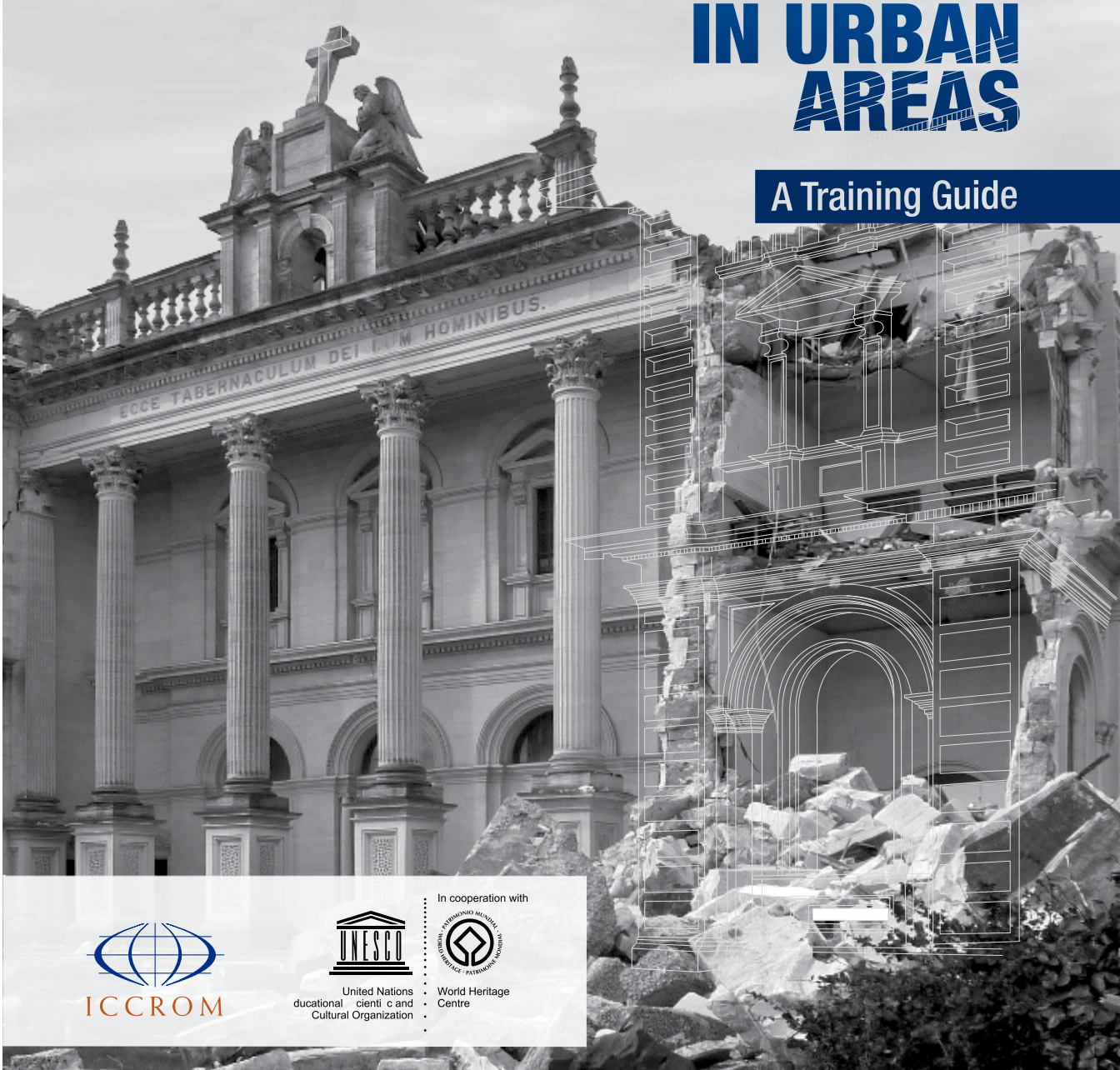
Rits-*DMUCH*

Research Center for Disaster Mitigation of Urban Heritage, Ritsumeikan University

DISASTER RISK MANAGEMENT OF CULTURAL HERITAGE IN URBAN AREAS

A Training Guide



ICCROM

United Nations
ducational cienti c and
Cultural Organization

In cooperation with

World Heritage
Centre

DISASTER RISK MANAGEMENT OF CULTURAL HERITAGE IN URBAN AREAS

A Training Guide

Disaster Risk Management
of Cultural Heritage
in Urban Areas

is published by
Research Center for Disaster Mitigation of Urban Cultural Heritage,
Ritsumeikan University (RitsDMUCH), Kyoto, Japan

supported by
UNESCO World Heritage Centre
ICCROM
Ritsumeikan University Global COE

Authors: Rohit Jigyasu, UNESCO Chair Professor, RitsDMUCH
Vanicka Arora, Conservation Architect

Advisors: Kenzo Toki, Director and Professor, RitsDMUCH
Giovanni Boccardi, UNESCO World Heritage Centre
Joseph King, Director, Sites Unit, ICCROM
Takeyuki Okubo, Professor, RitsDMUCH
Naoko Itaya, Associate Professor, RitsDMUCH

Layout & Design: Designflyover Consulting LLP, 24, DFO House, Grace Dieu,
High Street, Lane Opp D-Mart, Hiranandani Gardens, Powai,
Mumbai, Maharashtra 400076, India
www.designflyover.com

Produced & Printed: NPC Co., Ltd 1-9-19, Tenma, Kita-Ku, Osaka-City,530-0043, Japan

ISBN:

DISASTER RISK MANAGEMENT OF CULTURAL HERITAGE IN URBAN AREAS

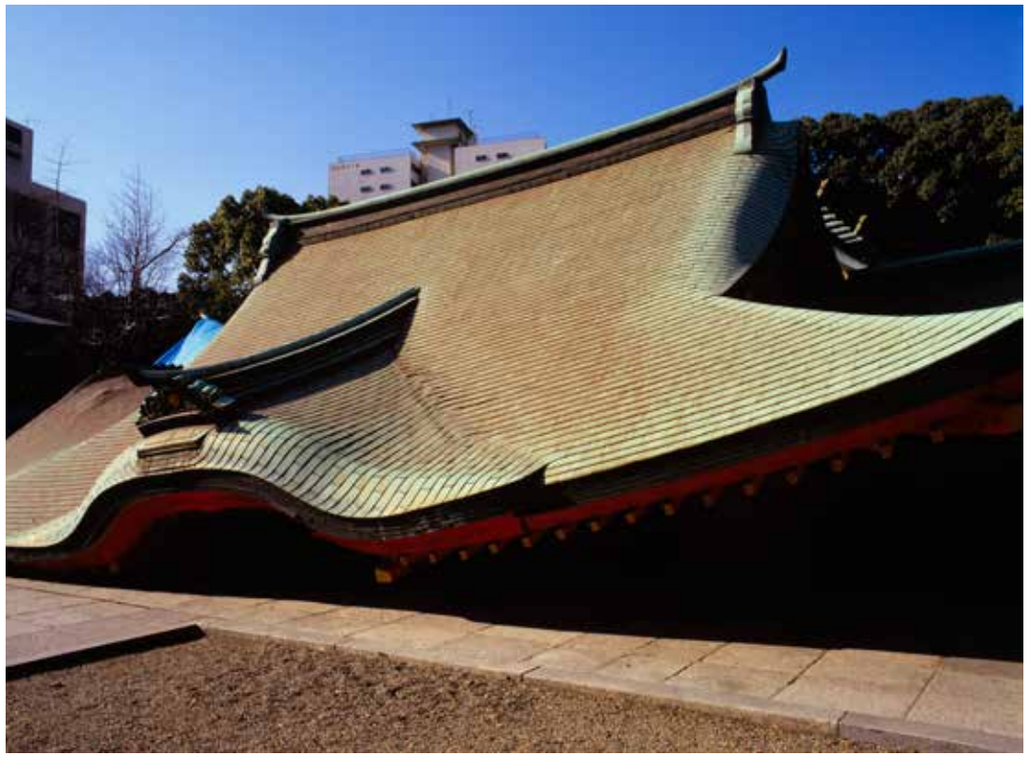
A Training Guide

Authors
Rohit Jigyasu, UNESCO Chair Professor, RitsDMUCH
Vanicka Arora, Conservation Architect

A training guide for conducting courses in Disaster Risk Management for Cultural Heritage in Urban Areas

Contents

Preface



"Like a phoenix descended to earth" - The Great Hanshin-Awaji Earthquake, 1995. Ikuta-Shirine, Kobe, Japan
©Shinchosha Publishing Co.Ltd. / Photo: Akio Nonaka

In 2003, the Japanese Ministry of Education, Culture, Sports, Science and Technology launched a research program to promote the establishment of "Centers of Excellence" in universities. This five years program covered all the fields of natural and social sciences. Most Japanese universities applied to the COE program, and Ritsumeikan University submitted a proposal under the title "Education, Research and Development of a Strategy for Disaster Mitigation of Cultural Heritage and Historic Cities". This proposal, prepared by a research group with researchers of several faculties, was accepted after a very competitive selection process by the Japanese Government. The approved activities of education and research began in 2005.

The main objectives of the COE program as a whole were the establishment of vigorous research centers and the provision of high level education for graduate students. The specific goal of Ritsumeikan's COE programme was the linking together of the fields of conservation of cultural heritage and disaster risk reduction. In the past, education and research in these two fields have been conducted using quite different concepts, with key issues being treated differently for cultural heritage, disaster risk, and high level education. There was very little integration despite areas of common concern. The Ritsumeikan COE has tried to unify the treatment of these important concepts through the development of an International Training Course on Disaster Risk Management of Cultural Heritage in which people from around the world, belonging to the cultural heritage and disaster risk fields, can study together. The importance of connecting these fields in order to protect the cultural heritage from natural hazards like earthquakes, fires, and floods cannot be underestimated.

This training course is the first attempt at the international level to provide high level educational opportunities on the topic natural disasters for people in the cultural heritage field and on the topic of cultural heritage for people in the natural disaster field. In the 7 years that the course has been implemented, 64 people from 26 countries have been trained. This number, the maximum possible given the limited budgets available, may be considered small, but it is an important starting point. Further, it is clear that there is a strong ongoing demand for the course. In 2012, the number admitted was 8, but these were selected out of 175 applicant from 50 countries.

The implication of these numbers is clear. There is a strong recognition of the significance of the training course throughout the world. For this reason, Ritsumeikan University has decided to provide the budget to continue the training course in the future, in spite of the fact that the COE program of the Japanese Government will conclude at the end of March 2013.

It is hoped that activities linking the fields of cultural heritage conservation and disaster risk reduction will continue to expand throughout the world and spread to many other kind of organisations. The final aim must be the protection of the various kind of cultural heritage from natural disasters. It is my sincere wish that this book will provide a resource for those who want to undertake this important work in the future.

Kenzo Toki

Director,
Research Center for Disaster Mitigation of Urban Cultural Heritage,
Ritsumeikan University

Section 1
Introduction

1.1 Background

Disasters and Urban Cultural Heritage: The Need for Capacity Building

Image Ref. 1.1
Remains of the Anglican Christchurch Cathedral after the earthquake in 2011 in Christchurch, New Zealand
Source: Bryan Lintott

Over the past several years, there have been frequent reports of large-scale disasters across the globe. In addition to causing enormous loss of life and property, these disasters have caused widespread damage to the cultural heritage of these towns and cities. Recent disasters such as Hurricane Sandy, which swept across the north-eastern part of the United States in 2012, the Great East Japan Earthquake and Christchurch Earthquake in 2011, are just some examples of the extreme vulnerability of cultural heritage and the lack of resources and planning in place to protect it. It is essential to take proactive measures to reduce risks to cultural heritage from these catastrophic events through adequate mitigation and preparedness. Cultural heritage, in both its tangible and intangible manifestations, is essential for a city's cultural identity. Given the exponential rate of urbanisation, and the inherent risks that are faced by dense urban areas, there is a need for a specialised approach to risk management of cultural heritage in urban areas. In light of these challenges, developing a disaster risk management strategy for cultural heritage is of paramount importance within the overall planning and management frameworks. Comprehensive disaster risk management plans need to be formulated based on the specific characteristics of cultural heritage and nature of hazards within a regional context. These plans should take into account the principles of risk management, response to historic, aesthetic and other values of cultural heritage, and, at the same time, address greater urban development challenges. Such planning requires skilled professionals, administrators and policy makers who are able to take into consideration various aspects for developing risk management plans in regards to cultural heritage.

Image Ref. 1.2
The Great East Japan Earthquake and Tsunami in Tohoku, 2011
Source: Koichiro Tezuka, The Mainichi Newspapers, AFLO

Several government and institutional organisations have recognised the need for building the capacity among professionals, administrators and policy makers to address these issues, however there are very few programmes which offer focused training for disaster risk management that is specifically tailored to the needs of cultural heritage. This training guide, compiled by the Cultural Heritage and Risk Management Project of Ritsumeikan University's Research Center for Disaster Mitigation of Urban Cultural Heritage (RitsDMUCH), intends to address this gap. This guide has been compiled with the primary objective of providing a detailed framework for institutions, governments and non-governmental organisations to carry out their own training and capacity building exercises for professionals, administrators and policy makers engaged in the fields of heritage as well as disaster management. These training programmes can be tailored to address varying scales and types of disasters as well as to relate to different types of cultural heritage, so that participating individuals and organisations are equipped to develop their own comprehensive risk management plans for the specific cultural heritage properties for which they are responsible

RitsDMUCH and the International Training Course on Disaster Risk Management of Cultural Heritage

The International Training Course on Disaster Risk Management of Cultural Heritage was introduced at RitsDMUCH, Kyoto in the year 2006, as part of the UNESCO Chair Programme. A Special Thematic Session on Risk Management for Cultural Heritage had been organised during the World Conference on Disaster Reduction (UN-WCDR) in January 2005 in Kobe, Hyogo, Japan. One of the outcomes of the conference was highlighting the urgent need for the academic community to develop rigorous scientific research, education and training programmes incorporating cultural heritage in both its tangible and intangible manifestations, into the subject areas of risk management and disaster recovery. RitsDMUCH had already been preparing for an International Training Course; and the recommendations of the conference helped steer the planning of such courses. The course, now in its eighth consecutive year has significantly evolved and has become popular among professionals, researchers and decision makers from the cultural heritage as well as disaster management sides.

The course includes field-based learning, class lectures and presentations. Additionally, academic support is provided by the resource persons to the course participants for developing disaster risk management plans for cultural heritage properties in their respective countries. This course has been organised in cooperation with the World Heritage Centre and the Division of Cultural Heritage at UNESCO, ICCROM, ICOMOS, and Agency for Cultural Affairs as well as other relevant institutions of the government of Japan. However due the limited resources, only 8-10 applicants are trained annually through this course. Considering the increasing need for capacity building in this area, it is important that the vast body of experience from this course available in the forms of its academic content, pedagogy as well organisation and methodology is communicated to a global audience. It is essential that similar courses are organised by institutions/organisations in other regions of the world. Therefore RitsDMUCH decided to develop the Training Guide for Disaster Risk Management of Cultural Heritage in Urban Environment with the support of UNESCO-World Heritage Centre and ICCROM.

Image Ref. 1.3
Participants from various nationalities engaged in a workshop organised as part of the International Training Course, 2012
Source: RitsDMUCH

RitsDMUCH intends to act as the hub for institutions concerned with organising such courses and also as a resource bank for experts as well as teaching material. It is willing to contribute as a hub until similar organisations are well established and able to function independently.

