ARCH – Saving Cultural Heritage from Climate-related and Other Hazards

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Abstract. This presentation will introduce the EU Horizon 2020 project ARCH "Advancing resilience of historic areas against climate-related and other hazards" [1]. The presentation will introduce ARCH's objectives, the work undertaken in the first 18 months of the project, and briefly touch on how these results go beyond the state-of-the-art.

Context and objectives

Historic towns, old urban quarters, villages, and hamlets, as well as historic landscapes make up a significant part of Europe's identity: Natural heritage sites cover roughly 18% of the European land territory [2], and on average 22% of the European housing stock was constructed before 1946 [3]. These historic areas are deeply embedded in larger urban and rural environments, serving a role in preserving local identity and personality as well as local knowledge.

Although climate change has become one of the most significant and fastest growing threats to people and their cultural heritage [4] the impacts of climate-related and other natural hazards on historic areas have not been studied extensively [5], and disaster risk reduction seldom registers as a priority area for management of World Heritage property [6].

Therefore, there is a need for specific methods and tools that provide better information and decision-support for climate change adaptation and disaster risk reduction for heritage managers, urban planners, policymakers, and the general public. These methods and tools need to take the unique physical, environmental, economic, social, cultural, and political aspects of historic areas, as well as the enabling conditions these areas provide for taking action into account.

However, tools and methods alone are not enough. They need to be supported by a stronger promotion of relevant public policies and participatory governance processes, which include residents from local communities and general public. The awareness of climate change
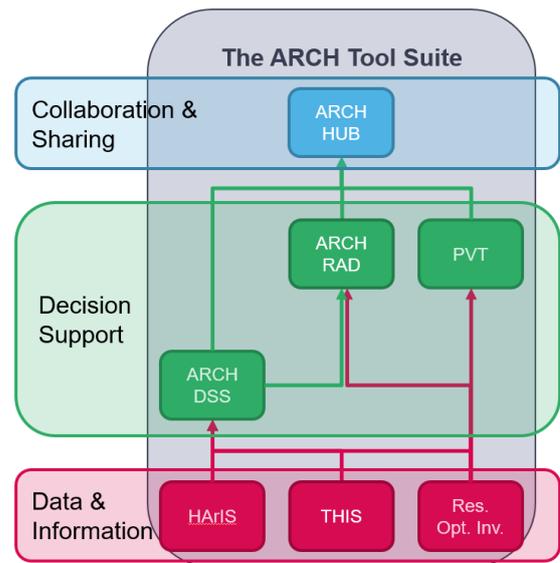
Figure 1: ARCH develops a collaborative, web-based disaster risk management plaform for urban heritage districts.

impacts on historic areas needs to be increased, resilience building strategies need to be included in heritage management policies and practices, while at the same time the role heritage can play for climate change adaptation and disaster risk reduction within the wider urban context has to be emphasized.

The EU Horizon 2020 research project ARCH aims to take a step in this direction. ARCH will provide a suite of tools (see Figure 1) for assessing and improving the resilience of historic areas, and at the same time ARCH will advocate new policies as well as necessary changes to existing regulations for heritage management, climate change adaptation, and disaster risk reduction of historic areas. The ARCH solution will be targeted at heritage managers, urban planners, and other professionals from the fields of climate change adaptation and disaster risk reduction as well as politicians and the general public, in order to improve the cooperation and communication between these stakeholders and to enhance the definition and implementation of sustainable resilience building

strategies.

1 Results achieved so far

ARCH started with the production of a series of state-of-the-art reports of concepts, approaches, standards, and technologies on topics crucial for the project. These reports dealt with, amongst other things, the current state of conservation practices, the concepts of disaster risk management and building back better, gender mainstreaming, decision-support frameworks, as well as existing standards related to the ARCH's topics. Some of the key findings from these reports include:

- Cultural heritage management and disaster risk management remain poorly integrated.
- An indicator-based approach to risk assessments seems most appropriate for historic areas.
- Disaster risk management, for historic areas hinges critically on the inclusion of local communities, local practices, and traditional knowledge.
- Users need to be able to understand the decision process, limitations, and associated uncertainties of a Decision Support System (DSS).

In parallel to the state-of-the-art reports, four City Baseline Reports were compiled that establish the baseline for the municipalities of Bratislava, Camerino, Hamburg, and Valencia, with respect to their selected historic areas. As ARCH has a multi-dimensional thematic focus on 1) cultural heritage management, 2) disaster risk reduction and 3) adaptation to climate change, all three dimensions were addressed in each city's baseline review.

Based on these reports, project partners conducted match-making meetings with each city to match local problems with specific solutions provided by ARCH. These meetings, as well as all co-creation activities of the project, are governed by an ARCH co-creation guideline document that presents a harmonised methodological approach and framework for the cooperation between scientific partners and a city.

In addition to the match-making meetings, each ARCH pilot city identified 'local partnerships' and developed a work plan for local activities, aligned with the research work of the project.

ARCH also looked beyond its pilot cities and compiled a report that maps and characterises European initiatives and case studies on advancing the resilience of cultural heritage to natural and human-induced disasters as well as to the long-term consequences of climate change. Forty initiatives are featured in this report, 32 as snapshots and eight as case studies.

In order to ensure that the solutions developed by ARCH are in line with the needs of local end-users, as expressed in the match-making sessions, and with current practices, a requirements analysis was conducted and system specifications were drawn up. ARCH partners identified 134 requirements across the four pilot cities, each mapped to one or more of the solutions that will be developed by the ARCH project partners.

Based on the exploratory work, ARCH has developed a combined disaster risk management (DRM) and climate change adaptation cycle, the ARCH Disaster Risk Management Framework. The ARCH DRM Framework is specifically aimed at historic areas and helps actors in the fields of heritage management, disaster risk management, and climate change adaptation to understand which steps are necessary to develop a combined disaster risk management and climate change adaptation plan with specific focus on historic areas.

1.1 Progress beyond the state-of-the-art

Although only halfway through the lifetime of the project, with some work packages still in the early stages of work, there is already significant impact and progress beyond the state of the art:

- The ARCH DRM Framework successfully combines the Disaster Risk Management Cycle with the Climate Change Adaptation planning cycle, also including issues of heritage management and social justice.
- The replicability framework developed for the mapping and characterisation of European initiatives and case studies provides an easily usable blueprint for identification of initiatives that might be better suited.
- The ARCH co-creation guideline provides a practical handbook for the consortium on how to conduct successful co-creation in an applied research project, which may be of use to other teams engaging in similar work.
- The establishment of local partnerships in each pilot city and the ongoing co-creation process has already resulted in higher visibility of the issues addressed by ARCH within the city administrations and larger stakeholder networks, e.g.

by establishing committed local cross-departmental partnerships that will ideally live beyond the lifetime of the project.

- The involvement of ARCH partners in formal standardisation processes on national and international level brings the project very close to influencing the state of the art in standardisation fields related to the project topics.

Acknowledgements

References

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