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HELLENIC MINISTRY OF CULTURE

INTERNATIONAL WORKSHOP
ON DISASTER RISK REDUCTION AT WORLD HERITAGE PROPERTIES

PROCEEDINGS



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TABLE OF CONTENTS

PREFACE

ELENA KORKA

Head of the Directorate of Prehistoric and Classical Antiquities, Hellenic Ministry of Culture, Greece

FRANCESCO BANDARIN

Director of the World Heritage Centre - UNESCO

MOUNIR BOUCHENAKI

Director General, ICCROM (The International Centre for the Study of the Preservation and Restoration of Cultural Property)

ACKNOWLEDGMENTS

INTRODUCTION

GIOVANNI BOCCARDI

Chief of Asia and Pacific Unit, World Heritage Centre, UNESCO

WORKSHOP PAPERS

Section I - International Contributions

MOUNIR BOUCHENAKI

Director General, ICCROM

ICCROM' APPROACH TO RISK MANAGEMENT FOR WORLD HERITAGE SITES

CRISTINA MENEGAZZI

Programme Specialist, ICOM (International Council of Museums)

SPECIFICITIES OF DISASTER RISK MANAGEMENT OF MOVABLE HERITAGE

DINU BUMBARU

Co-Chair, ICOMOS (International Council on Monuments and Sites) ICORP (International Committee of Risk Preparedness) and Policy Director, Héritage Montréal Foundation

RISKS AND (WORLD) HERITAGE: SOME BACKGROUND

PAOLA ALBRITO

Regional Coordinator Europe - International Strategy for Disaster Reduction, UN/ISDR

DISASTER RISK REDUCTION AND CULTURAL HERITAGE

Section II – Greece, Olympia Case Study

GEORGE LYRINTZIS and project team

Forest Operation Techniques Specialist - National Agricultural Research Foundation

THE RESTORATION OF THE ARCHAEOLOGICAL AND BROADER LANDSCAPE OF OLYMPIA

OLYMPIA VIKATOU

Head of the Department of Archaeological Sites, Monuments and Archaeological Research of the Seventh Ephorate of Prehistoric and Classical Antiquities

THE OLYMPIC LANDSCAPE BEFORE AND AFTER THE FIRE

GAVRIIL XANTHOPOULOS

Forest fires researcher-National Agricultural Research Foundation

THE FIRE OF AUGUST 26, 2007 THAT DAMAGED OLYMPIA: WHAT HAPPENED AND LESSONS LEARNT

Section III - Other World Heritage Case Studies

LEONARD AHONON

Site Manager of the Palais Royaux d'Abomey, Benin

CAN THE ROYAL PALACE OF ABOMEY BE AGAIN IN DANGER?

PATRIZIA BARUCCO

ARS Progetti Director Cultural Heritage Sector

DANIELE FANCIULLACCI

ARS Progetti Chief Executive

INVENTORISATION AND EARTHQUAKE HAZARD PERFORMANCE EVALUATION OF RELEVANT HISTORIC BUILDINGS IN ISTANBUL, TURKEY

MARGARITA KISTERNAYA

Senior researcher, PhD (Wood Science)-"Kizhi" State Open-Air museum of architecture, history and ethnography

MEASURES TO ENSURE SAFETY OF THE WORLD HERITAGE SITE "KIZHI POGOST", RUSSIAN FEDERATION

MITSURU NAGAO

Senior Specialist for Cultural properties, Disaster Prevention unit, Architecture and Other Structures Division, Agency for Cultural Affairs

RISK MANAGEMENT AT WORLD HERITAGE - ACTIVITIES IN JAPAN -

ROSE NKAALE MWANJE

Commissioner for Antiquities and Museums

DISASTER RISK MANAGEMENT AT THE WORLD HERITAGE PROPERTY THE KASUBI ROYAL TOMBS, UGANDA

KOSH PRASAD ACHARYA

Director General, Department of Archaeology, Government of Nepal

KATHMANDU VALLEY WORLD HERITAGE SITE DISASTER RISK MANAGEMENT, NEPAL

JUAN RUBIO RUIZ

Chief Officer of the Department for Fire Prevention and Extinguishing and Rescue, Municipality of Toledo

ISABELO SANCHEZ GOMEZ

Chief Officer of the Fire and Rescue Department for the Municipality of Cordoba

FIRE PREVENTION IN SPAIN'S WORLD HERITAGE CITIES

ARI SETYASTUTI

Head of Conservation and Protection Task Force

RECOVERY OF PRAMBANAN TEMPLE AFTER THE EARTHQUAKE, INDONESIA

JOSEF STULC

Director National Institute for Protection and Consecration of Monuments and Sites

THE FLOOD AT THE HISTORIC CENTRE OF ČESKÝ KRUMLOV, CZECH REPUBLIC

GUO ZHAN

Director, World Heritage Expert Committee of China, Vice President of ICOMOS

MANAGEMENT AND STUDY ON RESCUE AND MAINTENANCE OF CULTURAL HERITAGE AFTER THE 8.0-MAGNITUDE EARTHQUAKE IN WENCHUAN, SICHUAN PROVINCE, POPULAR REPUBLIC CHINA

Section IV – Results

ELENA KORKA

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WORKSHOP CONCLUSION

OLYMPIA PROTOCOL FOR INTERNATIONAL COOPERATION

ANNEXES

1. List of Participants
2. Programme
3. Bibliography on line
4. World Heritage 31 COM
5. The 2008 Regensburg Recommendation
6. The 2006 Davos Declaration
7. The 2005 Kyoto Declaration

PREFACE

Elena Korka

Head of the Directorate of Prehistoric and Classical Antiquities, Hellenic Ministry of Culture, Greece

In Ancient Olympia, where Phidias established his workshop 2.500 years ago in order to create the majestic statue of Zeus, another workshop has taking place, serving another purpose, as the result of the initiative undertaken by UNESCO and the Directorate of Prehistoric and Classical Antiquities of the Hellenic Ministry of Culture. It is the International Workshop on Disaster Risk Reduction at World Heritage Properties.

Today, we are experiencing a transitional period of monumental changes in the environment. The international community is facing nature's destructive forces, which threaten not only World Heritage but also human life itself. A tangible proof of this change was the destructive fire that endangered the Archaeological Site of Ancient Olympia in 2007. The site was salvaged thanks to the immediate response of the involved bodies and their superhuman efforts in an uneven fight against the fire.

The organisation of this International Workshop actively corresponds to the global demand for action so as to deal with these risks. We should examine: the identification of all the elements for disaster planning, the analysis and evaluation of risks, risk mapping, the definition of a proper strategy ensuring appropriate risk preparedness and capacity building, ultimately aiming at the risk and disaster mitigation with integrated protection of World Heritage, actions which undoubtedly contribute to sustainable development.

Ancient Olympia, with its stadium and preparation areas (the *palaestra* and gymnasium), is interweaved with struggle, but also preparation. This Workshop constitutes a step toward the necessary stage of preparing ourselves for the efficient protection of World Heritage; we hope that our efforts will be crowned with an olive wreath and that we will manage to safeguard World Heritage.

Francesco Bandarin

Director, World Heritage Centre, UNESCO

World Heritage properties, as with all heritage properties, are exposed to natural and human-made disasters which threaten their integrity and may compromise their values. The loss or deterioration of these outstanding properties is negatively impacting national and local communities, both for their cultural importance as a source of information on the past and identity, and for their socio-economic value.

Unfortunately, most World Heritage properties, particularly in developing areas of the world, do not have any established policy, plan of process for managing risks associated with potential disasters. Existing national and local disaster preparedness mechanisms, moreover, usually do not take into account the significance of these sites and do not include heritage expertise in their operations. As a result, hundreds of sites are virtually defenceless with respect to potential disasters.

Improving the risk management at properties inscribed in the World Heritage List is the main aim of this Workshop. It is thus necessary to prevent and reduce damage from disasters and to preserve the World Heritage cultural and natural values, thereby protecting an essential support for the social and economic well-being of their communities.

The UNESCO World Heritage Centre is therefore grateful to the Greek Ministry of Culture for co-organising this meeting with the Centre, as well as to ICCROM for its valuable technical inputs. Special thanks from UNESCO are also addressed to Mrs Marianna Vardinoyannis, UNESCO Goodwill Ambassador, for providing financial support to the event.

Mounir Bouchenaki

Director General, ICCROM

ICCROM and other international organisations, such as UNESCO, ICOMOS, ICOM, IFLA, are all concerned with the issues that form the topic of the workshop. In the Mediterranean region, whether Italy, France, Greece, Portugal, and also in some countries of North Africa, hectares and hectares of woodland disappear because of fires each summer with incalculable environmental damages and, in most of the cases, threatening cultural resources. It is very important to raise awareness about preventive measures and to put in place appropriate regulations.

ICCROM has started, some years ago, to promote the recognition of the importance of risk preparedness through initiatives involving partnerships with Member States. Activities included participation in conferences, workshops, and training initiatives. Moreover ICCROM advisory action, in cooperation with national and international agencies, has been addressed to the development of appropriate strategies, the organization of training activities, and participating in related technical missions.

Special aspects to be developed related to this topic are strengthening the protection of cultural heritage in a context of general development, integrating heritage into risk reduction policies, and incorporating concern for disaster reduction within site management plans. The exchange of orientations and guidelines is another important aspect to be developed with appropriate means of education and awareness to the importance of risk preparedness.

ACKNOWLEDGMENTS

The World Heritage Centre and the Hellenic Ministry of Culture wish to acknowledge the UNESCO Goodwill Ambassador Mrs. Marianna Vardinoyannis for her financial contribution to the Workshop, which enabled a larger international participation. The invaluable technical contribution of ICCROM, through its Director-General Mr. Mounir Bouchenaki, should be also recognised.

Special thanks go to Mr. Dinu Bumbaru, Co-Chair of ICOMOS International Committee on Risk Preparedness (ICORP); Ms Cristina Menegazzi Programme Specialist, ICOM; Ms Paola Albrito, Regional Coordinator of Europe, International Strategy for Disaster Reduction, UN ISDR and Ms Sue Cole Senior Policy Officer, World Heritage and International Policy, English Heritage, for their participation in the debates and scientific contribution to these proceedings.

The World Heritage Centre is grateful to ICOM for allowing Ms Menegazzi to compile and edit these proceeding.

Most of all, the World Heritage Centre and the Hellenic Ministry of Culture would like to express their gratitude to all the experts that have come to Olympia from various regions of the world to enrich the Workshop with their experiences and practical knowledge.

Giovanni Boccardi

Chief of Asia and Pacific Unit, World Heritage Centre, UNESCO

Rationale for the Workshop

Risks from disasters have been identified as one of the most significant threats to World Heritage properties and their inhabitants. Recently, and possibly in connection with climate change, the rate of disasters related to extreme weather events has increased. However, World Heritage sites which have a risk-reduction component in their conservation and management plans are extremely rare, especially in developing regions. In response to this situation, the World Heritage Committee adopted, at its 31st session in 2007 (Christchurch, New Zealand), a “*Strategy for Disaster Risk Reduction at World Heritage Properties*”¹.

Conceived within the overall framework of the *Hyogo Framework for Action* (HFA), the UN-wide policy in the area of disaster reduction², the *Strategy* aims to “strengthen the protection of World Heritage and contribute to sustainable development by assisting States Parties to the Convention in integrating heritage concerns into national disaster reduction policies as well as in incorporating concern for disaster reduction within management plans and systems for World Heritage properties in their territories”.

The recommendations contained in the HFA are addressed, among others, to all Organizations of the UN system, including of course UNESCO, which are called upon to implement them “*within their mandates, priorities and resources*” (HFA, page 16). The HFA identifies specific gaps and challenges in the following five main areas:

- Governance: organizational, legal and policy frameworks;
- Risk identification, assessment, monitoring and early warning;
- Knowledge management and education;
- Reducing underlying risk factors;
- Preparedness for effective response and recovery.

The objectives and related actions of the *Strategy* have been accordingly structured around the five main priorities for action defined by the Hyogo Framework for Action, but adapted to reflect the specific concerns and characteristics of World Heritage. They are the following:

1. Strengthen support within relevant global, regional, national and local institutions for reducing risks at World Heritage properties;
2. Use knowledge, innovation and education to build a culture of disaster prevention at World Heritage properties;
3. Identify, assess and monitor disaster risks at World Heritage properties;
4. Reduce underlying risk factors at World Heritage properties;
5. Strengthen disaster preparedness at World Heritage properties for effective response at all levels.

For each of the above mentioned objectives, priority actions were identified within the *Strategy*. Since the adoption of the *Strategy* by the World Heritage Committee in 2007, the World Heritage Centre has worked in collaboration with the Advisory Bodies to the 1972 Convention to translate its objectives in concrete actions, including by designing a possible “Programme” containing a series of proposed activities. The launching of the Programme involved the organization of an

¹ The *Strategy for Reducing Disaster Risks at World Heritage Properties* is contained in Document WHC-07/31.COM/7.2, accessible online from: <http://whc.unesco.org/en/sessions/31COM/documents/>

² The *Hyogo Framework for Action* was adopted in 2005 at the World Conference on Disaster Reduction held in Kobe, Japan. It is accessible online from: <http://unisdr.org/wcdr/intergov/official-doc/L-docs/Hyogo-framework-for-action-english.pdf>

international workshop to review its contents, share experiences among managers of World Heritage properties at risk from disasters and develop a network of potential partners.

Following the tragic fire that had struck Greece in the summer of 2007, the Hellenic Ministry of Culture and the World Heritage Centre, in collaboration with ICCROM, decided to organise such a workshop at Olympia, one of the properties most affected by the disaster.

The present document thus contains the proceedings of this *International Workshop on Disaster Risk Management at World Heritage Properties*, which gathered some 30 site managers and experts working on World Heritage properties around the world. These included, of course, Olympia, as well as other outstanding sites such as the Royal Palaces of Abomey (Benin); the Kathmandu Valley (Nepal); the World Heritage properties of Sichuan (China); Istanbul (Turkey); the Historic Centre of Český Krumlov (Czech Republic); Kizhi Pogost (Russian Federation); Cordoba (Spain); and others (see Section III of the Workshop Papers).

Objectives and structure of the Workshop

The objectives of the Workshop included the building of capacity among participating World Heritage site managers through exchange of information and experiences; a review of needs and opportunities with regard to disaster risk reduction at World Heritage properties; and the development of a framework for international cooperation, based on the draft Programme prepared by the World Heritage Centre and built on the principles and overall objectives of the *Strategy*.

This framework, later renamed the “*Olympia Protocol for International Cooperation on Disaster Risk Reduction at World Heritage properties*” (in short, the Olympia Protocol), constitutes one of the main outcomes of the Workshop and is contained in Section IV of these Proceedings.

The Workshop provided as well an opportunity to introduce the Draft of a *Resource Manual on Disaster Risks Reduction at World Heritage Properties*, currently being developed jointly by ICCROM and the World Heritage Centre, with inputs from IUCN. In line with the approach promoted within the *Strategy*, the Workshop included the participation of representatives from the International Strategy for Disaster Reduction (ISDR), and the International Council of Museums (ICOM), underlying the importance of taking into consideration the larger context of disaster risk reduction as well as the movable heritage.

A series of presentations by various resource persons introduced the main concepts and provided the context for the discussions (see Section I of the Workshop Papers). These were followed by the review of a number of case-studies, including Olympia (see Section II of the Workshop Papers). In conclusions, participants were divided in three working groups and asked to review the Draft programme elaborated by the World Heritage Centre and used it as a basis for developing the above-mentioned framework for international cooperation on disaster risks reduction at World Heritage properties.

WORKSHOP PAPERS

Section I - International Contributions

Mounir Bouchenaki

Director General, ICCROM

ICCROM' APPROACH TO RISK MANAGEMENT FOR WORLD HERITAGE SITES

ICCROM, as other international organisations, such as UNESCO, ICOMOS, ICOM, IFLA, is concerned by issues that this topic is rising, especially after the terrible fire which hit the Olympia region where the flames approached this World Heritage Site. A number of meetings have been held, and some principles have been already expressed about risk management of cultural heritage. We shouldn't always look exclusively at the sites, the monuments, the movable heritage, but also at the intangible aspects and the consequences of this disaster on the population living in the surroundings.

Another principle which has been also very widely developed is the preparation and definition of a strategy, which should take into account various elements that a community is suddenly confronted with during the disaster. This would involve both analysis and definition of measures which could mitigate the risk, taking into account also the past experience. It was not a case that the dramatic flood in Florence (1966) and the "Acque Alte" (high waters) in Venice led UNESCO to launch the International Campaign for the Safeguarding of Venice and its Laguna.

We are living in a planet where many regions, subject to earthquakes, to floods, to strong winds, to hurricanes and to tsunami, are still very much populated. In addition and increasingly, conflicts target the symbols of culture to destroy people's identity. So, how can we manage disasters that are not always predictable? The establishment of risk maps, the organisation of appropriate training, the involvement of local communities, the application of proper technologies, all these aspects have been already widely developed and disseminated. As it has been already pointed out, an important issue is that it is untrue that conservation professionals approach disasters only from the point of view of the cultural heritage safety.

Last year we were all struck by this terrible fire in the area of Peloponnesus in Greece which lasted several weeks. All of us witnessed, through the television, the population escaping from the fire, the effort made by the Government of Greece, but also the inevitable damages. The fire touched houses, people, but also one important symbolic site in Greece, which is a World Heritage site, the site of Olympia, which has given rise to the Olympiads. I had the opportunity to discuss, only few weeks after the fire, with the Director of Antiquities of Greece, Ms Vivi Vassilopoulou, and the Head of the Directorate of Prehistoric and Classical Antiquities, Ms Elena Korca, who is also Member of ICCROM Council, as well as with the Goodwill Ambassador to UNESCO from Greece, Mrs. Marianna Vardinoyannis, and agreed that a strategy had to be developed in view of mitigating these natural and human disasters.

In the Mediterranean region, whether Italy, France, Greece, Portugal and also in some countries of North Africa, hectares and hectares of wood disappear because of fires each summer. There are two explanations: one, climatic, due to the high temperature in summer when even the reflection of the sun on a piece of grass can create fire, that can easily expand with wind; the other is human: people willing to speculate on land and to perpetrate criminal acts. Unfortunately, in many places around the world fire is destroying and affecting human beings and their cultural heritage. In the last few years we witnessed a growing phenomenon of fires in the centres of historic cities, as in the case of Quebec, in Canada, and of Seoul, in Korea. In fact, the destruction in a fire of the 600-year-old southern gate, the Sung Nye Gate, to what was once the walled city of Seoul, a landmark that survived foreign invasions and wars to be designated South Korea's top national treasure, has shocked the nation.

We cannot always predict, and all the monitoring methods put in place e.g. for earthquakes can give us maybe some information, few hours before the disaster, but this is not helpful for a real advanced preparation. In South East Asia, UNEP, UNESCO and many governments have put in

place a system in order to warn the populations which are living near the coast about a possible tsunami, because the last one of 2004 was a real disaster. A major conclusion from this important meeting would be to raise awareness about preventive measures and to put in place appropriate regulations.

ICCROM initiatives to tackle risk preparedness issues

ICCROM has started already some years ago the recognition of the importance of risk preparedness, through joint initiatives with Member States, through the participation to conferences, workshops, training initiatives, and also advising in cooperation with national and international agencies on the development of appropriate strategies. In relation to participation at conferences and seminars we could mention ICCROM participation to the thematic session on cultural heritage risk management in the framework of the *World Conference on Disaster Reduction* in Kobe, Japan, in 2005. Japan has fortunately regulations already in place. Nevertheless the scale of the earthquake is over any regulation.

In addition, on 31st of August 2006, a workshop about integrating traditional knowledge systems and concern for cultural and natural heritage into risk management strategies was organized in cooperation with the World Heritage Centre of UNESCO in Davos, Switzerland, in occasion of the *International Disaster Reduction Conference*; as well as an expert meeting for the development and wide dissemination of the risk management approach to collections in collaboration with the Canadian Conservation Institute, Canada, and Netherlands Institute for Cultural Heritage in March 2007.

ICCROM is also looking at the aspects concerning movable heritage during a disaster: such as works of arts, books, manuscripts. After disasters I could personally witness how the objects in the museum are affected, in particular fragile objects such as ceramics, pottery, objects in precious material. These are issues that should be considered in the preparation of strategies for reduction of impact produced by disasters. ICCROM has conducted a number of training activities. The most recent is the *International Course on Preventive Conservation*, in Ottawa in October 2006, which was addressed specifically to collections' professional. Another regional course on *Preventive Conservation - Reducing Risks to Collections*, was co-organized by ICCROM, the Romanian Ministry of Culture and Religious Affairs, and the ASTRA National Museum Complex in Sibiu, Romania, the European Capital of Cultural 2007, on last June-July. This course on the topic of Risk Management is an outcome of ICCROM partnership with the Canadian Conservation Institute and the Netherlands Institute for Cultural Heritage. It also benefited from the collaboration of the Canadian Museum of Nature, the National Museum in Belgrade - Department for Preventive conservation 'Diana', the National Archives of Hungary, and other institutions. Another course was done in cooperation with the UNESCO Beijing Office in Ulaanbaatar in Mongolia, on introduction to preventive conservation, focusing on textile that had a very good impact on the conservators in Mongolia. Then we had another course, which has been an introduction to risk management of cultural heritage, organised with the Academy of Arts and Design in Stuttgart, Germany, also last year, and the *Teamwork for Integrated Emergency Management* course developed in partnership with ICOM and the Getty Conservation Institute in the framework of ICOM's Museums Emergency Programme.

ICCROM has developed an educational kit with teaching materials that has been translated into Arabic. Mr. Herb Stovel, formerly at ICCROM and, at the same time, member of Executive Committee of ICOMOS, prepared in 1998 the booklet "Risk Preparedness, a Management Manual for World Cultural Heritage" with ICOMOS and the World Heritage Centre, translated into Arabic in 2007.

In addition, ICCROM is participating in a number of missions aiming to identify the suitable means, according to the specific situation, in order to strengthen the protection of cultural heritage and contribute to sustainable development, through promoting the integration of heritage into risk reduction policies and addressing concerns for disaster reduction within site management plans.

Conclusions

This Workshop brings concrete experiences by scholars and by professionals in the field and, through this exchange, a number of guidelines and orientations can be developed. At this regard, thanks to an agreement with Google, we are developing at ICCROM a more expanded networking system with all our partner institutions dealing with the study and protection of cultural heritage. Certainly this could be available as a tool to facilitate the exchange and the development of information about risk preparedness.

Education is the basis. Many conferences are insisting in the fact that attention should be given to young generations: making them aware of the importance of cultural heritage, tangible and intangible. In bringing the attention to young generations, we introduced the notion of preparation to risks.

This Workshop will come out with very important orientations for professionals, decision-makers who have in their hand also the possibilities of launching regulations, of giving instructions to the different authorities at different levels in different countries. This is the role and this is the value of such a meeting.

Cristina Menegazzi
Programme Specialist, ICOM

SPECIFICITIES OF DISASTER RISK MANAGEMENT OF MOVABLE HERITAGE

Abstract

ICOM (International Council of Museums) has undertaken in 2006 a research in order to identify museums that are included in the World Heritage list of UNESCO either as a museum itself, or as part of a complex, or as a content of a listed site. More than 1300 museums are concerned with the World Heritage list among cultural and mixed properties.

Movable heritage requires specific protection measures, methodologies and techniques. The Disaster Risk Management of movable heritage has some peculiarities too that can be included into the Strategy for Disaster Risk Reduction for World Heritage Properties.

The loss of movable heritage during a catastrophe means a loss of value for the local identity and for the national and international community. It also represents a loss of an opportunity of social and economic development.

ICOM maintains among its priority Disaster Risk Management actions in order to make people aware of the value of heritage and of the role that heritage could play in our multicultural society. In particular, ICOM has launched in 2002 the long term Museums Emergency Programme (MEP), which is its main activity in the field of the protection of museums in emergency situations and which aims at developing and disseminating the tools museums need to protect themselves in order to in turn best protect our cultural heritage in the worst of times.

The programme includes different modules where the training component and the awareness raising of the potential hazards threatening the cultural heritage are playing the major role. The Programme will respond to the global need for museums to develop expertise in the areas of risk management taking into consideration all kind of emergency situations such as human made and natural catastrophes. Intercultural and interdisciplinary approaches have been taken into consideration enhancing the quality of the results obtained while the role of the communities and their responsibility vis-à-vis the cultural heritage protection, the preservation of the environment and of the local traditions have also been tackled.

In the framework of the Museums Emergency Programme, ICOM initiated the partnership with ICCROM and the Getty Conservation Institute to develop the "Teamwork for Integrated Emergency Management" (TIEM) course.

Key words: museum, collections, integrated emergency management, traditional knowledge, intangible heritage, evacuation plans

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Introduction

Disaster Risk Reduction is one of the main preoccupations of the five existing cultural heritage NGOs constituting the International Committee of the Blue Shield (ICBS) that have their own specificity by dealing with different kind of heritage: books, monuments and sites, museum objects and collections, audiovisuals, archives... In all NGOs mission³ it can be found, in a more or less extensive way, some common points such as: the world wide distribution of the activities and the fundamental interest in the preservation of the cultural heritage in all its representation.

³ ICA mission: <http://www.ica.org/static.php?ptextid=mission&plangue=eng>

IFLA mission: <http://www.ifla.org/III/intro00.htm>

ICOMOS mission: http://www.international.icomos.org/mission_eng.htm

ICOM mission: <http://icom.museum/mission.html>

CCAAA mission: <http://www.ccaaa.org/what.shtml>

More specifically in the field of preservation, IFLA has created in 1984 the *Core Activity on Preservation and Conservation* (PAC) (<http://www.ifla.org/Vl/4/pac.htm>) to focus efforts on issues of preservation and initiate worldwide cooperation for the preservation of library materials, while ICOMOS has an *International Scientific Committee on Risk Preparedness* and an annual publication: "Heritage @ Risk" (<http://www.international.icomos.org/risk/index.html>). ICOM has developed in the last six years two main activities on disaster risk management (http://icom.museum/risk_management.html): the *Museums Emergency Programme* (MEP in 2002) and the *Disaster Relief for Museums'* initiative (DRFM in 2005).

Despite of the specificity of each NGOs, nevertheless their fields of interest and action go across the borders: many museum, archive and library collections are kept in historic buildings; museums have libraries and archives in their institutions; archaeological sites have dig storages with collections and site museums too; monuments and palaces have collections (objects, books, pictures, videos...); churches, temples and mosques include sacred objects, manuscripts, documents...; libraries and archives preserve objects among their collections, and so on. This thought can bring us to the conclusion that an integration of movable and immovable heritage concerns in the disaster risk reduction has to be foreseen for a more comprehensive and holistic approach. Thus as the disaster risk management of movable heritage has some peculiarities it should be included into the Strategy for Disaster Risk Reduction for World Heritage Properties.

Recent Declarations and Recommendations inspiring ICOM activities in Disaster Risk Management

The "Kobe/Tokyo Declaration on Risk Preparedness for Cultural Heritage", which is the result of *The International Symposium on Risk Preparedness for Cultural Properties* held in Kobe/Tokyo in January 1997 was intended to guide governments to improve their ability to integrate concern for cultural heritage within existing emergency planning and response infrastructures. At the same time, it gave to ICOM the principal guidelines for starting designing and developing in 2000 the Museums Emergency Programme (MEP) and for integrating the suggestions from interdisciplinary and multicultural specialists attending the Symposium.

Under the framework of MEP, ICOM organised in 2003 the *International Symposium on Cultural Heritage Disaster Preparedness and Response* in Hyderabad, India where cultural heritage professionals together with civil defence, military, and humanitarian organisations representatives discussed issues on community responsibility and involvement; preserving the environment and local traditions; and networking, coordinating and collaborating among diverse institutions and organisations in emergency preparedness and response. The Symposium resulted into recommendations⁴ that are addressed to ICOM, to ICOMOS to ICCROM, to UNESCO and to the museum community in general. Several of them concern the training and capacity building activities.

The "Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters"⁵ was adopted at the *Kyoto International Symposium 2005 - Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster*. On that occasion the structure of the *Museums Emergency Programme* and the teaching approach of its *Teamwork for Integrated Emergency Management* (TIEM) course have been presented. In a more broader way, the "Hyogo Framework for Action 2005-2015", result of the *World Conference on Disaster Reduction* held in Kobe, Hyogo, Japan also in 2005, together with the above mentioned Kyoto Declaration have been taken into consideration by ICOM in the development of the training curriculum of the TIEM course together with its partners.

ICOM was represented at the *International Disaster Reduction Conference* (IDRC), special session on: "Integrating traditional knowledge systems and concern for cultural and natural

⁵ For the consultation of the text, see the following link:

http://icom.museum/disaster_preparedness_book/annex/recommendations1.pdf

⁵ For the consultation of the text, see the following link: http://www.heritagerisk.org/kyoto_declaration.pdf

heritage into risk management strategies” organised by ICCROM, ICOMOS and the WHC-UNESCO on 31 August 2006 in Davos, Switzerland. The meeting resulted into the “IDRC Davos 2006 Declaration”⁶ where, under chapter: Education, Knowledge and Awareness, it says that: “Concern for heritage, both tangible and intangible should be incorporated into disaster risk reduction strategies and plans, which are strengthened through attention to cultural attributes and traditional knowledge”.

The Museums Emergency Programme (MEP)

After having explored and taken into consideration that many entities outside the cultural heritage world are involved and have a lot of experience in disaster risk management - such as the humanitarian organisations like the International Committee of the Red Cross (ICRC), *Médecins sans frontières* (MSF); the Civil Defence; the military; the UN Organisations like UNESCO, the United Nations International Strategy for Disasters Reduction (UN-ISDR); the insurance companies; the fireman, the public and private agencies like the Federal Emergency Management Agency (FEMA), the Asian Disaster Preparedness Center (ADPC), etc. - and being convinced that ICOM could learn from the above entities’ experience, ICOM launched, in 2002, the Museums Emergency Programme (MEP) as its institutional contribution in support of the ICBS mission.

The Programme responds to the global need for museums to develop expertise in the areas of disaster risk management. It emphasises training and collaboration within regional communities and at the same time tries to raise awareness on the vulnerability of museums and create self-sustained regional networks equipped with basic instruments and reference material.

Collaboration with specialised institutions at international and local levels has been and will be a priority in order to avoid overlapping of actions in the same field. The Blue Shield National Committees network, together with the National and relevant International Committees of ICOM - the International Committee for Conservation (ICOM-CC), the International Committee for Museum Security (ICMS), the International Committee for the Training of Personnel (ICTOP) - the Getty Conservation Institute (GCI), ICCROM, UNESCO, ICA, ICOMOS, IFLA and ICRC and other humanitarian organisations have played and will continue to play an active part in the development and implementation of the programme.

The aim of the programme is to advance understanding and awareness of the nature of disasters and how to limit and contain damage by using preventive conservation measures and rapid interventions in order to save cultural heritage. Clearly, consideration is given to a variety of specific types of natural and man-made disasters, such as earthquakes, floods, hurricanes, tornadoes, volcanoes, armed conflict etc. The Museums Emergency Programme is a long-term programme divided into 6 modules among which training and awareness raising activities and the production of support tools in the field of disaster risk management play a major role. Module 4 is the education initiative of the Programme. Under this context, ICOM, together with the two partners in this training collaboration: ICCROM and the Getty Conservation Institute, developed in 2004 the “Teamwork for Integrated Emergency Management” (TIEM) course⁷ addressed to museums and cultural heritage institutions.

TIEM curriculum topics

The curriculum takes into account the fact that institutions have differences in resources, size, culture, traditions, etc. Teaching therefore emphasises how museum teams can adapt approaches to integrated emergency management to their particular situations. Curriculum topics are intended to be adapted and modified according to different context and regions. Some of them are: introduction to the concept of integrated emergency management addressing the museum buildings, the collections and institutional operations; terminology and definitions; integrated emergency management process/cycle; different types of risks and their nature; risk analysis

⁶ See the text at : http://www.davos2006.ch/Declaration/IDRC_Davos_Declaration_20060908.pdf

⁷ See the following link : http://icom.museum/mep_module4.html

exercise; methodologies for risk and vulnerability assessment; risk perception; creation of professional and technical alliances with local/ national/regional emergency preparation and response providers; creation of local support and alliances: social, political, economic; development and implementation of emergency plans and strategies before the emergency (prevention and mitigation), during the emergency (response actions) and after the emergency (recovery); risk transfer: insurance consideration for museums; the building maintenance strategies; techniques for handling the collections; techniques for fixing and protecting objects in exhibition and storage areas (Fig.1 to 4), aids for emergency response planning; local traditions for the mitigation of risks ...



Fig.1 and 2 Salvaging measures (left) and packaging of salvaged artefacts (right). (C. Menegazzi 2007)



Fig3 and 4 Fixing technique in earthquakes' prone countries, Istanbul, Private collection (left) and National Archaeological Museum (right). (C. Menegazzi 2005)

Local tradition(s) for the mitigation of risks and Community involvement

One of the specificity of the course and of the MEP programme is the respect for local traditions. The TIEM approach emphasises the importance of respecting local traditions in disaster risk management. Throughout the whole course, traditional – and sometimes forgotten- mitigation measures to manage risks have been identified, collected and discussed.