Learning and Outcomes of Previous Courses Organised by RitsDMUCH

The International Training Course has evolved significantly since its first session in 2006, which consisted of eight participants from four countries that had been struck by major disasters. Based on the experience of the first year, the course was modified in 2007 to closely interlink the lectures, site visits and workshops. The second year also focused on participants developing their own disaster risk management plans, which enabled interactive training sessions and an exchange of knowledge between participants. In its third year, the training course was refined significantly and the primary focus shifted towards making the course field-based. Many of the workshops that were conducted were based around site visits to the World Heritage Sites in Kyoto, Japan.

In the fourth session held in 2009, the training course introduced a specific thematic focus entitled 'Earthquake Risk Management of Historic Urban Areas'. For this purpose, Kyoto and Kathmandu; two historic cities with rich cultural heritage but which are both extremely vulnerable to earthquakes, were chosen as the primary case study sites for undertaking field exercises during the training course. The fifth International Training course focused on emergency response and long term recovery of wooden and composite cultural heritage from earthquakes and fire. The emphasis of the pedagogical strategies was on community engagement in disaster risk management planning at settlement scale. The theme of the sixth year in 2011 was 'Integrated Approaches for Disaster Risk Mitigation of Historic Cities.' The goal of this course was to introduce participants to approaches which could enable them to proactively protect historic cities from disasters, and develop mitigation measures to be undertaken through an integrated approach aimed at comprehensive risk management of urban cultural heritage.

Given the growing concerns for mainstreaming disaster risk reduction into sustainable development, the thematic focus of the 2012 International Training Course was framed as 'From Recovery to Risk Reduction for Sustainability of Historic Areas'. It built upon the lessons from the long-term recovery of the Great Hanshin Awaji (Kobe) Earthquake of 1995 as well as the challenges presented by the Great East Japan Earthquake and Tsunami of 2011. Its focus was on the post disaster recovery of cultural heritage, extending beyond restoration, to the revival of tangible and intangible aspects of heritage. It stressed effective engagement with various stakeholders at city, national and international levels for protecting cultural heritage in urban areas during catastrophic situations.

Image Ref. 1.4

Participants making observations during a site visit as part of the International Training Course, 2011

Source: RitsDMUCH

1.2 Objectives of the Training Guide

This training guide builds upon three closely interlinked components: disaster risk management, cultural heritage management and urban planning and development. At one end of the spectrum, it addresses the general principles of disaster risk management for cultural heritage, while at the other it attempts to provide focused learning for participants to deal with various challenges related to disaster risk management of cultural heritage within their local context.

The main objectives of the training guide are:

- To provide interdisciplinary training for participants in order to equip them to undertake integrated disaster risk assessment of cultural heritage, build comprehensive systems for disaster risk management incorporating various measures aimed at reducing risks, respond to disasters and recovering from them, and lastly, be able to formulate disaster risk management plans for cultural heritage that correspond to urban planning frameworks.
- To equip government organisations, NGOs, the private sector, academic institutions and other allied organisations to carry out courses in their own regions.
- To provide a resource bank of data and research, and also to identify potential resource persons who may help steer such courses. This will eventually constitute a robust international scientific network and build institutional capacity over an extended period of time.
- To provide teaching/pedagogical tools in an organised manner, in the form of case studies, checklists, and workshop formats that may be adapted depending on the thematic focus of the course.

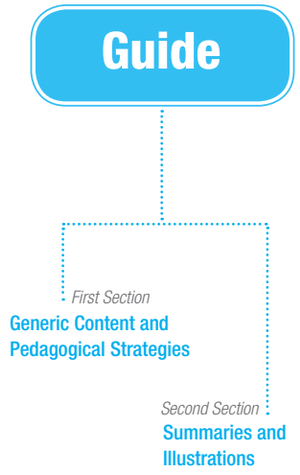
1.3 Users

This guide is intended to act as a resource for government organisations/ministries/departments, NGOs, the private sector and academic institutions to carry out courses on disaster risk management for cultural heritage.

An indicative list of its primary users (Potential Organisers of the Course) includes:

- Disaster risk management institutions at urban, regional or national levels.
- Cultural heritage management institutions at site, regional and international levels.
- City administration, municipalities, urban local bodies and planning departments.
- Educational and research institutions which have specialised programmes in engineering, planning, and disaster risk management, conservation of cultural heritage as well as institutions focusing on trans-disciplinary learning.
- Cultural institutions such as museums, libraries, archives and national parks.

1.4 How to Use the Guide



This guide contains a systematic sequence of modules that have been arranged based on the integrated disaster risk management cycle that is described in detail in Section 2. Each module responds to a specific stage in the disaster risk management planning process and has been further sub-divided into sections. Since the disaster risk management planning process is a continuous cycle, the links between each module have been emphasised.

The Guide has essentially got two components; the first being generic content and pedagogical strategies. Each sub-section contains a brief summary of the content to be covered as well as various pedagogical strategies on how to deliver that content. The summary of content broadly outlines the various topics to be covered as well as the significant terminologies and approaches to be discussed. The pedagogical strategies prescribe different formats through which the content may be delivered effectively, including lectures, site-visits, workshops and class interactions.

The second part of the Guide consists of summaries and illustrations of various lectures and exercises from previous years training programmes organised by RitsDMUCH. These have been used to supplement the content in each module. Previous year's lectures have been briefly described, along with specific strategies such as using secondary case studies to highlight certain aspects and linking lectures to site visits and workshops. Furthermore, site visits and primary case studies have been described in detail and are supplemented with sample worksheets and formats used by participants.

This is a way of illustrating how the pedagogical strategies may be executed and it also highlights different themes that have been used to steer the course. A detailed list of resource people who could potentially contribute to organising the course has been provided in the guide, along with the areas of expertise. Each section is supported with literary resources and an indicative bibliography accompanies each module to help prepare the teaching material.

Section 2
Course Planning and Implementation

Course Planning and Implementation

The process of planning a training course for disaster risk management of cultural heritage begins with identifying key objectives and understanding the need for such a course in a particular area. In order to structure the content and its delivery, the disaster risk management framework may be applied along with pedagogical approaches that emphasise using practical examples as a means of communicating the general principles and content of the course. This training guide covers various aspects of carrying out such initiatives, which include conceptualising the course and its content, communicating the key principles, engaging participants who already have experience in the field and finally, evaluating the outcomes and disseminating the information on a larger scale. In order to achieve these goals the course may then be developed based on the following parameters:

- Integrating cultural heritage concerns into the overall planning for disaster risk management while simultaneously responding to complexities of an urban context within a single framework.
- Identifying the needs of various kinds of training programmes based on potential risks, the nature of heritage artefact or site as well as the resources available and professionals involved.
- Developing a team of experts and professionals to develop and deliver the course content. Assessing the logistical implications of conducting such a course and arranging for funding, institutional support and other resources.
- Preparing long term or short term programmes with course content suitable for different audience types.

2.1 Objectives of Training

Core Objectives

The objectives of this type of course are to provide interdisciplinary training for professionals, policy makers, administrators and students from heritage and disaster management fields and to equip them to:

- Understand the need for an integrated approach to disaster risk management for cultural heritage in urban areas.
- Undertake integrated disaster risk assessment and build systems for disaster risk management of cultural heritage; incorporating various measures aimed at reducing disaster risks, responding to disasters and recovering from them.
- Formulate disaster risk management plans for cultural heritage that correspond to urban and regional planning and disaster management systems.
- Implement, monitor and update disaster risk management plans and collaborate with the local community and other stakeholders at each stage of the disaster risk management process.

Additional Objectives

As a result of the training courses, other initiatives in the fields of disaster risk management and cultural heritage can be supplemented. These could potentially include:

- Establishing new networks and supplementing existing international scientific networks for risk management of cultural heritage in order to build institutional capacity across the world.
- Highlighting specific issues of disaster risk pertaining to a geographical and cultural context and including the training courses as a part of a greater exercise in building awareness amongst local stakeholders and the community.

2.2 Designing the Course

Thematic Focus

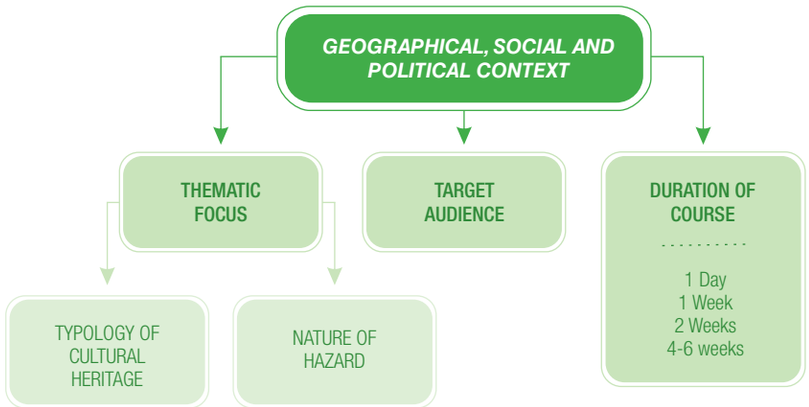
The experiences of the International Training Courses organised by RitsDMUCH indicate that courses which focused on a single theme had a greater impact on participants. A thematic focus allows the organisers to limit the scope of training which is generally time-bound and is more effective in addressing specific concerns along with teaching the broad principles of disaster risk management. It also helps organisers in selecting participants who are most likely to benefit from the course. The thematic focus of the course is dependent on the nature of cultural heritage, the kinds of disaster risks being addressed and could also respond to geo-political contexts.

Type of Cultural Heritage Being Addressed

The changing scope and nature of heritage has extended beyond monuments to include typologies such as settlements, cultural landscapes, movable objects and even intangible aspects such as socio-cultural beliefs, skills and practices. This new definition brings into focus the living dimension of heritage that seeks to pursue continuity and evolution rather than mere preservation. The exposure of cultural heritage to various disaster risks depends greatly on the typology of heritage being addressed. The training course could potentially focus on a specific type of heritage based on

- ***Typology and scale:*** The scale and form of the heritage in question could include movable objects such as sculptures or paintings, individual heritage structures, historic urban landscapes or heritage precincts and towns.
- ***Materials and construction systems:*** Different materials and construction systems have different kinds of vulnerability to certain hazards, and an emphasis on a single material or a combination of materials and technologies would help participants focus on approaches, methodologies and techniques responding to specific kinds of hazards.

COURSE STRUCTURE



- ***Values and significance:*** The historic, aesthetic and other values of cultural heritage under discussion are especially important while formulating a disaster risk management plan, as they will inform the planning process, its limitations and scope in detail.

For example, *in 2008, the International Training Course organised by RitsDMUCH had a specific thematic focus: 'Earthquake Risk Management of Historic Urban Areas'. For this purpose, Kyoto and Kathmandu were chosen as the case study sites for undertaking field exercises during the training course. Over the course of two weeks, participants were introduced to prevention facilities in Kyoto, and also the challenges and opportunities for disaster risk management in Kathmandu. Through two regions that were distinct geographically, yet similar in terms of scale, typology and hazards, common solutions and approaches could be highlighted.*

Type of Hazard Being Addressed

The type of hazards causing disaster risks vary widely based on geographical locations, the socio-political and legal contexts in addition to the type of cultural heritage. Since disaster risks are essentially a product of hazards and vulnerabilities, prior identification of both these aspects would contribute to the overall content of the course.

- ***Hazards:*** A hazard may be a naturally occurring phenomenon or a human induced event. Natural hazards can include meteorological, hydrological, geological and biological events ranging from hurricanes, tornadoes and storms to earthquakes, landslides and volcanoes and epidemics. Human induced hazards include arson, armed conflicts, infrastructure failures and the long term effects of climate change.
- ***Vulnerabilities:*** Vulnerabilities are largely dependent on the inherent characteristics of the cultural heritage site or object and its general socio-economic and institutional context.

The Target Audience for the Course

The content, duration and focus of each training course needs to be designed to respond to the varying audience groups. The potential audience groups for such courses include:

- ***Heritage professionals:*** People who are directly engaged in the field of cultural heritage conservation. This would include site managers, heritage conservation and management professionals such as architects, archaeologists, conservators, curators and restorers.
- ***Disaster risk management professionals:*** Emergency responders, civic defence, security agencies, risk assessment professionals, structural engineers, geologists, meteorologists and other professionals from relevant disciplines.
- ***Urban practitioners:*** Urban planners, architects, urban designers along with other professionals who may be allied to the fields of heritage or disaster management and help in developing disaster risk management plans for large scale urban heritage sites.
- ***Administrators and policy makers:*** People engaged in government agencies, public and private institutions, who are involved in the planning process for cultural heritage and disaster management at local, regional and national levels. This could include high-ranking government officials and city-administration officials to enable them to understand the larger framework which would help in decision making process.
- ***Non-Governmental Organisations:*** Members of international, national and local non-governmental organisations engaged in the field of heritage conservation or management as well as disaster management.
- ***Students:*** Postgraduate students pursuing the fields of heritage management or disaster risk management and allied disciplines.
- ***Local Residents:*** The course could also raise awareness of local residents in and around cultural heritage site and become part of a larger process of community engagement and capacity building in the field.

It is sometimes preferable to mix various target groups. However in other cases, the courses may be targetted for specific groups.

The Duration of the Course

Based on the thematic focus, and the audience groups identified for the course, the duration of the course could range from a single day module for senior administrators as an exercise in generating awareness to an intensive two- week course targeted at professionals in the fields of cultural heritage management and disaster risk management. A longer course could also be designed for students specialising in the field of conservation, planning or disaster management. In a short training course format, it may be possible to take two different approaches to training. TYPE A is an overview course covering all aspects of disaster risk management for cultural heritage in urban areas. This course is intended to equip participants with the tools and skills needed to understand the entire process of disaster risk management and enable them to participate in the process at different levels, as planners, heritage managers or disaster risk professionals. Course TYPE B could be a short course (1-3 days) which may focus on a single module or two modules within the disaster risk management framework to highlight specific issues or concerns. For example a special course can be developed to communicate methodology for risk assessment of cultural heritage sites.

The Geographical Context, Planning Frameworks and Institutional Capacity Available

The content of this type of course is broadly divided into core content and thematic content. The core content comprises of the basic principles and approaches of disaster risk management and cultural heritage management and would remain the same regardless of geographical and administrative context. On the other hand, the thematic content that focuses more on variables such as the nature of cultural heritage and the type of hazards can vary widely. The length of the course and the people organising it are largely dependent on the administrative and institutional set up in the area as well as the availability of resources. The core content of the course needs to be prepared and disseminated by senior experts in the field. For the thematic content, it is possible for the resource person to be a working expert or professional who has extensive practical experience in either field.

Some potential organisers with the necessary resources for such a course could be:

- Local and regional planning authorities.
- Local, regional and national cultural heritage institutions.
- Public and private academic and research institutions, in addition to universities specialising in the fields of cultural heritage, archaeology, architecture, conservation, disaster management and other related fields.

2.3 Selection of Participants

The selection of participants is an important component of the overall course organisation as it directly affects the long term impact of the course. Different types of target audiences for the course have already been identified in the previous section. Within these broad groups, participants with the maximum potential to effectively apply the training they receive through the course should be selected. Therefore, criteria such as their official designation and basic knowledge and skill level are important. Potential leaders, whether they are administrators, policy makers, professionals or students should be identified since they would likely contribute to the overall goal of capacity building in the long term. At the same time, participants from diverse disciplinary backgrounds related to cultural heritage conservation/management and disaster risk management should be selected to enable mutual learning through group interaction and team projects. The process of selection should be based on qualifications, skill sets and experience, but also take into account the participant's objectives and goals along with other soft skills.

