuring climate change related impacts on built heritage," *Heritage Science* 7 no 32

Derouin, S. 2019. "Historic Solutions to Sea Level Rise May Help Modern Communities." *Earth & Space Science News* eos.org/articles/historic-solutions-to-sea-level-rise-may-help-modern-communities

Directorate-General for Research and Innovation (European Commission). 2011. *Survey and outcomes of cultural heritage research projects supported in the context of EU environmental research programmes. From 5th to 7th Framework Programme* op.europa.eu/en/publication-detail/-/publication/2573d211-036f-473a-aab3-da1d345022e8/language-en/format-PDF/source-search

European Commission. 2018. *Safeguarding Cultural Heritage from Natural and Man-Made Disasters. A comparative analysis of risk management in the EU*. Directorate-General for Education, Youth, Sport and Culture Directorate D — Culture and Creativity. Unit D1 – Cultural Policy op.europa.eu/en/publication-detail/-/publication/8fe9ea60-4cea-11e8-be1d-01aa75ed71a1/language-en/format-PDF/source-search

European Commission. 2018. *Heritage at risk. EU research and innovation for a more resilient cultural heritage*. Publications Office of the European Union. op.europa.eu/en/publication-detail/-/publication/1dcbe60b-79ba-11e8-ac6a-01aa75ed71a1/language-en/format-PDF/source-search

ICOMOS. 2019. *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action*, Climate Change and Cultural Heritage Working Group International Council on Monuments and Sites – ICOMOS, Paris, France indd.adobe.com/view/a9a551e3-3b23-4127-99fd-a7a80d91a29e

Lefèvre, R.A., and Sabbioni, C. (eds.) 2018. *Cultural Heritage facing Climate Change: Experiences and Ideas for Resilience and Adaptation*, Bari: EDIPUGLIA www.coe.int/en/web/europarisks/publication-cultural-heritage-and-climate-change

Gustafsson, C. & Mellár, B. 2018. *Research for CULT Committee – Best practices in sustainable management and safeguarding of cultural heritage in the EU*, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels www.europarl.europa.eu/RegData/etudes/IDAN/2018/601988/IPOL_IDA(2018)601988_EN.pdf

Newman, J.; Minguez Garcia, B.; Jain, V. 2017. *Technical deep dive on resilient cultural heritage and tourism: summary report*. Washington, DC: World Bank Group. hubs.worldbank.org/docs/imagebank/pages/docprofile.aspx?nodeid=29987900

Pica, V. 2018. "Beyond the Sendai Framework for Disaster Risk Reduction: Vulnerability Reduction as a Challenge Involving Historical and Traditional Buildings," *Buildings* 8, 50

Romão, X. and Paupério, E. 2019. "An Indicator for Post-disaster Economic Loss Valuation of Impacts on Cultural Heritage," *International Journal of Architectural Heritage*

Sabbioni. C., Cassar, M, Brimblecombe, P., and Lefevre, R.A. 2008. "Vulnerability of Cultural Heritage to Climate Change," *European and Mediterranean Major Hazards Agreement* (EUR-OPA) AP/CAT 44.

Sabbioni, C., Brimblecombe, P., and Cassar, M. 2010. *Atlas of climate change impact on European Cultural Heritage*, Anthem Press.

Sesana, E., et al., 2018. "Adapting Cultural Heritage to Climate Change Risks: Perspectives of Cultural Heritage Experts in Europe," *Geosciences* 8 no. 305.

UNESCO. 2010. *Managing Disaster Risks for World Heritage*. Paris: UNESCO whc.unesco.org/en/managing-disaster-risks/

UNESCO/World Bank. 2018. *Culture in City Reconstruction and Recovery*. Paris: UNESCO and Washington, DC: World Bank. openknowledge.worldbank.org/handle/10986/30733