Whether in a museum or another site within a community, the protection and security of cultural heritage will be the responsibility of a diverse group of people both within and outside of the institution. These include personnel responsible for administrative, technical and support duties, as well as local, national or regional emergency responders (i.e., fire and rescue departments,

regional emergency prevention units, the Red Cross, etc.), and various community 'stakeholders'. The alliance of these groups of individuals is critical to the creation of viable and sustainable integrated emergency management strategies for cultural heritage. Therefore, while the TIEM curriculum has been developed primarily for the training of museum personnel, it intends to bring them into contact with other cultural heritage and emergency professionals as well as community representatives with whom they must engage.

The table that follows shows some examples of traditional mitigation methods that were collected and discussed during the TIEM course organised in Asia in 2005-2006.

TRADITIONAL MITIGATION KNOWLEDGE

COUNTRY NAME	TYPE OF HAZARDS	METHOD INFORMATION
CAMBODIA	Flood/Humidity Pest	<ul style="list-style-type: none"> • Tobacco tramped in water to put on the surface of the wooden object (after a flood against mould) • Birds of prey against bats
INDIA	Pest Pest and water Water/Flood Rats Fungus and pest Earthquake and tsunami	<ul style="list-style-type: none"> • Dried neem leaves. For books, you put them inside the pages. For textiles, you put between the layers of the folder of textiles. For wood and for any organic material. • Peacock feathers to prevent insect and lizards. Only one feather is enough for one room exposed on the wall. • Linseed oil for the preservation of wooden object displayed in open areas will prevent from insect attack and from humidity. • Make the landscape in such a way that the water should flow in other direction not entering in the exhibition and/or storage area. • Pieces of papaya fruits displayed in the room where organic material is displayed. • Natural camphor for organic materials. • Look at the behaviour of animals.
SRI LANKA	Pest	<ul style="list-style-type: none"> • Resin oil exposed to the air for old books, old printed maps; • camphor exposed to the air and display cases for textiles and other organic material, • linseed oil (dorana) applied like varnish on the paintings against moisture and dust; • and cinnamon oil exposed in the air (for books and manuscript)
TURKEY	Physical Forces	<ul style="list-style-type: none"> • Half-timber houses as consolidation technique in earthquake region • Fixing technique for fragile objects • Objects packing and storing methods
PAKISTAN	Physical Forces	<ul style="list-style-type: none"> • Half-timber houses as consolidation technique in earthquake region
SAMOA	Physical Forces	<ul style="list-style-type: none"> • Traditional houses on wood and ropes against wind and hurricanes • Traditional windows against wind and hurricanes
JAPAN	Pest	<ul style="list-style-type: none"> • To expose to air (in shadow) in summer or autumn books and/or objects normally in storage, so as to prevent from insect attacks.

Integrated Emergency Management approach

The curriculum of the training course as well as the approach of the whole Programme focus on risk assessment, emergency preparedness, response and recovery— or Integrated Emergency Management. This approach has been developed considering all the aspects that are associated to museum disaster risk management, such as: the local landscape and the environment, the building, the premises, the staff, the public, the stakeholders and local communities, the decision makers and the collections. The new element that has been introduced into the Integrated Emergency Management approach is that the collections have to be considered as composed not only by objects themselves, but also by their documentation in paper and digital format (inventory, catalogue, pictures...). An object dissociated from its documentation decreases or loses completely its value and can easily be found in booty of an illicit traffic. The related intangible heritage aspects of an object -such as the oral knowledge about the use of an object during rituals, or about a method of conservation and about a technique of creation- should also be taken into consideration by the Integrated Emergency Management approach. Therefore, the museum emergency plans that result from an Integrated Emergency Management approach should also include some actions and finances to the safeguard of the inventories and the intangible heritage concerned by the collection's object items.

Disaster risk management of movable heritage-evacuation of objects, as an example

The disaster risk management of movable heritage has some peculiarities. Apart from considering all the aspects related to the museum building and its emergency plan, which are common to immovable heritage too, one additional aspect to be considered is the evacuation plan of museum objects and its related documentation. This plan has to be designed, tested and put into place whenever necessary (Fig.5).



Fig.5 Building an evacuation plan in occasion of the TIEM-SEE course. (C. Menegazzi 2007)

The emergency situation caused by a particular hazard, differs case by case. It is therefore necessary to describe a possible scenario of what could happen in the museum (room by room, floor by floor...) in occasion of each of the potential hazards. This permits to anticipate and identify the possible risks and the consequent damages. In order to decide which object can be evacuated in occasion of an emergency it is necessary to identify the value criteria for singling out the list of priority objects. These criteria have to be crossed with the different type of hazards and their entity. The definition of the “values” and of the “Priority list” should be done in team, with the contribution of different professional profiles (Security manager, Conservator/Restorer, Curator, Fireman, Museum Director, etc.). A rate range has to be defined too. As an example, the object with the highest number is the one to be put on the top of the priority list (see the following table: Object 1 with 33 points). This result can of course be discussed again during the team session and readjusted. The same value's table can be used and adapted by discussing possible hazards related to fire, flood, theft... The following table shows an example of values/criteria that can be considered for a sample of museum objects in order to prioritise the evacuation in case of an emergency.

CRITERIA FOR SINGLING OUT THE LIST OF PRIORITY OBJECTS FOR EVACUATION

Inventory Number/Type of object	Economic value (insurance)	Symbolic value	Subjective value	Historic value	Collection Contest value	Accessibility	Weight	Encumbrance/Bulk	Fragility	Intangible relation	TOTAL
Object 1 Part of a golden crown	4	2	5	4	3	1 (exhibited in a locked showcase)	5	5	3	1	33
Object 2 Contemporary Art Mobile (ex: Calder)	3	2	4	3	3	2	4	1	1	1	24
Object 3 Feathers head cover	3	4	3	2	5	1	5	2	1	5	31

Scale: from 1 to 5, being 5 the highest value

Conclusions

ICOM's Museums Emergency Programme was launched in 2002, overlapping two key periods in the recent history of the destruction of cultural heritage (Afghanistan in 2001, Iraq and Iran in 2003 both striking examples of such disasters) and continuing during the earthquakes and tsunamis of 2004 in the Indian Ocean, the hurricane in USA and the flood in Central America both in 2005, during the February 2006 destruction of the golden dome of the Shiite Iman Ali al-Hadi Shrine in the city of Samarra in Iraq, the August 2007 earthquake in Peru and the very recent collapse of the Archives of the City of Cologne in Germany in March and the earthquake in the Abruzzi region in Italy in April 2009 ...

This reminds us that unfortunately catastrophes are very democratic, because they tackle all the countries of the world and can occur in every moment. ICOM, with the Museums Emergency Programme, would like to make museum professional as well stakeholders and policy making bodies aware of the fragility of their unique collections, its value for the local and international communities and its vulnerability. ICOM will continue to work at international level in the respect of cultural diversity and with a broader scope that goes beyond the museums limits in order to include cultural heritage concerns into the global disaster risk reduction strategies and plans and is therefore available to continue the collaboration with the World Heritage Centre in the implementation of its *Strategy for Disaster Risk Reduction at World Heritage Properties* through the "Olympia Protocol for International Cooperation".

References

Natural Disasters

BARIL, Paul. "Fire Prevention Programs for Museums". In *Technical Bulletin*, Ottawa, Canadian Conservation Institute, No. 18, 1997, 12 p. ISBN 0-660-16968-1. ISSN 0706-4152.

ISTITUTO CENTRALE PER IL RESTAURO (Italy). *La Carta de Riesgo : una experiencia italiana para la valoración global de los factores de degradación del patrimonio monumental* / Marcelo Martín (coord.) ; Rosalía Gómez Muñoz y Fiannetta Cincera (trad.). [Sevilla, Spain], Junta de Andalucía Consejería de Cultura y Medio Ambiente, Istituto Italiano di Cultura, [1992]. 58 p. ISBN 84-8726-32-6.

PICHARD, Pierre. *Emergency Measures and Damage Assessment After an Earthquake*. Paris, UNESCO, [ca 1984]. 40 p. + ann. (Studies and Documents on the Cultural Heritage ; 6).

Human Disasters

DUTLI, María Teresa. *Protection of Cultural Property in the Event of Armed Conflict: Report on the Meeting of Experts (Geneva, 5-6 October 2000)* / in coop. with Joanna Bourke Martignoni, Julie Gaudreau. Geneva, ICRC, International Committee of the Red Cross, 2002. 223 p. ISBN 2-88145-119-5. (Also in French/Existe aussi en français).

MANISCALCO, Fabio (a cura di). *La Tutela del patrimonio culturale in caso di conflitto*. Napoli, Italia, Massa Editore, cop. 2002. 374 p. (Mediterraneum. Tutela e valorizzazione dei beni culturali ed ambientali ; 2). ISBN 88-87835-18-7.

Proceedings of the International Congress "Catastrophes and Catastrophe Management in Museums", Sarajevo, 17-21 April 2001 = Zbornik radova sa međunarodnog kongresa "Katastrofe i zaštita od katastrofa u muzejima", Sarajevo, 17.-21. april/travanj 2001 / ed. by Sylvia Mader. Sarajevo, Zemaljski muzej i Bosne i Hercegovine ; Innsbruck, Tiroler Landesmuseum Ferdinandeum, 2004. 289 p., ill. ISBN 9958-502-00-3 (ZmBiH) ; 3-900083-07-X (TLF).

SOCIETÀ ITALIANA PER LA PROTEZIONE DEI BENI CULTURALI. *Uno Scudo Blu per la salvaguardia del patrimonio mondiale : Atti del III Convegno Internazionale sulla Protezione dei Beni Culturali nei Conflitti Armati, Padova, Italia, 19-20 marzo 1999* / a cura di Massimo Carcione. Milano, Edizioni Nagard, cop. 1999. 211 p. ISBN 88-85010-55-5.

TOMAN, Jiří. *The Protection of Cultural Property in the Event of Armed Conflict*. Aldershot, UK, Dartmouth ; Paris, UNESCO, 1996. 525 p. ISBN 1-85521-800-3 (Dartmouth) ; 92-3-102862-6 (UNESCO).

WORLD BANK (THE). *Post-Conflict Reconstruction: The Role of the World Bank*. Washington, D.C., USA, The World Bank, cop. 1998. x, 69 p. ISBN 0-8213-4215-0.

Traditional Knowledge

AGRAWAL, Om Prakash. "An Asian View of Conservation". In *Museum International*, vol. 27, 4, Paris, UNESCO, 1975, pp.157-160.

ICCROM Conservation Studies 3. *Conservation of Living Religious Heritage*. Edited by Herb Stovel, Nicholas Stanley-Price and Robert Killick. Rome, ICCROM, 2005.

JADÉ, Mariannick. Patrimoine immatériel-Perspectives d'interprétation du concept de patrimoine. Paris, L'Harmattan, 2006, pp. 278. ISBN 2-296-00295-1

SIDI, Ali Ould. "Monuments and Traditional Know-how: the Example of Mosques in Timbuktu". In *Museum International*, vol. 25, 1-2, Paris, UNESCO, 2006, pp.49-58.

ZUZAQO, Lin, "The Traditional and Modern Preservation of Library Rare Books and Precious Materials in China". In *International Preservation News*, no. 19, Paris, IFLA, July 1999, pp.8-11.

General Literature on Risk Management in Cultural Institutions

DORGE, Valerie and JONES, Sharon L. *Building an Emergency Plan: A Guide for Museums and Other Cultural Institutions*. Los Angeles, Calif., USA, The Getty Conservation Institute, cop. 1999. viii, 272 p. ISBN 0-89236-551-X.

HUNTER, John E. *Emergency Preparedness for Museums: Writing a Disaster Plan*, Washington, D.C., USA, American Association of Museums, 1980.

INTERNATIONAL COUNCIL ON ARCHIVES (ICA). Committee on Disaster Prevention. *Guidelines on Disaster Prevention and Control in Archives*. Paris, ICA, 1997. 44 p. (Studies = Études ; 11).

ICOM. "Endangered Museums". In *ICOM News*, Paris, Vol. 49, No. 3, 1996, pp. 2-12. ISSN 0018-8999.

ICOM INTERNATIONAL COMMITTEE FOR MUSEUM SECURITY. *Museum Security and Protection: A Handbook for Cultural Heritage Institutions* / Edited by David Liston ; ICOM International Committee for Museum Security. London, New York, Routledge, 1993. xiii, 319 p., index (The Heritage: Care, Preservation, Management). ISBN 0-415-05457-5

ICOM INTERNATIONAL COMMITTEE FOR MUSEUM SECURITY. *Comité international pour la sécurité dans les musées = International Committee for Museum Security* / Günther Dembski (scientific ed.). Paris, ICOM, 1997. 32 p. (Cahiers d'étude = Study series ; 4). ISBN 92-9012-038-X. ISSN 1020-5543.

ICOMOS. *Heritage at Risk: ICOMOS World Report 2000 on Monuments and Sites in Danger* / ed. by Dinu Bumbaru, Sheridan Burke, Michael Petzet, [et al.]. München, K.G. Saur, 2000. 240 p., ill. ISBN 3-598-24240-9.

ICOMOS. *Heritage at Risk: ICOMOS World Report 2001-2002 on Monuments and Sites in Danger* / ed. by Dinu Bumbaru, Sheridan Burke, Jane Harrington, [et al.]. München, K.G. Saur, 2001. 260 p., ill. ISBN 3-598-24241-7.

ICOMOS. *Heritage at Risk: ICOMOS World Report 2002/2003 on Monuments and Sites in Danger* / ed. by Dinu Bumbaru, Sheridan Burke, Jane Harrington, [et al.]. München, K.G. Saur, 2003. 240 p. ISBN 3-598-24242-5.

KANNAN, R. *Manual for Disaster-Management in Museums*. Chennai, India, Government Museum, 2001. 49 p.

MANSELL, Heather. *Guidelines on the Principles of Emergency Planning and Disaster Management for Museums, Libraries and Archives*. Brunei Darussalam, ASEAN, cop. 1999. xiv, 42 p. ISBN 99917-30-01-X.

MENEGAZZI, Cristina. "Museums at risk. ICOM Museums Emergency Programme: Prevention and Recovery in Emergency Situations". In *Heritage at Risk: ICOMOS World Report 2001-2002 on Monuments and Sites in Danger* / ed. by Dinu Bumbaru, Sheridan Burke, Jane Harrington [et al.]. München, K. G. Saur, 2001, pp. 248-249. ISBN 3-598-24241-7.

MENEGAZZI, Cristina. "Museums Emergency Programme: Preparedness and Response in Emergency Situations". In *La Tutela del patrimonio culturale in caso di conflitto* / a cura di Fabio Maniscalco. Napoli, Italy, Massa Editore, 2002. Vol. 2 : p. 91-94. (Mediterraneum, Tutela e valorizzazione dei beni culturali ed ambientali). ISBN 88-87835-18-7.

MENEGAZZI, Cristina. "Museums Emergency Programme-Origin, past events and future developments". In *Cultural Heritage Disaster Preparedness and Response, Proceeding of the International Symposium, Salar Jung Museum, Hyderabad, 23-27 November 2003*, pp. 21-30. ISBN 92-9012-056-3. (Abstract in French and Spanish)

MENEGAZZI, Cristina. "ICOM activities for the protection of Museums in the emergency situations". In *Collection Management Seminar on Museums and Private Collections*, Yildiz Technical University, Istanbul, 13 April 2006, pp. 45-65. ISBN 975-7843-08-3. (Also in Turkish)

OKADA, Shin'ichi. "International Flood Network". In *Asia-Pacific Perspectives: Japan +*, Tokyo, Vol. 1, No. 2, June 2003, p. 17.

REBIÈRE, Jacques and MOUREY, William. *Congrès international Prévention 2000 : La prévention des sinistres dans les aires de stockage du patrimoine = Prevention of Disasters in Cultural Storage Areas, Draguignan-Figanières, du 7 au 10 novembre 2000*. Draguignan, Centre archéologique du Var, Laboratoire de conservation, restauration et recherches, [2003]. 239 p. ISBN 2-905757-01-9.

RESOURCE. THE COUNCIL FOR MUSEUMS, ARCHIVES AND LIBRARIES (United Kingdom). *Security in Museums, Archives and Libraries: A Practical Guide*. 2nd ed. London, UK, Resource, The Council for Museums, Archives and Libraries, cop. 2003. v, 175 p. ISBN 1-903743-13-3.

Risk Preparedness for Cultural Properties: Development of Guidelines for Emergency Response: 1997 Kobe-Tokyo International Symposium / ed. by Hidetoshi Saito. Tokyo, Chuo-Koron Bijutsu Shuppan, 1999. 499 p. ISBN 4-8055-0370-X.

STOVEL, Herb. *Risk Preparedness: a Management Manual for World Cultural Heritage*. Roma, Italy, ICCROM, 1998. xiii, 145 p. ISBN 92-9077-152-6.

UNITED NATIONS. International Strategy for Disaster Reduction (ISDR). *Living with Risk: Turning the Tide on Disasters Towards Sustainable Development*. Geneva, Switzerland, United Nations, 2003. [44] p. (2003 World Disaster Reduction Campaign).

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RISKS AND (WORLD) HERITAGE: SOME BACKGROUND

Abstract

The great diversity of threats affecting cultural heritage structures, sites or areas has concerned many generations of conservators and authorities. Yet, as Leo Van Nispen, the former Director of ICOMOS who played a key role in launching the Inter-Agency Taskforce with UNESCO and the International Committee of the Blue Shield in 1996, observed, prevention it often remains a secondary issue to the more appealing restoration or theoretical concepts like authenticity. Threats to heritage derive from natural phenomena or human activities, including conflicts or technological accidents. Over the past 20 years, the non-governmental and intergovernmental sectors have progressed a lot as a result from events – major earthquakes in Italy in the 1980s, First Gulf War, Kobe earthquake in 1995 and, mostly, the 1991-1996 collapse of Yugoslavia which shocked the professional and international communities by its deliberate targeting of cultural heritage, an act that would unfortunately be echoed in Afghanistan in 2001. These and the favourable conditions given by instruments like the World Heritage Convention, raised awareness of heritage's increased vulnerability, and the need to better position it within local, national, regional, and international frameworks for disaster reduction (and response since much losses still result from post-disaster response and recovery.) Improved documentation and communication of cultural heritage or the training of civil defence or conservation personnel contributed to these recent developments and the expansion of an active interdisciplinary network on the subject through the innovative NGO partnership of the Blue Shield, and its National entities.

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Drawing on the energy, attention and will generated by the tragic 2007 fires in the Peloponnese, the Greek authorities took the initiative of convening this international workshop in cooperation with UNESCO. First of all, I would like to thank these authorities for their effort and determination to better ensure the fullest protection of the cultural heritage of the world they are the rightful guardians of. In our days, protection is not only a simple matter of legal status or restoration work but indeed, a duty that includes addressing emergency situations be them directly affecting the heritage property or even their significant setting. This call for science and society to work more closely together in order to understand threats, acknowledge the value of traditional and modern knowledge and to develop the means and practices to prevent losses which in the case of cultural heritage, are so often irretrievable.

The purpose of this contribution is to draw a panoramic view of the evolution of thought and cooperation in relation to the issue of natural or man-made hazards and their potential impact on cultural heritage sites. It applies particularly but not exclusively those whose Outstanding Universal Value has been acknowledged through their inscription on the World Heritage List, for example, the Archaeological Site of Olympia in Greece.

Somehow, it is of interest to recall that the modern heritage system is partly the result of major disasters occurring. The global human tragedies of the First and Second World Wars, major infrastructure projects like the Aswan Dam or natural disasters like the Florence floods brought the creation of international organisations – inter-governmental ones like UNESCO and ICCROM or non-governmental like ICOMOS, the International Council on Monuments and Sites (www.icomos.org) which was created in 1965. ICOMOS is an expert network and, along with ICCROM and IUCN, an Advisory Body to the World Heritage Committee under the terms of the 1972 World Heritage Convention of UNESCO. It operates through a central Secretariat in Paris and a system of some 150 National and International Committees grouping over 9000 professional or institutional members world-wide. Its purpose is to improve conservation through sharing knowledge and experience. In a trans-disciplinary, trans-cultural and trans-generational context, ICOMOS develops, disseminates and debates conservation principles and animates a global

professional network through symposia – an average of three per month world-wide – or publications such as the “Heritage @ Risk Reports” produced since 2000 by inputs from members and committees.

ICOMOS is also developing an *Observatoire*, a cooperative and communication mechanism engaging its full membership into documenting the evolving situation of cultural heritage at the site, local, national or regional levels so that the International ICOMOS can plan activities or supply advices in a better informed way. This continuous information is important since the field of cultural heritage is one in evolution, either on its own terms or within the World Heritage context. This has a strong bearing on the concept of risk management since it has to adapt to the heritage object. The very subject of ICOMOS and its work has greatly expanded from the more clearly defined «monuments and sites» including individual structures like buildings, monumental artworks or painted caves, and archaeological sites to include nowadays what is best described as living cultural ecosystems such as cities, landscapes or land or water routes.

Within such diversity, values and significance are what gives the heritage distinction among existing sites, structures or areas. In ICOMOS, values have to do with memory, the embodied meaning and knowledge, the presence in the physical or cultural space, the symbolic value or, even though the term is surprisingly reserved to natural site, beauty. Cultural heritage sites are prime expressions and evidences of the living cultural diversity. In the case of buildings or settlements, heritage has a strong use value as a resource for individual or collective needs. It is a part of life of society. It also has a scientific value as an authentic «document» of the human endeavour in the full richness of its diversity.

As an organisation, ICOMOS is an illustration of how the expansion of the heritage field has not only occurred in the fascinating area of definitions, inventories or semantics. Since the 1970s, the organisation has worked closely with UNESCO and others on the expansion of the field of conservation. One of the signs for such expansion has been the establishment in 1997 of ICORP, the International Committee of ICOMOS on Risk Preparedness set up at the initiative of Leo Van Nispen, then Director of the ICOMOS Secretariat following a number of seminars and meetings in the 1990s, prompted in a great way by the dramatic bombing of the World Heritage site of Dubrovnik in December 1991. ICORP is one of 28 International Committees of ICOMOS who cover a diversity of scientific or professional themes, from 20th C. Heritage, Underwater Cultural Heritage, Gardens & Landscapes, Pacific or Polar Regions Heritage to Intangible Cultural Heritage, Collection Management in Monuments and Sites, Tourism, Legal Tools or Cultural Routes.

One of the means ICOMOS has used since its foundation to accomplish its goals is the development, dissemination and discussion of charters, guidelines and principles. Since the seminal 1964 International Charter on the Conservation and Restoration of Monuments and Sites (the «Venice Charter»), documents have been adopted that deal with Historic Gardens (Florence Charter, 1981), Historic Towns (Washington Charter, 1987), Underwater Cultural Heritage (Sofia, 1996) or, adopted just a few weeks ago by our 16th General Assembly in Québec, on Cultural Routes and Interpretation / Presentation. ICOMOS Assemblies have also adopted declarations like the 2005 Xi'an Declaration on the Conservation of Settings of Heritage Sites, Structures and Areas. Yet, ICOMOS has not yet produced and adopted a set of guidelines or principles specific to risk management as a fundamental part of the conservation practice. Hopefully, the 17th General Assembly planned for 2011 in Isfahan, Iran, and its scientific theme of Natural Disasters and Cultural Heritage will provide the stimulus to the organisation to focus on this.

It is conceivable that the mainstream practice of conservation has put crisis situations or risk management on the side for many generations. Indeed, the sources of threats to cultural heritage are numerous – natural decay; destructive or demeaning change, development threat, oblivion as well as violent force of nature or humans. In addition, people or institutions in charge of conservation have to face broader phenomena such transformation of society or economy like those lived through in Post-Communist Eastern Europe, massive movements of populations, epidemics such as HIV in Africa or a changing environment in terms of climate or the water cycle.

The acceleration of change in society is particularly important bringing along the impact of global economy on cities, landscapes and their heritage. Loss of traditional knowledge, rituals or skills as well as the increasingly induced obsolescence of many heritage structures or traditional settlements is another current issue in the field. Also, the growing concern for security and sense of insecurity is a current issue which impacts on heritage and the general concern for disasters.

Conservation has complexified over the past 30 years with the above-mentioned thematic or conceptual expansion of types, periods or meanings being one aspect of such process. The action system has also changed with the transformation of the public sector into a decentralised model, the growth of the non-governmental sector or the increased involvement of private or academic sectors in conservation projects. Human, scientific or financial resources have evolved in quantities and qualifications. Interdisciplinary work has grown in the academic sector if not in the management institutions themselves, bringing fresh eyes to complex issues. And, with the example of the spectacular success of the World Heritage Convention among sovereign states or the policies of many international development agencies such as Agencia Española de Cooperación y Desarrollo, the international cooperation context has greatly increased.

Such context offers good potential to improve risk reduction for cultural heritage properties. For the moment, there are needs to fill. For instance, there is a need to articulate principles for practice or even a theoretical framework to position risk reduction in the overall ethos of conservation. Also, there are needs to connect cultural heritage with the legal obligations national governments are giving themselves to reduce risks; for instance in ensuring an appropriate and respectful place for cultural heritage structures or sites in building codes. And there is a need for the assessment of risks and hazards coming from nature or human activities and the assessment of preparedness of responsible institutions and managers in charge of heritage that could be vulnerable to such risks. Finally, there is a need to better link the heritage management system and the disaster management system at the local, national and regional level by establishing relations between organisations, by promoting the value of traditional knowledge and art of building as a source of preventive action, and the potential benefit of heritage structures or sites for recovery as usable emergency rallying spaces or as symbols for the endurance of the community.

Although we see still much need to be fulfilled, there has been substantial progress in the field over the last decades. It is useful to recall the following milestones here.

- 1960s-70s-80s: UNESCO and ICOMOS meetings on floods, earthquakes, fires and heritage buildings, sites; UNESCO and ICCROM publications on heritage in earthquake zones
- 1992: Initiative of the Inter-Agency Taskforce (IATF) by ICOMOS with UNESCO after Dubrovnik bombing and UNESCO missions, with participation of ICOM, ICCROM and other organisations
- 1995: Meeting of South Asian Association for Regional Cooperation in Colombo (SAARC), Sri Lanka, where connection with the sectors of archives and regional cooperation started
- 1996: Establishment of the International Committee of the Blue Shield (ICBS) as a coordination partnership of existing organisations in the field of heritage– ICOMOS, ICOM, (museums), ICA (archives), IFLA (libraries) and National Summit on Heritage and Emergency Response in Canada
- 1997: Kobe-Tokyo International Symposium and Declaration on the occasion of the second anniversary of Great Hanshin-Awaji earthquake in Kobe, Japan
- 1998: Publication of the Risk Preparedness Manual by ICCROM, ICOMOS, UNESCO and its World Heritage Centre

- 2000: Publication of the First issue of the ICOMOS “Heritage @ Risk Report”
- 2005: Kyoto-Kobe meetings and Declarations on the occasion of the 10th anniversary of the Great Hanshin-Awaji earthquake
- 2008: Establishment of the Association of the National Committees of the Blue Shield, linking national correspondents of ICOMOS, ICOM as well as the archives and library associations.

Initiated by ICOMOS, the Inter-Agency Task Force (IATF) was an important break through in particular for its attention to inter-institutional cooperation within the various sectors of UNESCO as well as between the different non-governmental organisations. It developed the 5-component Risk Preparedness Scheme – Emergency Response Personnel/Squads; Emergency Response Fund; Documentation; Manuals and Training, and Public Awareness – as a strategy based on a bottom-up and twining approach to develop cases for implementation. UNESCO called upon the IATF to review some of its programmes for their capacity to accommodate Risk Preparedness components or objectives. The IATF also gave a platform for cooperation with other inter-governmental organisations such as the Council of Europe and the UN World Meteorological Organisation.

One of its outcomes was the creation in 1996 of the International Committee of the Blue Shield (ICBS) as a partnership between existing non-governmental organisations - ICA, ICOM, ICOMOS and IFLA. The agreed heads of agreements identify the following objectives for the ICBS: provide advice; facilitate international response; act as an advisor in the implementation of “The 1954 Hague Convention for the Protection of Cultural Property in the event of Armed Conflicts”; encourage safeguarding and preparedness; consult and co-operate with other organisations and facilitate professional action. The General Assembly of ICOMOS formally resolves to endorse these objectives as a definer of ICOMOS’ involvement in this partnership. At the end of 2008, the formal establishment of the Association of National Committees of the Blue Shield (ANCBS) took place in The Hague, a further step towards better coordination of the non-governmental cultural heritage sector to improve risk management and enhance the capacity of sites and their caretakers to prevent or respond to disaster.

This international development should not prevent observing the great progress made at the national level and the diversity of models. Although a comprehensive catalogue of such initiatives including models at the provincial or local level would be a worthy enterprise to engage in, one can already see some value in listing a few cases. Japan offers one of the most interesting experiences with the on-going work to prepare for major hazards such as earthquake and their secondary disasters like massive fires. Japan offers also the example of its designation of 26th January as the National Day for Prevention of Fire in Cultural Property in commemoration of the tragic fire at Horyu-ji temple in 1949, giving a very valuable opportunity for highly publicised yearly drills or activities to raise public awareness and renew the commitment of emergency services – an example which should definitely inspire other countries. Other national models include the appointment of a special Ministerial advisor on Fire and Risk Prevention in Historic Monuments in France or the lauded Monumentenwacht organisation of regular maintenance and preventive conservation teams for historic buildings in the Netherlands. In Sri Lanka, the ICOMOS National Committee showed another type of model in initiating a very rapid response team of professionals and academic to carry on rapid post-tsunami assessment work. In Canada, the holding of a National Summit in 1996 had positive ripple effects by raising awareness among emergency management organisations, for the humanitarian priority for cultural heritage in disaster response.

Actually, the instrument of National Summit is one that should be more strongly promoted as both conservation and disaster reduction are planned and coordinated within national framework even in federated states. In 1996, the Canadian Summit produced the “Québec Declaration” which identified the following themes in relation to risks and cultural heritage:

- **Challenges:** vulnerability; lack of preparedness
- **Opportunities:** public interest; leadership; experience

- **Awareness:** identify heritage; media; local
- **Collaboration:** in heritage field; with fire departments or civil defence
- **Local Capacity:** roles; personnel; manuals
- **Enabling Framework:** legal; early warning

It was followed in 1997 by the “Kobe / Tokyo Declaration” and Guidelines for the care of cultural properties in case of disasters. This text focused on strategies on these themes:

- **Regional, national, local cooperation:** Develop joint Heritage / Civil Defence National Panels, charters or guidelines, professional networks or forums, etc.
- **Funding:** Include risk preparedness for cultural heritage in international projects;
- **Emergency Response:** Incorporate Heritage organisations in the line-of-commands, make further use of international conventions like UNESCO’s “1954 Convention for the Protection of Cultural Property in the event of Armed Conflicts” or “1972’s World Heritage Convention”;
- **Documentation and Research:** Develop methodologies for risk assessment methods, early warning and the documentation of damage to cultural heritage as part of overall disaster assessments and statistics;
- **Education and Training, Awareness:** Upgrade existing curricula to include preventive conservation and care as well as traditional knowledge applicable to disaster prevention and response for cultural heritage among others.

(...) to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes;
World Heritage Convention, Article 5.a

Over the past 10 years, a greater attention has been given to the overarching capacity of the “World Heritage Convention” as a tool to enhance conservation as part of an overall model of sustainable development. Article 5 of the Convention quoted above provides a quintessential illustration of this attention by encouraging States Parties to integrate the protection of the cultural and natural heritage into planning programmes, conceivability inclusive of those programmes aimed at reducing disasters from natural or human origin. This attention is not contradictory with the World Heritage Committee’s strong commitment to enhancing the capacity of each individual site on the World Heritage to better prevent and respond to disaster so as to maintain the Outstanding Universal Value it has been acknowledged for. Further exploration of the potential use of Article 5 and other provisions of the “World Heritage Convention” might prove useful to develop a stronger conservation-positive policy and development models, inclusive of disaster reduction.

Before concluding this panoramic exposé, it would be useful to remember that conservation, while practiced within a national organisational framework and an international inspirational or cooperative one, remains an activity performed locally since the cultural heritage we are considering in these discussions are immovable. The sense, the essence and the substance of a place is where the place is and, for that reason, all conservation action needs to be brought to that place. Unlike in medicine or museums where it’s often possible to bring the patient to the hospital, we have to bring medical care to the patient, hence stressing the need and importance of documenting and sharing examples of local models or experience in the form of cases.

One such example is the case of Montreal, the French-speaking metropolis of Canada, in the Province of Quebec. The identification, protection and care for the heritage of Montréal are the result of a complex arrangement of a three-tier governance structure described in a highly summarised ways as follows:

- **Canada’s Federal Government:** It has very little power to protect cultural heritage in private ownership and is mainly doing non-binding commemoration or managing its own heritage properties. It is responsible for implementing the “World Heritage Convention” and

has the capacity to provide the Provinces with civil or military support in case of emergencies.

- **Québec’s Provincial Government:** It is the main authority with Constitutional powers to protect heritage properties, sites, areas and their setting. It creates municipalities and gives them their obligation to prepare and maintain civil security plans but has yet to specify how cultural heritage is to be included in these.
- **Montréal’s Municipal Administration:** It can list and protect exterior of buildings and sites and identify heritage areas in its urban planning document. The municipal level is in charge of the fire, police and civil security services and mentions the need to integrate heritage in emergency planning. Yet, although some valuable cases of cooperation had taken place between the heritage and emergency services in the context of Old Montreal or the historic and natural district of Mount Royal, much has still to be done to better integrate these two.