For instance, in the International Training Courses organised by RitsDMUCH, a concerted effort is made to have an equal number of participants from the cultural heritage and disaster management fields. These include professionals and administrators as well as researchers. Moreover the selection of participants is made in two stages:

a. Shortlisting on the basis of applications submitted by candidates.

b. Telephone interviews with shortlisted candidates.

Telephone interviews should be conducted by an expert panel set up by the organisers and should include course coordinators and other experts from relevant fields. The selection of participants should attempt to fulfil the objectives set out by the organisers of the course. The candidate selection criteria used to evaluate applicants to the International Training Course organised by RitsDMUCH is listed as an example.

CANDIDATES SELECTION CRITERIA

Entry Number:
Field: Cultural Heritage / Risk Management
Name of Candidate:

A) General Matters (Please select between the options and mark points.)

Official Presentation					
National authority	**3**				
Professional institution of national relevance/ university		**2**			
Private firm/Individual professional			**1**		
Student				**0**	
Present Position					
in an institution, in a position to contribute to preservation policies or education strategies	**3**				
Professor, Associate Professor		**2**			
in private practice, employee			**1**		
Educational Background					
University degree in related area	**3**				
Other courses in related area		**2**			
University studies in other areas			**1**		
No higher studies				**0**	
Professional Experience					
5-15 years' experience in the cultural heritage conservation or risk management field	**3**				
More than 15 years' experience in the cultural heritage conservation or risk management field		**2**			
Less than 4 years' experience in the cultural heritage conservation or risk management field			**1**		
Language Ability (English)					
Excellent/ Good/ Fair/Poor	**3**	**2**	**1**	**0**	
Member state					
ICCROM member state or country in the process of becoming ICCROM member state			**1**	**0**	

B) Special Matters (Please select between the options and mark points.)

Additional Suitability Points (please assess according to range of points)				
Special achievement in research or publications (3. PUBLICATIONS AND RESEARCH)	**2**	**1**	**0**	
Active in professional or cultural heritage-related associations (5.PROFESSIONAL ACTIVITIES)	**2**	**1**	**0**	
Multiplying effect (6.PERSONAL STATEMENT)	**2**	**1**	**0**	
Case Study Site				
World Heritage Site/ Historic Area/ Monument	**2**	**1**	**0**	
Reason for Selecting	**2**	**1**	**0**	
PROGRAMMATIC PRIORITIES				
Low access to training opportunities in the member state		**1**	**0**	
The institution is actively involved (at national/regional level) in the dissemination of knowledge and training in conservation of cultural heritage		**1**	**0**	
EFFICIENCY IN TRAINING IMPLEMENTATION				
The potential of pairs for team project		**1**	**0**	
Sufficient information about case study area		**1**	**0**	

C) Telephone Interview

• **Telephone interview by the UNESCO Chair professor**	**20**	**15**	**10**	**0**

Total Score (A+B+C)

2.4 Framework for Developing Course Content

Disaster risk management is a cyclical process, with three basic stages: before, during and after a disaster. Before a disaster, the main activities include risk assessment, prevention and mitigation methods and warning systems for specific hazards. Planning for emergency evacuation and response procedures are all activities which should be undertaken in advance for responding during the disaster situation, which is generally defined as a period extending for the first three days after an incident. Activities initiated after the disaster include damage assessment, treatment of damaged components of the heritage property through interventions such as repairs, restoration and retrofitting and recovery or rehabilitation activities. At this stage the effectiveness of the previous stages can also be evaluated, so that once again it becomes possible to prepare for any successive event.

An integrated approach to disaster risk management of cultural heritage considers the possibilities of multiple hazards that may occur in parallel or as follow up due to interactions between various natural and human induced causes. It stresses on the importance of community participation, and ensuring regular maintenance and management procedures for the site. It also highlights the importance of having a proactive role for cultural heritage in reducing disaster risks. The disaster risk management framework forms the basis of planning the course in a fairly straightforward manner. Accordingly, the course can be divided into six modules:

DISASTER RISK MANAGEMENT CYCLE FOR CULTURAL HERITAGE SITES

Introduction to the Course

MODULE 1

BACKGROUND OF THE FIELD, APPROACHES AND PRINCIPLES

- Overview of the international theories, principles and activities in the field
- Scope of cultural heritage in the urban environment
- Understanding key terms -hazards, vulnerabilities, scope of disaster risks vis-à-vis risks in general

Before a Disaster

MODULE 2

RISK ANALYSIS AND ASSESSMENT OF CULTURAL HERITAGE IN HISTORIC URBAN AREAS

- Objectives and integrated approach for risk analysis and assessment
- Methodology for risk assessment at site level and building level

MODULE 3

PREVENTION AND MITIGATION OF DISASTER RISKS TO CULTURAL HERITAGE

- Introduction to various approaches for risk reduction
- Reducing disaster risks from various hazards

During a Disaster

MODULE 4

EMERGENCY PREPAREDNESS AND RESPONSE

- Planning and procedures for emergency preparedness for people and heritage
- Preparation of directories, equipments, evacuation routes, signage, emergency teams, protocols for evacuation of people, salvage of heritage objects,engaging communities as volunteers, immediate damage inspection and protection strategies, immediate treatment of damaged cultural heritage

After a Disaster

MODULE 5

PREPARING FOR POST-DISASTER RECOVERY OF CULTURAL HERITAGE

- Damage assessment
- Linking with larger institutional framework and methods for post disaster recovery
- Long term treatment of cultural heritage (restoration, rehabilitation, retrofitting etc.)
- Preparing business continuity plan for cultural heritage sites
- Financial management of recovery process
- Training of heritage managers

Conclusion of the Course

MODULE 6

INTEGRATING DISASTER RISK MANAGEMENT INTO OVERALL PLANNING AND MANAGEMENT FRAMEWORK

- Linking with other plans and management systems land coordination with relevant organizations/departments , community engagement exercises

EVALUATION OF THE PARTICIPANTS AND THE COURSE

- Presentation of outlines of DRM plans/strategies by the participants for respective cultural heritage sites.
- Review the lessons of the course.

2.5 Pedagogical Strategies

I hear and I forget.
I see and I remember.
I do and I understand.
– Confucius

The course structure can be designed in such a manner that the theoretical principles and approaches are communicated through introductory lectures and presentations, supplemented with site visits to various locations in order to understand issues and initiatives on the ground and then finally culminate in workshops where the participants are actively involved in classroom or field based exercises facilitated by the instructors that are intended to help reinforce the contents of the lectures. Case studies are at the core of the pedagogical approach of this course. They ensure that participants are familiarised with each stage of the disaster risk management cycle and are eventually capable of preparing their own disaster risk management plans for cultural heritage that takes into account the specificities of the site and engages with the various stakeholders that are relevant to their context. This guide provides different teaching formats: integrating lectures with site studies, workshops and participant presentations using case examples from previously held training programmes organised by RitsDMUCH.

With each stage of the course, the subject matter may be introduced through one or more introductory lectures, which may also include secondary case examples illustrating certain principles approaches and/or actions. This may be followed by one or more case studies and site visits which form the basis of a participant workshop or activity. Follow up discussions on the case study or workshops are helpful in revisiting the core content delivered through the lectures and illustrated through exemplary practices.

The Core Lectures will present the general principles relating to the disaster risk management process for cultural heritage. These lectures can include various case examples from secondary sources and introduce the potential primary case studies. Further, the resource person may refer to his or her own case examples based on individual experiences.

Thematic Lectures can focus on specific aspects of the disaster risk management process pertaining to the overall thematic focus of the course. These could be supported extensively with secondary case studies along with the primary case study incorporating site visits and workshops. Depending on the length of the course, the proportion of thematic content to core content could vary.

Secondary Case Studies may be used where an aspect of a situation including challenges, opportunities or a successful initiative can be highlighted. Generally, this kind of a study will be brief, concerning itself with a specific aspect of the disaster risk management planning process.

Primary Case Studies (based on site visits) can be highlighted in cases where there is sufficiently detailed information for an in-depth analysis of course content. Also, in some cases, there is more than one aspect, which can be highlighted so that a number of site based exercises together can form part of a primary case study. In order to undertake such a case study, the course instructor must have made an on-site appraisal of the situation and ideally should have good working relationship with the key stakeholders associated with that site such as the site owner or administrator, heritage manager, specialist who has undertaken any task related to disaster risk management of the site. The workshops and lectures should directly link to the primary case study.

Workshops are an important part of the training course and should be linked to the course content. These are primarily aimed at introducing participants to the real issues, challenges, testing tools and methodologies for disaster risk assessment and management of cultural heritage. The workshops consist of classroom or field based exercises to be conducted with simple aids such as work sheets and checklists to be introduced by the resource persons. The resource person or coordinator should be familiar with the site on which the workshop is based and have knowledge of its constraints, context and values. Ideally they should be, or have been, directly involved in the site management in some capacity.

Participant Case Study Project aims at preparing an outline of disaster risk management plan to be prepared by each participant for a particular cultural heritage site from his or her home country. This case study project should be decided by the participant before attending the course and all the relevant information including data and maps on the site and its disaster profile should be collected in advance by the participant before attending the course. In fact for the training courses organised by RitsDMUCH, the selection of case study project is made by the candidate at the time of application for the course and is one of the important criterion for the selection of participant. The participants can develop the case study project through the duration of the course. In fact specific time slots should be kept for this purpose under each module so that lessons learned in that module can be applied by the participants to their case study projects. The team of resource persons can mentor the participants for developing case study projects, which can be presented by each participant at the end of the course for evaluation by an expert jury. Preparation of case study projects is given high priority in the international training course organised by RitsDMUCH and a mid-term review is also organised at the end of first week. Having a tangible goal for the end of the course is useful for participants.

Image Ref. 2.1
A participant making a presentation based on his selected case study, International Training Course, 2011
Source: RitsDMUCH

Image Ref. 2.2
Participants making observations during a site visit organised as part of the International Training Course, 2012
Source: RitsDMUCH

Timetable of The International Training Course on Disaster Risk Management of Cultural Heritage 2012, 7th Year

	9/8 (Sat)	9/9 (Sun)	9/10 (Mon)	9/11 (Tue)	9/12(Wed)	9/13 (Thu)	9/14(Fri)	9/15 (Sat)	9/16 (Sun)	9/17 (Mon/Holiday)	9/18 (Tue)	9/19 (Wed)	9/20 (Thu)	9/21 (Fri)	9/22 (Sat/Holiday)
THEME	**INTRODUCTION**	**Self-Study**	**Principles, Framework and Risk Analysis at site level**	**Risk Analysis at Urban level**	**Risk Assessment**	**Mitigation (Earthquake, Landslidesand Floods)**	**FirePreventionand EmergencyPreparedness**	**Planning for Recovery: Lessons from Kobe**	**Self-Study**	**From Response to Recovery: Great East Japan Disaster**	**From Response to Recovery: Great East Japan Disaster**	**Policy for Risk Management**	**Formulating DRM Plan**	**Formulating DRM Plan**	**Open Jury**
RM															
Venue	*DMUCH*	*DMUCH WHS in Kyoto*	*DMUCH Kiyomizu-dera*	*DMUCH Sannei-zaka*	*DMUCH*	*DMUCH*	*Ninna-ji DMUCH*	*Kobe*		*Tohoku*	*Tohoku*	*DMUCH*	*DMUCH*	*DMUCH*	*DMUCH*
Before	9:30-10:00(30) Registration				9:30-10:00(30) Case Study PJ (Resource Persons)	9:30-10:00(30) Case Study PJ (Resource Persons)		*To KOBE*		*To MinamiSanriku-cho*		9:30-10:00(30) Case Study PJ (Resource Persons)			
1st	10:00-10:10(10) Opening Address (Chancellor KAWAGUCHI) 10:10-11:10(60) Orientation to the Course (JIGYASU)	9:30-11:00(90) Lecture 2 Introduction to the Context of Historic City of Kyoto (YAMASAKI)	9:30-10:40(70) Lecture 3 Disaster Risk Management of Cultural Heritage - Significance and Core Principles (JIGYASU)	9:30-10:40(70) Lecture 4 Disaster Imagination Game (DIG) (OKUBO)	10:00-11:10(70) Lecture6 Ecology and Sustainability of Historic Urban Areas (S. MOFFATT)	10:00-11:10(70) Lecture9 GIS (Geographic Information System) for Disaster Management of Historical City, Kyoto (YANO)	9:30-10:40(70) Lecture13 Dynamic analysis of Earthquakes and Seismic Performance of Japanese Historical Structures (IZUNO)	9:30-10:45(75) Site Visit 4 Disaster Reduction and Human Renovation Institution Theater and 3D	*Self-Study*	10:00-11:10(70) Lecture17 Issues and Challenges for recovery of historic areas following East Japan Disaster (R. SHAW)	10:00-12:00(120) Special Lecture 2 Relocating Communities for Post Disaster Recovery (ISHIKAWA)	10:00-11:10(70) Lecture18 Emerging Polices for Disaster Risk Management of Urban Cultural Heritage in Japan (ACA Japan UMEZU)	Case Study PJ (Resource Persons)	Case Study PJ (Resource Persons)	*Preparationof Open Jury*
			Lunch					*Lunch*		*Lunch*					
2nd	11:30-12:40(70) Lecture 1 The Need for Disaster Risk Management for Cultural Heritage in Historic Cities: The Case of Kyoto (TOKI)	*Lunch*	*to Kiyomizu*	*To Sannei-zaka*	11:30-12:40(70) Lecture7 Disaster Mitigation and Integrated Planning of Historic Cities' (S. MOFFATT)	11:30-12:40(70) Lecture10 Flood prevention and Mitigation Techniques (SATOFUKA)	10:50-12:00(70) Lecture14 Disaster Prevention for Cultural Heritage in Kyoto City (Kyoto City FD)	11:30-14:30(180) Lecture15 Experience of the Great Hanshin-Awaji Earthquake, Ris k Assessment (MURAKAMI)		12:30-15:30(270) Site Visit 6 Tohoku area affected by the East Japan Disaster (HIRAOKA, TAKEDA)	+Discussion (Resource Persons)	11:30-12:40(70) Workshop 4 Role Playing Exercise :Emergency Response Procedures (JIGYASU)			11:00-12:00(60) Lecture20 Institutional Initiatives on Disaster Risk Management of Cultural Heritage (ICCROM)
	Lunch		12:30-15:00(150) Site Visit 1 Observations of Risks atWHS in Kiyomizu-dera Temple (Kyoto Pref.)	11:00-12:30(90) Site Visit 2 Sannei-zaka Important Preservation District (OKUBO)	*Lunch*	*Lunch*	*Lunch*	Lecture16 Planning for Disaster Mitigation of Cultural Heritage Training of Heritage Manager (MURAKAMI)	*Lunch*		*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*
3rd	14:00-16:30(150) Presentations by the Training Participants (Resource Persons)	*Self-Study*		*To DMUCH* *Lunch* 14:00-15:30(90) Workshop 2 Risk Assessment Exercise: Presentation and Discussion on DIG (OKUBO)	14:00-15:10(70) Lecture 8 Introduction to the Integrated Methodology for Assessing Risks (JIGYASU)	14:00-15:10(70) Lecture11 LANDSLIDE, Prevention and Mitigation Techniques (FUKAGAWA)	To Ninna-ji 13:30-15:30(120) Site Visit 3 World Heritage Site Fire Prevention Facilities at Ninna-ji Temple (OMORI)		*To Tohoku*		*To Kyoto*	14:00-15:10(70) Lecture 19 Lessons from Integrated Management Plan for Kathmandu World Heritage Monument Zones (K.WEIZE)	*Cont.*	13:30-16:30(180) Open Jury *(All the lecturers)*	
4th			*To DMUCH* 15:30-17:00(90) Workshop 1 Risk Analysis Exercise for Kiyomizu-dera temple, Introduction to Key Terminology (JIGYASU)	15:50-17:00(70) Lecture5 How to make the EWSS plan? (OKUBO)	15:30-17:00(90) Workshop 3 Building a Disaster Risk Scenario and Assessing Risk Levels (S. MOFFATT)	15:30-16:30(60) Case Study PJ (Resource Persons) 15:50-17:00(70) Lecture 12 Performance of Historic MasonryStructures (FURUKAWA)	*To DMUCH* 16:00-18:00(120) Case Study PJ First Half Presentation (Resource Persons)	To NADA 15:00-17:00 Site Visit 5 Former House No.15 in Kobe Foreign Settlement(MURAKAMI)		16:00-18:00(120) Special Lecture1 Coordination of Site Level Stakeholder with National and International Agencies for Post Disaster Recovery (HIRAOKA, TAKEDA)		15:30-18:00(150) Case Study PJ (Resource Persons)	*Cont.*		
5th	*17:00-19:00(120) Welcome Dinner*		17:00-18:00(60) Case Study PJ (Resource Persons)	17:00-18:00(60) Case Study PJ (KANEGAE)	17:00-18:00(60) Case Study PJ (Resource Persons)			*To Kyoto*		+Discussion (Resource Persons)				*Preparationof Open Jury*	*17:00-19:00(120) Farewell Party*
accommodation	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*	*Sendai*	*Minami Sanriku*	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*	*Kyoto*

