

RISK MAP OF HISTORICAL HERITAGE IN TURKEY

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ABSTRACT

Disasters, accepted as unavoidable events, do happen with increasing number in last decades. Although heritage is not taken into account in global statistics concerning disaster risks; historical heritage is increasingly affected by hazards such as earthquakes, floods, fire, mudslides, civil unrest and etc. Generally vulnerability of historical heritage to disasters is recognized and considered after a catastrophic event occurs. Considering this fact, mitigating the risks before any disastrous event and giving response in quick and efficient way in case of event are vitally important in the protection of cultural heritage. Mitigation has to be a part of disaster risk management plan which should include all actors in the field of heritage protection and associate their works properly in all phases of the disaster as preparedness, response and recovery.

The aim of this paper is to prepare risk map of historical heritage in Turkey in order to prioritize mitigation works and being a part of disaster risk management plan in the field of cultural heritage protection. The risk map will be based on vulnerabilities of historical heritage structures to different types of hazards achieved from geographical data and fault lines of the country, information of the frequency and intensity of happened disasters during the history, structural and material typology of historical buildings, behaviour of historical structures, social, legal and political situation etc. Determination of risk parameters is based on natural and human-induced hazards and environmental conditions and policy level as well.

Keywords: Risk, Historical heritage, Disaster, Risk map, Risk criteria,
Risk Map of Historical Heritage in Mediterranean Countries

1. INTRODUCTION

An extraordinary historic, cultural and environmental heritage characterizes, with its diffuse presence, the territories of all the Mediterranean Countries and give evidence of a common identity. It is therefore important to strengthen the Cultural Heritage dimension in the future interregional and translational projects. The conservation of Cultural Heritage represents indeed a strategic value, and such activities should encourage the scientific comparison of models and results as well as the elaboration of projects shared among communities. In particular, it is really important to realize some projects and activities characterized by some innovative and technical solutions that can strengthen the role of the local institutions in preservation and promotion of Cultural Heritage [1].

The implementation of the Risk Map is in line with the definition and implementation of the Protocols for Cultural Heritage conservation that should be shared in the European and Mediterranean area. The project of building a Risk Map foresees cooperation among different institutional partners based in the Mediterranean and the Balkan areas activated at a regional level from all the institutional actors responsible for preservation and management of Cultural Heritage, involving SMEs, research institutes and the academic world.

1.1. Restoration and conservative praxis

According to the definition given in the Restoration Map of 1972, the term of restoration means "...any kind of intervention with an aim of facilitating the reading of some important work of art...". It also

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means... “any kind of intervention in order to efficiently preserve and to integrally transfer to the future such work of art”. The first step in the implementation of such activity is the ascertainment of a damage, which is, totally or in part irreversible. In the meantime, the implementation of an intervention of restoration could remove some historical and essential parts of a monument which characterize its national cultural values [2]. Then it might be necessary to reconsider the role of the restoration activities which traditionally prevail upon the conservation ones. A careful information about the Cultural Heritage (i.e. monumental building) and its environmental interaction is generally required. It will be better to consider such activity as a praxis in the near future. Indeed, the information activities will allow any operator in this field to think about how to reduce the process of deterioration which are related to the Cultural Heritage, taking also into account the environmental risks. All these activities represent an excellent way to implement an effective model of economic, social and territorial development.

2. THE RISK MAPS

2.1. The risk maps

In order to realize the aforementioned ambitious objectives it is essential to apply as much as possible the method of analysis which is clearly defined in the Risk Map. This method of analysis has been defined for the first time by- the I.C.R. of Rome (Istituto Centrale Per Il Restauro). It concerns both the Environmental and Cultural Heritage. With this methodological tool, it is possible to better identify the Cultural Heritage which is placed in a particular area; on the other hand, it is easier to estimate the relations between the concept of vulnerability related to the Cultural Heritage (i.e. the degree of susceptibility to be damaged) and the three levels of risk (i.e. static, structural and anthropic) which characterize a specific territory [3]. Therefore, important and cognitive instruments in order to classify some of the risk factors which are related to the Cultural Heritage and to adopt more appropriate strategies for a better territorial management are developed. The methodological approach of the work will also guarantee the conservation of the territorial cultural identities. There is a strong evidence that a different model of management of such aforementioned instrument of analysis, especially when this methodological tool is applied to the national territory should have been built. In addition, in relation to the cultural specificities of a territory, it is required to involve as much as possible the regional authorities responsible for protection and management of Cultural Heritage.

2.2. Best practices of the regional risk maps

Examinations of the applicability of Risk Map have already been conducted in different Mediterranean Countries, through the implementation of some EC-funded projects. The first experience which deserve to be mentioned is related to the ARCHIMED project, better known as “*Risk Map of Cultural Heritage and Mapping and Description of Cultural Landscape*”. The ARCHIMED project is cofinanced by the Union within the INTERREG IIC Programme [4]. This project gives partners opportunities to compare all the experience related to the realization of a Risk Map in thirteen Italian regions, including Sicily, the Spanish region of Catalonia, and the Greek region of Dodecanese. The project implementation confirms some interesting elements for the analysis, which are stated here below. First of all, it is essential to identify the regional scale in order to define some paths of consultation and the studies aimed at improving our understanding about the specific territorial vocations. Secondly, the Regions become the main actors capable of observing the cultural heritage. The Regions work in order to:

- a) realize some shared data bases;
- b) adopt some criteria and common methodologies aiming at building their regional Risk Maps.