In 2005, Montreal adopted a Heritage Policy, quite an exceptional case among large urban or metropolitan agglomerations where cultural heritage is often handled in a separate cluster of inventory or restoration projects or through specific regulations rather than as part of an overall policy. Inspired in part by the “World Heritage Convention’s” Article 5, this *Politique du patrimoine* creates an obligation for all City departments and services, including Civil Security, to act in an exemplary way as stewards and care-takers of the collective heritage. The policy also provides for links between the City’s Master Plan and other policies on natural sites, housing or sustainable development. Finally, it stresses the important role of citizens and non-governmental organisations in the process of conservation, in normal circumstances as well as in times of emergencies.

The presentation of the Montreal experience cannot be limited to the description of a few planning or policy documents but would also require the description of the cultural transformation which brought citizens, independent organisations like Héritage Montréal as well as university, professional or economic associations to combine their efforts and share their perspective to change the concept of urban development. Yet, the case is useful and can bring a few simple and applicable lessons worth sharing in the context of this International Workshop dedicated to World Heritage properties. Here are five of these lessons from Case Montréal:

- Build and maintain awareness for heritage in the general public, institutions and individuals through education campaigns, awards, the medias,
- Create and maintain professional / personal links with Civil Security, Permits, Fire Departments,
- Involve owners (private, public, religious, non-governmental organisations),
- Draw constructive lessons of big or small disasters of all kind, and
- Be patient and creative to overcome institutional inertia!

Or, in another format, here is a table built on the experiences and discussions listed above to connect the global and local level of our work on disaster management for heritage properties. It takes the form of a simple matrix to encourage a more systematic review of risks to heritage – actually to the sites, structures or areas themselves but in relation to the values they are recognised for – and the action and actors to engage in the Before, During and After phases. Risks indicated are examples. Completing such matrix can be a role for the site managers or authorities in charge of the sites or, even better, of a cooperative exercise engaging these as well as those in charge of civil defence, municipal administration or academia and could prove a very potential opportunity to raise inter-agency awareness and cooperation.

TYPE OF CULTURAL PROPERTY	RISKS TO THEIR HERITAGE VALUE	BEFORE What? Who? How?	DURING What? Who? How?	AFTER What? Who? How?	NEEDS (material, human, finance)
Intangible value memorial sites,	Vandalism Non-transmission				
Sites of visual interest	Loss of landmarks,				
Structures, buildings in use	Destruction, fire, damage, disuse				
Archaeological sites, remains	Destruction, looting				
Complexes, planned groups	Demolitions, site plan and gardens				
Settlements, urban areas,	Demolition, fire, accidents, unrest				
Living landscapes	Climate, fire, agriculture				
Traditions, know-how	Death or break in family chain				
Related objects and archives	Dispersion, fire, insects, water				

More and more, the basic definition of a conservation or management system for a heritage site – even more so for a World Heritage site – includes adequate measures to ensure it can face disaster risks and maintain its significance, integrity and authenticity. Such definition calls for an effective balance between preventive and curative action, and for an adapted approach to heritage types and ownership, social structures and traditions and values carried or illustrated by the heritage site, structure or area. It also requires knowledge which tradition and modern science can provide.

Building better praxis at the regional, national or local level requires the comparative documentation of cases by connecting the What (what is protected? what are its specific or outstanding values?), the Who (who protects cultural heritage in regular times as in emergencies – owners, communities, national or international institutions – and how are they trained, equipped or communicating to do this?), and the When (when are measures enacted in the preventive, response or recovery phase? How do people and organisations develop appropriate reflexes?) This documentation should look at the ‘software’ as much as the ‘hardware’ of disaster reduction for cultural heritage since training, practice drills and awareness or communication tools are as important as infrastructures and technological improvements. The impact of traditional management, ongoing maintenance or inspection, the continuous presence of coordinating mechanisms between the heritage and disaster management sectors – plans, institutions, community – should also be appreciated.

In conclusion, much can be said to promote a stronger commitment of conservation authorities and specialists to make disaster management and reduction a fundamental part of their task. Yet, the reality is often putting a lot of stress on those organisations and individuals whose daily normal work already has many priorities. In many places, the basic level of appropriate resources is barely met to ensure the conservation needs, not to mention the inspiring range of the “World Heritage Convention’s” Article 5. In its contemporary model, conservation has to face risks and hazards for which organisations have developed a specific expertise. Achieving its goals thus requires their engagement so that heritage sites are ready to face hazards and risks and retain their essential values, be they of local or global resonance.

Paola Albrito

International Strategy for Disaster Reduction, UN/ISDR-Regional Coordinator Europe

DISASTER RISK REDUCTION AND CULTURAL HERITAGE

Abstract

The International Strategy for Disaster Reduction (ISDR) aims at building disaster resilient communities by promoting increased awareness on the importance of disaster risk reduction as an integral component of sustainable development, with the goal of reducing human, social, economic and environmental losses due to natural hazards and related technological and environmental disasters.

In January 2005, 168 Governments adopted a 10-year plan to make the world safer from natural hazards at the *World Conference on Disaster Reduction*, in Kobe, Hyogo, Japan. The “Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters” (Hyogo Framework) provides guiding principles, priorities for action and practical means to substantially reduce disaster losses by 2015.

The “Hyogo Framework” represents the essential international guide for implementation of the ISDR in the coming years and it constitutes an unprecedented conceptual shift that takes account of the complexity of actions in disaster risk reduction and the large variety of actors whose inputs are required in the pursuit of this objective.

Whilst knowledge on risk and vulnerability is spreading, it is important that such concept is applied addressing cultural heritage. The “Hyogo Framework for Action” highlights a number of activities that can be undertaken and adapted addressing cultural heritage by applying a mainstreaming approach to its five priorities.

These will imply: strengthening institutional support and governance for reducing risks at world heritage properties; identifying, assessing and monitoring risks from disasters at world heritage properties; using knowledge, innovation and education to build a culture of disaster prevention at world heritage properties; reducing underlying risk factors at world heritage properties; and strengthening disaster preparedness at world heritage properties.

What can we use to advance on this topic? The HFA as a framework to become familiar with the activities related to Disaster Risk Reduction; establish contacts with national coordination mechanisms on disaster risk reduction (at the national level), including specialised centres working on this topic; establish contact and collaborate with regional entities and international players part of the ISDR system; become familiar and adapt the ISDR systems tools, mechanisms and take advantage of key events organised on this topic worldwide; lean from existing examples on advancements related to this topic

What can we do to advance on this topic? Propose actions to connect/integrate cultural heritage in disaster reduction and provide bases for sustained cooperation; appoint cultural heritage liaisons on national, local and regional committees on Disaster Reduction; hold joint national summits on cultural heritage and risk preparedness and other national, regional or international summits; develop/promote charters and standards on risk preparedness for cultural heritage, including standard for reporting impact of disasters on cultural heritage.

International Workshop on Disaster Risk management at World Heritage Properties

Olympia Greece 6-7 November 2008

Disaster Risk Reduction and Cultural Heritage: Using the Hyogo Framework for Action

www.unisdr.org

Paola Albrito
Regional Coordinator Europe

United Nations International Strategy for Disaster Reduction (UNISDR) ¹



Intensive Disaster Risk

- *82% disaster mortality 1975-2005 in 20 large disasters with over 10,000 deaths each, mainly in developing countries*
- *38.5% disaster economic loss in 21 large disasters with over US \$10 billion losses each, mainly in developed countries*
- *Disaster loss, particularly mortality, is concentrated in intensive risk hotspots*

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2

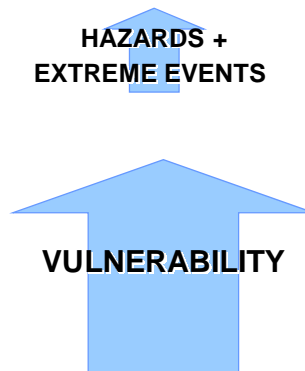
Global Trends - Disasters are NOT natural

Natural and human-induced hazards
Climate change and variables
(global warming and “global dimming”)

Socio-economic: poverty,
unplanned urban growth, lack of
awareness and institutional capacities...

Physical: insufficient land use planning,
housing, infrastructures located in hazard
prone areas...

Environmental degradation
ecosystem degradation; coastal,
watershed, marshlands...), etc.



$$\text{Natural hazard} \times \text{Vulnerability} = \text{Disaster Risk}$$

3

Hyogo Framework for Action 2005-2015:

Building the resilience of nations and communities to disasters

... to substantially reduce disaster losses, in lives,
social, economic and environmental assets....

Three strategic goals

- The integration of disaster risk reduction into sustainable development policies and planning.
- The development and strengthening of institutions, mechanisms and capacities to build resilience to hazards.
- The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.



4

Hyogo Framework for Action 2005-2015:

Building the resilience of nations and communities to disasters

Five priorities for action

1. **Governance:** ensure that disaster risk reduction is a national and local priority with strong institutional basis for implementation
2. **Risk identification:** identify, assess and monitor disaster risks and enhance early warning
3. **Knowledge:** use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. **Reducing the underlying risk factors** in various sectors (environment, health, construction, etc.)
5. **Strengthen disaster preparedness for effective response**

www.unisdr.org



*Words Into Action:
A Guide for Implementing the Hyogo Framework*

www.unisdr.org/eng/hfa/docs/Words-into-action/Words-Into-Action.pdf

5

The vision of disaster risk reduction:
Building resilient communities towards sustainable development

International Strategy for Disaster Reduction

Mission of the secretariat:

Catalyze, facilitate & mobilize commitment and support for the implementation of the ISDR and the Hyogo Framework in partnership with national, regional and international actors of the ISDR system

ISDR system:

International and regional organizations incl UN system, WB (GFDRR), regional development banks, IFRC, NGOs, NATIONAL PLATFORMS

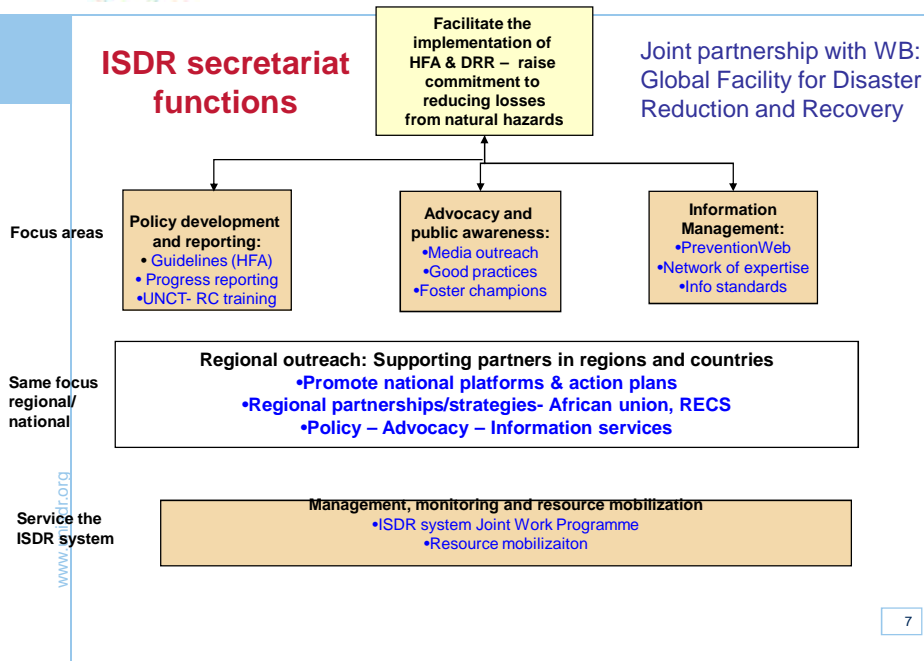
Building a DRR MOVEMENT!



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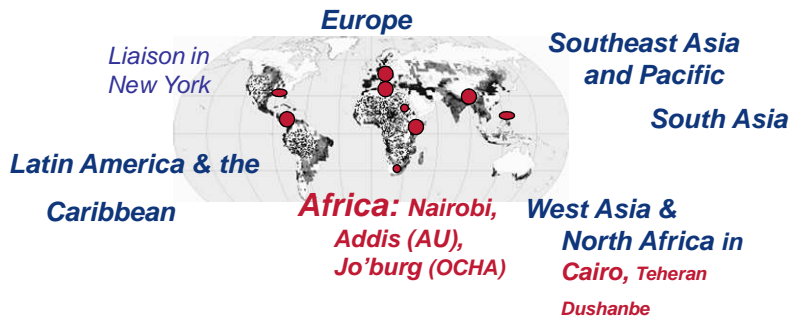
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ISDR secretariat functions

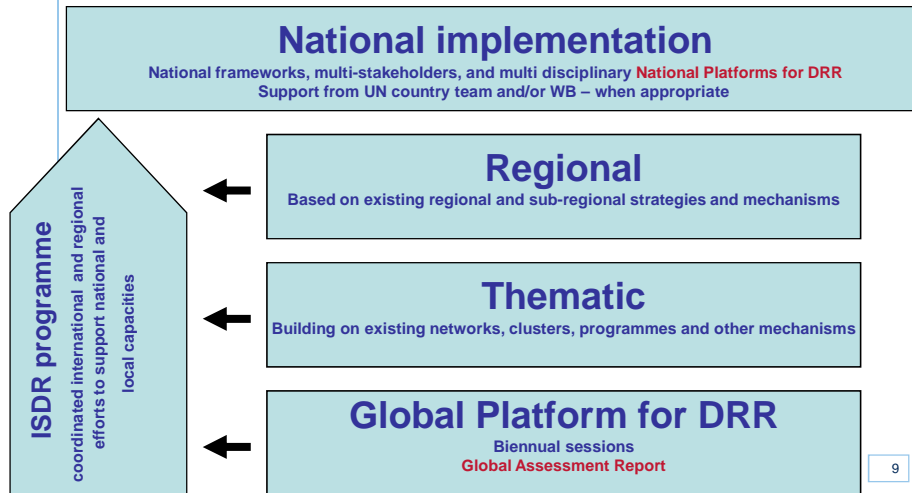


ISDR secretariat, UN/ISDR

Headquarters in Geneva
Early Warning platform in Bonn



**ISDR system levels of action (“platforms”)
Define priorities: Strategic information, guidance
and assessments of progress**



**Recognized advancements on cultural heritage and
Disaster Risk Reduction**

- Leadership of UNESCO in organising a workshop in New Zealand in 2007 concerning the Protection of the World Cultural and Natural Heritage
- Development of strategy to address Cultural Heritage from a disaster risk reduction perspective within the context of the HFA;
- Current workshop to address the issue

What can you use to advance on this topic:

- The HFA as a framework to become familiar with the activities related to Disaster Risk Reduction;
- Establish contacts with **National Coordination Mechanisms** on disaster risk reduction (at the national level), including specialized centres working on this topic (a.i. **European University Centre for Cultural Heritage, Ravello, Italy**);
- Establish contact and collaborate with regional entities and international players part of the ISDR system (i.e.. **The Council of Europe EUR-OPA**) ;
- Become familiar and adapt the ISDR systems tools, mechanisms and take advantage of key events organised on this topic worldwide: (i.e.. **Global Platform for Disaster Risk Reduction Geneva 15-19 June 2008**);
- Learn from existing example on advancements related to this topic (i.e. **some examples reported below more to be collected**).

Bhutan Example

- **Cultural Heritage and Disaster Management Major buildings housing arts, artifacts and other materials of cultural importance shall have a comprehensive disaster prevention, preparedness and response plan.**
- **An inventory of cultural properties followed by activating mitigation and protection measures against disasters**
- **Non-structural mitigation measures as an important step to safeguarding many important artifacts.**

Bhutan Example

Proposed actions to connect/integrate Cultural Heritage in Disaster Reduction and provide bases for sustained cooperation:

- **Appoint Cultural Heritage liaisons** on national, local and regional committees on Disaster Reduction.
- **Hold joint National Summits** on Cultural Heritage and Risk Preparedness and other national, local, regional or international.
- **Develop/promote charters and standards** on risk preparedness for cultural heritage, including standard for reporting impact of disasters on cultural heritage.

Kyoto Example

- Under the Disaster Prevention Plan in Kyoto, **the action plan for citizens to participate in disaster prevention and mitigation** was formulated for citizens of each town.
- Each citizens is familiar with which types cultural heritage in each area and **handling methods of the anti-disaster facilities installed in advance**.
- To know those information will give an opportunity **to learn about the history of the area and to raise the awareness of 'cultural properties** in our own area'.
- Based on the survey of the underground structure of the Kyoto Basin, the **Disaster Prevention Map was developed**. This map aims at providing useful information such as the danger of the area and useful facilities look upon during disaster so as to prevent or mitigate the damage sustained.

Section II - Olympia, Greece, Case Study

The following Case Study is presented by three different papers in a complementary approach. This permits to identify the real threats to an archaeological site of the significance and value such as the World Heritage site of Olympia; to outline the research needs in many disciplines; to classify the quick response and recovery interventions implemented and the proposals for prevention actions; and to list the different entities that are to be considered as integral part of a disaster risk management plan.

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Landscape Architecture – Applied ecology specialist

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Environmental Rehabilitation- Responsible for the hydro seeding works

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THE RESTORATION OF THE ARCHAEOLOGICAL AND BROADER LANDSCAPE OF OLYMPIA

Abstract

The landscape restoration in the archaeological area of Olympia was characterised as “national goal” because of the strict timetable imposed by the very specific date when the ceremony of the Olympic Flame for the Beijing Olympic Games of 2008 was scheduled. This time confinement was the central point of thoughts and problems as it had a particular impact on the scientific approach with regard to works for the protection and restoration of the landscape. The existing state of the natural and anthropogenic environment surrounding the archaeological findings and monuments prior to the destructive fire, was a serious factor that affected the work planning, whereas the suggested plan of restoration seriously took into consideration the existing historical and bibliographical references.

The main aim was to restore the landscape with immediate measures and interventions so as to protect soil against erosion and floods and rehabilitate the land vegetation through plant establishment. Particular emphasis was given to the maintenance of the geomorphology of the Kronios hill. The planting of a variety of trees and bush species existing in the ancient oak forest, will enhance the resistance of the forest against fires, will increase plant biodiversity and will approach as much as possible the composition and structure of the old forest.

Key words: wildfire, landscape, rehabilitation, soil erosion, hydro seeding, plant establishment.

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General presentation of the area

The renowned archaeological site of Olympia is found in twenty two kilometers southeastern from the town of Pyrgos, the capital of Iliia prefecture, at northwestern Peloponnesus in Greece, separated from the contemporary municipality of Ancient Olympia by the small river Kladeos over the Valley of Alpheios River.

On the summit of Kronios hill or Kronion, distinctive landmark of Olympia, where the cult of Kronos was practiced, one of the most important pan-Hellenic sanctuaries was created. With its famous Temple of Zeus, in Kronios hill lower slopes, Olympia rapidly developed into one of the most important religious and athletic centers becoming the heart of the Olympic Games and the place where the Olympic ideals were born.

The broader area of Ancient Olympia belonging to the Hellenic Ministry of Culture (Seventh Ephorate of Prehistoric and Classical Antiquities), has been characterised as “Special Area of

Natural Beauty” included in the European Natura 2000 network while the archaeological site is, from the year 1989, in the list of the world heritage properties.

The devastating fire of August 27th, 2007 burnt completely the area and a large part of the surrounding tree and bush vegetation was lost. However, the fire respected the famous sanctuary of Zeus, the Stadium and the Museums of Olympia, but the Kronios hill was completely stripped down.

Immediately after the fire, the main and primary objective was to restore the archaeological site and to ensure that Olympia recovers its natural beauty known as Olympic landscape. More precisely, the aim of Olympia’s landscape restoration -characterised as “national goal”, because of the strict timetable imposed by the very specific date (March, 24th, 2008) for the ceremony of the Olympic Flame for the Beijing Olympic Games of 2008 - was the embellishment of the place with immediate measures and interventions for the protection of the soil against erosion and floods and its restoration of the vegetation through plant establishment with particular emphasis given to the maintenance of the Kronios hill geomorphology.

The restoration project focused mainly on the hilly area (Kronios, Zouni, Kalosaka, Inomaos hills) and the area of the International Olympic Academy surrounding the archaeological site covering about 60 hectares.

Post fire meteorological conditions

Olympia has a Mediterranean climate, characterised by a prolonged period of drought, of about five months duration with high temperatures and very low rainfall. The mean annual temperature is 17.4 °C, with a minimum annual average of 10.8 °C, and a maximum annual average of 22.7°C.

The annual precipitation is 920.9 mm with an annual average of rainy days of 99.1. The seasonal course of precipitation shows that the winter is the wet season of the year (409.6 mm), with autumn following (325.1 mm). During the spring, precipitation is less (158.8 mm), but summer is the driest period of the year (27.4 mm). Bioclimatically the region of Olympia is semi thermo-Mediterranean type (Maheras and Balafoutis, 1988), with a wet bioclimatic floor and mild winter (Mavrommatis, 1980).

During the summer of 2007, the temperature conditions prevailing in the area were significantly different from the average climatic conditions. The summer period (June to August 2007) a sum of 15.4 mm precipitation was recorded in a short two-day period in June. July’s and August’s 2007 precipitation was 0 mm. The high temperatures (minimum, mean and maximum) of summer and especially its mean values of August, lead to extremely dry conditions in the area. The absolute maximum summer temperatures were the highest ever recorded having values of 39.4, 43.0 and 42.2 °C, in June, July and August, respectively. The 25-year period before, those values were significantly lower: 37.2, 42.4 and 41.0 for June, July and August, respectively. Wind speed values for the summer 2007 period were higher (5.97 knots) compared to the average conditions (4.9 knots), contributing further to drought. These meteorological conditions had a significant effect in the extensive damages, caused by forest fire in the area.

The restoration measures undertaken

Soil erosion and flood mitigation measures

From the various measures taken in burned areas for the protection of soil from erosion and the mitigation of floods in the lower parts of the area affected by fire, the log erosion barriers were selected (USDA, 2003). The log erosion barriers were constructed from the trunk of burned Aleppo pine and cypress trees and they were fixed parallel to the contours of the slopes of the hills. The aim of these works was: to shorten the length of the slopes; to increase the surface roughness; to increase the infiltration rates of the soil; to trap surface runoff and sediment and to improve the location behind the log barriers for the recovery of vegetation. This measure was selected because wood was considered as the appropriate material for the fulfillment of archaeological, historical, aesthetic, ecological, environmental and mainly protective requirements of the area.

The length of the log barriers varied from 0.50 to 2.00m and their diameter from 0.15 to 0.25m. They were secured on wooded stakes forming, as was mentioned, lines parallel to the contours from 1.00 to 3.50m apart from each other. This distance was determined according to log characteristics and also to topographic and hydro-meteorological conditions of each site they secured. The log barriers formed continuous or empty-space lines for better fulfillment of aesthetic requirements of the area. They also placed in a “mosaic design” (Baloutsos et. al., 2007) consisting from single or double in height logs (one over the other) according to the gradient of the slopes (Fig. 1). The total length of the constructed works was approximately 115,000 m.



Fig.1 Stadium view from the top of Kronios hill, treated by single log erosion barriers (September, 2007)

Gully and small stream channel check dams

In the past, severe erosion and landslides occurred and formed a number of gully and small stream channels in the hills of the area. These sites could not be protected from further deterioration by log barriers and so logged check dams were constructed into them (Robichaud et. al., 2000). The aim of the check dams was: to protect the channels from further erosion, deepening and widening; to trap sediment or land masses moving down from the above sites; to decrease the risk of new landslides initiation; to improve the site behind the check dams for planting trees or shrubs

Wood-made check dams were selected for the same reasons concerning the log barriers. They were also temporary constructions and were built perpendicularly to the main channel of the stream or the gully. The construction cross-sections of these works were selected according to their morphological and hydro-geological characteristics. Twenty five check dams were constructed in the rehabilitated area (Fig. 2).



Fig. 2 Check dams in the channel of a small stream (October, 2007)

Post fire natural regeneration

Mediterranean pine forests are well distinguished from the other ecosystems due to the considerable hosted plant and animal biodiversity, the climate conditions (dry and hot summer, mild and humid winter) and particularly their adaptation to wildfires (Dafis 1997). Aleppo pine (*Pinus halepensis*) has developed several adaptation mechanisms against fires (Dafis 1987, Thanos and Daskalaku 2000). It is an obligate reseeded (regenerated only by seeds) and the mature trees usually die during the fire (Daskalaku et al. 2007). The Aleppo pine survival depends on the annual production of mature cones and seeds, as well as on the maintenance of a large fraction of the annually produced seeds in the closed cones (canopy seed bank). The closed and mature cones (in unburned forests) are accumulated in the canopy seed bank, which is constituted by cones of various ages (Daskalaku and Thanos 1996, Nathan and Ne'eman 2000, Tapias et al. 2001, Goubitz et al. 2004). An important parameter for evaluating the pine post fire forest regeneration is the burned stand age, which is directly associated with forest productivity in cones and seeds, respectively. In the area, the burned Aleppo pine stand age fluctuated from 40-80 years old and the forest constitutes of mature trees, with a mass of reproductive structures (cones) in its canopy seed bank.

In the framework of the Olympia restoration project, the monitoring of the post fire Aleppo pine regeneration was achieved in four established experimental plots (10 X 1m²) during the first post fire year (2007-8).

Soil samples (r=3.25 cm and 2 cm in depth, burned soil sample area=33.18 cm²) were collected before the onset of the first post fire rainy season from all experimental plots. The soil samples for containing *Pinus halepensis* seeds were carefully inspected in the laboratory. The mean density of the soil containing pine seeds was 678.06 seeds/m², which converted into ha is a significant quantity of 6780600 seeds/ha, enough for the pine forest restoration.

In the burned area, many post fire regenerated plant species (*Quercus* sp., *Pistacia* sp., *Asparagus* sp.) are already present (field measurements by the end of September 2007). It is noteworthy to mention, that no pine seedling was recorded at the same time in the experimental plots (September 2007), a fact that is strictly related to the onset of the first post fire rainy season in the area.

After the onset of the first post fire rainy season (November 2007), the Aleppo pine post fire regeneration was very satisfactory and the mean pine seedling density reached up to 11.55 ± 0.77 seedlings / m² (Fig. 3). The maximum pine density (30.40 ± 4.04 seedlings/m²) observed to Kronios foothill and the minimum on the top of Kronios hill (0.50 ± 0.14).



Fig. 3 *Pinus halepensis* postfire natural regenerated seedlings (February 2009).

Revegetation establishment by hydro seeding

Quick revegetation establishment by hydro seeding technique was a direct dynamic intervention applied to the broader archaeological site of Olympia following the big fire of 2007. Apart from the

direct aesthetic result, it usually constitutes a first priority activity in inclined slopes for their protection from soil erosion (Albaladejo Montoro et al. 2000), but also in complementarity with the other soil erosion prevention measures. Hydro seeding technique was not applied to the total burned area but only to 21 ha and mostly on the steep slopes with the following mixture:

Water	20 m ³ /Ha
Fertiliser N:P:K 6:48:6	400 Kg/Ha
Glue	10-170 Kg/Ha
Fibre wood	1800 Kg/Ha
Organic soil improver	400 kg/Ha
Seeds	200 Kg/Ha

The mixture of the used plant taxa seeds was:

Lolium rigidum	15%
Phacelia tanacetifolia	15%
Sanguisorba minor	20%
Onobrychis sativa	18%
Medicago lupulina	18%
Plantago lanceolata	7%
Achillea millefolium	7%

Hydro seeding with the particular technology of the machinery used and with the help of hosepipe reached the 120 metres in length and at 90 metres elevation difference (Fig. 4).



Fig. 4 Application of hydro seeding technique on the eastern side of Kronios hill (February, 2008).

In the cases where the slope was particularly steep (an area of 3ha), a kind of geotextile, the jute, was used in order to cover the soil before the application of hydro seeding. In some cases the jute was applied even between log erosion barriers. The jute that was used is manufactured 100% from plant materials and it is biodegradable in 4 years time. Its role is double: it retains and protects the surface of the soil and provides favourable micro-environment for the plants because of humidity retention and shading. Jute was fixed with metal biforcates and for better contact with the soil, smoothing the top of the slope was needed, so that there were no gap between jute and the soil (Fig. 5).



Fig. 5. View of the Eastern side of Kronios hill treated by log erosion barriers and geotextile from jute (on the steep slope of the top) (February, 2008).

Plant establishment

The objectives of the post fire restoration activities in the archaeological site of Olympia were the re-establishment of the ancient oak forest based on Xenophon, Theophrastus and Pausanias references and Leonardos (1901), Zacharis (2006), the long-scale broadleaved species introduction and the locally replacement of Aleppo pine forest with a mixed forest for fire prevention.

Taking into account the Hellenic Central Archaeological Council's limitations, an authority responsible for any archaeological site management in Greece, the specific restoration project has considered the following principles: the plant selection (selection of planted taxa) should follow the historical perspective of the site, utilise physiological fire resistant species and provide the paramount landscape aesthetic values; the optional planting of big trees that will narrow the burned landscape image at the ceremony of the Olympic Flame for the Beijing Olympic Games of 2008; the specific emphasis was given on Kronios hill geomorphology maintenance, due to the proposed infrastructures for fire prevention and the surrounding area of the New Archaeological Museum should be aesthetically restored as soon as possible.

Moreover, the selected plant species should be vigorous and not infected by insects or fungi (*Seiridium cardinale* commonly affects the cypress plantations in the area). The plant material should be supplied from the broader region of Peloponnese nurseries, in order to maintain the local plant genetic resources and preserve the biodiversity. In addition, the high risk of erosion observed in the broader area, combined with high slopes (>60-70%) decrease considerably the success of planting works. Furthermore, an irrigation technique was a necessary forecasted action. A specific plan for plant establishment was applied for each hill, using the form, the colour and the height of the plant species, according to their environmental needs, for the design of the desirable landscape. Nevertheless, the aesthetic and functional re-establishment of vegetation will require enough time, while the broader area should be managed as a high biodiversity spot due to the valuable existing archaeological monuments (Fig. 6).



Fig. 6. Pierre de Coubertin's monument view after the restoration of the area (February, 2008).

Apart the re-vegetation establishment of the area by the hydro seeding technique, further plantations have been designed as follows: dynamic plantations of higher plants for ornamental purposes in visible areas from the archaeological site, the museum, the International Olympic Academy and the monument of Pierre de Coubertin; further reforestation, mainly on the hilly burned area, used 26 different plant species, as referred below, which were recorded in natural non-adjacent burnt region; special cultivating care of the natural post fire regenerated plant taxa.

Table 1.

<u>Tree species</u>	<u>Shrubs species</u>
Valonea oak (<i>Quercus ithaburensis</i> ssp. <i>macrolepis</i>)	Hawthorn tree (<i>Crataegus monogyna</i> Jacq.)
Pubescent oak (<i>Quercus pubescens</i> Willd.)	Turpentine tree (<i>Pistacia terebinthus</i> L.)
Holm oak (<i>Quercus ilex</i> L.)	Mastic tree (<i>Pistacia lentiscus</i> L.)
Kermes oak (<i>Quercus coccifera</i> L.)	Flowering ash (<i>Fraxinus ornus</i> L.)
Upright cypress (<i>Cupressus sempervirens</i> L.)	Smoke tree (<i>Cotinus coggygia</i> Scop.)
Cretan maple (<i>Acer sempervirens</i> L.)	Strawberry tree (<i>Arbutus unedo</i> L.)
Olive tree (<i>Olea europaea</i> L. var. <i>europaea</i>)	Greek Strawberry tree (<i>Arbutus andrachne</i> L.)
Olive tree (<i>Olea europaea</i> L. var. <i>sylvestris</i> Brot.)	Sweet-scented oleander (<i>Nerium oleander</i> L.)
Judas tree (<i>Cercis siliquastrum</i> L.)	Chaste-tree (<i>Vitex agnus castus</i> L.)
Umbrella pine (<i>Pinus pinea</i> L.)	Myrtle (<i>Myrtus communis</i> L.)
White poplar (<i>Populus alba</i> L.)	Spanish broom (<i>Spartium junceum</i> L.)
Laurel tree (<i>Laurus nobilis</i> L.)	Alaternus (<i>Rhamnus alaternus</i> L.)
Jasmine box tree (<i>Phillyrea latifolia</i> L.)	Jerusalem sage (<i>Phlomis fruticosa</i> L.)

All plant species, planted either in growing season of 2007-8 or 2008-9, are presented in Table 1. Totally, more than 39.000 plants were planted, from which about 3.000 of aromatic shrubby vegetation of the area were used in the Museum's garden (Fig. 7).



Fig. 7. Plant establishment at the New Archaeological Museum – Olympia (March, 2008).

Future monitoring and maintenance of the area

Further study of the restoration measures undertaken is needed to prevent any change of the situation achieved in the area. Hence, in the framework of the Olympia restoration project and at least for its duration 2007-2012, a network of plots has been installed to monitor and investigate: the meteorological conditions of the studied area, mainly the rainfall and the temperature; the effectiveness of the specific design of the log erosion barriers for the protection of the soil from erosion and floods; the post fire regeneration of Aleppo pine in order to secure the reforestation

priorities applied in the broader area; the estimation of the plant establishment, mainly the plant survival and growth.