Organized by Research Center for Disaster Risk Mitigation of Urban Cultural Heritage, Ritsumeikan University, Kyoto, Japan
In Cooperation with UNESCO World Heritage Centre, ICCROM, ICOMOS

OBJECTIVES OF MODULE	TEACHING STRATEGY	CONTENT AND THEME
As the introductory module to the course, the objective is to familiarise participants with the basic principles of disaster risk management with respect to cultural heritage. The lecture was followed by a site visit to a World Heritage Site which showcased many of the issues discussed. A workshop based on the principles was organised at site and through this exercise key terminologies of disasters, risks, hazards and vulnerabilities were introduced. Based on the learning of the day, participants were able to initiate the process on their selected case studies.	**Lecture** (incorporating secondary case studies)	Disaster risk management of cultural heritage - Significance and Core Principles *Resource Person: Prof. Rohit Jigyasu*
	Site Visit 1 (incorporating a Primary case study)	Observations of risks at the World Heritage Site of Kiyomizu-dera Temple *Resource Person: Prof. Tsuruoka*
	Workshop 1 (focused on primary case study)	Risk analysis exercise for Kiyomizu-dera temple, Introduction to Key Terminology *Resource Person: Prof. Rohit Jigyasu*
	Case Study Project (selected by participants)	Individual case studies , risk analysis by participants

In the International Training Course Session of 2011, Day number 3, which focused on the first stage of the course, was structured in the following manner

Duration of Programme	Lectures and Presentations	Primary Case studies and Site visits	Primary Case Study (Participant Based)
4-6 weeks	Separate lectures for each topic focusing extensively on secondary examples	Workshops for the various topics and site visits. Each workshop can be up to 8 hours if combined with a site visit. Themes such as specific kinds of heritage, disasters or geographical context could be explored	Individual case studies may be undertaken as running workshops through the course, the end objective being the formulation of a disaster risk management plan for an actual site.
2 weeks	Lectures which cover the fundamentals of all the topics and also explore certain themes		
1 week	Core lectures with thematic content	Due to time limitations , either secondary case studies and site visits or a single running case study may be explored as it may not be possible to do both	
3 day TYPE A	Lectures covering fundamentals of the content briefly, with extensive reading lists	A single case study may be selected to highlight the module content	
3 day TYPE B	Lectures which cover the fundamentals of all the topics and also explore certain themes	Both secondary and primary case studies and workshops may be conducted	
1 day TYPE A	Core lecture introducing the basics of the module	Workshop combining content with other modules	
TYPE B	Lectures covering fundamentals of the content briefly, with extensive reading lists	A single case study may be selected to highlight the module content	

2.6 Preparation of Resource Material

Selection of Experts

Once the course structure has been prepared, and the thematic focus, targeted audience and duration finalised, the next stage is the identification and selection of the specialists involved in teaching various modules. A schematic list of experts is outlined for this purpose:

Course Coordinators: A potential coordinator/s for the course is an expert proficient in disaster risk management of cultural heritage, with extensive practical experience in the field who is able to draw upon live case studies and structure the course thematically while linking themes to the core material of the course.

Core Faculty: Experts from the fields of disaster risk management; cultural heritage management, urban planning, and civil engineering should be selected to give focused knowledge on their areas of specialisation.

Workshop and Site Visit Coordinators: These are professionals who are familiar with the course organisation and content, but more importantly, with the sites being used for case studies and workshops.

Apart from these experts, administrative staff, media-persons, supporters would need to be engaged for the logistical planning and implementation of the course.

Session Outlines

In order to streamline the course content and its delivery mechanism, the resource persons delivering the lectures or organising workshops and site visits should be asked to prepare session outlines based on some basic guidelines and formats. These have been briefly summarised below:

Lectures and Presentations

- Key information including a summary of the lecture/ presentation and its objectives.
- Detailed explanations of key points, identification and definition of key terminology.

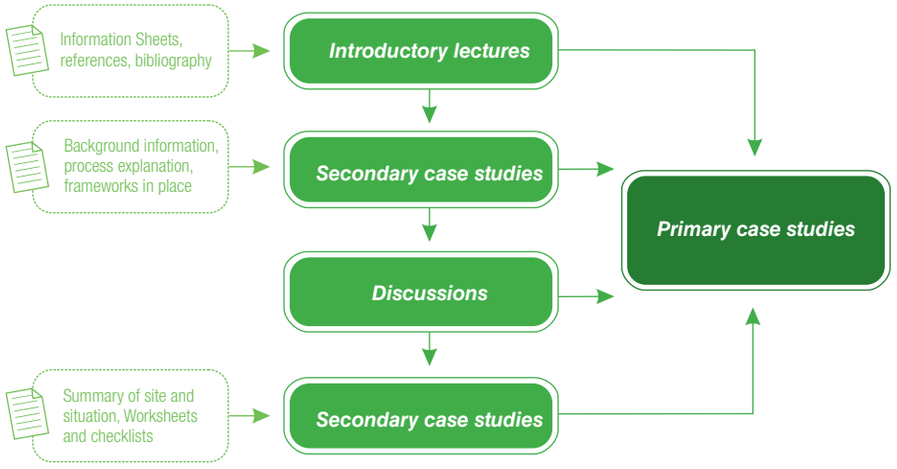
- Figures and illustrations to support the content.
- Suggested references and bibliography, hand-outs relevant to the lecture.
- Links to the overall course content to help orient the student.

Workshops and Exercises

- Summary of the workshop along with introduction to the site, situation and context. Links to lecture notes and link to overall course content should be included in the summary.
- Key learning objectives of the workshop.
- Any physical resources or equipment that may be needed along with worksheets, checklists for participants and reference maps or data.
- Dissemination of results.

Development of Primary and Secondary Case Studies

- Subject of case study and background information on site/ situation and context.
- Objectives of case study – Issues, challenges and available opportunities and solutions.
- Scope and limitations of case study.
- Explanation of the process applied, and the resources used.
- Lessons learnt during various phases.
- Supporting visuals /illustrations.
- Links to lectures and presentations, workshops, exercises and to the overall course.



Course Overview and Participants' Introductions

On the first day of the training course, each participant should make a brief presentation explaining current issues and challenges for disaster risk management of cultural heritage in his or her own country. The presentation should include a brief description of various types of natural and human-induced disasters affecting the participant's home country and how these put cultural heritage at risk. Also a brief explanation of existing disaster management systems especially those that are related to cultural heritage in the participant's country would be beneficial.

Background Information for Case Study Projects

Participants should be given detailed preparation instructions prior to the course so that they attend the course fully prepared with all base information needed to carry out case study projects on disaster risk management plan for their respective cultural heritage sites. Additional information about the course, the logistical requirements and any other pertinent information should also be included as a preparation package for the participants.

Checklist of documents to be prepared by the participants of 7th UNESCO Chair International Training Course on Disaster Risk Managment of Cultural Heritage, Kyoto.

Name of the Participant:
Country:
Case Study Site:

(A) Preparation for Case Study Projects

During the course each participant is required to develop a detailed outline for disaster risk management plan for the case study heritage site from their country that they have already selected at the time of their application for this course. For this purpose, they are supposed to bring with all the background material that is needed for preparation of this outline. Please find below checklist of the documents that should be gathered:

Maps, drawings and photographs (at appropriate scale for maximum information at site level)

S.No.	Description of Contents	Check
1.	Map of the city in which your cultural heritage is located. If the entire city is historic, please gather map of the larger urban region showing new developments. The map should also show natural features such as water bodies, green areas etc.	☐
2.	Detailed map of the cultural heritage site (area level) for which you will make your Disaster Risk Management Plan	☐
3.	Detailed plans, sections and elevations of selected heritage attributes of the site e.g. monuments/ historic buildings, houses etc. In case of large urban sites, you have to choose a representative sample only.	☐
4.	Topographical map of the region of your cultural heritage site.	☐
5.	Geological map of the region of your cultural heritage site.	☐
6.	Hydrological map of the region of your cultural heritage site showing water shed region.	☐
7.	Micro-Hazard Zonation maps of the region of your case study site. These maps show specific areas in the region that are prone to various hazards such as earthquakes, floods, cyclones etc. These maps are generally available from disaster management department of the municipality. E.g. earthquake map should show location of fault lines and epicenters of past earthquakes. Food map will show those areas that are vulnerable to floods.	☐
8.	Photographs in digital format showing heritage attributes of your case study site and their existing condition. Please bring as much visual documentation as possible.	☐

Documents related to your cultural heritage site:

S.No.	Description of Contents	Check
1.	Inventories / listing of various heritage attributes of your cultural heritage site	☐
2.	Historical background of your cultural heritage site	☐
3.	Legislation for protection of your cultural heritage site and its attributes, categories and guidelines for protection	☐
4.	If your site is a World Heritage, please bring the nomination dossier and statement of Outstanding Universal Value (OUV), State of Conservation, Periodic Reporting etc.	☐
5.	Existing management plan/system for the site, including its boundaries for the core and buffer zone (where applicable)	☐
6.	Annual and monthly data on the number of visitors/tourists to your site	☐
7.	A brief overview of past conservation interventions done at the site (specify year, and type of intervention)	☐
8.	History of natural and human-induced disaster incidents at your site or immediate vicinity e.g. fires, flooding, earthquakes etc. specifying year of incident and its impact on people and heritage. Please note that you should also list incidents where damage or any other impact was not reported.	☐
9.	Existing disaster management plan/systems for your cultural heritage site (if existing)	☐

2.7 Delivering the Course

Delivering the course effectively requires a systematic approach not only to designing the course content and pedagogical strategies but also ensuring both human and financial resources as well as providing infrastructural support. The process of planning for funding, engaging expert instructors and administrative staff needs to be undertaken well in advance of the actual course. During the course, both participants and instructors may need to be debriefed regularly, and each session requires supporting material in the form of literature, worksheets and other related materials. Equally important is following up on participants and instructors when the course has concluded in order to get their feedback on the course and also to collect the information generated through the course for future initiatives. A brief summary of the basic preparation needed to organise and deliver each module, incorporating lectures, site visits and workshops, is given below:

Before the Course

Planning and structuring the course:

- Identify the basic themes being covered, such as a specific geographical context, specific hazards or disasters or specific aspects within disaster risk management.
- Identify experts in the field for various topics and engage them for the course. Also engage support staff, coordinators for site visits and workshops and an administrative staff. The scope of work for each resource person identified should be clearly communicated.
- Collect information on relevant secondary and primary case studies. Recent disasters and the cultural heritage which has been impacted should be highlighted. Maps and information on global and local issues should be collected along with briefs, worksheets and checklists for participants introducing the site components and context. A detailed schedule for the course should be prepared.
- Identify and coordinate with module coordinators, site managers and workshop coordinators. Permissions and access to the site should be arranged for in advance.

Resources and funding:

- A detailed budget accounting for all aspects of planning, implementing and following up the course should be formulated. This should include the fees and expenses for the resource persons, logistical expenses such as arranging for a venue, transport and infrastructure along with a contingency fund.
- Potential funding agencies or sponsors could be identified if resources of the organising body are insufficient. International funding agencies, local and national governments or institutions could be potential sponsors.

Infrastructure and facilities:

- Venues for conducting the course, accommodating participants and resource persons if needed should be identified. The venue for conducting the course should have the entire basic infrastructure needed for lectures, presentations, small-scale practical demonstrations and workshops.
- Transport to the venues and to the sites should be planned for before the course.
- All equipment and stationery should be arranged for.

During the Course

Planning and structuring the modules:

- Introduce the module and the key resource people to participants.
- For each case study, ensure enough background information is provided to participants.
- Each module should be linked to the disaster risk management framework and be summarised before proceeding to the next module.

Infrastructure and facilities:

- Ensure that worksheets and sample formats are provided for participants on site and that literature and other supporting documents for each lecture are circulated.
- Stationery and equipment needed for conducting workshops and lectures should be arranged.

After the Course

Reviewing the course and creating a network:

- Evaluate the participants' progress and obtain feedback from them regarding the course.
- Assess the impact of the course, resource utilisation.
- Follow up with participants and engage them in a continuing dialogue, to ensure the long-term goals of the course are achieved.

Creating a resource bank:

- The instructors' data as well as the participants' progress and data should be kept on official record.
- If possible this should be compiled in print or electronic format and circulated widely.

Section 3
Course Contents and Detailed Teaching Strategies

This section provides a brief summary of each module of the course and detailed teaching strategies which may be used to communicate key concepts. It draws heavily from the International Training Courses that have been organised at RitsDMUCH, but at the same time provides various alternative strategies that may be used for different formats of the course. Each module is based on the integrated disaster risk management framework and is further divided into smaller sections that may be dealt with individually for exhaustive training programmes, and combined together for shorter courses.

Image Ref. 3.1

A participant introducing his case study project to other participants as part of the orientation session in the International Training Course 2011

Source: RitsDMUCH

Orientation to the Course

Section 2 described the selection process of participants and also the advantages of having participants select their own case study projects prior to the commencement of the course. Before introducing the subject matter to participants it is important to orient them to the objectives and methodology of the course and also enable interaction between participants and resource persons. This may be done through an orientation session facilitated by the course coordinators and instructors, briefly introducing the organisers, objectives and structure of the course while also discussing what expectations the participants have about the course.

Ice-breaking exercises may be organised in order to ensure that participants not only are introduced but also feel comfortable in each other's company.

The orientation session can also address logistical concerns that participants may have. This is especially important in the case of courses that cater to an international audience. Participants who are unfamiliar with the host organisation's or host country's cultural aspects may benefit from this type of session. Informal interaction should be encouraged at this stage so that participants are receptive to team exercises through the length of the course.

Finally during this session, an opportunity should be provided to the participants to make brief presentations on the cultural heritage and disaster management context in their home countries and the challenges and initiatives for disaster risk management of cultural heritage.

