
Sustainability and Cultural Heritage Buildings

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4.1 Introduction

Conservation of cultural heritage buildings is a demand from society, which recognizes this heritage as a part of their identity, but it is also an economic issue. In Europe, tourism accounts for 10% of the gross domestic product (GDP) and 12% of the employment, if linked sectors are considered [1]. The European Union (EU) is the world's number one tourist destination, with 40% of arrivals in the world and with seven European countries among the top ten [2]. According to the World Trade Organization (WTO) estimates, international tourist arrivals in Europe will increase significantly. The built European heritage, namely monuments or historical centres, is a main attractor for tourism, with 45% of the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage sites situated within the EU. Therefore, the need for their conservation is unquestionable.

Cultural heritage buildings are particularly vulnerable to disasters because they may be deteriorated and damaged, they were built with low-resistance materials, they are heavy, and the connections between the various structural components are often insufficient. The main causes for damage are the lack of maintenance, water-induced deterioration (from rain or rising damp), soil settlements, and extreme events such as earthquakes, but there are many other causes of damage, namely: high stresses due to gravity loading, alterations in layout or construction, cyclic environmental actions, climate change, physical attack from wind and water, chemical and biological attack, vegetation growth, fire, floods, vibration and micro-tremors, and anthropogenic actions. Nevertheless, extreme events often lead to disasters, in light of the high vulnerability.

A disaster is an event caused by nature or man, which causes great physical damage, destruction or loss of life, or a drastic change in the natural environment. Danger is the level of threat to life, property, or environment, but it is important to understand that danger is not correlated to damage, and that disasters are the result of poor risk management. Risk management involves,