Regarding the maintenance of the area and according plan of restoration, additional planting is provided for autumn 2009. The number of additional plantings, for the following years, will depend on the success of the natural regeneration and the survival of established plant species. The management also of flammable biomass has been foreseen to prevent new fires. Additionally, special cultivating care and irrigation of the established and of the natural post fire regenerated plant taxa is needed. The number of irrigated plants depends on the following dry summers, at least for the installed plants in winter 2008-2009.

Conclusions and Recommendations

The applied treatments effectiveness rating used quality parameters across the spectrum from “excellent” to “poor”. The rating for contour-felled logs was “excellent” or “good” in 70% of the measurements, while the rating for hydro seeding was 60% “excellent”. For jute technique the rating was 60% “good” or “fair” because of its application on particularly steep slopes. According to the measurements none of the treatments were considered as “poor”. The various measures taken for the protection of soil from erosion and the mitigation of floods combined with the vegetation establishment by hydro seeding protected effectively the whole burnt area and ameliorated significantly the broader landscape.

The burnt area, two months after the fire, was immediately filled with wild flowers and the natural regeneration of Aleppo pine gave the hope and an optimistic message that Olympia was already starting to recover. Also, as expected, the natural regeneration of evergreen broadleaved was highly satisfactory. It is noteworthy to mention, that the plantation established, except in certain positions where additional interventions were needed, is estimated to have been successful over 95%. Apart from the restoration of the archaeological and broader landscape of Olympia for the embellishment of the site, further objective should be to forestall and minimise as far as possible any future risk mainly caused by fire, which is a natural factor of hazard in the Mediterranean environments. However, in such areas, general management strategies should be as follows: any intervention should strive to be continuous and moderate, without irreversible changes to the natural and cultural environment; management should maintain landscape complexity and diversity by conserving the abundance of ecological and cultural landscape units and new structures should respect local styles taking into consideration the natural and anthropogenic environment, surrounding the archaeological site, the historical references and to avoid violent display.

Acknowledgements

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References

- Albaladejo Montoro J., Alvarez Rogel J., Querejeta J., Diaz E. and Castillo V. 2000. Three hydro-seeding revegetation techniques for soil erosion control on anthropic steep slopes. *Land Degradation and Development* 11, 315–325.
- Baloutsos G., Bourletsikas A., and Lyrantzis G. 2007. Soil erosion and flood mitigation protection works in Ancient Olympia after the fire of 26th August 2007: Planning, supervision and functioning. Workshop of Technical Chamber of Greece, 5th December 2007, Athens pp. 13 (in Greek).
- Brofas G., Mantakas G., Tsagari K., Stefanakis M., and Varevides C. 2007. Effectiveness of cellulose, straw and binding materials for mining spoils revegetation by hydroseeding, in Central Greece. *Ecological Engineering* Vol. 31, p 193-199

- Dafis S. 1987. Ecology of Aleppo and Brutia Pine Forests. *Proceedings of the Greek Forestry Society, Aleppo and Brutia Pine Forests (Ecology and Management)*, 30/9-2/10/1987, Halkis, Greece, pp. 17-25.
- Dafis S. 1997. The protection of the Mediterranean Forest. *Scientific Anniversary of the Forestry & Natural Environment Department*, Volume ΑΖ/1994, Thessaloniki 1997, pp. 159-170.
- Daskalakou E., Albanis K., Skouteri A. and Thanos C. 2007. Postfire growth and reproductive dynamics in *Pinus halepensis* (Aleppo pine) forests of northern Euboea Island, Greece. In: *Book of Proceedings of the XI International Mediterranean Ecosystems Conference (MEDECOS XI)*, Perth, Western Australia, Australia 2-5/9/2007, pp. 59-60.
- Daskalakou, E.N. and Thanos, C.A. (1996) Aleppo pine (*Pinus halepensis*) postfire regeneration: the role of canopy and soil seed banks. *International Journal of Wildland Fire* 6, 59-66.
- Goubitz, S., Nathan R., Roitemberg R., Shmida A. and Ne'eman G. 2004. Canopy seed bank structure in relation to: fire, tree size and density. *Plant Ecology* 173, pp. 191–201.
- Leonardos B., 1901. *The Olympia*. Athens
- Maheras P. and Balafoutis C. 1988. Contribution on the Bioclimate study in Greece (Application of Emberger's method). *Proceedings of the 1st Greek Conference on Geography*. Athens, pp. 349 – 357.
- Mavrommatis G., 1980. Le bioclimatic de la Grece - Relations entre le climat et la vegetation naturelle – Cartes Bioclimatiques. *Forest Research*, Vol. 1, Annex.
- Nathan R. and Ne'eman G. 2000. Serotiny, seed dispersal and seed predation in *P. halepensis*. Pages 105-118 in G. Ne'eman and L. Trabaud, editors. *Ecology, Biogeography and Management of Pinus halepensis and P. brutia Forest Ecosystems in the Mediterranean Basin*. Backhuys Publishers, Leiden, The Netherlands.
- Papachatzis N., 1979. *Pausanias, Travel in Greece*, (in greek) Volume 4,5,6 Messinika and Iliaka. Ekdotiki Athinon.
- Robichaud P.R., Beyers J.L. and Neary D.G., 2000. *Evaluating the Effectiveness of Postfire Rehabilitation Treatments*. USDA Forest Service, Rocky Mountain Research Station, General Technical Report, RMRS-GTR-63, September 2000, p. 89.
- Tapias R., Gil L., Fuentes-Utrilla P. and Pardos J A. 2001. Canopy seed banks in Mediterranean pines of southeastern Spain: a comparison between *Pinus halepensis* Mill., *P. pinaster* Ait., *P. nigra* Arn. and *P. pinea* L. *Journal of Ecology* 89: 629–638.
- Thanos C.A and Daskalakou E.N. 2000. Reproduction in *Pinus halepensis* and *P. brutia*. Pages 79-90 in G. Ne'eman and L. Trabaud, editors. *Ecology, Biogeography and Management of Pinus halepensis and P. brutia Forest Ecosystems in the Mediterranean Basin*. Backhuys Publishers, Leiden, The Netherlands.
- Theophrastus. *Enquiry into plants*. (In two Volumes, with an English translation by Sir Arthur Hort). Harvart University Press. (Reprinted in London 1949).
- USDA Forest Service. 2003. Designing Log Contour Basins for Effectiveness. *Stream notes*, Stream Systems Technology Center, Rocky Mountain Station, July 2003, pp. 1-2.
- Zacharis A., 2006. *Nature and forest in ancient Greece*. Volumes A', B', C'. (in Greek). Press by Ministry of Agriculture, Athens.

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THE OLYMPIC LANDSCAPE BEFORE AND AFTER THE FIRE

Abstract

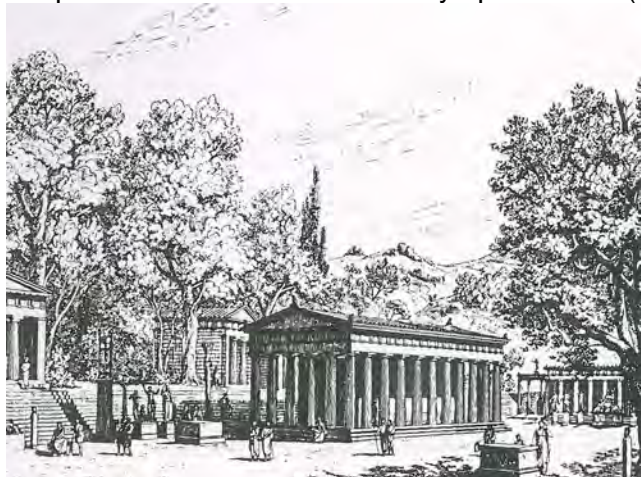
Ancient writers' testimonies and descriptions of travelers of the 19th century give us vital information of the Olympian Landscape. Lysias states, that "Olympia's valley is the most beautiful place of all Greece".

2007 August's Fire, which during its catastrophically deed vanished properties, estates, natural wealth, but mostly human lives, left untouched the museum installations and the sanctuary of Zeus. The hills that surrounded the Museum, including Kronios - symbol of Olympia's myths –were burnt utterly. State's intervention was immediate. The day after, a massive project was scheduled for the restoration of Olympia's natural environment. The terms and conditions were set by the Central Archaeological Council. The restoration should have complied with the testimonies of ancient sources, the descriptions of the European travelers of the 19th century, and mainly to the environmental image of the Olympian landscape within the last decades. The difficulties were enormous, due to the great expectations, which were imposed by the holy ground of Olympia. Our highest debt was, of course, the activation and participation to this effort, which was a result of struggle and everyday work. We tried to heal the wounds of Olympia, with love and mostly with great respect. During six months an enormous project was carried out –unprecedented to Greece – so that today, Olympia depicts a new hopeful image. The landscape calms, nature reborns, advances. Thousands of trees that were planted are now growing, the earth is getting greener, natural harmony and beauty is returning.

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The ancient Greek writers give us valuable information about the Olympic landscape in antiquity. Referring to the Sanctuary of Olympia, Pindar says "Oh, the beautiful forest of Pisa, by the river Alpheios". Lycias characterises Olympia as the most beautiful place in Greece. Strabo says that the Stadium is placed in a grove of wild olive trees. Pausanias is clearer and refers to the many different kinds of trees that existed in Altis, cypress, poplar, plane and oak trees as so many others.

The worship of Zeus began in a grove, by the rivers of Alfeios and Kladeos and under the hill of Kronios. The pilgrims used to leave their votive offerings in front of the altars or hanged them to the branches of the trees. The name "Altis" was given by the aeolic word "grove" and comes from the verb *άλδω* which means feed. Altis was full of wild olive trees, plane trees, cypress trees, poplar trees, pine trees, oak trees, myrtles, willow trees and others. Near the temple of Zeus and by the Altar of the Nymphs, there was the wild olive tree from which they used to cut a wreath, *kotinos*, the price for the winners at the Olympic Games (Fig.1).



During the Games, people sprinkled the athletes with leaves and flowers. Many plants took their names from nymphs and heroes. For example, Iris, the messenger of Gods, the beautiful Narcissus, Adonis and many others. Between the trees of this beautiful forest the magnificent temple of Zeus and the other buildings of Altis were erected. The forest was composed by strong and powerful oaks, poplars of the sacrifice, erotic myrtles (symbol of love), apple trees (symbol of wisdom, beauty and victory), vines, ivies, palm trees and of course the sacred olive trees, symbol of peace. The oak, cedar, cypress, myrtle and fig tree were used for the construction of wooden statues. The altars were decorated with ivy (symbol of immortality), wild carnations, lilies and roses. For the sacrifices they used poplar. The trees and plants were part of the famous Olympic landscape.

The travellers of the 19th and 20th century give us valuable information. They all refer to the beauty of the Olympic landscape, the rich vegetation, the high forests (Leake W.M. 1830, Dodwell E., 1819, Pouqueville, F. C. Beule E. 1855). The sketches they made of the Alpheios valley show that Kronios, at that time was not abounding with pines. It resembles to the image we face today, after the fire (Fig.2)



At the beginning of the 20th century the landscape changed. The archaeologist B. Leonardos, in 1901, describes the place full of many kinds of trees and plants: Kronios was planted with pine trees, cypress trees, myrtles, plane trees, oak trees and others. At that time, Kronios looked like the hill we knew before the big fire of the 26th of August 2007. The great fire which was burning for many days destroying houses, fortunes, and vegetation soon reached Olympia. In just a few minutes time it destroyed the beautiful and peaceful Olympic landscape, the hills around the Archaeological Museum, the hill of Kronios, Academia and the Coubertin Monument. Thanks to the fire department and the change of the wind, the fire stopped by the bank of the river Kladeos and the southern end of the Archaeological site. The Olympic landscape has a strange power; its soil is sacred and fertile. It has beauty and charm. It's connected to the Sanctuary of Zeus and the Olympic Games. It charms every pilgrim's soul and offers balance and freedom (Fig.3).



The Next Day was much more difficult that we could ever expect. The atmosphere was muddy, full of smoke. The museums and the Sanctuary were not damaged. The fire had respected them. But a big part of the vegetative life of Olympia was destroyed. The trees were burned, the animals disappeared, and the earth became black. The feelings of sorrow, disappointment, desperation, and wrath were very intense for all of us who live in Olympia. But the intervention of the Ministry of Culture was immediate. Representatives of the Ministry, of the Prefecture of Northern Greece, the forests' inspection department, and our Ephorate created a big project for the regeneration of the Olympic landscape. The project was undertaken by *ΕΘΙΑΓΕ* (National Institution of Agricultural Research). The Central Archaeological Council asked to use the same kind of plants that existed in ancient years. We should mention that Kronios was also destroyed by a fire during the 1930's.

Restoration of the vegetation

The damage at the sides of the Stadium was easily restored, thanks to the installation of a watering system and fertilisation (see previous paper). In a few days, the Stadium looked better than before.

Restoration of the architectural remains at the storage at the south of the Stadium

At the south of the Stadium, in an area of about four acres is the place where architectural remains from different buildings of the Sanctuary had been stored. This area is under the responsibility of the German Archaeological Institute and is not of great scientific importance, as we don't know in most cases the buildings from which the architectural remains (about 3000) came from. Close to them, there is a storage, where the most important remains were kept (parts of columns, capitals ect.). This storage was also destroyed by the fire. The day after the fire, specialists from the Department for the Restoration of Ancient Monuments of the Hellenic Ministry of Culture found out that the damage was not that serious. The restoration of the storage and the remains began immediately. The architectural remains were cleaned, conserved and covered with plastic. These days the reconstruction of the storage is completed (Fig.4).



The area of the regeneration of the Olympic landscape

The restoration took place in an area of 500 acres, which included the hill of Kronios, the hills around the Archaeological Museum, the Coubertin' Monument and the atrium of the Museum (Fig.5).



All the burned trees were cut down and removed. Moreover, corroding and flooding preventive constructions were immediately made, by using trunks. New trees (about 35000) were also planted (Fig.6 and 7).



The Olympic soil is fertile and blessed. That's why this soil was worshipped as the Goddess Mother Earth at the antiquity. Its strength was proved a month after the fire, when the first cyclamens, the wild flowers, the lilies and finally the pine trees appeared. The budget for the prevention of the corroding and flooding was covered by the special depository for the confrontation of emergency situations. The project of the planting of the new trees was fully covered by Latsis Group and Eurobank EFG.

We hope to see Kronios, the symbol of the myths of Olympia, full of trees again. The hill of Kronios, during the ancient years witnessed the altars, the temples, the magnificent buildings of the Sanctuary, the thousands of votive offerings and the youth of Ancient Greece fighting for *kotinos*, the humble price for the Olympic winners. Later on, Kronios witnessed the destruction of the Sanctuary by humans and nature. It was present when the sacred rivers of Alpheios and Kladeos covered with mud the Sanctuary, protecting its ruins. Many centuries later, Kronios was there when workmen dug and brought these ruins back to light (Fig.8).



Our highest debt is to contribute to the regeneration of the Olympic landscape. A very important project was completed in six months. Today, Olympia is a calm and peaceful place again. The landscape is getting greener; the plants grow higher day by day. But we must be patient and never stop taking care of the plants.

Acknowledgements

Special thank to the Ephorate for their fight and labor during this extremely difficult year. Especially; to all the people who put themselves in danger the day of the fire and all the people who stayed at the museum that terrible night; to The Ministry of Culture, the Prefecture of Northern Greece, the donors, the Municipality, the City of Olympia, the Forests' Inspection departments, the Police, the Olympic Academy, the volunteers and all those who worked for this national project. Thank to *EΘΙΑΓΕ* and its scientists and to all those who dedicated themselves to Olympia.

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THE FIRE OF AUGUST 26, 2007 THAT DAMAGED OLYMPIA: WHAT HAPPENED AND LESSONS LEARNT

Abstract

A series of large fires started on August 23, 2007 in many parts of Peloponnese, Greece, and within five days burned more than 150.000 ha of forests and agricultural lands, killing more than 60 people. One of these fires reached the archaeological site of Olympia on August 26, 2007 and caused serious damages. This paper presents an account of the events that resulted in the fire reaching Olympia, of the firefighting efforts and of the damages caused. The pitfalls that led to the disaster are discussed. Finally, the discussion is followed by conclusions on what should be done in the future to avoid such disasters not only in Olympia and the other archeological sites in Greece but also in other world heritage monuments around the world.

Keywords. Forest fires, disaster, archaeological site, Olympia

Introduction

The archaeological site of Olympia in Greece (Fig. 1) is one of the best known ancient monuments in the world. Olympia is the place where the Olympic Games took place every four years in ancient Greece. Nowadays it is visited by thousands of people every year for the archaeological site and for admiring the precious exhibits in the archaeological museum. Every four years, in a ceremony held on the site, the Olympic torch is lighted here, starting a trip to the place where the Modern Olympic Games are to be held. In 2004, when the Olympic Games were held in Greece, the ancient stadium was also used for some of the competitions.



Fig. 1. The location of Olympia on the map of Greece.

The archaeological site is on a hilly location. The hills are covered by rich vegetation, mainly Aleppo pine (*Pinus halepensis*) forest, creating a beautiful and tranquil environment. Most of the area around Olympia, however, is covered by agricultural fields (Fig. 2). Unfortunately, the peace and beauty of the site were affected negatively on August 26, 2007, when a raging fire reached the area of Olympia causing serious damages. This paper is a short account of what happened.

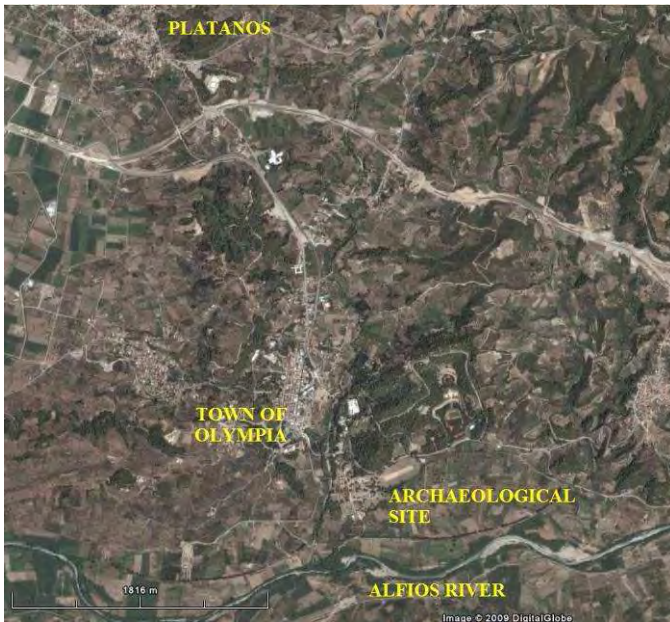


Fig. 2. The town of Olympia and the area north of it on a satellite image taken from Google Earth.

The fire season of 2007

The fire season of 2007 in Greece was the worst in recent history as it set new records in regard to damages and loss of life (Xanthopoulos 2007). A total of seventy eight people, mostly civilians, lost their lives. More than 270,000 hectares of vegetation burned and more than 110 villages were affected directly by the fire fronts. Many hundreds of homes were totally destroyed while many others were seriously damaged. The worst fires occurred in Peloponnese, in just five days, starting on August 23. On that hot day two fires that started on Mount Parnon and Mount Taygetos in south Peloponnese were not attacked effectively (Fig. 3). On the 24th of August the conditions became worse as the high air temperature and low relative humidity were combined with a strong northeast wind. Those two fires started growing quickly while new fire starts, in the prefectures of Laconia, Ilia and Arcadia became large, growing fast in deadly conflagrations in a matter of minutes. More than 35 people were killed by the flames on that day. The spread of the fires continued on the 25th (Fig. 4) while the fire fighting forces, overwhelmed by the fierceness of the fires and the news about the deaths, did little to control the blazes, concentrating their efforts on evacuating villages and saving individual properties. Among the fires that expanded rapidly that day there were two fires that had started on the 24th near the villages of Valmi and Klindia north of Olympia and merged into one. The potential danger they meant for Olympia was not recognised at the time.



Fig. 3. The fires of August 23, 2009, in the morning, in Peloponnese. Source: NASA



Fig. 4. The fire situation on August 25th. The fires of Valmi and Klindia are clearly visible north of Olympia.

The fire arrival at Olympia on August 26, 2007

High fire danger conditions continued on the 26th of August as the wind changed direction and started blowing from the northwest. The Valmi-Klindia fire started spreading in a southeast direction developing two fronts (Fig. 5). The first front, reaching the village of Varvasaina early in the afternoon, attracted a lot of attention by the fire fighting forces as there were numerous pleas for help. A little later, the second front advanced to the village of Platanos about 3.5 km northeast of Olympia. Even then, in spite of warnings by many local officials, the threat to the archaeological site was not clearly recognised by the fire fighting authorities that had been receiving numerous calls for help from various sources, and seemed confused and without a concrete plan of action. After passing the village of Platanos, where it left two dead persons, the fire moved quickly and aggressively towards Olympia burning a mix of pine stands and agricultural fields (figure 6). Fine fuels in the latter made its spread very rapid. This quick spread left no time to the fire fighting forces to regroup and to try and defend the site in a coordinated way taking advantage of the existing roads.

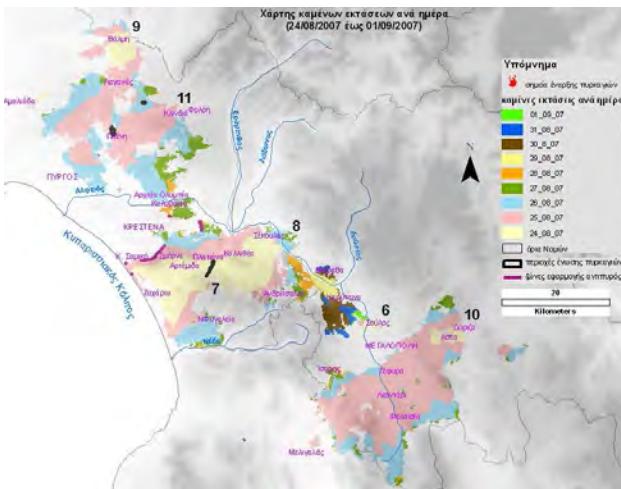


Fig. 5. Daily evolution of the fires in western Peloponnese between August 24 and September 1, 2007 (Athanasίου 2008).

The fire first hit the outskirts of the town of Olympia where visitors of the ancient site had found refuge. As buildings in Greece are built mainly with non-flammable materials, there was no real threat to lives and only few homes were damaged. Many TV station reporting crews and photographers were already located in Olympia and documented like the fire spread (Fig. 7) and the lack of significant fire fighting resources at that moment.



Fig. 6. The fire approaching the town of Olympia from the north.



Fig. 7. Pictures from the fire front passing through Olympia (top) and entering the archaeological site (bottom) as reported by the Mass Media.

A few minutes later, as the fire entered the archaeological site additional ground resources arrived, including a specialised fire fighting tank. They were helped by helicopters and amphibian Canadair aircraft which, at that time, started making water drops from the air. In a last minute effort of the fire-fighters, the aerial resources and the personnel of the Archaeological Service, the damage to buildings and the other historic elements of the site was minimised. The effort also resulted in stopping the fire at the south edge of the site, taking advantage of Alfios river and the agricultural fields there (Fig. 8). However, significant damage to the site was already done at few secondary buildings, most of the vegetation in the area burned, and a number of archaeological monuments were affected. The archaeological museum and the main buildings of the Olympic Academy were not damaged (Fig. 9).



Fig. 8. The final perimeter of the fire showing that the front was controlled immediately after it passed the road (yellow line) that crosses the archaeological site. The fire also spotted on the opposite side of Alfios river but was controlled before spreading too much (Source: SERTIT - Service de Cartographie Rapide).



Fig. 9. Aerial photo of the burned archaeological site of Olympia. The museum can be seen at the left edge, the installations of the Olympic Academy in the middle and the stadium at the bottom of the photo.

It should be noted that an automatic sprinkler system that had been installed on the site a few years before the disaster (Fig. 10) (Dimitrakopoulos et al. 2002) did not operate fully due to an electric malfunction. It was intended to wet the vegetation and not to extinguish a fire. Under these circumstances it did not contribute much to the protection of the site.



Fig. 10. A photo of the sprinklers that had been installed in Olympia, in operation (Source: Dimitrakopoulos et al. 2002).

Discussion and Conclusions

The fire of Olympia highlights a number of issues about the potential for such disasters in sites of archaeological or cultural importance with similar characteristics to those of Olympia. The lessons this disaster teaches us can help us draw conclusions for future actions.

In a monument such as Olympia, surrounded by flammable Mediterranean vegetation, a wildfire every few decades is more than just a probability. It is a certainty and it must be seen under this light. Increased protection by local firefighting forces may be enough to control small starting fires, but roaring mega fires coming from a distance can defy all firefighting efforts at their front and can sweep the site with disastrous results. Furthermore, the case of Olympia illustrates that under such extreme conditions, further compounded by deaths, a temporary collapse of command is a possibility that cannot be ruled out. Then, a preferential external effort to protect the site may be absent when most needed, and the whole effort may have to rely solely on the local people, resources, infrastructures and plan.

Mega fires, as a rule are not a common event. As a result people tend to forget and the emphasis given to the preparation for such an event decreases with time. However, this should not be an excuse for a highly visited site of great importance. Adequate planning and provisions should always be in place to secure the safety of the monument and of the visitors even when a large fire reaches its perimeter. In light of the above, each monument with similar characteristics to Olympia must have a high quality fire management plan that outlines actions in regard to fire prevention and suppression. The plan must be prepared by highly specialised experts in cooperation with all the local authorities and groups that will be involved in its application. These authorities will introduce in the plan the special limitations that need to be considered, such as archaeological considerations, and will also offer ideas and solutions.

The plan should:

- Foresee scenarios for fires starting within or near the perimeter of the site, and for large fires coming from a distance.
- Identify specific weaknesses, such as construction materials of certain buildings, outlining measures to be taken for risk mitigation (materials removal or replacement, extra protection, etc.)
- Include a firefighting infrastructure design, including water transport system, hydrants, sprinklers, and other tools, appropriately allocated on the site, and able to function under adverse conditions. For example, there should be backup for the lack of electricity, redundancy of critical components, etc.
- Provide guidance for vegetation management in order to keep fuels under control. Furthermore, it should foresee gradual enrichment of vegetation with less flammable species that will also improve the aesthetics of the site. It should be noted that certain options, such as construction of wide firebreaks, may not be an option of such sites for practical (e.g. land uses, ownership) or aesthetic reasons.
- Include a plan of action for the safety of the visitors, identifying or developing safety areas while taking into consideration the adverse conditions (e.g. smoke, low visibility, panic) at the time of crisis.
- Provide for the training of all the personnel involved (archaeological authority, firefighters, local authorities, seasonal personnel, etc.) including familiarisation with the plan.
- Provide information to the neighboring population about the potential for disaster and the actions they can take to reduce it. Practical guidance and help are among the tools to be used.

In conclusion, the well known saying “better to prevent than to cure” clearly applies in this case. As current climate change trends increase the occurrence of days with extreme fire danger conditions, and socioeconomic changes (e.g. abandonment of rural areas) lead to wild land fuel accumulation, mega fires seem to be a reality that will happen more often in the future. Other archeological sites in Greece but also in other world heritage sites around the world with similar characteristics to those of Olympia should realise the danger and should be prepared accordingly.

Acknowledgements

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References

Athanasίου, M. 2008. Forest fire behavior in Greece: Characteristics and prediction. M.Sc. Thesis. Inter-University Post-Graduate Studies Programme on “Prevention and Management of Natural Disasters”, Department of Geology and Geo-Environment of the National and Kapodistrian University of Athens, and Department of Geoinformatics and Topography of the Technological Educational Institute of Serres. 140 p.

Dimitrakopoulos, A.P., D. Mitrakos, and V. Christoforou. 2002. Concepts of Wild land Fire Protection of Cultural Monuments and National Parks in Greece. Case Study: Digital Telemetry Networks at the Forest of Ancient Olympia. *Fire Technology*, 38: 363–372.

Xanthopoulos, G. 2007. Olympic Flames. *Wildfire*. 16(5):10-18.

Section III - Other World Heritage Case Studies

Leonard Ahonon

Site Manager of the Palais Royaux d'Abomey, Benin

CAN THE ROYAL PALACE OF ABOMEY BE AGAIN IN DANGER?

The royal palace site of Abomey with 47 ha is on the World Heritage List since December 6th 1985 with the number C 323 and is the function palace of Danxome Kings. It is composed by 184 components and 10 Small palaces (Fig.1, 2 and 3).



Fig.1 Location of the Site's components. Fig. 2 The main component of the Site - Gblogblodji

Its particularity is that it is in earth architecture and it is based on the "hill" of Abomey where thunder, tornado and wind are very hard. The soil appropriated by grass houses animals which eat wood, grass and the ground.



Fig. 3 Adoxo (grabe of the king)

That site is vulnerable to several hazards:

Natural risks:

- heavy rains caused by Tornados with strong wind
- landscape (grasses and small trees growing in non stop) during the dry seasons they became the cause of site fires
- Small animals which create their houses in the basement of the constructions

Human actions:

- Destruction and vandalism
- Fire

If specific disaster risk reduction actions are not put into place unsolvable damages will make disappearing the exceptional and universal value of the site. In order to prevent such a situation and to secure the site, some actions are developed.

Preventive measures:

- Inspections
- treatments
- small interventions of conservation
- Integrity of the site

Convivial management:

Royal families;
local community;
town council, city

Pact with policemen and firemen /fire fighter

These permanent operations have given satisfaction and contributed to remove the site from the World Heritage in Danger List of UNESCO in June 2007 at the Committee Meeting in Christchurch, New Zealand. Such experiences need to be encouraged by all the partners through the *Programme for Strengthening Disaster Risk Reduction at World Heritage Properties* proposed by the World Heritage Centre of UNESCO.

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INVENTORISATION AND EARTHQUAKE HAZARD PERFORMANCE EVALUATION OF RELEVANT HISTORIC BUILDINGS IN ISTANBUL, TURKEY

Abstract

This project, carried out by a joint venture headed by ARS Progetti-Italy (with SPC-Studio Progettazione e controlli-Italy and Consultancy for Conservation-UK) on behalf of the Istanbul Directorate of Survey and Monuments of the Ministry of Culture and Tourism, with a World Bank financing, represents one of the most significant efforts undertaken by a public administration to analyse the seismic vulnerability of their built cultural heritage and to strengthen their preparedness for a potential earthquake. The built heritage of Istanbul is astonishing in quantity and quality while on the other hand the seismic hazards to which this heritage is subject to are the most striking. The research took into consideration 175 historic buildings (Fig. 1) including Hagias Sofia and the Topkapi Palace and built a GIS-database containing all the relevant historic, architectural and structural information of these buildings along with the assessment of their vulnerability and risk and the recommended retrofitting actions. This data-base has a web interface and can be interrogated by the various relevant administration departments as well as, partially, by the general public.

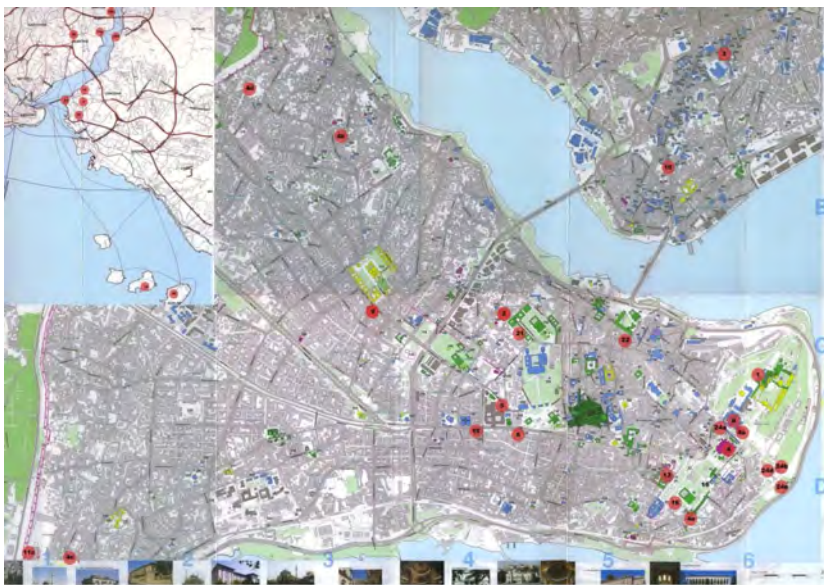


Fig. 1 Map – location of building complexes

Its objective was to avail the administration with a planning/monitoring tool and not with an engineering design of retrofitting measures, which would involve more detailed analyses and design work. The tool allows the establishment of priorities and forms a basis for the formulation of general action plans aimed at risk mitigation. On the other hand it allows the assessment of development projects based on the movable cultural heritage, where the seismic risk must be taken into consideration.

