



2nd International Symposium "NEW METROPOLITAN PERSPECTIVES" - Strategic planning, spatial planning, economic programs and decision support tools, through the implementation of Horizon/Europe2020. ISTH2020, Reggio Calabria (Italy), 18-20 May 2016

A novel paradigm to achieve sustainable regeneration in Historical Centres with Cultural Heritage

Trillo Claudia^a, Petti Luigi^b

^a *University of Salford, Salford M5 4WT, UK*

^b *University of Salerno, Fisciano (SA), Italy*

Abstract

Historical urban centres have particular vulnerabilities both to natural hazards and to extreme climatic events. At the same time, cultural heritage is a significant driving force in the European economy, society and culture. This paper suggests that a novel paradigm, capable to tackle the issue of protecting Historical Centres with Cultural Heritage Value with a holistic approach, would allow a sustainable management of their values. Historical Centres with Cultural Heritage Value conservation needs to be integrated into wider urban -and metropolitan- strategies. Setting up a novel methodology for the analysis and management of risk of Heritage City Centres would promote a wider understanding of the social and ecological costs associated with the loss of cultural assets. This can lead to better informed clear and measurable targets and evidence-based decision making. The resulting strategies should help costly damage to valuable Historical Centres with Cultural Heritage Value assets, but will also lead to the enhancement of Heritage City Centres to ensure progressive resilience measures are implemented in the future in metropolitan areas.

© 2016 The Authors. Published by Elsevier Ltd.

Peer-review under responsibility of the organizing committee of ISTH2020.

Keywords: Historical Centres, Cultural Heritage, Climate Change, Sustainable Urban Regeneration

1. Historical Centres with Cultural Heritage Value (HCC) and vulnerability to climate change

Historical urban centres have particular vulnerabilities both to natural hazards and to extreme climatic events. These latter are related to a number of factors including the age and fragility of the fabric of the structures, and for some, their location in places that may become unsafe such as floodplains or steep slopes. Many represent the focus of increased significance in terms of their symbolism to local people (sense of place) and national identity (Marzeion and Levermann 2014; Adger et al. 2012). Flooding in Florence (1966) and other similar events through Europe provide us with a clear understanding of the specific risks that undermine Historical Centres with Cultural Heritage Value. Since 1966, a dramatic increase in severe weather conditions harnessed the Historical Centres with Cultural Heritage Value even further (IPPC 2007). Heavy rainfall is determining subterranean erosion of Palatine Hill in Rome; sea level rise endanger historic places such as Venice and Westminster Palace, the Tower of London and the historic ensemble at Greenwich in London (Adams 2007); in 2002 a flash flooding inundated the historical centre of Prague and in 1994 the Citadel of Alessandria (ICOMOS 2005), acid rain combined with the effects of climate change hasten processes of decay in several places such as the Cimitero Acatolico in Rome (WMF 2007).

The Namur Declaration (EC 2015a), recognising that our societies and heritage are challenged by several threats including climate change and socio- economic crisis, endorses the promotion of a shared and unifying approach to cultural heritage management, based on an effective legal framework for the integrated conservation of heritage, involving all the interested players and stakeholders. Furthermore, being fragile and complex environments, Historical Centres with Cultural Heritage Value conservation need to be integrated into wider urban strategies. Setting up a novel methodology for the analysis and management of risk of Heritage City Centres would promote a wider understanding of the social and ecological costs associated with the loss of cultural assets. This can lead to better informed clear and measurable targets and evidence-based decision making. The resulting strategies should help costly damage to valuable Historical Centres with Cultural Heritage Value assets, but will also lead to the enhancement of Heritage City Centres to ensure progressive resilience measures are implemented in the future (Ribera et al, 2015).