Module **3.1**

Background of the Field, Approaches and Principles

General Teaching Strategy for the Module

This module familiarises participants with the fundamentals of the aspects of disaster risk management of cultural heritage in the urban environment. It may be combined with the orientation sessions. Most of the content in this module is central to the entire process of disaster risk management and should thus be considered vital to all variations of the course structure. Broadly, this module covers the following topics:

- ***Cultural heritage***, its evolving scope, significance and the opportunities it offers for disaster risk management.
- ***Cultural heritage in the urban environment*** and the complexity of relationships between cultural heritage and its urban context.
- ***Disasters and their impact on cultural heritage***, which includes an overview of recent disasters or disasters with a specific relevance to the participants. This section may help set the theme for the entire course.
- ***Interrelationships between the causes of disasters and introduction to the basic terms***, such as disaster, risk, hazard and vulnerability. Thematic content such as the impact of climate change or man-made disasters may also be introduced at this stage.
- ***The basic principles of disaster risk management of cultural heritage.***
- ***The evolution of the field***; describing various initiatives at the global scale as well as regional and national scales and the need for action. This topic helps in orienting the participants to understand the need for the course and their roles as cultural heritage managers, disaster risk managers, policy makers etc.

The module can be tailored in different ways, depending on the overall course structure and the thematic focus. For example, in the RitsDMUCH International Training Course series, courses generally extend for a period of two weeks and this module is covered over 2-3 days (16-20 hours).

In shorter courses, the module can be structured to combine various topics in a continuous presentation or workshop. For such courses, which may range from a single day seminar or course to a 2-3 day programme, the content may be summarised depending on the course objectives. For instance, in the TYPE A variation of the course, this entire module may be compressed into a single lecture).

INTRODUCTION	Self-Study	Principles, Framework and Risk Analysis at site level
9/8 (Sat)	9/9 (Sun)	9/10 (Mon)
9:30-10:00(30) Registration	9:30-11:00(90) Lecture 2 Introduction to the Context of Historic City of Kyoto (YAMASAKI)	9:30-10:40(70) Lecture 3 Disaster Risk Management of Cultural Heritage - Significance and Core Principles (JIGYASU)
10:00-10:10(10) Opening Address (Chancellor KAWAGUCHI)		
10:10-11:10(60) Orientation to the Course (JIGYASU)		*Lunch* *to Kiyomizu*
11:30-12:40(70) Lecture 1 The Need for Disaster Risk Management for Cultural Heritage in Historic Cities: The Case of Kyoto (TOKI)		12:30-15:00(150) Site Visit 1 Observations of Risks at WHS in Kiyomizu-dera Temple (Kyoto Pref.)
Lunch	*Lunch*	To DMUCH
14:00-16:30(150) Presentations by the Training Participants (Resource Persons)	Self-Study	15:30-17:00(90) Workshop 1 Risk Analysis Exercise for Kiyomizu-dera temple, Introduction to Key Terminology (JIGYASU)
17:00-19:00(120) *Welcome Dinner*		17:00-18:00(60) Case Study PJ (Resource Persons)
Kyoto	*Kyoto*	*Kyoto*

An excerpt from the timetable of the International Training Course 2012, illustrating the structure of Module 1, which included lectures as well as site visits. The orientation to the course is directly linked to the first module. The chronology of various lectures and exercises may not always be possible to implement, due to limitations of time, availability of resource people and logistics. Here, the workshops for Module 1 and Module 2 have been combined using the primary case study of Kiyomizu-dera. The detailed process of the case study is explained in Module 2.

Cultural Heritage in the Urban Environment

Image Ref. 3.2

Traditional house example in Eskigediz, turkey

Source: Zeynep Gul Unal

Summary of Content

This section introduces the scope of cultural heritage and approaches related to heritage and the urban environment.

Introduction to cultural heritage and its significance

- Overview of what constitutes cultural heritage and its associated values.
- The role of cultural heritage plays within the urban environment.

Approaches related to cultural heritage

- Examining the changing scope of heritage from monuments to settlements, cultural landscapes, movable objects and intangible traditions and skills.
- Focus on the living dimensions of heritage that seeks to pursue continuity and evolution rather than mere preservation.
- The increasing significance of disaster risk management of cultural heritage.

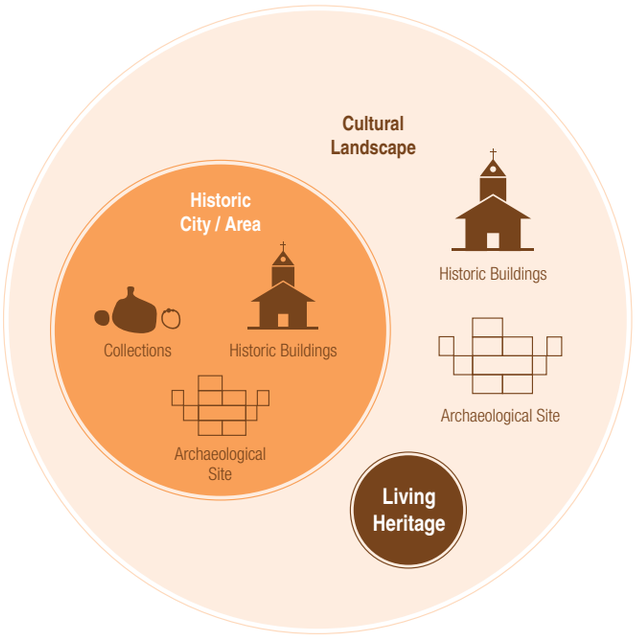
Approaches relating to the urban environment

- Specific innovations in methods for urban planning, design and management.
- Examples of how each innovation can assist in the development of disaster risk management plans for urban cultural heritage.

Teaching Strategies

Core Lectures

Lectures comprised of secondary case examples, rapid fire slide shows and discussions drawing upon participant experiences may be used to explain the changing scope of heritage especially in an urban context using relevant examples. Key concepts may be supported by personal anecdotes. Some concepts could also be illustrated on a white board or flip chart. Examples which would help the participants relate the theoretical content to actual events or sites should be highlighted. The instructor should facilitate discussion among participants on their understanding of cultural heritage and the challenges of conservation and management.



A diagrammatic representation of the realm of cultural heritage and interconnectedness of various components in an urban environment.
Source: Rohit Jigyasu

Image Ref. 3.3
The historic city of Patan was used as a secondary case example to illustrate the complexities of cultural heritage and the urban environment
Source: Rohit Jigyasu

Sample Lecture

Disaster Mitigation and Integrated Planning of Historic Cities, Lecture 5, International Training Course 2011

Instructor: Sebastian Moffat | Duration: 80-90 minutes

This session summarised three innovations in analysis and urban planning, which form a part of the principles, approaches and methodologies to assist with the analysis of risks and disaster risk management for urban heritage. These innovations are:

1. Conceptualising the built environment as a socio economic system.
2. Systems thinking and the process of integrated planning and design.
3. Collaborative modes of decision-making and policy formation.

Each of these innovations has generated a series of tools and practices. These were examined one by one, and specific questions about each topic were addressed. The central question of this session was then focused on: How might this concept/tool/method assist with the preparation and application of disaster risk management plans for cultural heritage in urban environment. Rapid fire slideshows, diagrammatic explanation of concepts and case studies were used to communicate the content.

Image Ref. 3.4
Sebastian Moffat explaining various aspects of systems thinking for urban management. The disaster risk management cycle is illustrated within the classroom, indicating the stage of the process being discussed with the participants.
Source: RitsDMUCH

Key references

Moffat, S. and Kohler, N., (2008). Conceptualizing the Built Environment as a Social Ecological System. Building Research and Information. 36(3), pp.248-268.
Tung, A.M., (2001). Preserving the world's great cities: the destruction and renewal of the historic metropolis. New York: Clarkson Potter.
Suzuki, H., Dastur, A., Moffatt, S., Yabuki, N., Maruyama, H., (2010). Eco2 cities : Ecological cities as economic cities. World Bank.

Impact of Disasters on Cultural Heritage

Summary of Content

The section introduces the following issues in a broad manner, setting the context for the rest of the course. This section may be combined with the next section (Understanding Key Terminologies) and the previous sections (Cultural Heritage and the Urban Environment) in one session depending on time constraints.

- Impacts of disasters on cultural heritage.
- Critical challenges from global, national and regional perspectives.
- Causes of disaster risks to heritage sites.

Teaching Strategies

Core Lectures

This section introduces participants to the type of disasters and their impact on cultural heritage. Recent disasters and their consequent impact to cultural heritage may be highlighted graphically, using iconic images and also statistical data to impress upon participants the need for disaster risk management. A lecture could be supported by a series of rapid-fire slide shows resulting in an active dialogue between the participants and course coordinators. This section could also provide an opportunity for participants to introduce their own experiences and for the instructor to introduce primary or secondary case studies.

Sample Strategy

Participants are shown images of cultural heritage damaged as a result of a disaster and asked to guess the scenario. They are shown several such cases to highlight the risks faced by cultural heritage in the urban environment and to stress the need for disaster risk management of cultural heritage.

Image Ref. 3.5
Remains of Catholic Basilica after the earthquake in 2011
Source: Bryan Lintott

Sample Lecture

Reducing Risks to Cultural Heritage in Kyoto, Lecture 1, International Training Course 2012

Instructor: Prof. Kenzo Toki, Director, RitsDMUCH | Duration: 60 minutes

This session highlighted issues related to protection of cultural heritage from post-earthquake risks, focusing on the case of rich urban cultural heritage of Kyoto. Through this session, using the example of the Kobe Earthquake (1995), and the history of Kyoto's cultural heritage being damaged due to fire, the following issues were highlighted:

- Vulnerability of Kyoto in a post-earthquake fire
- Vulnerability of the fire-protection systems and fire extinguishing systems in the event of an earthquake, particularly in historic buildings such as old temples and shrines
- High density of the significant heritage structures and objects within Kyoto coinciding with the seismic faults
- Imminence of an earthquake occurring in the near future

Historically, Kyoto 's heritage had been at risk, primarily due to political issues and socio-economic causes with a significant proportion of the temples being destroyed in the mind-fifteenth century. However, the situation has changed dramatically over the past century and the greatest threat to the cultural heritage of Kyoto is the occurrence of an in-land earthquake or fire. The evolution of the urban structure of Kyoto is also responsible for dramatically increasing the risks, due to the increased density of urbanisation surrounding the cultural heritage of the city.

The issues with existing fire protection and extinguishing systems in the historic temples or shrines of Kyoto are that they deal primarily with the possibility of a fire occurring inside the structure itself. However, in the event of an earthquake, the possibility of a fire attacking the structure from the outside increasing significantly. Therefore, it becomes imperative to address this possibility as well. Historical sources indicate that a fire in 1788, referred to as the 'Big Fire' of Ten'mei was responsible for widespread damage to the timber shrines and temples in the area. Today, this region is devoid of any nationally significant structure or object, and it is fortunate that structures outside the periphery of this zone survived. The key objective now is to recognise that it is unlikely to reconstruct these

pieces of heritage, should they be destroyed and therefore it is all the more important to have protective measures and countermeasures in place for their continued protection.

A large active fault known as the Hanaore Fault runs through the Kyoto basin, which is subject to very high seismic forces. Besides this active fault, there are several other active faults. The cultural heritage of Kyoto is concentrated on two different geographical configurations. The first is the hill side and the second, flat land. The Kyoto basin is connected to a large lake, Lake Biwa through 2 canals, which provide the city with a large amount of water. The canal's water may be used during an emergency to create a water curtain around the structure. The feasibility of such systems needs to be examined carefully as they may not be applicable at all site locations. This system is an adaptation of a system used in the nineteenth century in the Higashi Honganji temple, located near the canal. The water supply system still exists and may be updated.

Similar case studies have been undertaken for implementing this particular system, such as in the case of the Kiyomizu Temple and near-by community. The plans have been made and implemented in the area as a five years programme of the central and local governments. In cases where the structures will be unable to withstand high pressures of water streams, misting systems are being designed. It should be reiterated that establishing countermeasures for protection of cultural assets in cities and districts such as Kyoto and Nara should be given the highest priority considering the possibility an earthquake occurrence in the future and the vulnerability of these areas for post-earthquake fires.

The lecturer emphasised that experts working on conservation of cultural assets and those working on disaster risk management have begun to collaborate on these issues, which is imperative for the long term future of these sites.

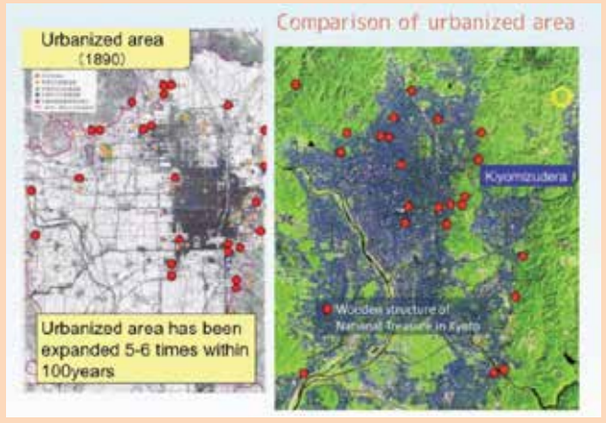


Image Ref. 3.6
Urban growth in relation to cultural heritage in Kyoto, shown through comparing two maps dating to 1890 and present day.
Source: Kenzo Toki

Key Terminologies and Relationships

Summary of Content

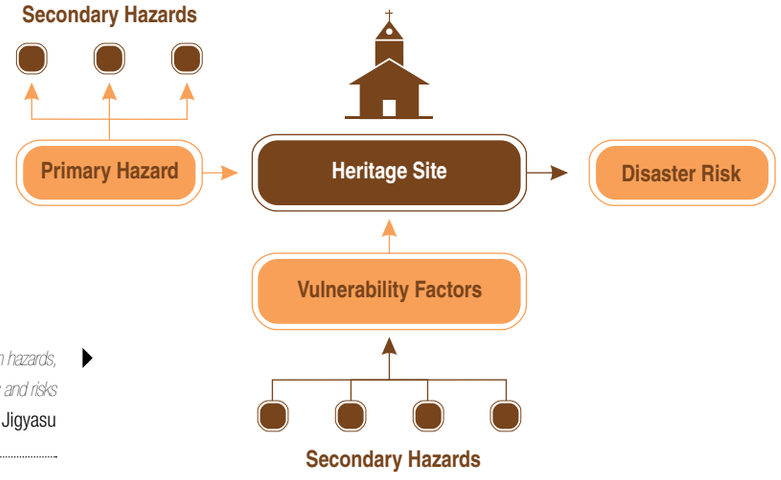
The section aims to introduce the participants to analyse the complexity of a disaster situation in terms of multiple cause-effect relationships. It also seeks to introduce the key terminology, namely:

- Disaster
- Risk
- Hazard
- Vulnerability
- Capacity and resilience

Relationship of hazard, vulnerability and disaster risk to be explained

Other key concepts to be introduced

Climate change, mitigation, prevention, recovery, response



Relationships between hazards, vulnerabilities and risks
Source: Rohit Jigyasu

Key references

UNESCO-WHC, (2010). Managing disaster risks for world heritage (World heritage resource manual). Paris: UNESCO.
UNISDR, (2002). Terminology of disaster risk reduction. Geneva, United Nations International Strategy for Disaster Reduction. Available at http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm.

Teaching Strategies

Core Lectures

The instructor can illustrate various terms and their interrelationships through secondary examples and explanatory diagrams and matrices. At this stage a detailed series of lists of hazards and related vulnerabilities should be given to participants as resource material as well.