The positive evaluation of the Risk Map experience has been affirmed like a “principle” in the document named “*The Declaration of Palermo on Cultural Heritage and Interregional Partnership in the Mediterranean*”. This Declaration was signed in November 2003, during a seminar held in Palermo, from 26 European, Mediterranean and Balkan Countries. During this event the participants discussed about the topic of Cultural Heritage Management.

The 130 representatives of the Mediterranean Countries strengthened the strategic importance of the Risk Map, considering it as an useful instrument to help each Mediterranean Country in its own strategy aiming at the prevention, conservation and management of Cultural Heritage. From 2005, the region of Sicily is involved in a project which is related to similar topics. The project is titled Noe – Patrimoine et Prevention des Risques Naturels. The project’s aim is to compare some territorial

management tools, such as the Risk Map, in relation to the natural risks that concern Cultural Heritage, with a particular attention to some key topics, such as diagnostic, prevention, participation and communication.

3. ACTIVITY STEPS

The implementation of a Mediterranean Risk Map foresees the following activities:

- census and cataloguing on a bibliographic basis of excellent example of Cultural Heritage;
- census and cataloguing of the Cultural Heritage which has received a formal acknowledgment of interest;
- verification of all data extracted from bibliographical and documentary sources, and production of identifying cards;
- geo-referentiation of the Cultural Heritage already classified and redaction of computer cartographies;
- redaction of thematic and territorial risk maps;
- cataloguing of the vulnerability related to the Cultural Heritage identified;
- creation and application of a specific database which should organize textual, graphical and photographic documentation in order to be shared, updated and integrated among
- definition and application of models of Cultural Heritage management;
- definition and implementation of tools and strategies for knowledge sharing.

3.1. The sources of data

According to the criteria chosen, it is important to create an instrument which describes with homogenous parameters the quality of the existing Cultural Heritage based in different Mediterranean regions. All these activities allows to prepare the cartographies through a common methodology, and guaranteeing the comparison of the results between the different regions. The first activity that should be carried out within the future Risk Map of the Mediterranean regions is the following: the identification of the bibliographical source based upon some analogous criteria. It might be useful to adopt a wider number of sources chosen among those produced with a similar approach in the different regional contexts. A fundamental role could be played by the exiting organizations based in the Mediterranean region which are engaged in activities related to Cultural Heritage management, namely the Arab League Educational, Cultural and Scientific Organization (ALECSO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

3.2. Assessment of dangerousness

The recording activity of the different factors of risk related to the environmental context should be carried out with some computer cartographies, where it is possible to find the Cultural Heritage assessed. The problem, which is not easy to solve, concerns the identification of sources that should be distributed homogeneously in all the Mediterranean territories. It will be necessary, at least, to bring all data collected to an acceptable level of homogeneity. The choice to write down some Risk Maps at the regional scale, even though partially, will disengage from an absolute homogeneity of the data.

3.3. Assessment of vulnerability

The intensity of the risks that concern the Cultural Heritage is strictly dependent on the environmental aggressive behaviour and the degree of its aggressiveness. The risk depend also on the capacity of such Cultural Heritage to resist external solicitations. It's easy to deduce the abovementioned considerations from observing the Vulnerability Cards, which are able to develop some dynamics of interaction with the environment, according to some mechanisms that are replicated artificially in the system of the Risk Map. In the meantime, the opportunity to use an articulate range of cartographic traces of vulnerability will allow to describe the variegated truth which characterizes the Cultural Heritage. The project should resolve the problem of dictionaries which are useful to organize the cards, and to bring them to coherent criteria in order to guarantee the sharing of the acquired information. The importance of the system and its capacity should be recognized to lead the complex galaxy of traces of cataloguing to clear indices of vulnerability, in order to activate better strategies of Cultural Heritage management.

3.4. Thematic Maps

It is possible to assert that the realization of thematic studies facing the problem of conservation and management of some particular types of Environmental and Cultural Heritage will constitute one of

the essential criteria of the Risk Map. Its implementation will allow to observe deeply the Cultural Heritage which strongly characterize the cultural vocations of the territory. It is another example which clearly shows the ductility of the regional instrument of Risk Map, and particularly how this instrument can be functional in order to support models of local development based upon a correct fruition of the Cultural Heritage. Certainly, it will be useful to define some shared and common paths of observation in relation to the thematic natures which constitute the traces of a common cultural line of different countries and regions.