2. The European framework for cultural heritage and socio- economic growth

At European level, consensus exists on the fact that cultural heritage is a significant driving force in the European economy, society and culture. The Horizon 2020 Expert Group on Cultural Heritage “Getting cultural heritage to work for Europe” (EC 2015b) label as “outdated” the “view of environmental protection as only an economic cost factor” (p.6). They argue on the contrary that: “Cultural Heritage must be seen as a special, but integral, component in the production of European GDP and innovation, its growth process, competitiveness and in the welfare of European society. Like environmental protection, it should be mainstreamed into policy and regarded as a production factor in economic and wider policy development” (p.6). Stemming from this position, a major consequence in terms of assessment of the heritage is the shift from a cost- centered view of cultural heritage towards a new position, considering cultural heritage as a strategic resource for a sustainable development of Europe. As well as it is now clear that underestimating environmental risks and neglecting environmental protection increase the costs related to risk- related damages, similarly, neglecting cultural heritage protection leads to significant losses in both economic and social terms (including the tourism sector), that need to be properly assessed through a comprehensive set of financial, economic, social and cultural values, including those related to societal assets such as cultural integrity. This is particularly necessary in Historical Centres with Cultural Heritage Value.

According to the Declaration of Ministers towards the EU Urban Agenda (EU 2015c), cities and towns do play a significant role in the territorial development of the EU, regardless their size. Hence, urban centres of all the scales, including the metropolitan scale, are considered as key-places for putting sustainable development policies forward. Historical Centres with Cultural Heritage Value are therefore the ideal setting to appreciate the role of cultural

heritage as driving force in an urban context and to apply the new concept disseminated through the DG Research and Innovation document mentioned above (EC 2015b).

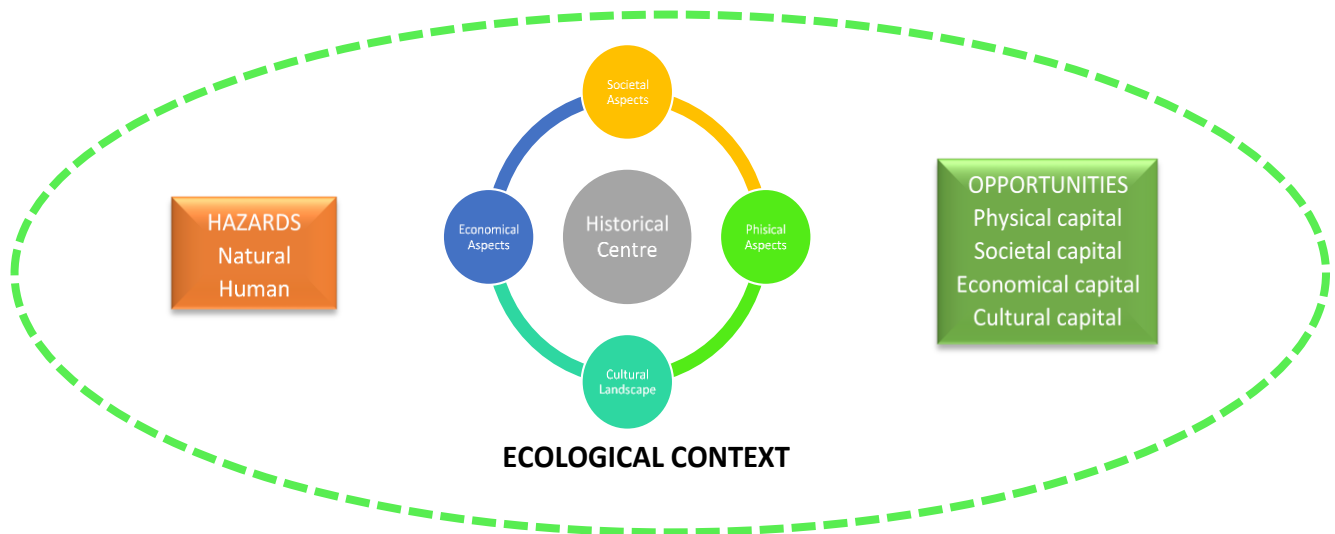
The need for a novel paradigm to achieve sustainable regeneration in Historical Centres with Cultural Heritage Value Cultural Heritage is currently endangered by new challenges related to the climate change and other natural hazards. In a study on the relationship between climate change and the historic environment, Cassar (2005) systematically assessed the impacts of climate change on cultural heritage, establishing a clear rationale behind the need for new actions required by the higher pressure on cultural heritage induced by the climate change and the related policy framework. The case of the Thames Barrier reported by Egloff (2007) is paradigmatic. Those Barriers were built to cope with extreme tidal floodwaters that happened 2-3 times a year in early 1980s, while now they are used 6-7 times a year. One single overtopping would cause catastrophic damage to the World Heritage properties (Egloff 2007: 200). There is a need for site- specific case studies, involving studies on current baseline and analysis of different scenario, as well as vulnerability assessment would require stakeholders' involvement in the studies, as highlighted also by the UNESCO (2006).