Primary Case Study

A workshop should be designed to highlight relationships between hazards, vulnerabilities and disaster risks. Ideally it should be based on an actual site/ case study to ensure that participants are able to apply their theoretical understanding in a logical manner based on actual site observations. In the International Training Course format, the primary case study format has been followed several times, combining this section with the next module (Module 2: Risk Analysis). The site of Kiyomizu-dera Temple, located in the Sanneizaka District of Kyoto has been used as the site for various workshops. This workshop also introduces participants to risk identification and preliminary analysis which is the first stage in the risk assessment process described in the second module.

Primary Case Study Example

STAGE 2: Identifying risks and potential negative impacts, Linking Various Aspects of Risks and Introduction to Basic Terminologies and Relationships, Site: Kiyomizu-dera Workshop 1, International Traning Course 2011

Instructor: Rohit Jigyasu | Duration: 90 minutes

- The instructor introduced the exercise and distributed the maps and secondary information on the site along with worksheet titled 'Observations and Recording' before the site visit. Upon return from the site visit, the participants were divided into groups. The instructor asked each group to list potential negative impacts on the site and sources/causes for the same based on their site observations.
- Each group was given two sets of placards of different colours for writing the potential impact and the causes/sources. The instructor collected the placards and put these up on the board. The instructor then facilitated an exercise where participants drew multiple links between potential impacts and the causes/ sources.
- He then re-organised these placards as hazards and vulnerabilities and introduced their definitions (including the types) and those of disaster risks. The difference between disaster risks and other kinds of risks and the links between the two was thus highlighted.

Image Ref. 3.7, 3.8

Participants record their observations and then place their separate placards on a common pin board trying to relate impacts with causes and develop relationships between the two

Source: RitsDMUCH

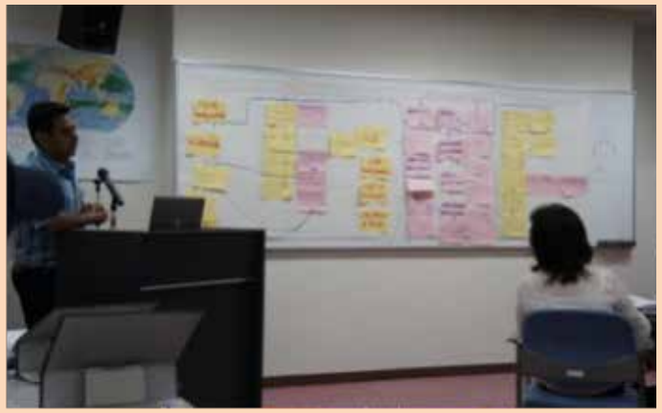


Image Ref. 3.9

The instructor explains the relationships between hazards and vulnerabilities once the placards have been organised on the board to summarise the workshop.

Source: RitsDMUCH

Sample format for recording observations on site

S. No.	Observations at the Site and its immediate surroundings (Damage or Deterioration pattern / phenomenon/activity/planning) Any secondary information from available sources	Location	Potential Negative Impacts on the World Heritage Property	Possible Cause(s) / Source(s)

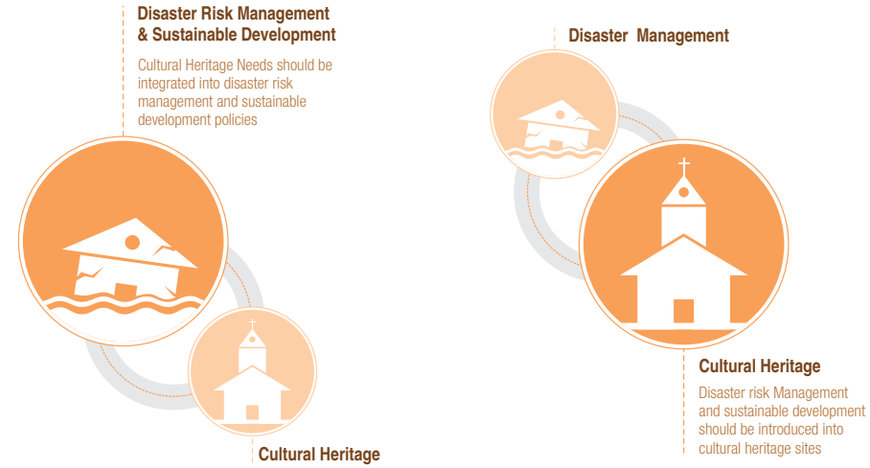
Approaches and Principles for Disaster Risk Management for Cultural Heritage

Summary of Content

This section outlines the need for an integrated approach for disaster risk management of cultural heritage by identifying the links between disaster risk management, sustainable development and heritage conservation and management. It introduces principles such as:

- Reducing disaster risks to various kinds of cultural heritage.
- Taking into consideration multiple hazards that may follow each other like the tsunami after the earthquake.
- Reducing underlying factors that cause disasters.
- Addressing the risks that may originate from inside the heritage site or object or from the surrounding environment.
- Addressing disasters as a continuous process preceding the event itself and developing as a consequence of actions taken after it.
- Reducing disaster risks to the heritage values embedded in the site.
- Identifying the role that cultural heritage can play in disaster mitigation.
- Reconciling conflicts and engaging multiple stakeholders.
- Linking with disaster management systems at site/ local / regional/national level.

Diagrammatic representation of integration of disaster risk management planning into overall site management and regional planning
Source: Rohit Jigyasu



Diagrammatic representation of integration of disaster risk management planning into overall site management and regional planning
Source: Rohit Jigyasu

Key References

Jigyasu, R., (2006). Integrated Framework for Cultural Heritage Risk Management. Disaster and Development Journal of the National Institute of Disaster Management, 1:1, November 2006, New Delhi

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. Kyoto Kaikan, 16 January 2005.

Thimphu Document 2010, outcome of the International conference on disaster management and cultural heritage. Thimphu, Bhutan, 12-14 December 2010.

Teaching Strategies

Core Lecture

The core lecture should present the various links between disaster risk management, cultural heritage and the urban environment through secondary case examples, which may be local or global depending on the focus of the course. This lecture should be approached as being central to the first module and the various other lectures and presentations should link back to the principles and concepts introduced at this stage. In case of a short term course or seminar, this lecture could potentially summarise all the other content of the module. Diagrammatic representations highlighting various relationships would be particularly useful in such a format. The lecture should be illustrated through secondary case examples to illustrate various approaches and principles.

Sample Lecture

Significance of Disaster Risk Management and Core Principles

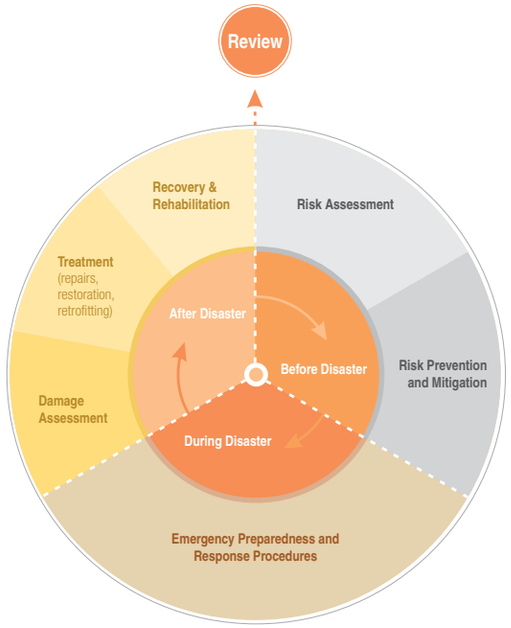
Instructor: Rohit Jigyasu, International Training Course 2011 | Duration: 80 minutes

The objective of this lecture was to engage participants in a discussion which would make them appreciate the need for an integrated approach towards disaster risk management, and then introduce the disaster risk management cycle which would form the basis for the rest of the course framework. This is a critical segment of the course. The presentation highlighted the issue that cultural heritage is under increasing threat from various catastrophic events; both natural and human induced such as earthquakes, floods, cyclones, fires, armed conflicts and terrorism. This was illustrated through examples from various parts of the world including some recent disasters such as Christchurch (New Zealand), Tohoku (Japan) and Haiti.

The presentation further highlighted various challenges in reducing risks to cultural heritage before, during and after disasters. Lastly, risks to cultural heritage during the post-disaster recovery phase were elaborated through examples. These included difficulties in undertaking damage assessment of heritage structures and challenges in taking decisions for recovery of cultural heritage and lack of integration of cultural dimensions in post-disaster reconstruction.

At the end of the lecture the disaster risk management cycle was introduced. This cycle highlights various activities to be undertaken for the prevention and mitigation, preparedness, response and recovery phases.

The lecture was followed by a site visit to the World Heritage Site of Kiyomizu-dera, where participants were introduced to their first workshop dealing with the initial stages of risk assessment, and highlighting relationships between disaster risks, vulnerabilities and hazards.



DISASTER RISK MANAGEMENT CYCLE FOR CULTURAL HERITAGE SITES

Image Ref. 3.10

Remains of the Anglican Christchruch Cathedral, used as a secondary case example

Source: Bryan Lintott

The integrated disaster risk management cycle

Source: Rohit Jigyasu

Evolution of the Field

Summary of Content

This section introduces the international developments in the field of cultural heritage risk management to participants highlighting the present discourse on the subject. Briefly, this session would include benchmark events, declarations, charters, principles and strategy documents related to disaster risk management of cultural heritage, tracing developments across the world and introducing the various organisations involved in the subject areas.

The following organisations and policy documents could be introduced:

- Organisations such as: ICCROM, ICOMOS, ICOMOS-ICORP, UNISDR, UNESCO World Heritage Committee, International Committee of the Blue Shield, International Council on Museums, IUCN, UNEP, UNHCR
- International Declarations such as: Convention concerning the Protection of the World Cultural and Natural Heritage, UNESCO, 1972, the Declaration of Quebec, Ist National Summit on Heritage and Risk Preparedness, Quebec City, Canada, 1996. (Stovel, ICCROM, 1998), the Kobe/Tokyo Declaration on Risk Preparedness for Cultural Heritage, Kobe/Tokyo, 1997, Strategy Document for Reducing Risks from Disasters at World Heritage Properties.

(Detailed list given in appendices)

The following issues need to be highlighted:

- The need to further build capacity at regional, national and local levels for various types of target groups including decision makers.
- Development and implementation of disaster risk management plans for various types of cultural heritage sites e.g. archaeological sites, historic cities, vernacular, cultural landscapes, museum catering to various types of natural and human induced hazards such as earthquakes, floods, fires, armed conflicts.
- Need for mainstreaming cultural heritage in wider disaster management field. Links of culture with various sectors such as housing, infrastructure, livelihood, and sustainable development. The process of connecting with existing networks and programmes.

Teaching Strategies

Core Lecture

A lecture should discuss the developments in the fields of disaster risk management of cultural heritage, internationally as well as relating to participants' local and regional contexts through secondary examples. If needed, the instructor may connect this lecture to local, regional and national policies on cultural heritage and disaster risk management. This subject may also be undertaken at a later stage in the course.

Thematic Lectures

Based on the length and focus areas of the course, thematic content emphasising management systems specific to the region, local policies and planning approaches could be introduced at this stage. A running primary case study, which would include site visits and workshops through various modules of the course, can also potentially be introduced here in order to connect back to it through each stage of the course.

Site Visit / Primary Case Study

A visit to a local heritage site may be arranged at this juncture of the module. The various site management policies, local policies and national and international frameworks that apply to it could be clearly illustrated to participants by the site manager or any other assigned resource persons with extensive knowledge of the site as well as the applicable policies. The history and background of the site and region may also be presented as part of these sessions or as a separate session, as a presentation or part of the site visit.

Sample Lecture

Linking with larger institutional framework and methods for post disaster recovery and rehabilitation of cultural heritage at international/national /regional levels, International Training Course 2010

Instructor: Giovanni Boccardi | Duration: 60 minutes

The objective of this session was to provide participants with an understanding of the larger global context, both in institutional and policy terms, in which the protection of cultural heritage properties from disasters takes place. Particular emphasis was placed on the opportunities that exist from a more integrated relationship between the fields of heritage conservation and disaster risk management. The session referred to key policy and guidance documents as well as to established international processes to which national and local actors may link their initiatives.

The lecture elaborated on the reasons for the growing number of disasters, focusing in particular on increasing exposure, vulnerability and the effects of climate change. The nexus between disasters and sustainable development and poverty, was also highlighted. . Examples were provided of ways in which well-maintained heritage can contribute to sustainable development through multiple "services and goods", including by the reduction of risks from disasters for people and assets.

The international institutional framework in the area of disaster risk management in general and with respect to heritage protection was briefly introduced. The basic terminology, main relevant institutions, policies, guidance and resources were presented, explained and commented on, focusing in particular on the Hyogo Framework for Action and the Strategy for Reducing Disaster Risks at World Heritage Properties, while emphasising links and possible synergies with other relevant international legal instruments (e.g. 1954 and 1970 UNESCO Conventions). Information on the specific functions and roles of UNESCO, ICOMOS-ICORP, IUCN, the International Blue Shield Committee and other relevant actors was provided.

The second part of the lecture touched upon existing processes which are important for heritage protection in the context of disaster risks. In particular, the Post-Disaster-Needs-Assessment (PDNA) and Post-Conflict-Needs-Assessment (PCNA) were introduced, including reference to methodologies for assessing impacts on heritage and their consequences for sustainable human development as well as proposals to the international donor community for financial support.

References:

ICCROM, ICOMOS, IUCN, UNESCOWHC, 2010, Managing Disaster Risks for World Heritage, WH Resource Manual, Paris, UNESCO.

Hyogo Framework for Action-2005-2015, Building the Resilience of Nations and Communities to Disasters

Sample Lecture

The International Context for Conservation and International Initiatives on Disaster Risk Management for Cultural Heritage, International Training Course 2012

Instructor: Joseph King | Duration: 60 minutes

The instructor introduced the international context for the various initiatives that have been undertaken for disaster risk management for cultural heritage at a global level. He introduced the structure and evolution of international organisations such as the UNESCO World Heritage Centre, ICOMOS, and ICCROM. The scope of other international organisations such as ALESCO, SPAFA, European Union / Council of Europe, private bodies such as the Getty Conservation Institute, World Monuments Fund were also discussed. These were then linked to the international organisations dealing with issues of disaster risk management such as UNISDR, Global Platform and Regional Platforms, World Bank, NGO's and Civil Society. Bilateral and Multilateral Development Agencies such as the World Bank, Sida, and USAID were also briefly discussed.
The specific mandate of ICCROM and its commitment to promoting the conservation of cultural heritage worldwide was briefly discussed.

Finally a strategy for risk reduction for World Heritage Properties was discussed by the instructor. This lecture related to other discussions initiated within this module and the previous modules dealing with international agencies concerned with the disaster risk reduction and disaster risk management of cultural heritage at a global scale.

Potentially, this type of lecture could be placed in an earlier module (Module 1) or towards the end of a course (Module 6)

3.2 Risk Assessment

General Teaching Strategy for the Module

At the conclusion of the previous module, participants should have been introduced to the impact of disasters on cultural heritage and the basic relationships between hazards, vulnerabilities and disaster risks. The disaster risk management cycle has also been introduced to them, illustrating each stage in the disaster risk management process. Building upon this base, participants can now be introduced to the approaches and methods for risk assessment.

This module is critical to the course, as it informs participants of the existing methodology and tools for risk assessment that form the basis of the disaster risk management plan. The thematic focus of the course will also determine a large share in this module, since risk assessment can vary widely depending on the scale, location and context of a site and the nature of the hazards under consideration. For instance, a course addressing earthquake risks for a heritage precinct with a large number of timber structures would need to emphasise risk assessment methodology based on seismic characteristics, risks of fire caused due to earthquake as well as the vulnerability of timber and soil conditions in order to determine the behaviour of individual structures. At the level of individual buildings, specific technologies such as behavioural studies of structures could come into play. It is important to introduce this concept to participants who may be professionals involved in the conservation of this type of buildings.