From the point of view of approach and methodology to achieve the above objectives the project constitutes a most significant experience, where different sources and methods of analysis were combined and weighted to achieve an acceptable reliability of the final vulnerability and risk assessment. These were: a thorough investigation of various historic archives of the Ottoman State, of the Turkish Republic period and of the various official bodies concerned with heritage conservation, to obtain information on the history of the monument, its layers and transformation, the damages suffered from earthquakes during their life, the repair and maintenance works

undertaken in different epochs; field surveys of architectural and structural characteristics, past interventions, present state and present degradation; qualitative vulnerability assessment based on expert (synthetic); assessment of vulnerability factors; quantitative (analytical) vulnerability assessment either through global indicators related with the structural features and behaviour of the building or, whenever possible, through a mechanical model specifically studied for seismic vulnerability assessment at planning /feasibility level; seismic hazards study with micro zoning of the project area; final risk assessment weighting the results of the different analyses carried out as above and taking into consideration the use and the significance of the cultural heritage. Final indication of retrofitting strategy, typical measures and further investigations needed to deepen the understanding of the structural behaviour of the building and/or to proceed with design of retrofitting measures.

The project, concluded in October 2008, took one and half year of very intense work, with the participation of several well known international experts, a team of well known scholars- historians of architecture, the most qualified Turkish experts in earthquake hazards assessment, a team of IT experts and a full-time team of 10 architects and engineers during the whole period for the field surveys, building reports compilation and data-base uploading.

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Project background

The Government of Turkey and the World Bank have agreed upon a contract to implement the Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP). Its objective is to improve the city of Istanbul's preparedness for a potential earthquake. The project is implemented through the Istanbul Special Provincial Administration (ISPA) by the Istanbul Project Coordination Unit (IPCU). One of the components of ISMEP Project is "Risk Assessment of Cultural Heritage Buildings", for which the Ministry of Culture and Tourism (MoCT), Istanbul Directorate of Surveying and Monuments (IDSM) is the responsible body. The main goal of this subcomponent is to assist the Government of Turkey in mitigating the impact of the seismic risks associated with the cultural and historical heritage in Istanbul.

Core data index and structure of the data-base

The Core Data Index is the basis for database design. The data are organised in six main sections or levels: basic compound data, basic building data, historical data, structural data, assessment (vulnerability and risk) and risk mitigation measures.

The assignment included the following components:

1. Literature survey
2. Field surveys,
3. Vulnerability and risk assessment
4. Risk mitigation measures
5. GIS database

Literature survey

The literature survey was conducted to obtain information on the history of the buildings and on earthquake damage incurred by the selected buildings during previous earthquakes and the repairs that were carried out to rectify earthquake damages. The sources from which this information was obtained included the official records of the Ottoman State and the Turkish Republic, published academic papers and university theses, and the records of the organisations concerned with the protection of the built heritage of Istanbul. The survey identified architectural drawings, other visual material, records of repairs and alterations, historical and architectural studies. Furthermore, the huge work undertaken in the many archives investigated brought to identify and collect a relevant amount of information of general historical interest, including old drawings, images, original documents, etc. Some of this documentation was scanned and uploaded in the data base where the rest is available in hard copy handed to Directorate of Surveying and Monuments.

Field surveys

The activities were conducted as indicated hereinafter:

On-site activities: survey of building materials and construction techniques; survey of material decay and structural damages (including measurements of deformations) and photographic survey. Office activities: collection and acquisition of electronic drawings and acquisition of paper documents through scanning process; preparation of drawings including material decay and structural damages mapping; preparation of the field survey report including basic information regarding the building; integration of results from the Literature survey. These reports were then completed by including the following data elaborated by the vulnerability assessment team: qualitative vulnerability assessment, previous investigation, proposed future investigations and outline of the main retrofitting measures.

Qualitative vulnerability assessment

The qualitative seismic vulnerability assessment for each building was based on the following parameters: relationship with adjacent buildings; geometric characteristics of the building: plan configuration, number of storeys and dimensions, presence of mezzanines; structural system description: vertical and lateral force-resisting system, floor and roof diaphragm effectiveness, connection in the wall's corners and between walls and floors, basement and foundation system; mass irregularity: it is the presence of heavy mass on a floor or when one floor is much heavier than the others, e.g., heavy machinery installed on an intermediate floor of a building; architectural features that may affect earthquake performance, as thrusting elements like arch, vault or sloped roof without ties, arcades or pillars alignments that behave as a soft-story, not regular arrangement of masonry partition walls, etc.; general conditions: decay of materials, damages, also due to past earthquakes, alterations and additions. The assessment was made after an analysis of the information contained in the field survey reports and after an expert visit to each building.

Quantitative vulnerability assessment

Quantitative assessment was made by two methods, i.e. by global indicators, related with the geometrical characteristics of the building, and by a mechanical model called FaMIVE. The application of global indicators require the following conditions: the structure is regular and symmetric; the floors act as rigid diaphragms and that the dominant collapse mode is in plane shear failure of the walls. The FaMIVE (*Failure Mechanisms Identification and Vulnerability Evaluation*) method, developed by one of the expert D'Ayala over the past 10 years is a data collection and numerical tool used to assess the seismic vulnerability of historic ordinary buildings at urban scale. Independently of the size of the sample, the method is based on an accurate analysis of the seismic performance of buildings, without foregoing their constructive features, particularly masonry types and connections among structural elements. The seismic vulnerability is defined by two indices, a structural index and a failure index, and their product provides the final assessment of vulnerability. A criterion for weighing the reliability of the information recorded in the survey allows lower and upper boundaries of the final vulnerability to be defined. For each building in each unit of quantitative assessment global, prevalent and local vulnerability judgement are provided with the following definitions:

- *Global vulnerability* refers to weaknesses which are either distributed in various and several parts of the building or characterise a most relevant part/section of it, such as more than one entire façade and involving in their collapse floors and roofs, so that possible damage would affect a large portion of the building.
- *Prevalent vulnerability* (class, load factor, failure mechanism) is neither the worst nor the average vulnerability, but the most significant i.e. that which best characterise or refer to the possible most significant damages, in other words, over more walls, is either the most common or the one with the most serious consequences. In this respect in some cases global and prevalent might coincide in terms of class or mechanism, but it is unlikely in terms of collapse load factor.
- *Local vulnerability* refers to the most vulnerable element/section/part of the building where possible damage affects a limited part of the building. It highlights a localised weakness where possible damage can occur for considerably lower collapse load factor than the rest

of the building. Also usually these are vulnerability that can be easily identified and mitigated with ordinary, conventional strengthening.

The reliability result, relating to the input of the data provides the range of confidence with which the central value of collapse load factor is arrived at. In this respect only one value is given for each building indicative of the overall quality of the assessment.

Seismic risk assessment

The vulnerability assessment coming from the qualitative and quantitative method were compared on the basis of their reliability and weighed by the information and data on their seismic performance through history as obtained from the Literature survey. The seismic risk was based on the comparison between the vulnerabilities of each building and the seismic hazard of its site. In other words it is considered as the relative measure between the capacity of the building and the demand of the external hazard. In general, this is expressed in terms of a certain level of damage expected compared to a given level of foreseen hazard. The hazard has been quantified assuming a deterministic earthquake scenario for Istanbul. On the basis of the risk evaluation and quantification, mitigation measures can then be identified, and ranked. This type of assessment corresponds to an intermediate level of what is commonly considered as risk assessment. The judgment is based on limited knowledge and simplified analytical models and hence represents an initial form of assessment.

Moreover the result should be weighted according to the protection level of which the building wants to be endowed. The expected performances of any building are generally diversified according to its importance and use, and therefore will provoke more or less heavy consequences of damage due to a seismic event. The level of protection depends on the historical and architectural value of the building and of its contents, as well as on its strategic importance and its level of use. In practice with the definition of a level of protection the conventional evaluation of the seismic risk is tailored to the expected performances of the assessed building.

The protection level rating is:

- **LOW:** are buildings of relative recent construction or that have undergone substantial alteration, i.e. of low architectural value, whit modest content and function;
- **MEDIUM:** are buildings of some architectural value with content and function of secondary importance;
- **HIGH:** are buildings which for either their artistic or architectural value or for their strategic use or for the value of their content are considered of primary importance.

The reliability of the risk assessment depends on the reliability of the vulnerability assessments and of the evaluation of on site seismic hazard. As the reliability result has been associated to each step of the assessment the risk reliability is the compound value of the reliability of all components.

Margarita Kisternaya

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MEASURES TO ENSURE SAFETY OF THE WORLD HERITAGE SITE “KIZHI POGOST” – RUSSIAN FEDERATION

Abstract

The World Heritage site “Kizhi Pogost” is an enclosed architectural ensemble composed of two churches – the Church of the Transfiguration (1714), the Church of the Intercession (1694-1765), and the bell-tower (1862). A real masterpiece of log engineering, it attracts many visitors. In 2008, there came 200 000 people altogether.

The museum activities focus on securing longevity of the wooden monuments. The emphasis is on safety and fire protection, as well as on control of deterioration. The system of monitoring timber structures aimed to prevent biodeterioration is operated in the museum under the supervision of the chief curator. The monuments of the Kizhi Ensemble and the Pogost territory are equipped with security and fire-alarm systems and outdoor fire-fighting system with nozzles remote-controlled by the central security post.

Present-day integrated security system is managed and maintained by the “Kizhi” museum staff; Republic of Karelia, Division of the General Board of the Russian Federation, Ministry for Civil Defence, Emergency Management and Response to Natural Disasters; Republic of Karelia, Division of the Ministry of Internal Affairs.

Keywords. Wooden monuments, fire, lightnings, fire-alarm and fire-fighting systems

The World Heritage site Kizhi Pogost is a masterpiece of Russian wooden architecture. It is located on a small island of Kizhi in the north-west part of Lake Onega – the second largest lake in Europe (Fig. 1).



Fig. 1. Location of Kizhi island. <http://kizhi.karelia.ru/info/en/about/txt3> (20.02.09)

Since prehistoric times Kizhi Island was supposed to be a sacred place for Finno-Ugric pagan tribes. The name of the island can be translated from Karelian as “a place for ceremonies”. The first Russians came here from Novgorod the Great in the 12th century. Since the 13th century they began to settle on the shores of the lake side-by-side with the native people. The Russians brought new constructive technologies, more progressive soil cultivation, crafts and a new, Orthodox, religion. They began to build the first orthodox churches on the sites of pagan sanctuaries. The Orthodox churches in Kizhi were first mentioned in Moscow census books in 1563. However, according to the historic documents those structures were struck by lightning and burnt down in the end of the 17th century. Then the new churches were built at the same place. The Kizhi Pogost architectural ensemble as it looks today, had been formed over a period of two centuries (from the end of the 17th

– to the mid-19th centuries). It is an example of traditional Northern Russian ternary group of buildings where a bell tower is located between the summer and winter churches (Fig. 2 and 3).



Fig. 2. The Kizhi Pogost of our Saviour. The Bell tower (1862), the Church of the Transfiguration (1714) and the Church of the Intercession (1764). (O. Semenenko)



Fig. 3. Checking of the lightning system on the Church of Intercession. (A. Ljubimtsev)

The Church of the Transfiguration (the summer church) was built in 1714, the Church of the Intercession (the winter church) - in 1764, the Bell Tower - in 1862. The structures are surrounded by the log wall. The Kizhi architectural ensemble, property of the Russian Federation, has been in day-to-day management of the “Kizhi” State Open-Air Museum since 1966. In 1990 it was included into the List of the World Heritage of UNESCO. In 1993 Kizhi churches were listed as the most valuable objects of the Cultural Heritage of the Russian Federation. The Kizhi churches are the most attractive sights in the Republic of Karelia. The main attention in disaster risk management on Kizhi is paid to fire protection. The churches are the highest points in the area. The Church of the Transfiguration has been serving as a visible symbol, from the distance, of Orthodoxy for nearly three centuries. Its height is 37 m (123 feet). Lightnings are very often in the region and they can cause serious problems for wooden monuments. As it was mentioned above the previous wooden structures in Kizhi were struck by lightning and burnt down in the end of the 17th century. That’s why protection against lightning is of great importance. The new lightning system was installed at the monuments in 2004. Every year it is checked by the museum employees.

The monuments of the Kizhi Ensemble are equipped with fire-alarm systems and outdoor fire-fighting system (Fig. 4). The fire –alarm system is supplied with the flame fire-sensors which are placed in the interior of the Church of the Transfiguration and along the perimeter of the enclosure. The smoke detectors are located in the interior of the Bell tower and the Church of the

Intercession. Seven remote-controlled nozzles of the fire-fighting system are installed along the perimeter of the Pogost enclosure.

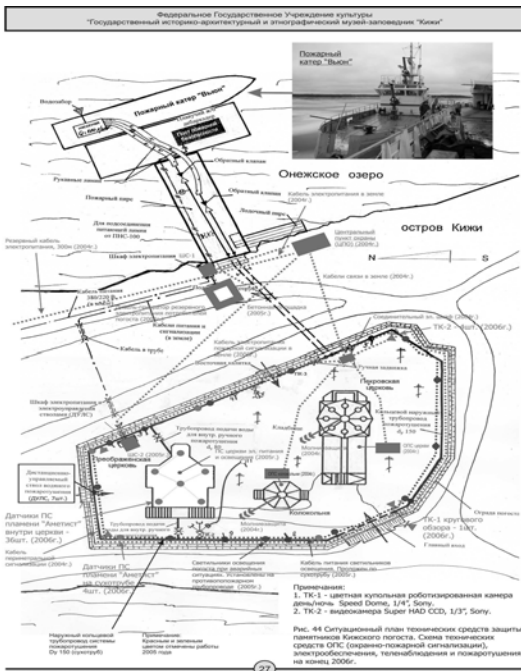


Fig. 4. The plan of the security system of the Kizhi Pogost objects. (N. Popov)

The manually-controlled fire-fighting system is placed in the Church of the Transfiguration. The fire-fighting systems are regularly checked and repaired if necessary. The fire team watches the Kizhi Ensemble around-the-clock (Fig. 5 and 6)



Fig. 5. Fire pipeline. Fire monitor. (A. Ljubimtsev)



Fig. 6. Fire boat "Vjun". Central guarding post. (A. Ljubimtsev)

The Kizhi museum is located at 68 km from Petrozavodsk – the capital of Republic of Karelia. The nearest village with the police station is at 26 km from the island, that's why the securing of the monuments and collections is of great importance. All the monuments are equipped with the security system. TV monitoring system covers the visitors' entrance area. Installation of powerful lamps around the Kizhi Ensemble also serves to the purpose of controlling the area especially in winter when the days are short.

During its 300 years long history the Church of the Transfiguration has been periodically repaired and maintained. In 1980's the condition of the structure was recognised as crucial and a steel framework was installed inside the building to support and reinforce the structure. At that time the iconostasis and the "sky" ceiling were removed from the interior of the Church and placed in the storage. Nowadays a restoration project has started aimed at regaining structural strength, dismantling the steel supporting structure and re-establishing the iconostasis and the "sky" ceiling in the interior. To control the safety of the structure during the period of its restoration additional video surveillance camera system has been installed in the Church of the Transfiguration (Fig. 7).



Fig. 7. WEB-camera and fire alarm sensor in the Church of the Transfiguration. (A. Ljubimtsev)

All the full-time museum workers as well as seasonal custodians and guides are trained how to respond to possible threats (a fire, vandals, theft, etc.). Nowadays the main problem concerning the protection of the World Heritage site from disasters is the impossibility to provide water supply in the fire protection system in winter time, when it is not feasible to get pumps of fire-boat "Vjun" that produce enough volume of water (at least 150 litres per second) for fire-fighting. This problem, will be solved in 2009, by designing and constructing a stationary pump installation for Pogost fire protection. It is also important for the restoration of the Church of the Transfiguration, because this is not possible in winter unless this problem is solved. Besides, winter is the most favourable moment for restoring church log framework because there are no tourists and there is no need to obey to limitations related to this issue. During 2009 we are also planning to mount two additional remote-controlled nozzles and implement a fire-fighting system of extinction fire with high fog stream in the Church of the Transfiguration as well as to install the fire mains with hand-controlled nozzles inside the Church of the Intercession and the Bell-Tower. Another important deal in providing safety of the monuments is a reliable electricity supply. Since 2005 we have been using the diesel generator for providing a reserve power supply system for the equipment of monuments' protection in case of the electricity network blackout. The Government of Russian Federation is aware of the importance of preserving Kizhi Pogost as one of the sites of World Cultural Heritage and this is why it approved by Decree № 1633-p (as of 07.11.2008) "the schedule of measures on preserving Kizhi Ensemble and developing infrastructure of the Kizhi Museum". First of all it is aimed at preservation of the monuments in Kizhi. Preservation means not only restoration and conservation but it is aimed at provision for integral protection, especially for the Kizhi Pogost monuments. Budgetary funds to the total amount of 396,2 million roubles have been secured for the above mentioned Decree for the restoration and protection of Kizhi Pogost monuments for a

period of 2009-2014, including 316,9 million roubles intended for the complex restoration of the Church of the Transfiguration.

In December 2008 the Ministry of Culture of Russian Federation issued the order (N 282) concerning the preservation of the Kizhi Pogost architectural Ensemble and development of infrastructure of the Kizhi Museum. One of the main issues highlighted in the plan is a provision of reliable power supply on Kizhi island. The funding of the project is 755,3 million roubles, including elaboration of working documents. According to the Decree of the Government of Russian Federation, the Government of Republic of Karelia has to elaborate working documents and present them to the Government of Russian Federation in the first quarter of the 2009. 166 million roubles are given for the reconstruction of power supply lines in Kizhi from the federal budget for 2009. At the present moment Russian Government takes the unprecedented measures to stimulate the museum's growth. It should raise the standards of our work to a higher level and thus secure the preservation of objects of cultural heritage according to world standards.

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RISK MANAGEMENT AT WORLD HERITAGE - ACTIVITIES IN JAPAN -

Abstract

There are 11 registered World Heritage Sites (Cultural Heritage) in Japan, 10 sites out of 11 include wooden architecture among their assets. Wooden architecture accounts for over 90% of Japan's total cultural property structures.

Japan's cultural properties are at risk of damage from a wide variety of sources. Damage can be caused by weather, such as seasonal heavy rains and strong winds; the combined assault of rain and wind in typhoons; lightning; and heavy snows. The warm, humid climate means there is an abundance of flora and fauna, including many forms of mould, insects, birds, and other animals. Damage caused by living creatures is frequent. Furthermore, Japan is an earthquake-prone area. In addition to these natural threats, cultural properties can be damaged by human behaviour such as trespassing, arson, and graffiti. Thus, there are many risks, but the greatest threat to wooden architecture is fire.

Fire prevention measures have been the highest priority for Japan's cultural properties administration. The paper presents some case studies of fire prevention measures at World Heritage Sites. Measures to deal with damage from earthquakes have also become an important issue since the 1995 *Hanshin Awaji* Earthquake.

Close cooperation among all related personnel is indispensable in order to protect cultural heritage from the damage caused by disasters. A system for inter-regional cooperation in the event of large scale disasters was set up among cultural properties administrative personnel in prefectures of the *Kinki* region. In addition, two international cooperative activities implemented by Asia/Pacific Cultural Centre for UNESCO, Nara are here outlined. The first is the "International Group Training Course" and the second is the "International Conference on Risk Management".

Keywords

Wooden architecture, fire prevention, seismic safety, conservation master plan, mutual support agreement, civic participation, international training course

Introduction

Registered World Heritage sites in Japan currently include 11 cultural heritage sites, and three natural heritage sites (Table 1). Aside from the "*Hiroshima* Peace Memorial (*Genbaku* Dome)", which is the ruins of a reinforced concrete and brick building, the cultural assets of these sites consist of wooden structures. Japanese cultural property structures are characterised by the use of wood as their main material, and by the wide use of various other plant materials such as cypress bark, cedar shingles, and reed thatching for roofing materials in addition to tiles. Walls are made of earth, and, in addition to wooden doors, rooms are often divided by fixtures of wooden frames on which paper is stretched, such as *fusuma* or *shoji*. Wooden architecture accounts for over 90% of Japan's cultural property structures. It follows, then, that the protection of World Heritage structures means precisely the preservation of these wooden structures.

Japan is made up of an archipelago stretching from the northeast to the southwest, and if one looks at the geographical distribution of World Heritage sites in Japan, aside from the "*Gusuku* Sites and related properties of the Kingdom of *Ryukyu*", it is clear that these sites are concentrated in the central region of the country. This characteristic reflects Japan's weather conditions. That is, the southern regions are hot and humid, and prone to damage from typhoons (massive seasonal low-pressure systems). The north, on the other hand, gets a lot of snow and low temperatures. Thus, preservation of cultural heritage is difficult in the northern and southern regions. In fact, many cultural property structures are located in *Kyoto* and *Nara* Prefectures, in *Kinki* Area (Fig 1).

	Site	Prefecture	Year of WH registration
1	Buddhist Monuments in <i>Horyuji</i> Area	<i>Nara</i>	1993
2	<i>Himeji-jo</i>	<i>Hyogo</i>	1993
3	Historic Monuments of Ancient <i>Kyoto</i> (<i>Kyoto, Uji, and Otsu</i> Cities)	<i>Kyoto, Shiga</i>	1994
4	Historic Villages of <i>Shirakawa-go</i> and <i>Gokayama</i>	<i>Gifu, Toyama</i>	1995
5	<i>Hiroshima</i> Peace Memorial (<i>Genbaku</i> Dome)	<i>Hiroshima</i>	1996
6	<i>Itsukushima</i> Shinto Shrine	<i>Hiroshima</i>	1996
7	Historic Monuments of Ancient <i>Nara</i>	<i>Nara</i>	1998
8	Shrines and Temples of <i>Nikko</i>	<i>Tochigi</i>	1999
9	<i>Gusuku</i> Sites and related properties of the Kingdom of <i>Ryukyu</i>	<i>Okinawa</i>	2000
10	Sacred Sites and Pilgrimage Routes in the <i>Kii</i> Mountain Range	<i>Mie, Nara, Wakayama</i>	2004
11	Silver Mine and its Cultural Landscape	<i>Shimane</i>	2007

Table 1. World Cultural Heritage in Japan (April 1, 2008, Registration order)



Fig 1. World Heritage in JAPAN

Fire risk for Japan's cultural property structures

Japan's cultural heritage is exposed to many dangers. Seasonal heavy rains and winds lead to floods and landslides. Typhoons bring heavy rain and strong wind at the same time; every year, approximately 20 typhoons are born, of which five to ten strike land, causing great damage. Japan's hot and humid climate supports an abundance of flora and fauna. That means a lot of damage from organisms such as mould, germs, insects, birds, and animals. In addition, the large trees nearby cultural property structures sometimes fall in with strong winds, damaging the cultural properties.

Further, Japan is located in the Circum Pacific Volcanic Zone, and is prone to earthquakes. In 1995, many lives were lost in the Great *Hanshin-Awaji* Earthquake, and many cultural property structures were damaged. Later, cultural property structures were damaged in the Mid *Niigata* Prefecture Earthquake in 2004, the *Noto Hanto* Earthquake in 2007, and others.

In addition to natural disasters, it has been seen recently damages to cultural properties through human action such as trespassing, theft, arson, graffiti, and so on. Cultural property structures are thus exposed to a variety of risks. For wooden structures, however, the greatest threat is fire. Damage from fire clearly deteriorates the value of cultural property structures which consist mainly of wood.

Fire prevention measures for cultural property structures in Japan

Considering the vulnerability to fire that characterises cultural property structures, Japan's cultural properties administration has made fire prevention measures a top priority task for many years. The basic principles of fire prevention such as early detection, quick reporting, initial fire extinguishing, and installation of necessary equipment has been promoted. Equipment must be appropriate for the situation of the cultural property, and of course, sufficient training and organisation of those involved is also necessary for effective use of the equipment. The automatic fire alarm system is an equipment that allows the early detection of fire. Originally, thermal detectors and smoke detectors were used, but flame detectors are more sensitive detectors of fire, and have proven especially effective in warning of fires in roofs made of plant materials, and have therefore been used in many cultural property structures in the recent years. Direct telephone lines to the fire department are also effective devices for rapid reporting (Fig. 2.).



Fig. 2. Flame Detector (left) and Direct telephone lines to the fire department (right)

Initial fire extinguishing equipment consists mainly of devices that use water. Durability and reliability are essential to this equipment, and the equipment must be used effectively. Special

water tanks must be large enough in order to be able to supply water for 50 minutes for the cultural property. Use of engine pumps makes possible the provision of the necessary water pressure even during power outages, supposed to happen in occasion of large earthquake. Water guns and easy-handling hose can be used by even a single person, so small numbers of people can effectively extinguish a fire with this equipment (Fig. 3.).



Fig. 3. Water tank (left) and Easy-handling Hose (right) ©ACA

In areas where earthquake is a risk, water tanks must be constructed to withstand earthquakes. In addition, high-density polyethylene pipes with electro fusion joints have been used recently to avoid damage by earthquakes.

Some specific equipment are used at World Heritage properties. A high-power water-gun, known as the Water Cannon, is installed at the World Heritage site “Himeji-jo” which is a tall castle (Fig. 4.).



Fig. 4. Water Cannon (World Heritage “Himeji-jo”) ©Himeji-city

Water guns are installed throughout the “Historic Villages of *Shirakawa-go* and *Gokayama*” site, and a water tank located on a hillside uses gravity to increase water pressure. Fire extinguishing drills are held on the World Heritage sites twice a year (Fig. 5 and fig. 6).



Fig. 5 Water Gun System in Shirakawa-go (World Heritage “The Historic Villages of Shirakawa-go and Gokayama”) ©Shirakawa-village

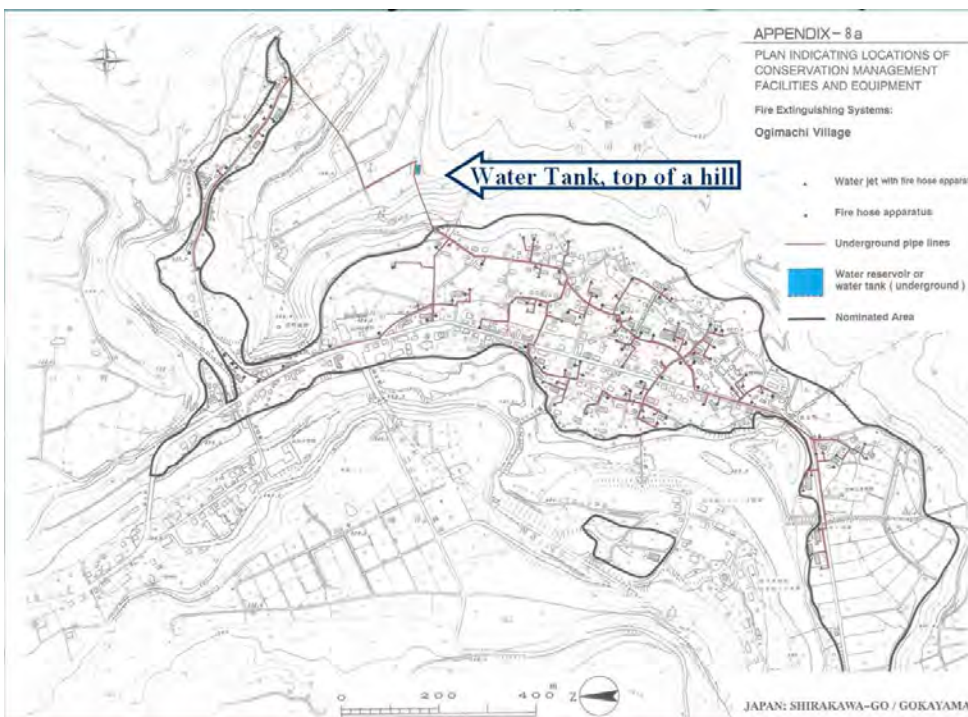


Fig. 6. Water Supply System in Shirakawa-go ©Shirakawa-village

Of the fire prevention equipment mentioned, Japan’s Fire Service Act requires the installation of automatic fire alarm systems in cultural property structures. In many actual cases, this equipment

has proven to be effective in early detection, and fires have been successfully extinguished at the initial stage, with only a minor resulting damage. It is essential to continue putting such legislation in place. On the other hand, fire extinguishing equipment is not required by the Fire Services Act except for certain purposes, but the Agency for Cultural Affairs provides subsidies for installation and inspection of fire prevention equipment, so that many cultural property structures have such equipment.

Even with such fire prevention equipment installed, it is essential to maintain it properly and use it effectively. In Japan, January 26th is set as “Cultural Properties Fire Prevention Day”, in order to raise awareness of fire prevention for cultural properties. This date commemorates the 1949 fire that broke out during repairs at the Main hall in *Horyu-ji* Temple (now part of the World Heritage site “Buddhist Monuments in *Horyuji* Area”), damaging the interior. Large scale fire defence training, is carried out by owners of cultural properties, with the participation of volunteer fire-fighting teams, fire-fighting associations, and fire departments. A synergy among owners, local inhabitants, and relevant authorities has been formulated for common purpose of cultural properties fire prevention (Fig. 7.).



Fig. 7. Fire defense training on Cultural Properties Fire Prevention Day (26, Jan.) ©ACA

Seismic Safety for cultural property structures

Many cultural property structures were damaged in the Great *Hanshin-Awaji* Earthquake of January 17, 1995, including the Former House No.15 of international settlement in Kobe, which was totally destroyed. All parts of this building were carefully retrieved, and the structure was rebuilt on a seismic isolator. After the Hanshin earthquake, the ACA made guidelines and manuals aiming at the improvement of the seismic safety of the cultural properties, including the following:

- Guidelines for Ensuring Seismic Safety (1996)
- Guidelines for analysing Seismic Safety (1999)
- Owner’s manual for checking Seismic Safety (1999)
- Engineer’s manual for checking Seismic Safety (2001)

The ACA is putting in place measures necessary for the improvement of the safety of cultural property structures in the event of an earthquake based on these guidelines and manuals.

Conservation Master Plan for cultural properties

Making a conservation master plan for individual cultural property structures is an effective measure for their safeguarding. The ACA created “Guidelines to making Conservation Master Plans” (1999), urging cultural properties owners to make master plans. The guidelines suggest the following framework for a master plan:

1. Definition of the Planning Zone
 - 2.1. Conservation and Management Plan
Recognition of Present Condition / Classification of Parts and Members / Protection Strategy / Management Guidelines and Restoration Guidelines
 - 2.2. Environmental Preservation Plan
Recognition of Present Condition / Decision of Present Zones / Guidelines for Environmental Preservation / Action Plan for Risk Preparedness
 - 2.3. Risk Preparedness Management Plan
Guideline for Fire and Crime Prevention / Guideline for Seismic Safety / Guideline to Prevent Wind Disasters / Guideline to Prevent other Disasters
 - 2.4. Utilisation Plan
Utilisation Strategy / Public Opening of Cultural Values / Facility and Equipment Plan / Action Plan for Utilisation
3. Identification of Legal Procedures

Points 2.1-2.4, the base of the plans, consider the cultural properties structures from four different angles. There are strong mutual relations among them. Contradictions among the points must be avoided. In particular, the Risk Preparedness Management Plan (hereinafter: RPMP) must be a prerequisite for the creation of the other part of the plans, and if the RPMP is insufficient, realisation of the other parts will be difficult. The property's owner drew up PRMP in principle of self-responsibility; however, it is very useful that the cooperation and sharing of the information with relevant bodies in its initial stage take place in case of a large-scale disaster.

Activities of Local Governments and other authorities

Mutual Support Agreement in Large-scale Disaster at the Level of the Local Government, Kinki-area

The Kinki area is in the centre of Honshu Island, the largest of the islands making up mainland Japan (Fig. 8).



Fig. 8. Mutual Support Agreement in Large-scale Disaster at the Level of the Local Government, Kinki area (underlines show prefectures where World Heritage are located) © base map: Geographical Survey Institute, Japan

There are several World Heritage sites in the *Mie, Shiga, Kyoto, Hyogo, Nara, and Wakayama* prefectures in this area. In addition, *Fukui, Osaka and Tokushima* prefectures join with these six to make a total of nine prefectures participating in the 2006 “Mutual Support Agreement for Large-scale Disasters”. This agreement was a result of the experience of the Great *Hanshin-Awaji* Earthquake, when the Government of Hyogo prefecture, at the centre of the disaster, was unable to function. Discussions are now underway to include the field of cultural properties protection in this agreement (scheduled to be in function in spring 2009). Preparations for disaster include maintaining shared lists of cultural properties. There is a common reporting form for assessing the damage to cultural property. In the event of disaster, officials in charge of cultural properties are dispatched. They assess the damage, and conduct urgent rescue of damaged cultural properties.

Civic Rescue Systems for Cultural Properties, Kyoto City Fire Department

Many cultural properties, including the World Heritage sites “Historic Monuments of Ancient *Kyoto* (*Kyoto, Uji, and Otsu* Cities)” are located in the city of *Kyoto*. In the year 2000, the *Kyoto City Fire Department* established the Civic Rescue Systems for Cultural Properties (CRSCP) in order to encourage citizen participation in rescue and initial fire extinguishing activities for cultural properties. It sensitise citizens who are living near cultural properties. In this way, a network of cooperation is built among cultural properties owners, citizens, and fire-fighting organisations. The fire department provides necessary equipment and training opportunities in initial fire-extinguishing. More than 230 groups are now active (Fig. 9.).