3. Re-casting HCC assessment methods with holistic approach

It is hereby suggested that a novel paradigm, capable to tackle the issue of protecting Historical Centres with Cultural Heritage Value with a holistic approach, would allow a sustainable management of their values. The overall concept underpinning the novel paradigm stems from a comprehensive and holistic approach to the historical centres, that holds the potential to better embed both physical and socio- ecological value. Currently, methods used to manage historical centres still rely on a dichotomized approach. From one side, conservation policies and management methods tend to consider interventions as if they were detached from the economic and social values thus underestimating the huge hidden value of the assets. On the other side, financial logic often tends to limit investments because the renovation and protection of these assets are considered too expensive. A more trans-disciplinary and holistically oriented approach would allow a better appraisal of the multi-dimensional values of the HCC, thus paving the way for fostering interdisciplinary collaboration among stakeholders and attracting funding based on a more robust and logical basis to calculate the return on investment.

This assumption stems from the emerging concept of sustainable development, that together with economic, social and environmental aspects includes cultural assets (UNESCO 2015). As urban artefacts, historical centres mirror the network of social relationships developed through the centuries and are able to provide cultural tourism with a varied and multi-faceted offer, both based on landscape and aesthetic of the place, and related to the intangible heritage that underlies the complexity of the urban centre. A thorough approach to risk management in urban centres must be based on the concept that HCC, particularly those that concentrate assets, should place an accurate value on physical, cultural, landscape, ecological and societal attributes in addition to the standard economic value. This is now possible using a range of valuation tools that originated outside the built environment or anthropological/ archaeological communities (Barone et Al. 2015; Petti et Al. 2015). These approaches include social return on investment, wellbeing valuation and ecosystem services analysis. Without better sustainability valuation methods, the intrinsic capital of the historical centres will default to a standard market valuation, which would ignore physical capital, societal capital, economic capital and cultural capital (Fusco Girard & Njicamp 2009). As it is in the nature of the ecological paradigm (oiko-logia), this allows considering historical centres as complex systems, thus requiring an intrinsic trans-disciplinary and cross-cutting approach (Trillo 2012, Esposito De Vita & Trillo 2014). The ecological and holistic approach applied to the risk assessment of cultural heritage in historical urban centres should follow the conceptualization visualised in the Figure 1:

Figure 1. The overall holistic concept underpinning the paradigm (authors' elaboration)



In order to comprehensively assess the range of hazards and threats from climate changes the cumulative effects have to be considered. Therefore, the proposal intends to integrate the following: natural hazards, that include: (1) climate change related natural hazards (flooding; coastal subsidence; raining; temperature) (Petti L. et Al. 2012, 2015); (2) not climate change related natural hazards (seismic hazard, volcanic hazard) and human hazards, that include: (1) lack of maintenance; (2) human pressure. According to the novel paradigm, a consistent evaluation methodology would allot to appraise the overall value of Historical Centres with Cultural Heritage Value and the costs and benefits of investing to protect them against damage from natural and climate change related hazards, in order to keep on exploiting their potential. This will provide the basis for return on investment calculations against a range of scenarios depending on the criteria for investment, and the preferred outcomes of the site managers and the community. This in turn should help to generate evidence-based management plans for Historical Centres with Cultural Heritage Value across Europe.