The general structuring of this module is as follows:

- ***Identification and analysis of disaster risks*** through collection of data from primary and secondary sources followed by linking primary and secondary hazards and vulnerabilities and their potential negative impacts.
- ***Developing alternative disaster scenarios*** for the heritage site and evaluating risks as low, medium or high level on the basis of their probability and severity of consequence. This may be used to prioritise options for mitigating risks on the basis of risk evaluation and other factors such as availability of resources and larger goals.

Since each step of the risk assessment process is closely linked, the lectures used to deliver the content could be combined. A single series of workshops or one large exercise could also be used to guide the participants through each stage of the risk assessment process. Secondary case examples are particularly useful for this module as they would help illustrate the detailed approaches and methodology applicable in specific contexts. They may also be used to explain how risk assessment fits within the disaster risk management planning framework.

This module's content can be summarised for a shorter course but can potentially be an independently taught module for heritage professionals or site managers, especially if it is structured around a specific thematic area. In the International Training Course series organised by RitsDMUCH, this module has generally been covered in three or more days out of two weeks and explored specific technical aspects depending on the annual theme of the course.

For shorter courses (TYPE A), this module can be summarised into a single lecture presentation and a workshop as part of a case study. As an independent module of 1-3 days (TYPE B), a series of workshops and case examples could be used to illustrate not just generic approaches to risk assessment but specific focused tools and techniques could also be highlighted.

9/10 (Mon)	9/11 (Tue)	9/12(Wed)
Principles, Framework and Risk Analysis at site level	**Risk Analysis at Urban level**	**Risk Assessment**
DMUCH *Kiyomizu-dera*	*DMUCH* *Sannei-zaka*	*DMUCH*
		9:30-10:00(30) Case Study PJ (Resource Persons)
9:30-10:40(70) Lecture 3 Disaster Risk Management of Cultural Heritage - Significance and Core Principles (JIGYASU)	9:30-10:40(70) Lecture 4 Disaster Imagination Game (DIG) (OKUBO)	10:00-11:10(70) Lecture 6 Ecology and Sustainability of Historic Urban Areas (S. MOFFATT)
Lunch		
to Kiyomizu	*To Sannei-zaka*	
	11:00-12:30(90) Site Visit 2 Sannei-zaka Important Preservation District (OKUBO)	11:30-12:40(70) Lecture 7 Disaster Mitigation and Integrated Planning of Historic Cities' (S. MOFFATT)
12:30-15:00(150) Site Visit 1 Observations of Risks at WHS in Kiyomizu-dera Temple (Kyoto Pref.)	*To DMUCH*	*Lunch*
	Lunch	
	14:00-15:30(90) Workshop 2 Risk Assessment Exercise: Presentation and Discussion on DIG (OKUBO)	14:00-15:10(70) Lecture 8 Introduction to the Integrated Methodology for Assessing Risks (JIGYASU)
To DMUCH		
15:30-17:00(90) Workshop 1 **Risk Analysis Exercise for Kiyomizu-dera temple, Introduction to Key Terminology** **(JIGYASU)**	15:50-17:00(70) Lecture 5 How to make the EWSS plan? (OKUBO)	15:30-17:00(90) Workshop 3 Building a Disaster Risk Scenario and Assessing Risk Levels (S. MOFFATT)
17:00-18:00(60) Case Study PJ (Resource Persons)	17:00-18:00(60) Case Study PJ (KANEGAE)	17:00-18:00(60) Case Study PJ (Resource Persons)
Kyoto	*Kyoto*	*Kyoto*

An excerpt from the timetable of the International Training Course organised by RitsDMUCH, 2012 which illustrates how Module 2 can be structured. There is the potential for overlapping content in all three modules which would need to be tailored based on specific needs of the course coordinators and participants and availability of resource persons.

Risk Identification, Analysis and Constructing Disaster Scenarios

Summary of Content

The objectives of this module are to introduce the basic methodology for undertaking risk assessment of cultural heritage sites and enable participants to prioritise risk reduction strategies and decide on the approach for mitigation. The first stage within this process is the identification and analysis of potential risks.

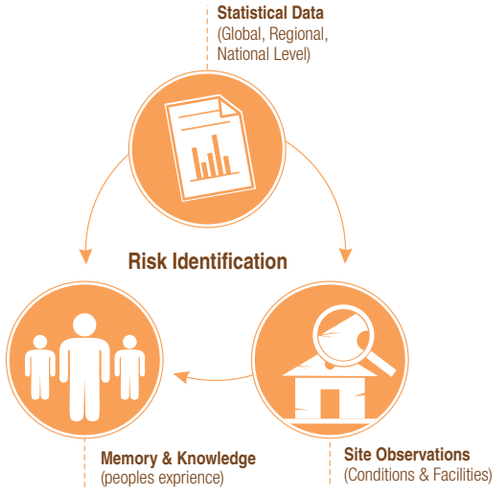
Identification of risks includes the following aspects:

- Establishing the values and significance of the site.
- Geographical, hydrological, meteorological and seismic data and other secondary information which may be applicable to a specific context.
- Historical data on previous disasters which may have affected the site or its surroundings.
- Detailed inventories of all information related to the site, its management and facilities, planning and infrastructure.
- First hand records of the site based on individual surveys and documentation.

Risk analysis builds upon risk identification and also takes into account various other issues such as the safety of visitors and local residents.

Risk analysis includes the following aspects:

- Listing all the natural and human-induced hazards that could potentially have an adverse impact on cultural heritage. This would link to the identification of risks covered in the previous section.
- Identifying the issues which when combined with potential hazards could cause a disaster risk to the site. These may be issues of site management, physical conditions of the site and/or buildings and movable objects, underlying social and economic issues, etc.
- Analysing the 'cause-effect' relationships between various primary hazards and underlying risk factors that increase the property's vulnerability and expose it to disaster risk.



The risk identification process
Source: Rohit Jigyasu

Risk identification and analysis may be undertaken at:

- Heritage site level
- Individual heritage building level
- Urban level

In the case of World Heritage Sites, this may also be considered at the core zone and buffer zone levels.

Constructing Disaster Scenarios

The next stage of the risk assessment process involves developing possible disaster scenarios for a heritage site. Scenarios are framed on a series of assumptions which are derived from the information gathered in the risk identification and analysis stages. The development of alternative scenarios helps in assessing different possibilities and their potential impacts on heritage resource components. Scenarios should be detailed as a sequence of events with cause-effect relationships. While the exercise itself involves a fair bit of speculation because of the different variables involved, the issues which are highlighted in the process can be addressed effectively in the disaster risk management process. Following the evaluation of disaster risks identified for a cultural heritage site is the prioritisation of risk mitigation strategies. As the concluding section of this module, there is a need to link this section with the next module which addresses prevention and mitigation strategies in detail.

Disaster scenarios would need to consider the following factors or variables:

- ***The hazard.*** Disasters can be the result of a single extreme primary hazard or a secondary hazard. For instance, an earthquake would be a primary hazard, but a resultant fire would be a secondary hazard.
- ***Vulnerabilities of the site in question.*** These can be identified in the risk analysis process.
- ***Potential impact of the disaster.***

Key References

FEMA. Region II Hazard Mitigation Plan Tool Kit: Risk Assessment. Washington DC, Federal Emergency Management Agency. Available at http://www.fema.gov/about/regions/regionii/toolkit_risk.shtm

Jigyasu, R., (2010). Risk assessment of world cultural heritage: tools and methodology, presented in Risk assessment in heritage: a need or a luxury? Conservation Institute (IC) of the Faculty of Engineering of the University of Porto (FEUP), Portugal.

Teaching Strategies

Depending on the scale of the course participants may focus on risk analysis at the urban, site or object level. A combination of presentations and workshops may be used for this section to explain the theoretical and mathematical aspects of risk analysis.

Core Lecture

The role of risk assessment for disaster risk management should be emphasised for participants in this lecture. It is possible to combine all the sections of this module in a single introductory lecture, and then elaborate each step using thematic lectures. Assessing values of heritage sites and property should be illustrated through examples and references from international charters and approaches, introduced in the previous module. Detailed lectures may help in exploring specific techniques of risk assessment and behavior of structures in case of a disaster resulting from specific hazards such as earthquakes, cyclones etc.

Thematic Lectures with Secondary Case Studies

Individual steps in risk analysis depend greatly on the scale and nature of the site and the types of hazards being addressed, so at this stage in the course, thematic focus becomes fairly significant. Thematic lecture presentations could potentially be

linked with secondary case studies building upon the application of analysis methods to actual heritage buildings or sites.

Primary Case Study

Participants working on a primary case study through the length of the course or though the length of this module could use this opportunity to begin the process of risk assessment on their own with the assistance of the instructor. This could be in the form of independent study groups or discussions or be linked with a workshop combining the content of the various sections of this module.

For instance, the previous module introduced the various terminologies of the disaster risk management process and their relationships through a workshop. Those concepts could be linked with the content of this module to integrate workshops based on a primary case study.

Participants' Case Study Project

In case participants are working on individual or team projects of their own selection, they may be given initial assignments based on the material they have gathered prior to the course. Formats and worksheets may be given to participants to initiate this process.

Image Ref. 3.11
Participants making observations of risks on site in Kathmandu, International Training Course 2011
Source: RitsDMUCH

Primary Case Study Example

For Risk Assessment used in RitsDMUCH Training Course Series
World Heritage Site of Kiyomizu-dera

Background

Kiyomizu-dera officially Otowa-san Kiyomizu-dera, is a temple of the Northern Hosso sect of Buddhism located in Higashiyama, Kyoto. The temple's origin dates back to 778 AD and it has a long history of disaster followed by reconstruction. The Kiyomizu-dera , a traditional Japanese wooden structure, has no nails or metal devices to assemble its columns and beams. The temple is located within historic preservation district of Sanneizaka

The case of Kiyomizu-dera was used to illustrate all the stages of the risk assessment process by taking into consideration the core area of world heritage and its buffer zone (including Sanneizaka preservation district). This case study was explored through lectures, focusing on treatments and analysis techniques utilised on site as well as an illustration of the methodology of risk assessment. The workshops, which involved participants visiting the site, formed the primary part of this exercise. The workshop aimed to introduce the participants to the analysis of the complexity of a disaster situation in terms of multiple cause-effect relationships. Specifically, it illustrated the basics of dynamics related to the earthquake response of the structure and helped explain the seismic performance of a traditional timber structure, and how it could potentially be strengthened against conceivable risks.

Image Ref. 3.12
A view of the site
Source: RitsDMUCH

Site Visit

Risks Identification and Analysis at World Heritage Site in Kiyomizu-dera Temple, Site Visit 1, 2011
Instructor: Noriyoshi Tsuruoka (Introduction to the site), Rohit Jigyasu (Introduction to the Workshop) | Duration: 120 minutes

This site visit and workshop was conducted in Module 1 to introduce the terminology of hazards, vulnerabilities and disaster risks Through this workshop the participants also learned to identify risks based on site observations and subsequently analyse them as causes and effects. In this module, the instructors again reflect on the activities organised as part of this workshop as an essential part of the risk assessment process.risks.

Performance of Historic Masonry Structures, Lecture 6, International Training Course, 2010

Instructor: Aiko Furukawa | Duration: 60 minutes

Using secondary case examples of structures in Nepal, the instructor explained the structural behaviour of masonry and how it could be used to predict building behavior in the event of an earthquake. Various experimental systems and theoretical framework were highlighted through this lecture.

The following aspects were covered:

- Identification of risks to masonry structures by evaluating their possible behaviour during a disaster event such as an earthquake.
- Measurement techniques such as elastic wave velocity measurement, static loading test and micro-tremor observations.
- Evaluation of dynamic behaviour of buildings using modelling techniques.

The purpose of the evaluation system was to make guidelines on disaster mitigation of cultural cities in earthquake zones. The investigation of dynamic behaviour by micro-tremor observations was examined, where the micro-tremor sources could range from human activity to natural phenomena. The natural frequencies and damping ratio of the selected building was estimated. The detailed analysis method for masonry may be carried out through Finite Element Method (FEM) (continuum) or Discrete Element Method (DEM) (discontinum) methods. The refined DEM method was then illustrated as an applied technique to a historic masonry building in Nepal.

Image Ref. 3.13
Measurement of a single brick
Source: Junji Kiyono

Image Ref. 3.14
Measurement of brick wall
Source: Junji Kiyono

Image Ref. 3.15
Material strength was also estimated by static loading test. Shear loading test
Source: Junji Kiyono

Image Ref. 3.16
Material strength was also estimated by static loading test. Shear loading test
Source: Junji Kiyono

Image Ref. 3.17
Mictotremor observation device
Source: Junji Kiyono

Image Ref. 3.18
Free vibration test
Source: Junji Kiyono

Seismic Performance of Japanese Historical Structures, Lecture 6, International Training Course 2011

Instructor: Kazuyuki Izuno | Duration: 60 minutes

This lecture presented an introduction to assessment techniques, investigation into past history of risks and disaster and examination of methods used to assess damage to the structure. It discussed various methods of inspection, the use of simple nondestructive deterioration testing methods in the case of Kiyomizu-dera and subsequent analysis of seismic performance. Kiyomizu-dera also served as the primary case study for the rest of the module, so the lecture directly linked to the site visits and workshops.

The instructor went into detail into some methods of inspections, such as X-Ray inspection, applying a simple electromagnetic radiation method to find internal damage of the wooden columns etc. The successive stages of risk assessment were also briefly discussed through the example of the Kiyomizu-dera Temple. The session concluded by highlighting the need to carefully assess and mitigate risks at the site.

Image Ref. 3.19
Electromagnetic radiation inspection at Kiyomizu-dera Temple
Source: Kazuyuki Izuno

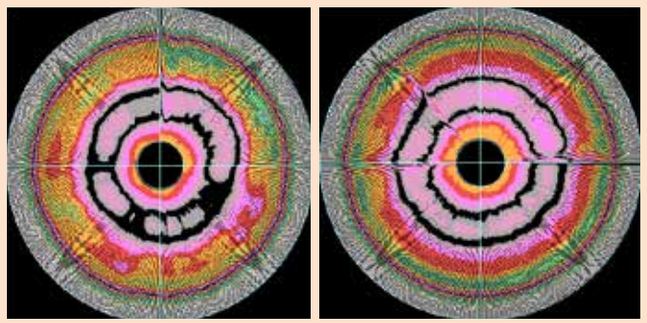


Image Ref. 3.20
Electromagnetic radiation inspection mapping. The reflected signal level from the void space was weak (black part) compared to the reflection from a healthy section.
Source: Kazuyuki Izuno

Sample Lecture

Risk Identification at Historic Urban Area Level (also buffer zone of the World Heritage Site of Kiyomizu-dera Temple) Introducing Community Engagement through the Disaster Imagination Game, Lecture 4, ITC 2011

Instructors: Takeyuki Okubo (and Hidehiko Kanegae) | Duration: 120 minutes

As a result of this session, participants were able to learn about the process of conducting workshops for citizens' participation and practice these techniques within the context of their own regions and country. They went on to make detailed hazard maps from the viewpoint of local communities and those who live in the sites.

"Disaster Imagination Game (DIG)" is one of the methods that can be used in a workshop, to discuss regional problems and possible solutions regarding disaster mitigation, or to evaluate the ongoing framework. There are three basic steps in this game. Some other gaming techniques and strategies targeted for general participants including school children, were also introduced as part of this session. Role playing games where volunteers take up roles of victims and rescuers were explored through the exercise introduced in the lecture.