Fig. 9. Manual for Civic Rescue Systems for Cultural Properties (CRSCP) ©Kyoto City Fire Department

Activities by Asia / Pacific cultural Center for UNESCO Nara

Two international cooperative activities are conducted by the Asia / Pacific cultural Centre for UNESCO Nara (ACCU Nara). The first is a programme, offered once every two years, titled “Preservation and Restoration of Wooden Structures” which is one of the international “Group Training Courses on Cultural Heritage Protection”. In this course, 16 participants are invited from the Asia / Pacific region to take part in a one-month training session. The author conducted lectures during the 2005 and 2007 training sessions on “Conservation and Management of Cultural Heritage - Conservation Master Plans and Risk Preparedness”. Through these training sessions, principles and techniques of risk management for cultural heritage have been disseminated. The

second is the “International Conference on Risk Management” which has been held as part of the International Conference and Symposium on World Heritage since 2007. This conference will continue to be held over a 10-year period.

Though such activities, ACCU Nara is expected to function as a hub facility for risk management for cultural properties.

Conclusion

Japan has more than a century of achievement in the administration of cultural properties protection. However, in order to continue protecting cultural properties from disaster, these efforts can never be let up. It is necessary to work to advance our measures to appropriately protect cultural heritage from disaster, through knowledge of the latest scientific techniques, using advanced technology, and strengthening the network among cultural heritage personnel.

Rose Nkaale Mwanja

Commissioner for Antiquities and Museums

DISASTER RISK MANAGEMENT AT THE WORLD HERITAGE PROPERTY THE KASUBI ROYAL TOMBS, UGANDA

The Kasubi Royal Tombs are located on the site of former palace of King Mukaabya Walugembe Muteesa I of Buganda. The Heritage Site is 5 km away from Kampala the capital of Uganda. The area is 27 hectares and the plot is demarcated with fig trees. There are several huts around the courtyard (Fig.1), new structures, traditional houses behind the inner fence, graveyard, vegetation, 2 mounds, and the great house Muzibu- Azaala- Mpanga (Fig. 2) is 31 meters diameters and 7,5 meters high.

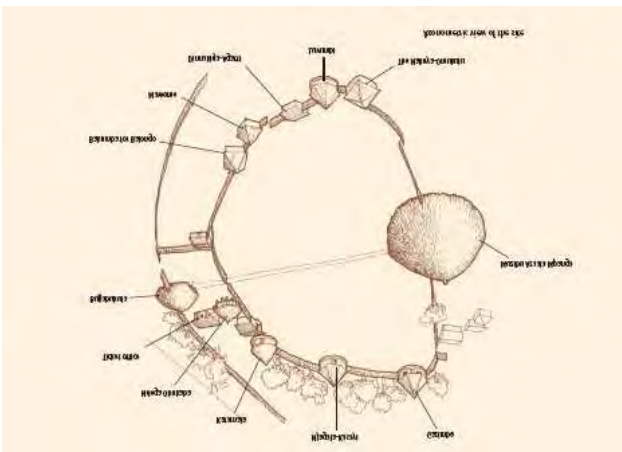


Fig. 1 Sketch outline of Kasubi Royal Tombs



Fig. 2 The great house Muzibu- Azaala- Mpanga

There are other two grass thatched houses representing the traditional architecture; Bujjabukula (entrance, fig. 3) and Ndogo-Obukaba (drum house, fig. 4). The following Kings are buried inside the conical main Tomb house known as Muzibu-Azaala-Mpanga: Muteesa I ruled (1856-1884); Mwangana ruled (1884-1897); Daudi Chwa ruled (1897-1939) and Muteesa II ruled (1939-1966.)



Fig. 3 Bujjabukula house



Fig. 4 Ndogo-Obukaba house

Types of risks at Kasubi Royal Tombs.

Risks primarily due to exposure to natural hazards:

- No lightening protection
- Earth tremors causing vibration on the structure
- Climatic change effects causing damages to grass (frequent and heavy rains, fig. 5)

Risks due to human interventions/actions:

- Encroachment pressure is increasing with urban development resulting in garbage disposal in this sacred place.
- Infestation of the vegetal materials used for construction.
- Poor and delayed maintenance actions .
- Practices by custodians on the site

Progressive risks due to local factors creating vulnerability.



Fig. 5 Damages to grass roof

Challenges for heritage professionals

- General lack of education, awareness and training amongst heritage professionals;
- Lack of integration of heritage concern into the larger disaster reduction management at local and national level;
- Ineffective public policies;
- Lack of resources/ Finance set aside for preparedness;
- General focus on response and recovery rather than preparedness;
- Encroachment pressure is increasing with urban development.

Actions for disaster risk reduction

Preparedness

- Reduce the identified risks;
- Put in place advance warning (where possible);
- Develop a response and mitigation plan for the whole property and all its elements involving site occupants/users;
- Train for plan implementation;
- Plan for a positive contribution of the heritage professionals during response and recovery phases;
- Create links, communication and integration with other sectors.

These actions are necessary in order to support the preparedness measures: more detailed research on site is necessary; implementation of training and awareness raising activities of the managers; sensitisation of the users, custodians and people living in and around the site, planners and the country at large; creation of links with disaster organisations for advise and co-ordination; development and inclusion of disaster plans into the site management plan; put in place necessary equipment and have regular meetings amongst the various stake holders (Fig. 6).



Fig. 6 Meetings of stakeholders

Response.

- Implement plan for the safeguard of the heritage;
- Ensure safe access for heritage expertise (a response team) as soon as possible;
- Work with other emergency personnel to ensure minimal impact on heritage resources;
- Use heritage resources in response efforts according to already identified plans (ensuring minimal impact on the heritage values);
- Contact networks (locally, nationally, internationally) to ask for specific needs;
- Take into consideration the traditional knowledge systems such as: construction techniques and materials, sustainable land use, traditions, myths, taboos, etc.

Before and after the disaster

Strengthen the National Heritage Committee and give it the responsibility to address and implement issues on disaster risk management.

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KATHMANDU VALLEY WORLD HERITAGE SITE DISASTER RISK MANAGEMENT, NEPAL

Kathmandu Valley with its seven monument zones was inscribed on the World Heritage List in 1979. Three Palace Squares, two Hindu Temples, two Buddhist Stupas along with their context broadly manifest the medieval architectural forms (mainly 16th to 18th century) and even older antiquities (Fig. 1).



Fig. 1 Location of Kathmandu Valley World Heritage sites

Due to the tectonic collision of the Indian and Eurasian plates, the Kathmandu Valley is at risk of major earthquakes. Being situated in a former lake, liquefaction magnifies the impact of tectonic movement. Earthquakes have been recognised as the major cause of devastating damage in the past. Soil erosion and fire are other major risks (Fig. 2 and 3).

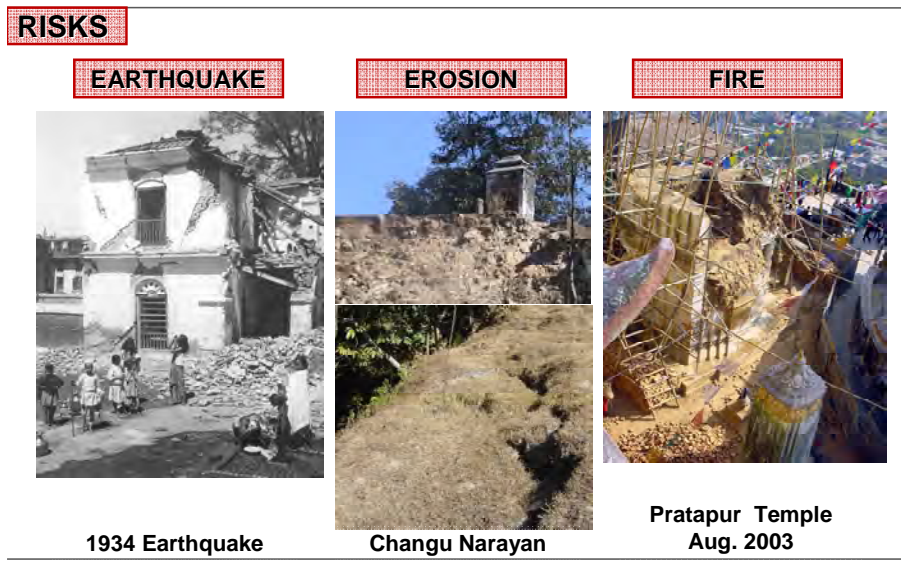


Fig. 2. Identified risks and major disasters happened in the Valley



Fig. 3 Pre and post earthquake of 1934

This has led to the practice of “Cyclical Renewal”. Retrofitting is known in Nepal but practiced without honouring the heritage value. The understanding of retrofitting has to be utilised to safeguard the value and sensibility of heritage. The recently adopted Integrated Management Plan for the Kathmandu Valley World Heritage Site establishes the institutional, legal and economic management frameworks. It further incorporates Disaster Risk Management within the overall integrated management framework. The natural and cultural hazards and vulnerabilities need to be identified. Appropriate mitigation and preparedness actions need to be carried out. Consideration must be given to immediate post-disaster response and relief and long-term rehabilitation and reconstruction.

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FIRE PREVENTION IN SPAIN'S WORLD HERITAGE CITIES

Abstract

Due to the Archbishop Palace fire of the city of San Cristóbal de la Laguna, the mayors of the respective World Heritage cities decided that their fire and civil protection chiefs would meet to analyse the existing risks in their cities and propose solutions to them. At the end of 2006, a declaration was drafted that contained the measures to take to attempt to minimise those risks. From that moment on, groups were created in order to perform the necessary studies and work. Several measures are already being put into practice, and others will be carried out shortly.

Keywords

Risk of fire, World Heritage, Fire Brigade, Minimizing risks, Work groups, Vulnerability

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Characteristics of historic Spanish cities

Most of the historic Spanish cities are built in a medieval style – a rough terrain with steep slopes and very narrow and irregular streets. There are normally few inhabitants, there may be abandoned buildings or buildings in ruins, power supply networks in bad condition, and these cities hold most of the buildings and assets that belong to the Heritage. In the cities, buildings are used in a different way as it was in the past – houses, restaurants, government buildings, etc., and in some cases there are houses in ruins or abandoned, which are tended to be occupied. At the same time, most of the buildings or what they contain, which are part of the heritage, are generally very old buildings, they have wooden structures and large empty areas; they are closed to each other and in many cases they have installations in bad condition.

Potential Hazards

Although there may be other risks, like flooding or terrorism for example, fire is the most destructive force that can affect these heritage buildings because the characteristics of the buildings make them especially vulnerable to this hazard, and it could even destroy them completely and leave no possibility for restoration anymore. Many historic buildings are still at a high risk, even though over the past years the situation has improved in terms of safety conditions and fire prevention, generally by accident, because as they have been used as houses or intended to hold government departments, in new or renovated buildings, they have had to adapt to the national fire prevention regulations.

Some of the features that make them so vulnerable are the following:

It is very easy for a fire to start inside a building because:

- The installations are not in good condition;
- There is a lack of proper maintenance;
- There is a lot of flammable material.

Fires can reach large proportions because:

- It is impossible to build suitable fire-prevention installations because of the characteristics of the buildings;
- In the previous case, there are no alternative measures that provide suitable safety levels;
- There are no fire-prevention installations;
- Fire would burn intensely because the buildings are composed by flammable material and they have wooden structures;
- It would take a long time to detect a fire because there are not many people living in them, there are no detection installations, or if there are any, they are not adequate.

Fire can spread easily because of:

- Added risks due to the other buildings in the city (houses, restaurants, abandoned buildings, etc.), which could cause fire to spread from the outside to the inside;
- The lack of suitable compartmentalization;
- Large empty spaces which are not compartmentalised, horizontally or vertically;
- Terraced houses;
- Very narrow streets;
- The city, which has steep slopes.

Difficulty to fight the fire:

- It is complicated for emergency services to reach the buildings;
- It delays their intervention;
- It limits the equipment used to extinguish the fire;
- Insufficient water supply networks for the fire brigade vehicles;
- It is hard for the fire brigade to operate because of large empty spaces full of smoke.

The heritage goods (books, paper, wood, fabrics, etc.) are especially vulnerable to fire, flames, heat and smoke and it is also very likely that they will get damaged while extinguishing the fire, because of the water used by the fire brigade.

Spain's Group of World Heritage Cities

Spain's Group of World Heritage cities is an association made up of those townships that have historical buildings that are listed and included in the UNESCO World Heritage list. Group membership is voluntary, and the objectives pursued are joint actions to defend and promote their historical and cultural heritage. The cities that currently compose the group are: Alcalá de Henares, Ávila, Cáceres, Córdoba, Cuenca, Ibiza, Mérida, Salamanca, San Cristóbal de La Laguna, Santiago de Compostela, Segovia, Tarragona and Toledo.

The fire of la Laguna Episcopal Residence

On the morning of January 23rd 2006, a fire was declared at the Episcopal Residence of San Cristóbal de La Laguna (Tenerife) (Fig. 1). In spite of the extraordinary effort made by the Tenerife Fire Brigade, in just a few hours, the fire completely destroyed the building from the seventeenth century, Palacio de Salazar and the heritage objects it had inside (paintings, furniture, works of art, books, documents and archives). To a lesser extent, the fire also affected several adjacent buildings (Diocesan Bookstore).



Fig. 1 The fire at Episcopal Residence of San Cristóbal de La Laguna

After that disaster, the mayors of Spain's World Heritage Cities, as the highest authorities in charge of preserving the historical and cultural legacy, agreed that the fire and civil protection chiefs should meet to evaluate the historical heritage situation in the event of a fire risk and propose solutions to improve fire safety conditions in their respective historic quarters. Thus, in 2006, the Fire Safety Commission for Spain's Group of World Heritage Cities was started. From that moment on, work meetings were held where there were problems in the historic cities.

Problems were analysed in relation to prevention and protection against fire risks:

- The risk of fire is very high in the respective cities' historic quarters. This risk threatens both the buildings themselves and the heritage they house. These historic cities' urban characteristics enable the spread of fires, hinder fire department intervention and aggravate the consequences.
- There is a loophole in protecting historic heritage against fire. There are no specific basic laws that wholly cover protection from fire for historic heritage. This is because the current laws are only applicable to newly-built buildings, those that are remodeled or given a new use.
- The Fire and Civil Protection Services do not actively participate in the areas of planning and managing the protection of Historic and Cultural Heritage.
- The Fire Departments' structures do not have personnel with enough technical qualification to evaluate the existing risks and propose corrective solutions.
- Fire and Civil Protection Services' personnel lacks specific training on those aspects concerning the interventions in fires that affect the historic heritage.

Cuenca Declaration

After analysing the problems presented at the International Conference on Fire Prevention in World Heritage Cities, (Cuenca, October 2006) in which experts from several European countries took part, a document known as the "Cuenca Declaration" was compiled. It stated the basic principles for action that had to guide the prevention of and protection against fire hazards in the historic quarters including the items of cultural interest contained in them.

These principles are hereby listed:

- It is necessary to have basic laws (State level) that fully approach the protection of historic heritage from fire;
- The municipalities must regulate the necessary special measures to safeguard their movable and immovable property via municipal ordinances;
- Fire departments must have an active presence in all areas of planning and managing historic and cultural heritage protection concerning preventing and extinguishing fires;
- It is necessary to draft response guidelines to confront the emergencies that may arise;
- The creation of prevention departments integrated into fire departments should be promoted;
- These departments should plan, inspect and assess fire protection issues;
- Training aimed at improving firefighters' firefighting techniques in fires that affect historic heritage;
- It is necessary to organise informative campaigns in order to make citizens sensitive to and aware of the need to protect the historic heritage from fire. Thus, a preventive attitude is instilled.

Actions carried out and future developments

The "Cuenca Declaration" permits the establishment of the creation of work groups in the Permanent Commission. The purpose was to study the most efficient ways of setting the different measures proposed by it into action. The Commission has been equipped with advanced technical resources for permanent communication among the groups via Internet. The Commission met every three months to coordinate, integrate and validate the different work groups' proposals.

Currently, several initiatives have been implemented:

- Several fire and civil protection departments of Spain's World Heritage Cities have hired fire prevention technicians;

- A training program has been developed for all world heritage city fire departments, and the first courses have already been taught;
- A manual has been edited for the fire brigade intervention in fire that affects heritage;
- The “Municipal Ordinance Project is finished. It will regulate protection against fires at cities' historic heritage sites by establishing requirements and conditions to be fulfilled in those activities and uses that affect fire hazard levels present in historic quarters;
- A technological platform is being developed to manage and display intervention records in the event of fire in buildings located in the cities' historic quarters. The information that must be recorded on those records will be obtained by the firefighters themselves. The records will serve as a guide for efficient action in case of fire;
- In several services, training programs have been introduced in different areas of the city:
 - Talks for children at schools and at fire stations;
 - Training for citizen groups or associations (neighborhood associations, cultural associations, etc.);
 - Training for employees in companies and industries;
- During the current year, courses are going to be given to personnel working in archives, libraries and museums;
- Technical conferences will be carried out periodically, and national and international experts and local and national authorities will be invited.

Many of the problems detected and the solutions proposed may be extended to other places that house historic or cultural heritage. In this sense, a proposal has been made to export the training program to other cities in the world that may require it.

Ari Setyastuti

Head of Conservation and Protection Task Force

RECOVERY OF PRAMBANAN TEMPLE AFTER THE EARTHQUAKE, INDONESIA

Abstract

Experience in rescuing Candi Prambanan after earthquake is scarce. After the earthquake May 27, 2006, emergency actions were carried out to overcome the damages as the result of the earthquake, such as temporary closing the temple for visitors, increasing security, placing police line, publicising after-earthquake condition, establishing rescue team, holding coordination with related institutions and also make coordination with UNESCO as Prambanan Temple (Fig. 1a, 1b and 2) is one the World Heritage site.



Fig. 1a Prambanan Temple



Fig. 1b Prambanan Temple stone carving



Fig. 2 Prambanan Temple after the 2006 earthquake

Further emergency rescue actions:

1. Documenting of existing condition after earthquake;
2. Mapping of damages;
3. Rescuing collapsed stones;
4. Rescuing fragile structure.

1. and 2. Based on observation on the damages after earthquake, we know that the damage of each temple has special characteristics due to previous preservation system. The types of the

damage are material and structural. In Rescue activity, observation on damages was held on qualitative observation.

3. In rescuing collapsed stones, the area where the stones are collapsed is signed by grids before moving the stones. This aims to make stone registration easier, to identify and classify the original position of the stones.

After having finished the rescue actions, the recovery actions start with technical study which was carried out by involving related sciences such as archaeology, civil engineering, geology, and geophysics to formulate and determine the specific actions required. The result of the study was presented at the International Expert Meeting held by Cultural and Tourism Department in cooperation with UNESCO in Yogyakarta on March 4-8, 2007. The activity then was followed by a National Technical Meeting. During the Expert Meeting, the "Action Plan for Prambanan Temple short, medium and long term rehabilitation" was successfully developed. One of the important activities is the visitors management that strongly related to the public demand. The "Action Plan" contains community empowering and raising of public awareness, as the community must be involved in cultural preservation.

Tourism sector has strong relation to the economic growth of public community. After the earthquake, visitors decreased, but fortunately it was temporary. Through the publication of the condition of Prambanan Temple after earthquake, the visitors increased because they were interested in seeing the damages. This phenomenon shows that recovery activities do not reduce the desire of visitors. The Site, under these conditions, becomes more attractive because visitors can see directly the preservation activities put in place for the preservation of the temple. This enriches their perspective on cultural heritage preservation.

Josef Štulc

Director National Institute for Protection and Consecration of Monuments and Sites

THE FLOOD AT THE HISTORIC CENTRE OF ČESKÝ KRUMLOV, CZECH REPUBLIC

Abstract

The Historic Centre of Český Krumlov is situated on the banks of the Vltava river. The town was built around a 13th-century castle with Gothic, Renaissance and Baroque elements. It is an outstanding example of a small central European medieval town whose architectural heritage has remained intact thanks to its peaceful evolution over more than five centuries.

Disastrous floods hit vast areas of Bohemia in 2002 including the Historic Centre of Český Krumlov (fig. 1a and 1b). What failed during the flood and the response actions most was the lack of disaster risk preparedness and in-time information. Most of damages on cultural movable properties in the storage areas of museums, archives, libraries etc. could have been spared if the institutions concerned had been better prepared. The historical building stock survived in an admirably well condition. However, many buildings were senselessly damaged by the after-flood repairs due to the money-hunting contractors wishing to get maximum profit of the situation.



Fig. 1a Before the flood



Fig. 1b During the flood

Guo Zhan

Director, World Heritage Expert Committee of China, Vice President of ICOMOS

MANAGEMENT AND STUDY ON RESCUE AND MAINTENANCE OF CULTURAL HERITAGE AFTER THE 8.0-MAGNITUDE EARTHQUAKE IN WENCHUAN, SICHUAN PROVINCE, POPULAR REPUBLIC CHINA

The 8.0-magnitude terrible and influential earthquake, occurred in Sichuan Province, China at 14:28 on May 12, 2008. Wenchuan Earthquake affected 10 provinces (municipality), including Sichuan Province, Gansu Province, Shaanxi Province, Chongqing Municipality, Yunan Province and 417 counties (cities or districts), covering an area of 500,000 square kilometres. Sichuan, Gansu and Shaanxi Provinces have 51 counties (cities and districts) in the extremely hard-hit and hard-hit disaster areas, covering a total area of 132,596 square kilometres, involving 1,271 towns and townships and 14,565 administrative villages, with a population of 19.867 million by the end of 2007. Some 69,227 people had been killed, 374, 643 injured, and 17,923 missing. The relief workers had managed to rescue and relocate 1,486,407 persons to safe areas. Numerous urban and rural residences were devastated. Some towns, including the Beichuan County, Yingxiu Town of Wenchuan County, etc, and a vast number of villages were nearly rased to the ground (Fig. 1).

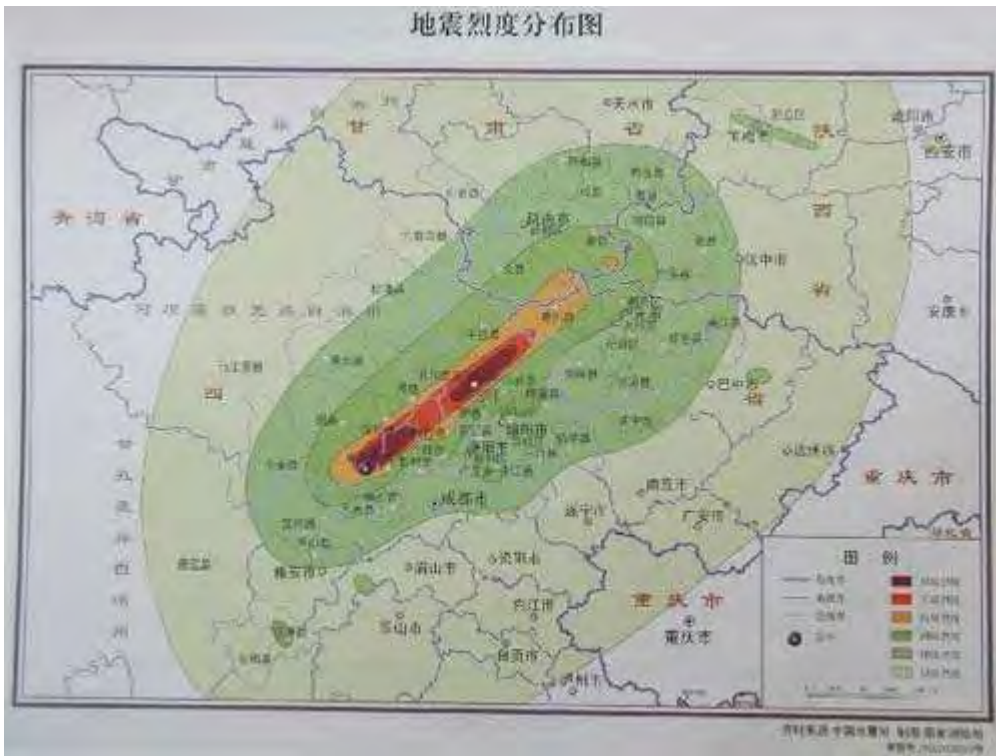


Fig. 1 Area tackled by the earthquake

Infrastructures were severely damaged, and the systems of transportation, electricity, telecommunications, water and gas supply, etc. were paralysed in vast areas. Countless aftershocks happened again every now and then. The aftershocks totalled more than 30 thousand times in the main seismic monitored areas.

The quake-stricken areas are mainly situated in the transitional area from the Qinghai-Tibet Plateau to the Sichuan Basin. These areas fall into the typical alpine canyon topography. Seismic rift zones are crisscross and the probability of earthquake disasters is relatively high; the spots for potential geological hazards, like landslides, landslips and mud-rock flow are densely and broadly distributed across these areas, which pose a grave threat. There are high mountains and deep valleys, which represent a vulnerable eco-environment. The farmland in the alpine areas is in bits and pieces with arid and thin soil layer and severe soil erosion. However, being of considerable ecological significance, the alpine plateau areas abound in fauna and flora resources in diversified

eco-system types. As an important ecological screen in the upper stream of the Yangtze River, the said areas provide critical havens for China's rare and endangered wildlife. The areas also see a concentration of world cultural and natural heritage sites and natural reserves. Haunted by economic instability, the areas have a single industrial structure and a concentrated poverty-stricken population. The planned areas are home of many ethnic minority groups, including China's only concentrated inhabitation area of the Qiang ethnic group and one of the major Tibetan settlement areas, with cultural diversity and unique historical and humanistic resources.

After the earthquake, China gives priority to take the measures as follow:

1. Make every effort to rescue the trapped persons;
2. Resettle the disaster-stricken population in a proper manner. A total of 15 million people have been relocated and resettled, wherein, 10 million people have been relieved; nearly 3 million people have been rescued and more than 96 thousand peoples have been hospitalised;
3. Race against time to resume the infrastructures, ensure normal living and resume production, such as rush repair of roads, power, water supply and telecommunication. There are more than 3,000 water reservoirs, 800 hydraulic power plants and 1,000 kilometres of dykes in the disaster-stricken area, luckily, no one is damaged. The damaged water supply pipes totalled 48,275.5 kilometres and 45,237.2 kilometres have been repaired;
4. Carry out epidemic prevention and rescue the injured;
5. Take measures to prevent secondary disasters. During aftershocks, a series of barrier lakes, particularly the Tangjiashan Barrier Lake, are successfully drained.

The actions of rescuing and protecting the precious cultural heritages shall be stipulated in the national legislations. China has done such a work. Not long after the Wenchuan earthquake, the State Council promulgated the "Regulations on Post-Wenchuan Earthquake Rehabilitation and Reconstruction" (hereinafter referred to as "Regulations"), which was passed at the 11th executive meeting of the State Council on June 4, 2008. The "Regulations" stipulates that the post-earthquake rehabilitation and reconstruction shall conform to the following principles:

1. Self-reliance and self-help through production in disaster-stricken areas combined with state support and one-to-one assistance;
2. Government dominance combined with social participation;
3. In-situ rehabilitation and reconstruction combined with ex-situ new construction;
4. Quality guarantee combined with efficiency enhancement;
5. Short-term considerations combined with long-term considerations; and
6. Economic and social development combined with protection of ecological environment and resources.

The state accepts aids provided by foreign governments and international organisations necessary for the post-earthquake rehabilitation and reconstruction. The "Regulations" comprises 80 articles, including several articles were the cultural heritage concerns are taken into consideration and included into the global disaster risk reduction management. Pursuant to the regulation, the competent administration has worked out the "Master Planning" for post-earthquake reconstruction that include the protection of excellent traditional national cultures, architecture, structures and buildings possessing historical value and ethnic minority characteristics, and the preservation of the traditional styles of the towns and villages as well as natural heritages and its ecological restoration, museums and cultural relics storehouses and intangible cultural heritage. It is worth mentioning that the "Planning" has been included into the Qiang's culture rescue project.

Beichuan County, the extremely earthquake-stricken area, has more than 2,000 years of history and is one of the oldest ethnic groups that reserve distinct ethnic traditions and characteristics in the world. The population of Qiang ethnic group is about 300,000. The disaster deprives one-

fifteenth lives, including some senior inheritors of intangible cultural heritage. The “Planning” requires to establish a national experimental zone for ecological protection of Qiang’s culture, repair severely damaged Qiang’s cultural relics and precious materials and document relating to intangible culture heritage, rescue cultural relics and classical books and intangible cultural heritage in disaster areas, set up a folk cultural database and compile reading books for the popularisation of Qiang’s culture.

The preliminary budget for post-earthquake restoration seems to be an astronomical sum of money. The post-earthquake restoration and reconstruction for Sichuan only require RMB 1,670 billion. The financial gearing of the province exceeds three fourth of the amount. Due to such expenditure required, the central government specially stipulated the assistance task of the non-stricken provinces and cities, in addition to a series of powerful fiscal and taxation policies, adjustment and preference of industrial direction and types as well as the domestic and international donation. 19 supporting provinces will provided no less than 1% of the ordinary fiscal budget revenue of the previous year per year. The mentioned “Regulation” and “Planning” strengthen the protection of relics and vestiges as well as the buildings with historical value and ethnic minority characteristics in case of earthquake. For the purpose of guaranteeing the traditional buildings, planning arts and techniques of Qiang and Jiarong Tibetan ethnic minorities as well as the continuity of true and complete intangible cultural relics, a training courses of traditional buildings, in the course of maintenance and strengthening projects of related villages and traditional buildings was organised. The local traditional craftsmen and the main backbones for construction participated in the courses. As a result, the projects can be carried out by both absorbing the modern reality and the integrity as well as remaining the old traditions accurately. Besides timely exploration, investigation, studying and mapping on disaster-stricken site, to search and make comprehensive analysis on enough original evidence and data are indispensable in the restoration. Right before the quake, a small group of professionals mapped several Diaolou building of ZhiBo Diaolou Cluster without intention when passing by a distant and precipitous mountain area. Unfortunately, these Diaodou buildings being mapped were badly damaged in the disaster in May. The drawings before quake will help to guarantee the repair work to comply with the principle of authenticity. It also reflects the importance of daily management, establishment and arrangement of archival data, etc. in disaster prevention.

As of early June 2008 the State Administration of Cultural Heritage had received reports on damage of cultural relics from seven municipalities: Sichuan, Gansu, Shaanxi, Chongqing, Yunnan, Shanxi and Hubei. According to the reports, 169 state priority protected sites (2 have been inscribed on the World Heritage List) and 250 province protected historic sites have suffered damage. A total of 2,766 collected cultural relics have been damaged, of which 292 are precious ones. In the cultural relic administration sector, one worker lost his life and many have relatives who were killed. It has been estimated that it will take up to five years for the objectives of post-quake cultural properties rescue and repair to be achieved and that this effort will cost nearly 6 billion *yuan*.

Cultural heritage administrators and experts, mostly ICOMOS members, have been highly influential in the efforts all over the quake-stricken areas. In a very short time, they have managed to make remarkable achievements, which include the completion of preliminary plans for major initiatives. For instance, the Dujiangyan Dam has been listed in the bill for provisional legislation and on June 30th 2008, a key repair project was launched for the Erwang Temple (the building in memory of Li Bing and his son who supervised the construction of Dujiangyan Dam). This is not a “repair” project in the true sense, but a project involving inspection, cleaning and clearing, surveying and mapping as well as damage evaluation at the quake-stricken site. Direct repair work will be carried out when the project plan will be approved by China’s legal & professional inspectors and reported to the World Heritage Committee for coordination. The rescue and repair project for “Tibetan and Qiang Diaolou and Villages”, a tentative property to be inscribed on the World Heritage list, had its opening ceremony on July 15. The nature, content, and procedures to be followed for this project are basically the same as those of Dujiangyan Dam only with more

concern for relevant intangible cultural heritage, since the rescue and preservation of the rare and now vulnerable Qiang and Jiarong Tibetan cultures is a necessary focus.

While Chinese colleagues have tried their best, it will take at least 3-5 years after this earthquake to rescue, stabilise & repair the objects of cultural heritage so dramatically effected. Millions of people in the quake-stricken areas are yet to have some semblance of their normal everyday lives restored. Despite the great need for attention of cultural property it remains a priority to meet the daily needs of the people and prepare them for and protect them from secondary disasters.

Perhaps unique to this disaster and a potentially challenging decision for the preservation community, is the recent decision by the Chinese government to select and permanently conserve several devastated towns and settlements as quake sites, as products of interaction between humankind and nature under extremely special circumstances. Some colleagues have proposed that these sites be nominated for the status of world heritage sites. Such an action calls for in-depth exploration and a relatively unified understanding within the international community as to the definition of the values, nature and genre of these sites as well as their understood meaning. Challenges will include how to convey and retain authenticity and integrity, as well as how to conserve and manage those values into the future.

Section IV Results

WORKSHOP CONCLUSION

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As our International Workshop has reached its end, we are pleased to note that the initiative taken by the Ministry of Culture and the World Heritage Centre of UNESCO, with the support of ICCROM, to organise this Workshop has proved to be of great benefit, an index mark for our future progress. Through presentations of case studies for specific World Heritage Properties and through constructive debate, all the participants had the chance to exchange knowledge, ideas and expertise, and to reach useful conclusions regarding Disaster Risk Management at World Heritage Properties.