4. The potential for a novel holistic assessment of HCC

The novel methodology pushes the body of knowledge forward because up to now no specific approaches, methodologies and tools have been ever designed to holistically and comprehensively exploit the socio- economic value of HCC by addressing the risk mitigation and setting a new vision that turns the issues into catalyst for attracting private funding or innovative financial instruments like JESSICA, the Joint European Support for Sustainable Investment in City Areas. By honing the consolidated assessment methods and tools in order to appraise the risk minimisation and management in HCC, it would be paved the way for attracting funding based on a more robust and logical basis to calculate the return on investment specifically within HCC (by reducing insurance costs, for example). This outcome can be converted in a new service made available to different end users: policy makers, decision makers, private companies, private and public owners.

Furthermore, this methodology might impact particularly in the tourism field, as the effective conservation of cultural heritage is precondition for retaining targets in the tourist market. This should be quantitatively assessed through the assessment framework, by estimating the loss of competitiveness in the tourist field following the decrease of value of HCC. In Europe, heritage is vital to the competitiveness of tourism (EC 2010).

A multi-disciplinary methodology would encourage collaboration and cooperation amongst decision-makers at different scales and levels (Heritage Conservation offices, risk management regional and local authorities, city planning offices...) and between public and private stakeholders, such as: public and private owners of heritage properties, private companies running businesses in the risk mitigation and heritage exploitation field. (Trillo 2014). The high level of fragmentation still present in this field will be reduced thanks to the opportunity of a collaborative and interdisciplinary platform for combining cross-cutting issues.

In conclusion, the suggested methodology is ground-breaking because, by applying the innovative concept embedded in the already mentioned document “Getting cultural heritage to work for Europe” (EC 2015b), it leads to a novel approach and method that allows a more effective exploitation of European heritage that encompasses tourism, culture, economic, social, environmental assets.

References

- Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2000). The art of writing a scientific article. *Journal of Science Communication*, 163, 51–59.
- Strunk, W., Jr., & White, E. B. (1979). *The elements of style* (3rd ed.). New York: MacMillan.
- Mettam, G. R., & Adams, L. B. (1999). How to prepare an electronic version of your article. In B. S. Jones & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York: E-Publishing Inc.
- Adam J. (2007) Global Climate Change: Every cultural Site at Risk? In: “Heritage at Risk”, 2006/2007, pp.196-197
- Adger W.N., Barnett J., Brown K., Marshall N. and O’Brien K. (2012) Cultural dimension of climate change impacts and adaptation, in: “Nature Climate Change”, 11 November, 112-117
- Barone F., De Feo R., Giordano G., Mammone A., Petti L., Tomay L. (2015) “A New Strategy of Monitoring in Cultural Heritage Preservation: the Trajan Arch in Benevento as a Case of Study”. In 1st International Conference on Metrology for Archaeology, 22-23 October 2015, Benevento, Italy, ISBN 978-88-940453-3-8
- Richard E. (2015) Developing an approach to Sustainable Return of Investment in the UK, Brazil and the USA, RICS Research Trust
- Cassar M. (2005) Climate Change and the Historic Environment. University College London, Centre for Sustainable Heritage
- Dresch A., Lacerda D.P. and Antunes Jr J.A.V. (2015) Design Science Research. A Method for Science and Technology Advancement. Springer
- EC (2010) Europe, the world’s No 1 tourist destination – a new political framework for tourism in Europe
- EC (2015a) Namur Declaration “Cultural heritage in the 21st century for living better together. Towards a common strategy for Europe”. 6th Conference of Ministers Responsible for Cultural Heritage, 22nd – 24th April
- EC (2015b) Getting cultural heritage to work for Europe. Report of the Horizon 2020 Expert groups on Cultural Heritage. Directorate- General for Research and Innovation
- EC (2015c) Declaration of Ministers towards the EU Urban Agenda, Informal Meeting of EU Ministers Responsible for Territorial Cohesion and Urban Matters, Riga, 10th June
- Egloff B (2007) Archaeological Heritage Management, Climate Change and World Heritage in the 21st Century, in: Heritage at Risk 2006/2007, pp. 200 – 202
- Esposito De Vita G. & Trillo C. (2014). Historical Architectural Heritage valorisation and enterprise promotion: the case of the Brewery, Boston. In: BDC, vol. 14, p.145-164, print ISSN 1121-2918, electronic ISSN 2284-4732
- Fusco Girard L. and Nijcamp P. (Eds.) (2009) Cultural Tourism and Sustainable Local Development, Ashgate
- Getty Conservation Institute (2015) Conservation Perspectives, in: The GCI Newsletter. Spring, Volume 30, N°1
- ICOMOS (2011) “The Valletta principles for the safeguarding and management of historic cities, towns and urban areas”
- ICOMOS (2009) Thematic workshop on cultural heritage and climate change 16th General Assembly and Scientific Symposium Quebec, Canada 1st October 2008 Issued 1st March
- ICOMOS (2005) Heritage at Risk: ICOMOS World Report 2004/2005 on Monuments and Sites in Danger, München
- IPCC - Intergovernmental Panel on Climate Change (2007) Fourth assessment Report on Working Group II on Climate Change Impacts, Adaptation and Vulnerability, Geneva
- Kelmar I. & Glantz H. (Eds) (2015) “Analyzing the Sendai Framework for Disaster Risk Reduction” Special Issue. June 2015, Volume 6, Issue 2
- Marino I., Petti L. and Palazzo B. (2010) “Una strategia a larga scala per la mitigazione del rischio sismico delle opere infrastrutturali: il caso della Regione Campania”, in: *Ingegneria Sismica*, Year XXVII – n. 2 – April-June 2010
- Marzeion B. & Levermann A. (2014) Loss of cultural world heritage and currently inhabited places to sea-level rise, in: *Environmental Research Letters* 9 (2014) 034001 (7pp)
- Petti L. & Lodato A. (2015) “Analisi della domanda sismica del terremoto di L’Aquila 09”, accepted by “L’Ingegneria Sismica in Italia”, ANIDIS 2015 - XVI Convegno, ISBN 978-88-940985-6-3
- Petti L. & Marino I. (2012) “Innovative procedures to assess seismic behaviour of existing structures by means of non linear static analysis: polar spectrum and capacity domains, Buildings, ISSN 2075-5309, doi:10.3390/buildings2030271, pp. 271-282, n.3