Evidence can come from topics such as the ancient theatrical architectures and the superficial floors of ancient age, which are subject of some specific studies and elaboration of thematic maps from the Sicily Region. The project conducts activities aimed at promoting the definition of specific protocols for conservation which should be shared between the partner participants at the research activity. These protocols could be applied in the specific territorial context. All this activity will allow to identify priorities for planning the exposure detection, including the related interventions, and to address the Policy of territorial management

3.5. Tools for Sharing Knowledge

Founded on March 2006 in Palermo and located at the Centro Regionale per la Progettazione ed il Restauro Herimed is an Euro-Mediterranean institution that groups Institutions and Research Institutes involved in cataloguing, preservation and promotion of Cultural Heritage across ten countries (Algeria, Egypt, France, Italy, Lebanon, Palestine, Portugal, Spain, Tunisia and Turkey), including UNIMED (Mediterranean Universities Union). The adoption and usage of data bases and ICT-based tools for archiving and sharing data is a functional requirement to achieve the aforementioned goals. It must be carefully decided the broad range of valuable tools to define the network enabling participative processes among partners and comparing knowledge and realities of different organizational structures. As a first hypothesis, a thematic portal is conceived for sharing results from activities and a multi-node network of servers able both to independently manage data base dedicated to each single region and guarantee the real-time exchange of data among regions. Such a knowledge sharing must be integrated with the need of an appropriate dissemination of topics and results achieved with research activities. Such a need can be fulfilled through a specific communication project dedicated both to institutions and communities facilitating a strong involvement and thus that cooperation and development processes among all the partners.

3.6. Emergence management

The activation of Mediterranean Risk Maps must contribute to the identification, definition and application of international emergence management models, for natural and not natural catastrophes, providing suitable indications to create specific protection plans, execute risk mitigation campaigns, develop intervention of restoration of high symbolic value [5].

3.7. Enhancing Research on Cultural Heritage

The Risk Map, in its evolution, concretely facilitates the generation of knowledge flows and research networks applied to Cultural Heritage in order to identify shared tools that can guarantee an effective preservation and management. This should put at a common factor different positive experience of research applied to heritage preservation. Hence it should be possible to define and develop research projects based on such themes, according with the consortium of partners involved, and aimed at creating and disseminating best practices on preventive preservation, planned maintenance and sustainable management of heritage so as to increase and improve opportunities to access and sharing of knowledge.

3.8. Risk map and local development

The project presented by the Region Sicily proposes the simultaneous activation of the Risk Map in the Mediterranean regions. Thinking about the experiences conducted in Sicily and in other regions, the Risk Map provides the involved countries with strategic tools for management and intervention on Cultural and Environmental Heritage as it allows to calibrate questions, verify answers and results, plan actions of prevention and effective management of heritage. More concisely, it allows to define a critical territorial planning and a vigilant Policy of preservation and promotion on Cultural Heritage. Furthermore, the realization of Risk Maps in the Mediterranean regions stimulate the aggregation of scientific and institutional partners and enables the growth of local economic systems. Creating and

developing companies allow the exchange of technology know-how and innovative methodological approaches. In few words, all this will facilitate the valorisation of scientific and cultural endogenous resources. As final consideration, stressing the relevance of this project, it must be pointed out that the realization and correct use of the Risk Map will allow to greatly resize the dynamic of degradation processes affecting Cultural Heritage and, consequently, to considerably reduce the cost of intervention for restoration, concurrently increasing the accessibility of monuments and Cultural Heritage inside the Tourism and Culture itineraries of the involved territories [9].

3.9. Damage risk assessment using local hazard map and risk filter

A risk estimate of damage to cultural heritages requires two fundamental components.

- A local risk that indicates vulnerability to disasters according to city planning districts.
- A risk filter that reflects the damage characteristics of a cultural heritage, which are determined by its shape and material quality, in the risk assessment.

The following eight local risks should be considered for each district.

- Earthquake
- Liquefaction
- Landslide
- Mudflow
- Cliff failure
- Fire
- Building collapse due to earthquake
- Flood

These local risk measurements were based on local hazard maps [6-8]. In the measurement of the building collapse risk, specific earthquakes are not anticipated and it is measured by establishing the same condition, such as the strength of the earthquake, in all districts. The local risk information, as well as cultural heritage information, should be inserted into the relational database.

4. CONCLUSIONS

The development of the Heritage at Risk Survey project brought both a new inventory method and a new concept of heritage planning. The survey methodology makes it easier to obtain archival records; faster to produce than hand measured surveys of comparable accuracy, and involving reduced resources. Such systematically organised data represents an invaluable instrument for a realistic strategy planned to make the best use of resources. It introduces new perspectives for intervention and preventive maintenance plans regarding the national architectural heritage. Moreover, data analysis leads to the establishment of intervention priority criteria, the definition of preventive maintenance plans, the study of causes of decay, assessment of potential risks, organisation of specific technical information, as well as to systematic updating of the IPA databases. It has been a commitment to develop a simple tool that proves helpful to the management of the cultural heritage, but at a national scale it overcomes the central administration responsibility and calls for the involvement of local authorities. It has been believed that more than a legal frame, it is through valuable information that heritage is best protected and enhanced. It must be done so with effective inventory tools ensuring critical and updated information on heritage.

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