We have seen a common concern emerging from all the presentations as well as from the work groups and a common conclusion resulting from the two-day workshop: World Heritage is faced by a continuous threat from disaster that is human-induced or the result of specific natural disasters such as earthquakes, tsunamis, fires, typhoons or floods. The effects of these disasters have been intensified by dramatic climate changes such as global warming, the rise in sea level, the erosion of the coast, intense rainfall, and drought. As many interventions showed, the time for action has come, since existing measures have proved inadequate for this direct threat to the world. It has also been understood that there are solutions to this problem: through studied and intelligent strategies, successful applications and methodology, and the appropriate national coordination within the framework of international planning, the danger can be averted and the effects of the disasters limited. Accordingly, national authorities, international non-governmental organisations and also local communities, are encouraged to become actively involved in risk reduction.

On the first day of the workshop we tried not only to identify the problems, but also to search for the best ways to solve them. The existing framework and international policy on Disaster Risk Reduction were analysed, and their application to movable and immovable properties were extensively discussed, as were the proper strategies for the development of the adequate infrastructure and skills.

One of the main purposes of our Workshop was to present useful tools existing in our hands, which can help us to propose and adopt best practices. In this context, the new Resource Manual on Disaster Risk Reduction at World Heritage Properties, developed by ICCROM, and the Programme on the same subject elaborated by the World Heritage Centre were presented, giving us useful input to discuss and reflect upon.

Furthermore, the case studies that were analysed gave us the chance to appraise the deficiencies and to identify the weaknesses of existing protection systems, such as the insufficient training and awareness of the public, and to discuss protective procedures and policies.

In addition, the Workshop allowed us to record the essential steps and phases for compiling a Disaster Risk Management Plan. This plan must constitute a specific component of the larger Management Plan for the property. We must pay attention to some of what are major points: the analysis, the evaluation and the charting of risks in up-to-date terminology.

These elements contribute to the proper planning of a preparedness strategy. This strategy must lead to the development of infrastructures and skills for immediate hazard mitigation, envisaging of post-disaster actions, and the long-term rehabilitation of a World Heritage Property exposed to risk.

For example, Disaster Management Plans should also include evacuation plans and measures taken to mitigate the disaster effects for cultural property in storage areas. New methods for storage and the preservation of movable properties and archives are essential.

On the second day, we had the opportunity, amongst other things, to visit and appreciate the rehabilitation of the archaeological site of Ancient Olympia, a site of great symbolic value for the world. During our tour of the site, and thanks to the explanations provided by our colleagues from the local services, we understood that through coordinated actions it is feasible to restore an archaeological site and its surroundings that have faced a great disaster.

Finally, our work carried out in groups offered us the possibility to review – and comment upon – the proposed Programme on Disaster Risk Reduction prepared by the World Heritage Centre. Taking advantage from the first hand experience of the participants, and through their useful suggestions and contributions, the outcome of our Workshop has taken a concrete form: the “Protocol for International Cooperation”, enclosed in Section IV of these Proceedings, to which we shall give the name of Olympia. It outlines a series of actions which may assist States Parties to the Convention in implementing the Strategy on Disaster Risk Reduction adopted by the World Heritage Committee in 2007.

The “Olympia Protocol”, I trust, will remain one of the main outcomes of this International Workshop, marking the beginning of a long term engagement to improve the conservation and management of World Heritage sites in disaster-prone areas of the world, through the appropriate synergies and partnerships.

Among the activities included in the Protocol, I wish to mention in particular the suggestion made here in Olympia to establish, through UNESCO, an international day dedicated to Disaster Risk Reduction at World Heritage properties. Such an event, coordinated with the existing UN International Day for Disaster Risk Reduction (each year on the second Wednesday of October) would provide an opportunity to carry out many activities at World Heritage Properties and their museums, aimed at training and awareness-raising.

In conclusion, I would like to thank all participants for their attendance and active contribution as well as for the positive, cooperative and atmosphere which, thanks to the blessing of Olympia, made our Workshop a success.



United Nations
Educational, Scientific and
Cultural Organization



World Heritage Convention



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STRENGTHENING DISASTER RISK REDUCTION AT WORLD HERITAGE PROPERTIES: THE OLYMPIA PROTOCOL FOR INTERNATIONAL COOPERATION

UNESCO WORLD HERITAGE CENTRE
2009

1. INTRODUCTION: WHAT IS THIS DOCUMENT AND HOW TO USE IT

This document is part of the outcome of a Workshop on Disaster Risk Management at World Heritage Properties, jointly organised in November 2008 at Olympia (Greece) by the Hellenic Ministry of Culture and the UNESCO World Heritage Centre, with a financial contribution from the UNESCO Goodwill Ambassador Mrs. Marianna Vardinoyannis.

During this workshop, which gathered experts and heritage site managers from various regions, participants discussed the scope and contents of a possible “Programme” for reducing disaster risks at World Heritage properties, which would assist States Parties to the 1972 Convention in translating into action the “Strategy for Reducing Risks from Disasters at World Heritage Properties” adopted by the World Heritage Committee in 2007⁸. The present document provides a summary of the discussions held at Olympia with regard to this possible Programme.

The participants in the Olympia Workshop recognised that a Programme for reducing disaster risks at World Heritage properties would have a considerable scope and require the joint effort of all the actors engaged in the implementation of the World Heritage Convention. Considering the difficulty of identifying resources for the entire Programme in one time, it was suggested that its implementation could proceed in steps, depending on the availability of funds and the interest of potential donors. It was not to be expected, thus, that this Programme be implemented within a given time frame as a standard project under a single, comprehensive funding, but rather that it may provide a framework under which separate, but related activities could be developed, funded and carried out. For this reason, the present Document makes reference to the “Olympia Protocol for International Cooperation”, named after the venue of the above-mentioned Workshop, rather than to a Programme in the more traditional sense.

It is hoped, indeed, that States Parties would use this document as a general framework, or protocol, for developing cooperation among them – possibly through partnerships and twinning arrangements among World Heritage properties sharing similar disaster risks - in the area of disaster risk reduction at World Heritage properties. At the same time, States Parties and other potential donors are encouraged to provide support to enable the UNESCO World Heritage Centre and other partners to ensure the overall coordination of the initiative as well as the implementation of the proposed activities at global level, within the framework of the Strategy approved by the World Heritage Committee. Some activities foreseen under this Document have already been carried out and others may be implemented with funding through the International Assistance scheme under the World Heritage Fund, or with support from States Parties and other donors. The majority of them, however, are currently not funded. The more resources can be mobilised, the larger the scope of the initiative that will be implemented and the more World Heritage sites that will benefit from it.

The present document includes an initial chapter explaining the rationale for its establishment (i.e. why such a protocol is needed), an outline of its main objectives and a description of proposed activities. The latter include both initiatives that would need to be implemented by UNESCO, owing to their global scope, and actions (the majority) that could be carried out directly by States Parties, individually or, more appropriately, in the framework of twinning arrangements among World Heritage sites, as mentioned above. Both the global and individual activities would be framed within a single, coherent strategy, where each step contributes to the achievement of the broader aims of the Protocol.

2. RATIONALE: WHY REDUCING DISASTER RISKS

World Heritage properties, as with all heritage properties, are exposed to natural and man-made disasters, which threaten their integrity and may compromise their values.

By disaster we mean here a sudden event whose impact exceeds the normal capacity of property managers, or of a community, to control its consequences. The loss or deterioration of these

⁸ See Document WHC-07/31.COM/7.2, available online from: <http://whc.unesco.org/archive/2007/whc07-31com-72e.doc>

outstanding properties would negatively impact the national and local communities, both for their cultural importance as a source of identity and of information on the past, and for their socio-economic value. Experience, moreover, has demonstrated that the conservation of cultural heritage and the transmission of traditional technology, skills, and local knowledge systems, are not just important *per se*, i.e. for their intrinsic historic, artistic or scientific significance, but because they may contribute fundamentally to sustainable development, including the mitigation of disasters. Heritage-sensitive practices, in fact, can assist in significantly reducing the impact of disasters, before, during and after they have taken place. For instance, research in areas affected by seismic activities has shown that buildings constructed with traditional techniques have often proven to be very resilient to quakes, when well maintained, as compared with modern construction. Sustainable land-use practices for agricultural and forestlands act to prevent landslides and floods, which each year cause more casualties than earthquakes in many parts of the world.

Risks related to disasters within heritage sites are a function of their vulnerability to different potential hazards. The recent natural disasters in Bam, Iran, or in the Old Fort of Galle in Sri Lanka are high profile examples of the vulnerability of cultural heritage worldwide. Natural heritage can also be threatened, in exceptional circumstances, by natural disasters. Hazards, however, may be also man-made, such as fire, explosions etc. Accidental forest fires, conflicts, massive refugee movements, bursting of tailing pond dams as in Doñana, Spain, are certainly a concern to natural World Heritage sites. If natural disasters are difficult to prevent or control, hazards resulting from human activities can be avoided, and the vulnerability of heritage sites to both natural and man-made disasters can be reduced, thus lowering the overall risk threatening a property. Despite this, most World Heritage properties, particularly in developing areas of the world, do not have any established policy or plan for managing the risk associated with potential disasters. Existing national and local disaster preparedness mechanisms, moreover, usually do not take into account the significance of these sites and do not include heritage expertise in their operations. At the same time, traditional knowledge and sustainable practices that ensured a certain level of protection from the worst effects of natural hazards are being progressively abandoned. As a result, hundreds of sites are virtually defenceless with respect to potential hazards and consequent disasters. Strengthening disaster risk management for properties inscribed in the World Heritage List, therefore, is necessary to prevent and reduce damage from disasters and preserve their cultural and natural values, thus protecting an essential support for the social and economic well-being of their communities.

UNESCO and other partner institutions such as ICCROM, ICOMOS, IUCN and ICOM, have in the past years developed a number of initiatives aimed at strengthening the capacity of site managers to address disaster risk management for World Heritage cultural and natural properties. These drew from concerns originating after the Second World War and renewed in 1992 because of the high and visible incidence of disasters and armed conflict on television in the early 90s. They were part of a general movement from curative approaches to conservation to a concern for preventive approaches, and from managing interventions to managing sites. While the need to strengthen disaster risk management for World Heritage has been stressed in the past, governmental commitments have not yet followed. In particular, the *Kobe-Tokyo Declaration* of 1997 and the *Recommendations from the Kobe Thematic Session on Cultural Heritage Risk Management* in 2005 pinpointed the necessity for better integration of concern for risk in cultural heritage management, and recognition of the value of local and indigenous knowledge in disaster risk reduction. The *Davos Declaration*, adopted in 2006 by the International Disaster Reduction Conference (IDRC), reiterated these principles⁹.

⁹ The *Davos Declaration* is accessible online from:
http://www.idrc.info/userfiles/image/PDF_2006/IDRC_Davos_Declaration_2006.pdf

3. OVERALL OBJECTIVES AND STRATEGY FOR IMPLEMENTATION

The overall objective of this Protocol is to provide a general framework for developing cooperation among States Parties in order to translate the *Strategy for Reducing Risks from Disasters at the World Heritage Properties* into concrete actions at the site level.

The Protocol is based on a combination of global and site-based activities complementing each other and contributing to its overall goal. Its main components are:

1. The establishment of a Clearing House on Disaster Risk reduction;
2. The organization of International Workshops to introduce the 2007 *Strategy for Disaster Risk reduction at World Heritage Properties* and the scope and contents of the present *Protocol for Cooperation*. These workshops should also facilitate the identification of pilot sites – and the establishment of twinning arrangements among them – for the implementation of the Protocol;
3. The development, mostly through partnerships or twinning arrangements, of disaster risk reduction strategies on pilot properties inscribed on the World Heritage List, selected among those more vulnerable to possible hazards in different regions of the world, and also using, as a methodological reference, the recently developed “World Heritage Resource Manual for Disaster Risk Reduction”;
4. The organisation of International Workshops to review the progress made at different pilot sites, harmonise the approaches and share the lessons learnt. The experience resulting from these activities will be widely disseminated through publications regional meetings, on line communications, etc.;
5. The development of complementary capacity-building, educational and communication initiatives.

4. ACTIVITIES AND EXPECTED RESULTS

A detailed description of the proposed activities is provided here below, arranged according to the three most relevant strategic objectives of the World Heritage Convention, i.e. Conservation, Capacity-Building and Communication, taking into account that the strategic objective of “Community” – adopted by the Committee in 2007 - is integrated within each of these. Activities that could be implemented directly by the States Parties, for example in the framework of twinning arrangements, are marked with an asterisk.

Conservation

4.1 Establishment of a Clearing House on Disaster Risk Reduction

It is proposed to develop a Clearing House of resource materials on Disaster Risk Reduction – possibly at the World Heritage Centre or at ICCROM - including policy texts, guidance, case studies and illustrations, drawing also from submission by States Parties in the context of Nominations and the Periodic Reporting exercise. This would include information on existing initiatives and twinning arrangements between World Heritage properties. ICOM will continue to collect and put at disposal resource material concerning principally the disaster risk reduction of movable heritage.

Expected result: *Information and reference materials on disaster risk reduction for World Heritage are accessible to those concerned.*

4.2 International Workshops¹⁰ to introduce the Protocol, to identify pilot sites and facilitate the establishment of twinning arrangements

¹⁰ The Olympia Workshop of November 2008 intended to achieve these objectives, as well as serving as an opportunity for the launching of the Programme and this Protocol for International Cooperation.

These international workshops (as many as appropriate and feasible) would involve bringing key management personnel from selected sites together with disaster risk reduction experts for cultural and/or natural heritage, depending on the selected sites. The Protocol for International Cooperation and its strategy for implementation will be presented, and case studies reviewed. In selecting potential sites, attention will be paid to ensure diversity of typologies (including presence of movable heritage), of disaster risks – with consideration given to post-disaster areas and linkages with Climate Change - and of geographical regions, with priority given to properties exposed to multiple hazards.

Expected results: *The objective and scope of the protocol for cooperation as well as a methodology for developing disaster risk reduction strategies for each site are introduced. Experiences on disaster risk reduction are shared among management personnel, while concrete twinning arrangements among partner World Heritage sites are developed; understanding of the “Strategy for Reducing Risks from Disasters at World Heritage Properties”(adopted by the World Heritage Committee in 2007) is increased.*

4.3* Workshops to build capacities of concerned stakeholders and launch the development of appropriate disaster risk reduction strategies at selected sites.

These workshops -to be organized once two or more World Heritage properties have decided to cooperate in the framework of a twinning arrangement- will involve key management personnel from each site, local and national-level authorities responsible for reducing disaster risks in each country concerned (i.e. civil defense officials) and international resource persons. A general introduction on Disaster Risk Reduction will be provided, based on the selected sites’ case studies, and modalities for long-term cooperation will also be identified through the establishment of time-framed action plans. This would be the first step towards the development of appropriate disaster risk reduction strategies at the concerned World Heritage properties.

Expected results: *Capacities among the key stakeholders are built, and a concrete time-framed plan of action is defined for the implementation of activities in the context of established cooperation agreements (e.g. twinning) among States Parties and other partners.*

4.4* Risk Assessment at selected pilot properties

An analysis and assessment of the risks threatening the selected pilot sites and the people living in them will be led by responsible site managers, in collaboration with local civil defence officials and in consultation with disaster risk experts, taking into account existing records of disasters, potential hazards and the vulnerability of the property. This assessment will also provide a complete understanding of existing policies and measures for reducing the impact of disasters (if any) on the World Heritage property, and opportunities for cooperation with other concerned institutions.

Expected results: *Risks to the World Heritage property are defined, which will have to be reduced through appropriate identification of potential hazards and vulnerabilities of the site. Priorities for intervention are set up.*

4.5* Socio-economic analysis and research on traditional skills and local knowledge systems relevant to disaster risk reduction

This activity will enable the understanding of the opportunities and threats, resulting in particular from the interaction between the local communities and the selected World Heritage properties, with regard to the risks associated to disasters. Research will be carried out on traditional land-uses, skills, knowledge systems etc. whose continuation or revitalisation might be beneficial to strengthen the preparedness to disaster for the protection of the World Heritage property. Research on traditional knowledge related to movable heritage disaster risk management will also be carried out. At the same time, the study will take into consideration the social and economic feasibility of the integration of this traditional knowledge in the management of risks within the property, making suggestions for its adaptation to modern constraints and requirements.

Expected result: *Essential information is provided for the establishment of consultations with the local community and valuable insights on its possible participation in the reduction of disaster risks in the context of the management of their World Heritage property.*

4.6* Inter-institutional Workshops on Disaster Risk Reduction at site level

At this stage of the Protocol for Cooperation, it is proposed to organise an Inter-institutional Workshop at each of the pilot-sites, including representatives from the heritage agency responsible for the protection of the property, and of all other institutions and agencies, both at national and local levels, concerned with disaster risk reduction. The workshop, moderated by an international resource person, will facilitate the exchange of information on perceived risks at the World Heritage property and existing policies and procedures to mitigate the impact of disasters. This will provide essential input for the integration of concern for disaster risks within Management Plans for the World Heritage property.

Expected results: *An understanding of the respective needs, roles and capacities with respect to disaster risk reduction for the World Heritage property is shared among participating institutes, and possible weaknesses and the scope for better coordination and integration are identified.*

4.7* Seminars with local community

A Seminar with representatives from the local communities will be held at each selected property in order to sensitise them to the risks from disasters affecting the World Heritage site in or around which they live, and the possible impact of a hazard on their persons and well-being. The Seminar will present and discuss the results of the research (see points 4.4 and 4.5 above) and solicit a reaction from the local communities on its possible direct involvement in disaster risk reduction activities for the protection of the World Heritage property, and the appropriate ways of achieving this.

Expected result: *A full understanding of the opportunities and constraints for the integration of local community concerns and capacities related to disaster risk reduction into the Management Plan for the World Heritage property are shared among local communities.*

4.8 Mid-term International Workshop to review progress of the activities and validate methodologies for developing an appropriate disaster risk management strategy at site level.

This international workshop, gathering representatives from the pilot sites where activities are being implemented, will enable the review of experiences and learning among the participating sites, and will compare proposals for finalising their respective risk-sensitive management plans.

Expected results: *The approach and methodologies being developed within each site are confirmed or reoriented, best practices are shared, and the network among all participants in the initiative is strengthened.*

4.9* Development of disaster risk reduction strategies at selected World Heritage properties

When activities 4.1 to 4.7 are completed, Heritage Conservation Agencies, assisted by international resource persons, will develop the appropriate Disaster Risk Reduction Strategies for their properties, taking into account all the elements gathered throughout the Programme. These will be integrated on one hand into Management Plans for the properties, if existing, and into existing Disaster Preparedness, Response and Recovery Plans at national and local levels. They will include the identification of indicators for monitoring the effective management of disaster risks at the sites.

Expected result: *conservation at selected World Heritage properties is strengthened through improved disaster risk reduction strategies.*

4.10* Follow up at Pilot Properties

A follow-up evaluation is suggested, at each pilot World Heritage property, to assess the impact of the activities carried out on the conservation and management of the sites. This evaluation could take place two years after the completion of activity 4.9 above.

Expected results: *lessons from past activities are learnt and corrective measures identified.*

Capacity building and Communication

4.11 Publications and dissemination of materials on the web

After the completion of the work at the selected pilot sites, a publication will be prepared, and translated into the official languages of UNESCO. Complementing the “Resource Manual” developed by ICCROM, IUCN and the World Heritage Centre, this publication will provide concrete references and best practices showing how the methodology outlined in the Resource Manual can be applied in practice. The Resource Manual will be also made available on the web, possibly in a more user-friendly format.

Expected result: *Publications and materials (including on the web-site of the World Heritage Centre) on disaster risk reduction are disseminated to site managers around the world.*

4.12 Distribution of information for each Region

Distribution of the results from the above activities will also take place in conjunction with scheduled regional meetings for each of the five geographic regions of the world, i.e. Africa; Arab States; Asia and the Pacific; Europe and North America; and Latin America and the Caribbean. The staff members of the Heritage Conservation Agencies for each pilot site will be asked to contribute to information sessions and presenting the above-mentioned publication, and to share their experience in helping completing the risk-sensitive Management Plan for their site in the context of their particular region. This component will complement the above publication in building capacities among the various regions of the world.

Expected result: *Firsthand knowledge about the development of disaster risk reduction strategies from the pilot sites exchanged.*

4.13 Development of a curriculum for a Training Course on Disaster Risk Reduction

Building on the experience of the activities carried out, and on the methodology outlined in the “Resource Manual”, it is suggested to develop a curriculum for a short (one or two weeks) course on World Heritage Disaster Risk Reduction, which could possibly become a regular feature of ICCROM’s Training programmes. This Course could be offered in different regions of the world, in partnership with the various Category 2 Centres on World Heritage that are being established, using one of the pilot World Heritage properties taking part in the initiative as a case study.

Expected result: *Progress is made towards the development of a much-needed training programme which would build capacity on reducing disaster risks among those responsible for the conservation of World Heritage properties.*

4.14 Development of a component on Disaster Risk Reduction within the World Heritage in Young Hands School Kit and activities

It is proposed to expand the current School Kit “World Heritage in Young Hands” by introducing a component on Disaster Risk Reduction. The related activities could envisage visits to sites exposed to disaster risks and activities to reduce underlying risk factors.

Expected result: *Educational material is developed which would contribute to sensitising the young people to the threats posed by disasters to World Heritage properties and the urgent need to reduce the related risks.*

4.15 International Day of Disaster Risk Reduction at World Heritage Properties

It is proposed to celebrate the International Day of Disaster Risk Reduction at World Heritage Properties, in coordination with the existing International Day of Disaster Risk Reduction (early October, every year), to give visibility and raise awareness about this important issue. This annual event will also provide opportunities for conducting drills and educational activities, including exhibitions, at World Heritage properties.

***Expected results:** Awareness is raised at the local and global level on disaster risks that affect World Heritage properties and ways to reduce them. At the same time, preparedness for effective response is strengthened at site level.*

5. IMPLEMENTATION MODALITIES

If resources were made available, the activities under this Protocol for International Cooperation could be coordinated by the World Heritage Centre of UNESCO, possibly through the establishment of a Focal Point, and implemented by various partners according to different modalities, including – as mentioned above – bilateral twinning arrangements.

Global activities such as International Workshops, publications and training courses will be implemented directly by the World Heritage Centre in collaboration with Advisory Bodies and other appropriate partners, including ICOM, the Blue Shield and the UN International Strategy for Disaster Reduction.

As already explained, considering the difficulty of identifying resources for all activities proposed under this protocol for Cooperation, it is envisaged that its implementation could proceed by steps, depending on the availability of funds and the interest of potential donors. The activities described in Section 4 above, on the other hand, lend themselves to a certain degree of flexibility. Site-based activities, for example, could be implemented independently from global ones in the framework of specific “packages”, and the number of sites concerned would also depend on the availability of resources and the number of twinning arrangements established. When the Programme reaches a critical mass of ongoing activities, it is proposed to establish an Advisory/Steering Group involving, of course, the Advisory Bodies to the World Heritage Convention, but also UN-ISDR, ICOM and other Members of the Blue Shield, the Council of Europe and other relevant Institutions. The role of this Steering Group would be to review the progress of the Programme and provide orientation for its improvement.

Annexes

Annex 1

INTERNATIONAL WORKSHOP ON DISASTER RISK REDUCTION AT WORLD HERITAGE PROPERTIES

PARTICIPANTS LIST

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INTERNATIONAL WORKSHOP ON DISASTER RISK REDUCTION AT WORLD HERITAGE PROPERTIES

Thursday 6 & Friday 7 November 2008
Ancient Olympia, Greece

UNESCO & THE HELLENIC MINISTRY OF CULTURE

and

*with a financial contribution by Mrs. Marianna Vardinoyannis,
UNESCO Goodwill Ambassador*

Thursday, 6 November 2008

08:30 -09:00 *Registration of Participants*

09:00 -09:45 *Opening of the Workshop*

Georgia Chatzi

Director of the Seventh Ephorate of Prehistoric
and Classical Antiquities, Hellenic Ministry of Culture

Welcoming addresses

Michalis Liapis

Minister of Culture

Francesco Bandarin

Director of the World Heritage Centre, UNESCO

Elena Korka

Director of Prehistoric and Classical Antiquities,
Hellenic Ministry of Culture

Coordinator:

Vivi Vassilopoulou

Director-General of Antiquities and Cultural Heritage,
Hellenic Ministry of Culture

1st Working Session
DISASTER RISK REDUCTION:
THE GLOBAL CONTEXT AND THE HERITAGE SECTOR

Chairperson:

Mounir Bouchenaki

Director-General of ICCROM

Panelists:

Katherine Paraschi

Senior Advisor of Minister of Culture,
Hellenic Ministry of Culture

Athanasios Nakasis

Director for Technical Research on Restoration,
Hellenic Ministry of Culture

Rapporteur:

Giovanni Boccardi

Chief of Asia and Pacific Unit, World Heritage Centre, UNESCO

09:45 -10:00

Disaster Risk Reduction: institutional frameworks and international policies

Paola Albrito

Regional Coordinator of Europe, International Strategy for Disaster
Reduction, UN

10:00 -10:15

*Disaster Risks in the heritage context: impacts of
disasters on Cultural and Natural Heritage Properties,
existing policies and tools, problems and perspectives,
methodology for reducing Disaster Risks*

Dinu Bumbaru

Policy Director, Heritage Montreal Foundation

10:15 -10:30

*Climate change and impact on the Disaster
Risk Management of Cultural Heritage*

Sue Cole

Senior Policy Officer, World Heritage and International Policy,
English Heritage

- 10:30 -11:30 Official presentation of the *Digital Exhibition of the History of the Ancient Olympic Games* by the Minister of Culture Mr. Michalis Liapis, at the Old Museum of Ancient Olympia
- 11:30 -11:45 Coffee break
Specificities of Disaster Risk Management at Movable Heritage
- Cristina Menegazzi**
ICOM Programme Specialist
- 11:45 -12:00 *Risk Reduction in the World Heritage context: the Strategy and the UNESCO proposed Draft Programme*
- Giovanni Boccardi**
Chief of Asia and Pacific Unit, World Heritage Centre, UNESCO
- 12:00 - 12:15 *Capacity Building in Disaster Risk Management: current activities and New Risk Management Manual*
- Gamini Wijesuriya**
Project Manager, Sites Unit, ICCROM
- 12:15 - 12:30 Interventions and Discussion
- 12:30 - 13:30 Guided tour of the site of Ancient Olympia and its Archaeological Museum
- 13:30 - 14:45 Light lunch

2nd Working Session WORLD HERITAGE CASE STUDIES

- Chairperson: **Vivi Vassilopoulou**
Director-General of Antiquities and Cultural Heritage,
Hellenic Ministry of Culture
- Panelists: **Georgia Chatzi**
Director of the Seventh Ephorate of Prehistoric and Classical
Antiquities, Hellenic Ministry of Culture
- Nikolaos Agriantonis**
President of the Hellenic Section of ICOMOS
- Rapporteur:* **Cristina Menegazzi**
ICOM Programme Specialist
- 14:45 -15:50 *Case study of Olympia*
- Olympia Vikatou**
Head of the Department of Archaeological Sites, Monuments and
Archaeological Research of the Seventh Ephorate of Prehistoric and

Classical Antiquities, Hellenic Ministry of Culture

Nikolaos Minos

Director of Conservation of Ancient and Modern Monuments,
Hellenic Ministry of Culture

Gavriil Xanthopoulos

Specialist in forest fires, Institute of Mediterranean
Forest Ecosystems and Forest Products Technology

George Lyrintzis

Director of the Institute of Mediterranean Forest
Ecosystems and Forest Products Technology

15:50 -16:00 Short film: *The Conservation project of the archaeological and broader landscape of Ancient Olympia*

16:00 - 16:15 Coffee break

16:15 -1 7:30 *Case studies from the participating countries: Disaster Risks and their Management on World Heritage Properties.*

Contributions from Heritage managers and Disaster Reduction officials

Speakers from:

Benin, Uganda, China, Indonesia, Japan

17:30 - 17:45 Coffee break

17:45 - 19:00 *Case studies from the participating countries: Disaster Risks and their Management on World Heritage Properties*

Speakers from:

Nepal, Czech Republic, Spain, Italy-Turkey, Russian Federation

19:00 -19:15 Interventions and Discussion

19:15 - 19:40 *Day's Review*

Elena Korka

Director of Prehistoric and Classical Antiquities,
Hellenic Ministry of Culture

Giovanni Boccardi

Chief of Asia and Pacific Unit,
World Heritage Centre, UNESCO

Friday, 7 November 2008

3rd Working Session
WORKING GROUPS
09:30 - 11:00

09:30 - 09:35 Introduction to the Working Group Session

Giovanni Boccardi
Chief of Asia and Pacific Unit, World Heritage Centre, UNESCO

Working Groups sessions:

Review of the structure and contents of the UNESCO Programme for Disaster Risk Reduction at World Heritage Properties. Identification of new elements and follow-up proposals.

Working Group 1 **Chair:**
Mounir Bouchenaki
Director General of ICCROM

Working Group 2 **Chair:**
Francesco Bandarin
Director of the World Heritage Centre, UNESCO

Working Group 3 **Chair:**
Elena Korka
Director of Prehistoric and Classical Antiquities,
Hellenic Ministry of Culture

11:00 - 11:30 Coffee break

4th Working Session
RESULTS, RECOMMENDATIONS AND FOLLOW-UP

Chairperson: **Francesco Bandarin**
Director of the World Heritage Centre, UNESCO

Panelists: **Elena Korka**
Director of Prehistoric and Classical Antiquities,
Hellenic Ministry of Culture

Mounir Bouchenaki
Director-General of ICCROM

11:30 - 12:30 *Presentation of Working Groups results and open discussion*

12:30 - 14:00 Light lunch

- 14:00 -14:30 *Conclusions of the Workshop*
Giovanni Boccardi
Chief of Asia and Pacific Unit, World Heritage Centre, UNESCO
- Cristina Menegazzi**
ICOM Programme Specialist
- 14:30 -15:00 **Closing of the Workshop:**
Francesco Bandarin
Director of the World Heritage Centre, UNESCO
- Vivi Vassilopoulou**
Director-General of Antiquities and Cultural
Heritage, Hellenic Ministry of Culture
- 16:30 Transfer to Athens









Annex 3

BIBLIOGRAPHY ON LINE

Disaster Risk Reduction for Cultural Heritage Bibliography on line, hosted by the Getty Conservation Institute: <http://gcibibs.getty.edu/asp/>

Museums Emergency Programme

[Scope Note](#)

-  A. Emergency Type
-  B. Planning
-  C. Response and Recovery
-  D. Risk Analysis
-  E. Social Factors
-  F. Heritage Type
-  G. Training
-  H. Legal

Annex 4



United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture

World Heritage

31 COM

Distribution Limited

WHC-07/31.COM/7.2
Paris, 10 May 2007
Original: English/French

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE

World Heritage Committee
Thirty first Session

Christchurch, New Zealand
23 June – 2 July 2007

Item 7.2 of the Provisional Agenda: Issues related to the state of conservation of World Heritage properties: Strategy for Reducing Risks from Disasters at World Heritage properties

SUMMARY

As requested by the Committee through Decision **30 COM 7.2** (Vilnius, 2006), this document contains a revised version of the "*Strategy for Reducing Risks at World Heritage Properties*" (presented in its original version in Document *WHC-06/30.COM/7.2*) with a prioritised list of actions. The Document contains also information on other related activities carried out by the World Heritage Centre and Advisory Bodies since July 2006.

Draft Decision: 31.COM 7.2, see Point IV

I. BACKGROUND

1. Following the examination of the Strategy for Risk Reduction at World Heritage Properties (Document *WHC-06/30.COM/7.2*), the World Heritage Committee had endorsed its objectives, but requested the World Heritage Centre and the Advisory Bodies “to work together, along with other UNESCO mechanisms, to prioritize the proposed actions contained in the Strategy” (Decision **30 COM 7.2**) (Vilnius, 2006).
2. Ten priority action points (two per Objective identified within the Strategy) were therefore identified, out of the many that were included in Table 1 of Document *WHC-06/30.COM/7.2*. These actions points, which were slightly revised, have been selected by the World Heritage Centre and the Advisory Bodies based on the following three criteria:
 - a) Actions that can be implemented by the World Heritage Committee, the World Heritage Centre and the Advisory Bodies;
 - b) Actions that respond to specific recommendations made by the Committee in past decisions;
 - c) Actions that balance site-based and global approaches;
3. The priority actions also take into account the outcome of a Workshop on “*Integrating traditional knowledge systems and concern for cultural and natural heritage into risk management strategies*” jointly organized by the World Heritage Centre and ICCROM at Davos (Davos, Switzerland, September 2006), within the framework of the International Disaster Reduction Conference (see more on this in Section III below).
4. A revised, and much shorter, *Strategy for Risk Reduction at World Heritage Properties* is therefore presented (see Section II), for the consideration and approval of the Committee.
5. It is important to note that the introductory part of Document *WHC-06/30.COM/7.2* (from page 1 to 7 in the English version) still remains entirely valid. It was not re-included in the present Document to avoid unnecessary waste of paper. Moreover, the World Heritage Centre and the Advisory Bodies consider that the Actions identified in Table 1 of Document *WHC-06/30.COM/7.2*, which are not reiterated in this revised version of the “Strategy”, would still deserve attention and follow up, although they constitute a lesser priority in the context of the implementation of the *World Heritage Convention*.