- Petti L. & Marino I. (2015) “The polar spectrum: a new spatial representation of seismic demand seismic demand”, pp.1-10. Proceedings of the 14th European Conference on Earthquake Engineering, Ohrid, 2010, ISBN:9786086518516
- Ribera F., Petti L., Miccio G., Landi A. and Lodato A. (2015) “Risk Analysis of Historic Urban Areas: A Case Study of the Salerno City, Italy” accepted by: Journal of Civil Engineering and Architecture
- Rohit J. (2013) Heritage and Resilience. Issues and Opportunities for Reducing Disaster Risks; 4th Session Global Platform for Disaster Risk Reduction
- Trillo C. (2012) Civic Economics and Cultural- Led Urban Regeneration. In: BDC, vol. 12; p. 1231-1255, ISSN: 1121-2918
- Trillo C. (2014). Urban Regeneration and new partnerships among public institutions, local entrepreneurs and communities. In: Advanced Engineering Forum, vol. 11, p. 303 – 313, ISSN print 2234-9898- ISSN doi: 104028/www.scientific.net/AEF.11.303
- UNESCO (2015) Transforming our world: the 2030 Agenda for sustainable development <https://sustainabledevelopment.un.org/post2015/transformingourworld>
- UNESCO (2014) Florence Declaration, "Third UNESCO World Forum on Culture and Cultural Industries “Culture, Creativity and Sustainable Development. Research, Innovation, Opportunities”– 4th October
- UNESCO (2013) Introducing Cultural Heritage into the Sustainable Development Agenda. Sessions 3A and 3A-a. Background Note prepared by Giovanni Boccardi and Cécile Duvette
- UNESCO(2011) A new cultural policy agenda for development and mutual understanding
- UNESCO (2006) Predicting and Managing the Effects of Climate Change on World Heritage, Paris