II. “STRATEGY FOR RISK REDUCTION AT WORLD HERITAGE PROPERTIES”¹

A. Purpose of the strategy

6. The purpose of this Strategy is twofold:
 - a) To strengthen the protection of World Heritage and contribute to sustainable development by assisting States Parties to the *Convention* to integrate heritage concerns into national disaster reduction policies and to incorporate concern for disaster reduction within management plans and systems for World Heritage properties in their territories; and

¹ World Heritage properties are cultural and natural heritage sites whose significance “is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity”. A list of World Heritage properties is maintained and up-dated every year by an inter-governmental Committee (also known as the World Heritage Committee) in the framework of the *World Heritage Convention*, adopted by the general Conference of UNESCO in 1972. More information on the *Convention* and its List of World Heritage properties are available at the following Web address: <http://whc.unesco.org>

- b) To provide guidance to States Parties, the World Heritage Committee, the World Heritage Centre, and the Advisory Bodies to integrate disaster risk reduction into World Heritage strategic planning and management, including the allocation and use of Emergency Assistance under the World Heritage Fund.

B. Objectives and recommended actions

General Considerations

7. In determining the appropriate means to achieve the Strategy, the following key considerations should be made, which are relevant to all of the objectives and actions:
 - a) Cultural and natural heritage, with their related technologies, practices, skills, knowledge systems and ecosystem's goods and services can play an important positive role in reducing risks from disasters at all phases of the process (readiness, response and recovery), and hence in contributing to sustainable development in general;
 - b) The key to an effective reduction of risks from disasters is advance planning and the building of a culture of prevention;
 - c) In developing plans for reducing risks at World Heritage properties it is essential to give adequate consideration to cultural diversity, age, vulnerable groups and gender perspective;
 - d) Property occupants and users, and concerned communities in general, should be always involved in planning for disaster risk reduction.
 - e) The protection of the Outstanding Universal Value and the integrity and authenticity of World Heritage properties from disasters implies consideration for the associated intangible aspects and movable items that contribute directly to its heritage significance.

Objectives and priority actions

8. In order to achieve the stated purposes of the Strategy, a series of objectives and related actions have been identified. These have been structured around the five main priorities for action defined by the Hyogo Framework for Action², but adapted to reflect the specific concerns and characteristics of World Heritage.
9. The five objectives are the following:
 - a) Strengthen support within relevant global, regional, national and local institutions for reducing risks at World Heritage properties;
 - b) Use knowledge, innovation and education to build a culture of disaster prevention at World Heritage properties;
 - c) Identify, assess and monitor disaster risks at World Heritage properties;
 - d) Reduce underlying risk factors at World Heritage properties;
 - e) Strengthen disaster preparedness at World Heritage properties for effective response at all levels.
10. These objectives correspond to the spirit of Article 5 of the *World Heritage Convention*³, requiring States Parties to take all necessary measures to ensure the protection, conservation and presentation of the cultural and natural heritage situated on their

² The most recent and important global policy text on risk reduction is the *Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters* (HFA), adopted at the UN *World Conference on Disaster Reduction* (WCDR), held from 18 to 22 January 2005 in Kobe, Hyogo, Japan. Taking place 11 years after the adoption of the seminal *Yokohama Strategy (1994)*, and five years after the end of the *UN International Decade for Natural Disaster Reduction* (IDNDR, 1990-1999), the HFA sets out the UN-wide strategic plan for reducing risks from disasters over the next decade. The HFA is available at the following Web address: <http://www.unisdr.org/> (March 2006).

³ available at the following Web address: <http://whc.unesco.org/en/175/> (May 2006)

territory. They also fit within three of the four Strategic Objectives established by the World Heritage Committee through its *Budapest Declaration*⁴, namely Conservation, Capacity-Building and Communication.

11. Objectives and related priority actions of the Strategy are shown in **TABLE 1**

TABLE 1. Objectives and Priority Actions

Objectives	Priority Actions
<p>1. Strengthen support within relevant global, regional, national and local institutions for reducing risks at World Heritage properties</p> <p><i>Global actors for disaster reduction should give more consideration to cultural and natural heritage among the issues to be considered when defining their strategic goals and planning their development cooperation activities. At the same time, general disaster reduction strategies at regional, country and local levels must take into account and integrate concern for world cultural and natural heritage in their policies and implementation mechanisms</i></p>	<p><i>Action 1.1</i> Promote cultural and natural heritage, and its potential positive role for disaster reduction as part of sustainable development, within relevant international development institutions, conventions and global forums and with other potential financial partners, as a means of raising support for the protection of heritage from disasters.</p> <p><i>Action 1.2</i> Strengthen policies and funding provisions for disaster reduction within the World Heritage system, for instance by including disaster and risk management strategies in the preparation of Tentative Lists, nominations, monitoring, periodic reporting and International Assistance processes.</p>
<p>2. Use knowledge, innovation and education to build a culture of disaster prevention at WH properties</p> <p><i>The building of a culture of prevention, at all levels, is one of the key elements for a successful disaster reduction strategy. Experience shows that reacting a posteriori, especially as far as heritage is concerned, is an increasingly ineffective way of responding to the needs of people affected by disasters. Training,</i></p>	<p><i>Action 2.1.</i> Develop up-dated teaching/learning and awareness-raising resource materials (guidelines, training kits, case studies and technical studies, glossaries) on disaster reduction for World Heritage, and disseminate them widely among site managers, local government officials and the public at large.</p> <p><i>Action 2.2.</i> Strengthen the capacity of World Heritage property managers and community members, through field-based training programmes, to develop and implement risk management plans at their sites and contribute to regional and national disaster reduction strategies and processes.</p>

⁴ Accessible online at: <http://whc.unesco.org/en/budapestdeclaration>

Objectives	Priority Actions
<p><i>education and research, including on relevant traditional knowledge, are the most effective ways of developing a culture of preparedness. This particular area of actions fits entirely within the broader mandate of UNESCO as the UN intellectual arm, in particular for establishing global knowledge networks</i></p>	
<p>3. Identify, assess and monitor disaster risks at WH properties</p> <p><i>The first step to reduce disasters and mitigating their impact is the identification of possible risk factors, including from global agents such as climate change. The vulnerabilities from disasters to World Heritage properties must be therefore identified, assessed in their level of priority and closely monitored, so as to inform the appropriate risk management strategies</i></p>	<p><i>Action 3.1</i> Support risk identification and assessment activities at World Heritage properties, including consideration of climate change impacts on heritage, consideration of underlying risk factors, all necessary expertise and the involvement of relevant stakeholders as appropriate.</p> <p><i>Action 3.2</i> Develop a World Heritage Risk Map at the global level or at regional levels to assist States Parties and the Committee to develop better responses.</p>
<p>4. Reduce underlying risk factors at WH properties</p> <p><i>When a disaster occurs, there are a number of underlying factors that can significantly aggravate its impact. These include land/water and other natural resources management, industrial and urban development, and socio-economic practices. Removing the root causes of vulnerability implies often the identification and reduction of underlying risk factors associated to human activities</i></p>	<p><i>Action 4.1</i> Give priority within international assistance to helping States Parties in implementing emergency measures to mitigate significant risks from disasters that are likely to affect the Outstanding Universal Value, including the authenticity and/or integrity of World Heritage properties.</p> <p><i>Action 4.2</i> Develop social training programmes for communities living within or around World Heritage properties, including consideration of heritage as a resource to mitigate physical and psychological damage of vulnerable populations, particularly children, during and in the aftermath of disasters.</p>
<p>5. Strengthen disaster preparedness at World Heritage properties for effective response at all levels</p> <p><i>The worst consequences of natural or human-made disasters can often be avoided or mitigated if all those concerned are prepared to act according to well conceived risk reduction plans, and the necessary human and financial resources, and</i></p>	<p><i>Action 5.1</i> Ensure that risk management components, with identified priorities, are integrated within management plans for World Heritage properties, as a matter of urgency. For World Heritage cultural properties, the scope of these plans should address ways of protecting the key assets that contribute towards the Outstanding Universal Value and should also include the protection of any significant original archival records that contribute to their heritage value, whether or not they are located within the boundaries of the World Heritage property. For natural properties, such plans should be oriented to</p>

Objectives	Priority Actions
equipment, are available	protect the key values for which the properties were inscribed as well as their integrity.
	<p><i>Action 5.2</i> Ensure that all those concerned with the implementation of disaster reduction plans at World Heritage properties, including community members and volunteers, are aware of their respective roles and are well and systematically trained in the application of their tasks.</p>

III. RELATED ACTIVITIES

12. From 28 August to 1 September, in Davos (Switzerland), the World Heritage Centre and ICCROM organized a one-day workshop on “*Integrating traditional knowledge systems and concern for cultural and natural heritage into risk management strategies*”, with resources from the World Heritage Fund. This event, in which ICOMOS and ICOM representatives also participated, took place within the framework of the International Conference on Disaster Reduction (ICDR), a major event following the World Conference of Disaster Reduction (WCDR) held at Kobe (Japan), in 2005.
13. In line with Decision **30 COM 7.2** (Vilnius, 2006), the session helped disseminate the “*Strategy for Risk Reduction at World Heritage Properties*” within this important international forum while promoting the integration of concern for heritage within broader disaster reduction strategies and plans at global, regional and national levels. As proposed within the “Strategy”, the primary purpose of this session was to strengthen ties and exchange experiences between the heritage community and the wider Disaster Reduction sector. The various papers presented and the outcome of the discussions will result in an e-publication edited by ICCROM, which will be made available on the website of the World Heritage Centre, together with the “Strategy” itself and the prioritized list of actions, upon validation by the World Heritage Committee.
14. One of the important results achieved by the session is reflected in the final Declaration (i.e. the “Davos Declaration”) adopted by the ICDR, which includes the following paragraph: “*Concern for heritage, both tangible and intangible, should be incorporated into disaster risk reduction strategies and plans, which are strengthened through attention to cultural attributes and traditional knowledge*”⁵. This constitutes the first reference, within a global policy document on disaster reduction, to the importance of the heritage in the context of disaster risk reduction.
15. Moreover, with respect to the provisions contained in paragraphs 7 and 8 of Decision **30 COM 7.2** (Vilnius, 2006), the World Heritage Centre and ICCROM are preparing a user-friendly resource material to build capacity on disaster reduction at World Heritage properties. This should be finalized within 2007. A revised format for Emergency Assistance requests has been prepared, and is presented for the consideration of the Committee in Document *WHC-07/31.COM/18*.

⁵ Excerpt from the “Davos Declaration”, *International Conference on Disaster Reduction*, ICDR, Davos, Friday 8 September 2006. Accessible in full online at: www.davos2006.ch

16. Finally, in the context of the meeting held at UNESCO Headquarters on 5 and 6 February 2007 to develop a Policy Document on World Heritage and Climate Change, a number of references have been made to the linkages between Climate Change and risk management or reduction. Climate Change, in this context, should be considered as one of the factors that, combined with specific vulnerabilities, can result in significant risks to the conservation of World Heritage properties. The policies and strategies of the World Heritage Committee on the issues of Climate Change and Risk Reduction, therefore, should be consistent and complementary.

IV. DRAFT DECISION

Draft Decision: 31 COM 7.2

The World Heritage Committee,

1. *Having examined Document WHC-07/31.COM/7.2,*
2. *Recalling Decision **30 COM 7.2**, adopted at its 30th session (Vilnius, 2006),*
3. *Takes note of the important outcome of the Davos International Conference on Disaster Reduction as reflected in its final Declaration, on the role of heritage within disaster risk reduction;*
4. *Approves the revised Strategy for Risk Reduction at World Heritage Properties with its prioritized list of actions;*
5. *Requests the World Heritage Centre and the Advisory Bodies to ensure that activities in the framework of the Strategy for Risk Reduction at World Heritage Properties are consistent and, when appropriate, complementary to the policies and strategies established by the World Heritage Committee on the issue of Climate Change.*

Annex 5

Regensburg Recommendation

“Earth, Wind, Water, Fire – Environmental Challenges to Urban World Heritage”

Organization of World Heritage Cities Northwest-European Regional Conference
September 16-18, 2008 in Regensburg, Germany

We, the participants of the conference, representatives of the Organization of World Heritage Cities in Northwest Europe,

emphasize the importance of safeguarding the world’s cultural heritage for present and future generations,

highlight that climate change and environmental challenges like storms, flooding, fire, earthquakes, weathering, erosion and landslides pose one of the most important threats to World Heritage cities, especially given the more frequent extreme weather situations,

emphasize that the loss and deterioration of the built cultural heritage due to natural disasters and climate change affects all people,

recall that the safeguarding of the urban cultural heritage is the shared responsibility of citizens, local and regional authorities, national governments and international organisations,

take into account the following documents:

- UNESCO’s Convention Concerning the Protection of the World Cultural and Natural Heritage of 1972 and the corresponding Operational Guidelines for the Implementation of the World Heritage Convention of 2008,
- the Council of Europe’s Recommendation No. R (93)9 of the Committee of Ministers to Member States on the Protection of the Architectural Heritage against Natural Disasters of 1993,
- the International Committee of the Blue Shields Radenci Declaration on the Protection of Cultural Heritage in Emergencies and Exceptional Situations of 1998,
- the Puebla Declaration regarding Prevention and Protection Measures for World Heritage Cities in Case of Disaster adopted by the Organization of World Heritage Cities General Assembly in Puebla, Mexico in 2001,
- ICOMOS Kyoto Declaration on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters of 2005,
- UNESCO’s Strategy for Reducing Risks from Disasters at World Heritage Properties of 2006,
- New Delhi Resolution on Impact of Climate Change on Cultural Heritage, adopted at the ICOMOS International Workshop on Impact of Climate Change on Cultural Heritage of May 2007,
- ICOMOS Recommendations from the Scientific Council Symposium Cultural Heritage and Global Climate Change of March 2008,
- the publication of the World Heritage Centre “Policy Document on the Impacts of Climate Change on World Heritage Properties” of 2008,

point out that in most cases the issue of natural hazards and urban heritage is not yet being approached in an interdisciplinary way. We recommend that the integrated research and

interdisciplinary dialogue in geo-scientific as well as in cultural and social sciences is fostered in the sense that different knowledge is brought together,

Underscore that traditional preservation techniques and local knowledge are invaluable in the protection of urban heritage sites from environmental challenges.

We the participants of this conference call on:

(1) the UNESCO World Heritage Committee,

- a. to encourage and increase dialogue on natural risks to cultural heritage and to develop proper strategies for risk prevention and management,
- b. to address the potential danger of natural disasters which confront urban World Heritage sites in the Operational Guidelines for the Implementation of the World Heritage Convention,
- c. to foster funding programmes for prevention, preparedness, response and recovery measures in urban World Heritage sites,
- d. to capitalise on existing initiatives and projects and to disseminate the results and information gained,
- e. to encourage interdisciplinary research on environmental challenges to urban cultural heritage by establishing UNESCO chairs and UNESCO networks in that field,
- f. to support international conferences dealing with climate change and natural hazards in relation to urban World Heritage sites,
- g. to establish awareness-raising programmes and to bring the topic into focus through UNESCO publications and other sources of information,

(2) the official Bodies of the European Union,

- a. to develop coherent policies on historic urban landscapes together with international expert bodies,
- b. to support scientific research on environmental challenges to urban World Heritage,
- c. to strengthen the role of urban World Heritage and its protection from natural risks through European Regional Development funding (ERDF),

(3) States Parties to the World Heritage Convention,

- a. to assure proper funding and staff for scientific research and preventive measures in the field of natural risks to urban World Heritage on a national level and to make risk prevention a topic for national funding programmes,
- b. to foster training and education for people concerned with the protection of urban World Heritage sites with regard to natural risks and preventive measures,
- c. to develop applicable instruments and provide resources that allow a fast reaction to natural hazards threatening World Heritage cities, considering that the complexity of cause and effect is not only limited to the World Heritage cities themselves,

(4) the World Heritage cities,

- a. to make risk preparedness and the impacts of climate change an integral part of the cities' management of the World Heritage area and to develop proper emergency plans,
- b. to pursue an integrated management approach that brings together different disciplines and institutions concerned with the protection of urban cultural heritage,
- c. not to decide to interfere in the surrounding of their World Heritage, before there is absolutely no doubt about the future effects of such actions on nature,

- d. to participate in research on risk preparedness and the protection of urban heritage from environmental challenges,
- e. to share information on best practices, knowledge and experience relating to environmental challenges with other World Heritage cities,

(5) the Organization of World Heritage Cities,

- a. to disseminate relevant information on natural risks to World Heritage cities, including case studies, recommendations and conference papers online via URBO – the Organization of World Heritage Cities research hub,
- b. to establish a thematic pool on the Organization of World Heritage Cities website as a place where experts in the field of environmental hazards will be listed as contacts,
- c. to make the issue of natural risks to World Heritage cities a topic of the next OWHC World Congress,
- d. to actively encourage the exchange of knowledge and information and the establishment of appropriate networks and partnership programmes,
- e. to disseminate the present recommendation adopted by the participants of the conference in Regensburg online.

We, the participants of this conference, submit this recommendation to the General Secretariat of the OWHC to be brought to the attention of:

- a. the authorities, departments, or bodies responsible for matters relating to urban World Heritage,
- b. various organisations or institutions concerned with natural risks and environmental challenges,
- c. their contacts within appropriate international organisations dealing with the protection of World Heritage cities.

Annex 6

IDRC Davos 2006 Declaration

Participants' self-commitment for action

We, the 900 participants of IDRC DAVOS 2006, declare our self-commitment and will to actively support and implement the conference recommendations on a regular basis in our daily work and communicate these recommendations to the wider community. Hereby, we call upon the international community to join us in this effort. Our declaration aims at drawing attention to the issues listed below.

Preamble

The IDRC Davos 2006 Conference, a multicultural, inter- and transdisciplinary gathering with 900 participants from almost one hundred countries, supported the objectives of disaster risk management as outlined in the *Hyogo Framework for Action 2005-2015: "Building the Resilience of Nations and Communities to Disasters"*. Special attention was given to the implementation in the community - at the "last mile"

The Conference provided a forum for decision makers, scientists and practitioners to exchange ideas on how to cope with disasters and risks using state-of-the-art methodologies.

The conference discussed:

1. Risks related to natural hazards and technological failures, as well as emerging human-induced risk factors such as pandemics, terrorism or climate change, in a truly integrated and participative approach.
2. Measures to identify, assess and monitor disaster risks and enhance early warning.
3. The need to prioritize the mainstreaming of disaster risk reduction into development policies, to transfer the knowledge, and develop the technology and education with the involvement of the communities at risk to build a culture of safety.

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General Findings and Recommendations

Integrated risk management and sustainable development:

- The conference reinforced the idea that to achieve the Millennium Development Goals (MDG), disaster risk reduction has to become an important and comprehensive part of the whole planning process for poverty reduction, food and water security, education and health – thus risk management must become an important part of national policies and strategies.
- We need to adopt an integrative, multi-disciplinary approach and bring representatives from the public and private sector, NGOs and academia to “the table” to discuss disaster prevention, mitigation, response and recovery.
- Disaster risk management has to concentrate more pro-actively on prevention and preparedness to reduce an adverse socioeconomic impact on the MDG. Rapid intervention and response during and carefully planned recovery after a disaster may limit subsequent losses and damages. Disaster risk management should be viewed as a process rather than a solution.
- Decision-makers have to include disaster risk management in their national planning and budgeting process, rather than waiting till disasters strike before they react. Institutional capacity building needs to be matched up with human capacity building, so as to have strong and efficient institutional mechanisms and as well as strong and efficient people in developing areas who are empowered to deal with disaster events themselves, before assistance comes their way.
- In addition to focussing on basic needs (food, water, shelter), infrastructure and environment, it is important to have preparedness plans addressing people’s social, psychological and emotional needs, thus involving those people directly affected.
- National strategies that integrate all types of risks and measures are needed. Disaster risk management and natural resource management have to go hand in hand.
- Presently available tools for hazard analysis, vulnerability assessment, risk appraisal, tolerability and acceptability judgments shall be used for a comprehensive disaster risk management to reduce risks and to build the resilience of the community. There is further need to enhance the tools for their practicality, especially for vulnerability assessments and priority setting in risk reduction measures.
- In designing community and rural risk management plans, the focus must be to protect people, as well as livestock and other agricultural assets, in order to preserve livelihoods, and reduce poverty, hunger, water shortage and the spread of zoonotic diseases.

Gender and disasters:

- Gender issues are an integral part of disaster risk reduction and it is imperative that the specific needs and contributions of both men and women are taken into consideration in practice, science, evaluation, policy and decision making.
- Communities at risk can benefit tremendously by using women and children as a change agent. We need to capitalize the potential of women and children and their effectiveness to contribute to the reduction of disaster risks.
- The specific vulnerability of women and children in disasters has to be taken into account. This requires awareness raising and capacity building of planners, decision makers and practitioners.
- Collected data needs to be separated into categories of different gender and age groups before being analyzed.

Environmental vulnerability

- Environmental degradation, whether creeping change or acute emergencies, poses a grave risk to human communities.
- The management of ecosystem services should be recognized as an integral part of disaster risk management.
- Estimates of cost-effectiveness are an important tool in deciding on the mix of using nature with its potential and man-made eco-engineered or technical disaster reduction measures.
- Some disaster reduction and recovery efforts can have adverse environmental consequences – these should be avoided as much as possible.
- Ecosystem services based management, environmental engineering solutions, mitigation of greenhouse gases, climate change adaptation and integrated water resource and catchment area management all support the goals of disaster risk reduction.

Research, education, awareness and capacity building

- We believe that education for disaster reduction should form an integral part of the United Nations Decade of Education for Sustainable Development (2005-2014).
- It is necessary to build the ability to reduce losses, as well as the capacity to respond to, and to recover effectively from extreme events when they do, inevitably, occur.
- A better working relationship between the scientific community and end-users, be they mitigators, planners, educators, communicators or responders, is of prime importance. The end-user's needs must be better articulated and the knowledge management improved. A scientific approach and international collaboration are encouraged.

- The availability of temporally and spatially accurate, relevant and usable information is essential to all aspects of disaster reduction. The development and enhancement of processes and infrastructure to acquire, manage, and share information across sectors, combined with the ability to make well founded decisions will substantially increase the efficiency and effectiveness of all aspects of disaster risk reduction.
- Knowledge transfer and capacity building shall contribute substantially to disaster risk reduction.
- Concern for heritage, both tangible and intangible, should be incorporated into disaster risk reduction strategies and plans, which are strengthened through attention to cultural attributes and traditional knowledge.

Terrorism and human security

- Transnational terrorism has developed into a worldwide threat. Community based disaster risk reduction strategies have to take this threat into account.
- As poverty, lack of good governance and economic and political instability are fertile ground for terrorism to flourish, this has to be addressed in a way so as to encompass its comprehensive dimension.
- Close international cooperation and mechanisms for forecasting, early warning and information exchange are needed to cope with this threat.

Regional dimensions

- Regional variations in disaster risk management awareness and abilities, in vulnerability and resilience are a fact. The unique needs, challenges and existing capacities of China, Central Asia and Africa were highlighted throughout the conference.
- Participants from Africa (annex 1) took the opportunity to advance plans for promoting mutual interest and cooperation in disaster risk reduction for safer, more disaster resilient communities and issued position papers outlining details in this regard.
- For the Central Asian delegation, adopting the principles of the integrated water resources management and increasing the activities of coordination at the national, interstate and global level will offer a good chance to reduce vulnerability. Actions should give priority to the human needs for water and should include the principals of the integral risk management for natural and man-made hazards (annex 2).
- Indigenous knowledge pertaining to disaster reduction and prevention should be assessed, widely developed and improved technologically, to enhance the traditional capacities of developing countries to deal with natural or man-made disasters.

Outreach Process

Participants are invited to report on their continuing activities and findings and to share their experiences with IDRC Davos. Periodic progress reports and assessments will be made available on the conference website www.idrc.info. This information will also be introduced to the UN-ISDR system.

Acknowledgement

Participants expressed gratitude and high appreciation to the IDRC Davos 2006 organizing committee and the sponsors whose efforts have been instrumental in making the IDRC Davos 2006 a success.

Davos, Oktober, 2006

IDRC Davos 2006
Declaration Committee

Next IDRC Conferences

2007: IDRC Harbin China, August 21 – 25, 2007

2008: IDRC Davos, August 25 – 29, 2008

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Annex 7

Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters

**(adopted at the Kyoto International Symposium 2005
"Towards the Protection of Cultural Properties and Historic Urban
Areas from Disaster"
held at the Kyoto Kaikan on 16 January 2005)**

Cultural Properties and Historic areas are irreplaceable cultural and social resources and a yet under utilized resource for sustainable development for the benefit of mankind, which should be handed down to future generations.

However, catastrophic hazards such as fires and tsunami caused by earthquakes, typhoons, floods and other disasters, pose grave threats, especially in the countries of Asia and Circum-Pacific region.

Through the reports of the participants of " ICOMOS-Japan International Expert meeting on Risk Preparedness for Cultural Heritage in Asia and Circum-Pacific Region " on the cultural heritage at risk and challenges confronting risk preparedness of cultural heritage in each country, and also on the basis of site inspection, with the cooperation of the people of the Kiyomizu Temple World Heritage Site and the surrounding Sanneizaka preservation district for Groups of Historic Buildings, we recognize the exceptional values that are embedded in the Cultural Properties and Historic Urban Areas, but at the same time also comprehend the risks to World Heritage Sites and the surrounding areas to earthquake, typhoon, flood and other disasters and that appropriate actions should be taken to improve their resilience.

While considering the probability of consequential fires after earthquakes resulting from insufficient preparedness, we recognize that such cultural resources are vulnerable to such hazards; not only in Kyoto but also in the world and that a priority list needs to be developed to focus attention and resources to improve the Historic Built Environment

However, considering the opportunity provided by the UNESCO World Heritage Convention for member states to take positive and effective measures in relation to risk preparedness at World Heritage Sites by undertaking the following activities as stated in Article 5 of the convention text,

- Integrating the protection of cultural heritage into national comprehensive planning programs [according to section (a) of Article 5]
- Developing scientific and technical studies and research and to work out such operating methods as will make the state capable of counteracting the dangers that threaten its cultural heritage [according to section (c) of Article 5], and
- Taking appropriate legislative, scientific, technical, administrative and financial measures [according to section (d) of Article 5]
- And also recognizing the great achievement of the Japanese government in stating a policy for disaster prevention of cultural properties and historic urban areas in " The Guidelines for Earthquake Disaster Prevention of Cultural Heritage and Surrounding Sites " issued by the Cabinet Secretary of Japan in 2004

We the participants of Kyoto Public Forum and ICOMOS-Japan International Expert Meeting on Risk Preparedness for Cultural Heritage in Asia and Circum Pacific Region, recommend that

1. Retrofitting and Community Infrastructure Upgrading needs to be systematically initiated to prevent loss of irreplaceable cultural resources due to disaster.

2. The information base for action programmes needs to be created and expanded to apply existing knowledge and new methods.
3. The past wisdom and experiences in disaster prevention, which were inherent in traditional local communities, and in cultural properties, historic areas and their settings should be preserved and/or recovered.
4. The environment surrounding heritage properties should be considered in the disaster prevention measures.
5. A comprehensive national policy of disaster prevention for cultural properties, historic areas and their settings needs to be formulated by States Parties who have ratified the World Heritage Convention.
6. The need for coordinated action by national and local governments should be emphasized to create an awareness of, and financial resources for addressing Historic Urban Area issues, improvement programmes and their implementation.
7. Outreach programmes in which governance and heritage interests are linked should be established in partnership with local government and universities, NGOs, and heritage entities; financial support from domestic capital markets should be provided to improve risk preparedness strategies in the present cultural heritage management measures; and clear delegation of responsibility and collaboration among various government departments should be promoted in disaster prevention and mitigation measures for cultural heritage.
National and local governments should develop capital investment plans based on socially, culturally, economically, environmentally and technically viable sustainable risk reduction programmes.

Therefore we, the panelists of the Kyoto international symposium, "Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster" and the participants of the "ICOMOS-Japan International Expert meeting on Risk Preparedness for Cultural Heritage in Asia and Circum-Pacific Region", hereby declare that

1. Cultural heritage is a priceless and non-renewable human asset and it is our duty to raise awareness and undertake all necessary measures for protection of cultural heritage from disasters.
2. Cultural heritage embodies accumulated knowledge in disaster prevention based on past experiences and traditional practices, together with modern science and technology, which should be researched and integrated into disaster prevention measures.
3. Disaster prevention measures should address cultural heritage comprehensively, rather than in isolation, through the planning process and programmes, and in coordination with various cultural institutions, urban planning and other departments. While undertaking disaster mitigation, it is essential to adopt a coordinated multi-agency approach to cultural heritage management, in which measures for risk preparedness are integrated through effective partnerships and appropriate funding
4. While establishing mitigation measures to protect cultural heritage from disasters, the responsibility of various bodies should be clarified at all levels.
5. Undertake collaboration through international networks, especially in the earthquake prone Asia and Circum-Pacific Region, to establish project development task forces.

And consequently,

We, the participants of these meetings, ask for the improvement of disaster prevention measures in Kyoto as part of national policy and to further establish a global benchmark by setting the standard for cultural heritage disaster prevention.

Furthermore, we strongly urge all the States Parties and the concerned inter-governmental and non-governmental institutions to build an international network among experts and all those concerned with cultural heritage disaster prevention. We also urge regional development banks to support lending programmes through national and local government; to be members of project development teams to build support systems for historic urban areas; and to organize forums for mutual cooperation and information exchange.

The "Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Disaster" (hereinafter the Kyoto Declaration) was adopted at the Kyoto International Symposium 2005 "Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster" held at the Kyoto Kaikan on January 16th, 2005, organized by Japan ICOMOS National Committee; Executive for "10 years Anniversary of World Heritage Registration" (Kyoto City, Preservation Technology Foundation for Cultural Heritage Building; All Japan Preservation Corporation for Roof Building Technique of Shrine and Temple; Kyoto Foundation for University Consortium; Kyoto City Preservation Foundation for Cultural Sightseeing Resources); Ritsumeikan University COE Program; Research Center for Disaster Mitigation of Urban Cultural Heritage Conference for Protection of Cultural Heritage from Earthquake Disaster and the NPO for Protection of Cultural Heritage from Disaster.

The drafting of the Kyoto Declaration began as a discussion in a small working group convened by Mr. Kanefusa Masuda, acting as coordinator of the International Expert meeting on Risk Preparedness for Cultural Heritage in Asia and Circum-Pacific Region 2005. This working group consisted of Prof. Takeyuki Okubo, Prof. Rohit Jigyasu and Prof. Kanefusa Masuda. Under the leadership of Prof. Okubo, the working group discussed elements to be included in the Kyoto Declaration for three months prior to the symposium. The outcomes of the working group's discussion were presented at the meeting of panelists and participants on 16th January, and after discussion the draft of the Kyoto Declaration was produced. The draft Kyoto Declaration was subsequently presented at the Kyoto International Symposium.

The panelists who participated in drafting the "Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters" are as follows (in alphabetical order).

- Azhar Tyabji (Preservation Planner, HCP Design and Project Management Pvt. Ltd., India)
- Hiroshi Adachi (Professor, Architecture Division, Faculty of Engineering, Kobe University, Japan)
- Damin Wang (Assistant Director, World Heritage Division, State Administration of Cultural Heritage, China)
- Dhammika Priyantha Chandrasekara (Lecturer, Moratuwa University, Sri Lanka)
- Dinu Bumbaru (Secretary General of ICOMOS International)
- Earl Kessler (Deputy Executive Director, Asian Disaster Preparedness Center (ADPC), Asian Institute of Technology (AIT), Thailand)
- George Okello Abungu, (Guest Scholar from Kenya, The Getty Conservation Institute, United States)
- Hae Un Rii, (Vice President of ICOMOS-Korea, Professor, Department of Geography, Dongguk University, Korea)
- Joseph King (Acting Unit Director, Heritage Settlements Unit, ICCROM)

- Kanefusa Masuda (Professor, Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan University, Japan)
- Khizer Farooq Omer (Manager Planning, Monitoring and Evaluation, Aga Khan Planning and Building Service, Pakistan)
- Khalid El Harrouni (Professor, Ecole Nationale d'Architecture, ICOMOS Morocco)
- Masami Kobayashi (Professor Dr. Eng., Graduate School of Global Environmental Studies, Kyoto University, Japan)
- Masaru Maeno (President of Japan-ICOMOS, Japan)
- Prem Nath Maskey (Professor, Department of Civil Engineering, Institute of Engineering, Pulchowk Campus, Nepal)
- Randolph Langenbach (Building Conservation Architect, ICORP)
- Robyn Riddett (Associate Director, Allom Lovell and Associates, Conservation Architects, Australia), Secretary, ICORP
- Rohit Jigyasu (Visiting Professor from India, Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan University, Kyoto, Japan)
- Mehrdad Hejazi (Associate Professor, University of Isfahan, Iran)
- Soeroso, Director for Archaeology and Museums, Department of Culture and Tourism, Indonesia.
- Takeyuki Okubo (Associate Professor Dr. Eng., Graduate School of Global Environmental Studies, Kyoto University, Japan)