Image Ref. 3.21
Community exercises through disaster imagination games and other training exercises
Source: Takeyuki Okubo

Image Ref. 3.22
Instructor introducing the site to participants using a detailed map. Secondary information was also circulated through the lecture and other handouts.
Source: RitsDMUCH

Primary Case Study Example

Disaster Imagination Workshop. Site: Kiyomizu-dera Temple and the surrounding Sanneizaka Preservation District, Site Visit and Workshop, Workshop 2 and 3, ITC 2011

Instructor: Takeyuki Okubo

This workshop format was introduced through a lecture by the same resource person (described previously). Participants were then taken on another site visit to the historic district of Sanneizaka

- Participants were presented the scenario of a serious earthquake which led to a fire in the Sanneizaka Preservation District.
- Participants were asked to mark the properties/areas of concern in the scenario and describe potential damage to the area due to earthquake based on risk identification undertaken through site inspections and secondary information collected from various sources such as hazard maps.
- They prepared a risk map of the historic area based on the above findings. They detailed the scenario, and identified the potential source and cause of this fire.
- They analysed ways of sheltering heritage buildings from fire, salvaging the artifacts from the buildings and mapped their analysis.
- Each group then made a detailed presentation, which was followed by a discussion.
- The outputs for this workshop were a risk map of the historic urban areas based on disaster imagination game as well as a map showing the strategy for fire prevention and presentation of arguments.

Image Ref. 3.23
A view of the site
Source: Kazuyuki Izuno

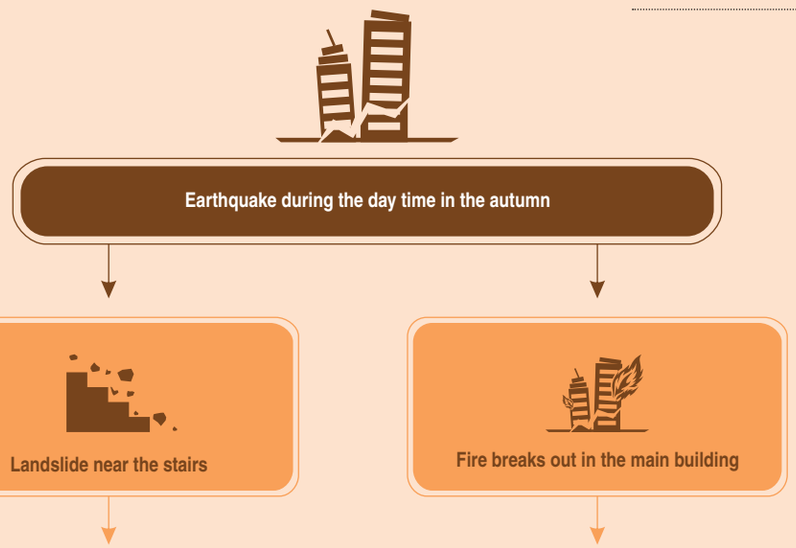
Image Ref. 3.24, 3.25
Participants mapping out their analysis on a site map of the district (Legend alongside)
Source: RitsDMUCH

Constructing Detailed Disaster Scenarios at Kiyomizu-dera Temple and its Surroundings

Scenarios prepared by Participants of 2011 RitsDMUCH ITC (Cheryl Nichols, Remigius Kigongo, Janhwij Sharma)

Disaster Scenario presented
HAZARD: Earthquake
Magnitude: 7.5 on Richter scale
Duration: 30 seconds and several aftershocks later
Time: 21 July, 2012 (Saturday; 12:25 pm)
Occupancy: 1227 people (within temple)
16,284 residents (within buffer)

Image Ref. 3.26
Participants presenting their work.
Source: RitsDMUCH



Some of tourists on the platform of the Main hall are fell down and got injured. Other tourists panicked and did not know how to get out of the site and evacuate the area. The gate to access the main hall was crowed by people. The stairs were blocked by stones. The monks and management staff tried to save the main hall from fire that started following the earthquake but they could find the efficient equipment and enough water to control the fire. After half hour the fire fighters arrived. They could not get close to the mail hall. As a result, the main hall got significantly burnt thereby damaging an important cultural asset of Japanese people

Tools for Risk Analysis at the Urban Level

GIS for Disaster Management of Historical City, Kyoto. Lecture 11, International Training Course 2011
Instructor: Keiji Yano | Duration: 80 minutes

The objectives of this session were to enable participants to understand the nature of the spatial data available and the techniques of spatial auto-correlation, sampling, and interpolation, as well as how to comprehend GIS-based visualisations that allow users to retrieve recorded information and understand the significance of GIS tools for the purposes of disaster risk management.

Secondary case examples from Kyoto were used to show how disaster simulation exercises could be conducted virtually to evaluate risks and prioritise mitigation strategies.

This instructor illustrated various scientific methods used to retrieve relevant information from spatially referenced data for the purposes of disaster management. The session was designed to elucidate concepts of GIS with examples, with their focus on the earthquake, tsunami and nuclear crisis, facing Japan since 11 March 2011. The instructor also introduced GIS databases of the historical city of Kyoto, created by Japanese public and private sectors.

The key result of this GIS database of Kyoto in the Virtual Kyoto Project was the possibility of running various simulations related to disasters. As a case study, a simulation to evaluate how accessible cultural heritages would be when an earthquake hits the City was undertaken. In order to predict the accessibility accurately, a simulation model was constructed to estimate detailed attributes of each building by combining multiple data sets, and then simulate if the buildings would collapse at the time of earthquake, and if so, how. The result revealed that, due to building collapse, 8 percent of cultural heritage sites would become totally unreachable, and that another 8 percent would have only 20 percent accessibility. In other words, approximately 20 percent of all the cultural heritage sites are at high risk of being damaged by earthquake-related fire. This result highlighted the urgent need to devise disaster mitigation strategies such as fire extinguishers on site. Through this exercise it can be seen that GIS tools are of immense significance to analysing potential risks to a site based on historical data, geographical attributes and geo-spatial monitoring

References:

Longley, P. A., Goodchild, M. F., Maguire, D. J. and Rhind, D. W. (2010). Geographic Information Systems and Science (Third Edition), Wiley.
Yano, K., Nakaya, T. and Isoda, Y. (2007): Virtual Kyoto: Exploring the past, present and future of Kyoto, Nakanishiya.
Yano, K., Nakaya, T., Isoda, Y. and Kawasumi, T. (2008): Virtual Kyoto as 4D-GIS. 71-88, in Lin, H. and Batty, M. eds. Virtual Geographic Environments, Science Press.
Yano, K., Nakaya, T., Isoda, Y., Takase, Y., Kawasumi, T., Matsuoka, K., Seto, T., Kawahara, D., Tsukamoto, A., Inoue M. and Kirimura, T. (2008): Virtual Kyoto: 4D-GIS comprising spatial and temporal dimensions, Journal of Geography 117-2, 464-478.
Yano, K., Nakaya, T., Kawasumi, T. and Tanaka, S. (2011): Historical GIS of Kyoto, Nakanishiya.
(http://www3.RitsDMUCH.jp/anshinanzen/main.html)

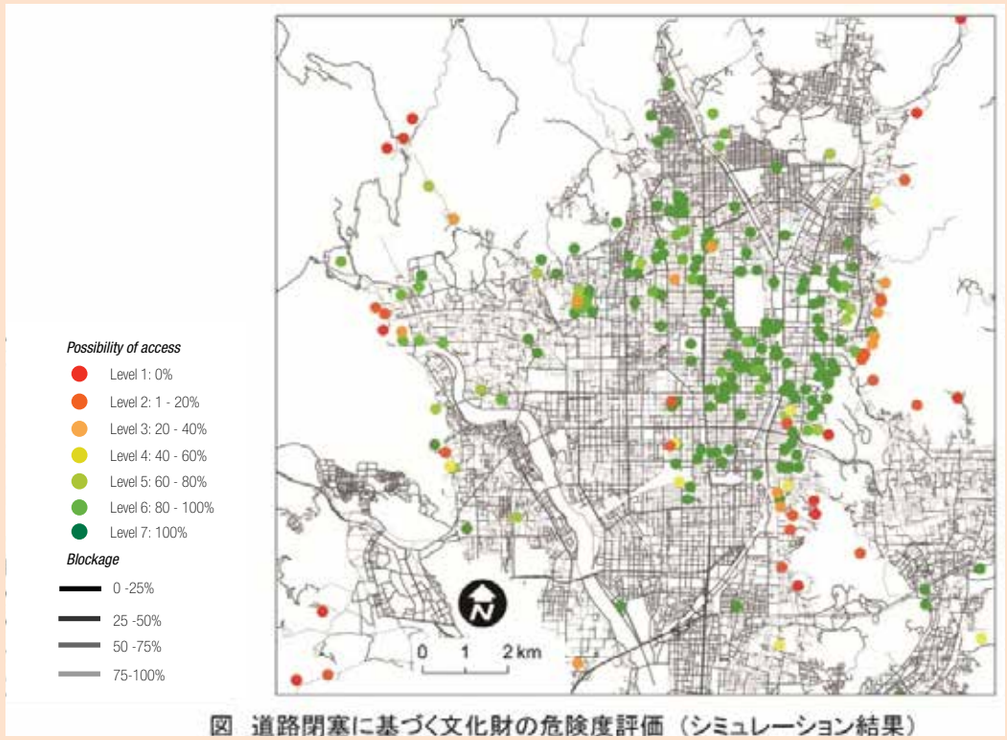


Image Ref. 3.27
Evaluation of accessibility to cultural heritages in road blockade caused by earthquakes.
Source: Chihiro KAMEI, Kazumasa Hanaoka and Tomoki Nakaya, Accessibility to cultural heritages in road blockade conditions caused by earthquakes, road blockade simulations based on estimated age and structure of buildings. Theory and Applications of GIS, 2009, Vol. 17, No.1, pp.73-82.
(http://www.gisa-japan.org/dl/17-1PDF/17-1-73.pdf)

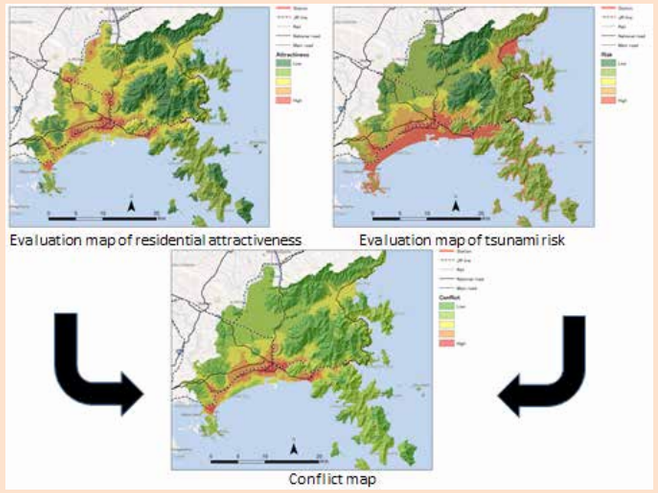


Image Ref. 3.28
Disaster risk mitigation for the reconstruction plan of Ishinomaki city.
Source: Keiji Yano

Participants' Case Study

Project: Kulangsu, Amoy, China

Participant: Qing Wei, 2010
Specific Aspect highlighted: GIS Tools for Risk Analysis

Kulangsu, is a unique amalgamation of influences and is representative of several different international cultures owing to its history and development. The narrow streets, together with the architecture of various styles from around the world, give the island a unique appearance.

The participant, Qing Wei undertook a detailed risk assessment of the site, documenting the history of Kulangsu. Kulangsu has an extensive history of typhoons and earthquakes, with over 180 typhoons in the past 50 years. It has also witnessed several fires, with over five in the past three years.

The participant then went on to list the vulnerabilities based on this research. Significantly he illustrated how the risks applicable to the site could be plotted using GIS mapping systems. Thus, the risk of fire to certain areas could be overlapped with identified safe places within the town using GIS mapping technology. This technique could be used extensively to communicate risks to a larger audience.

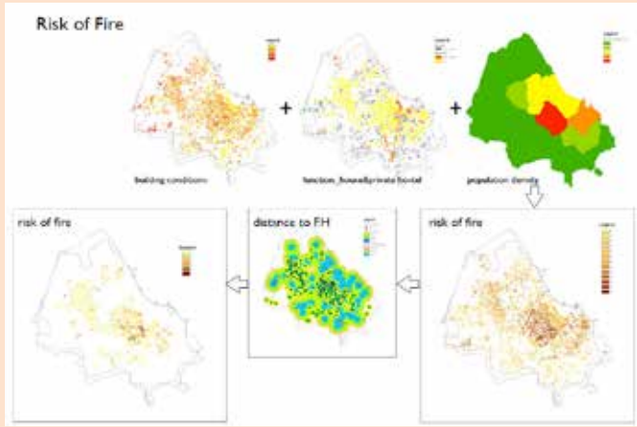


Image Ref. 3.29
Overlapping maps for identifying risks of fire to the site.
Source: Qing Wei

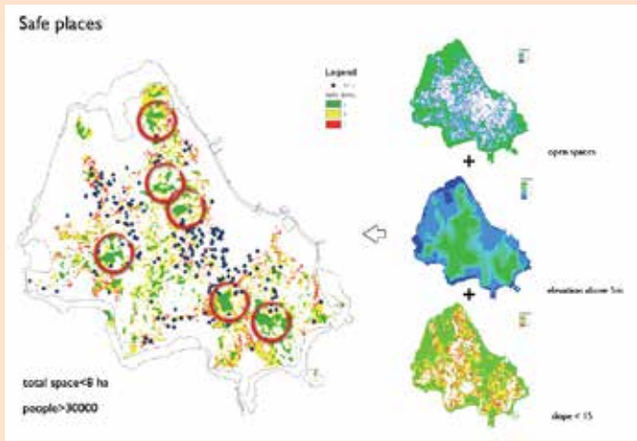


Image Ref. 3.30
Overlapping maps for identifying safe areas in case of a disaster
Source: Qing Wei

Evaluating Disaster Scenarios for Prioritisation

Summary of Content

Evaluation of disaster risks based on the following criteria:

- The possibility of a particular disaster scenario occurring, which range between high, medium and low.
- The severity of the consequences of the disaster scenario, on the site, its individual components, visitors and local stakeholders and other potentially irreversible impacts such as the loss of intangible heritage values, economic impact and other concerns. Consequences can also be rated from catastrophic or severe, mild, gradual or no consequence.
- The level of risk to the site for a particular scenario is assessed vis-à-vis the possibility, severity of consequence on people, lives and livelihoods, and potential loss of values.

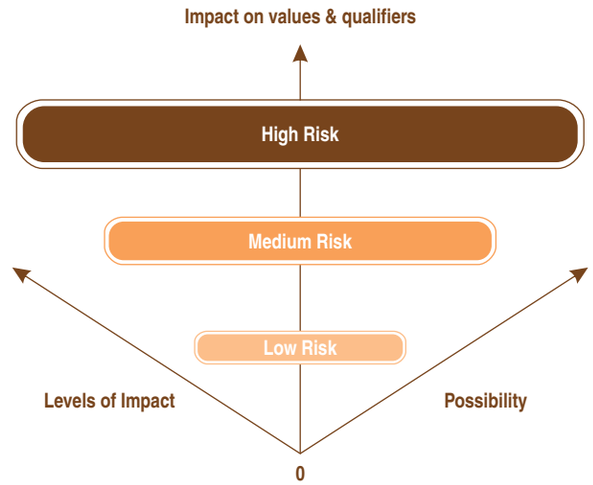
For instance, a flood in a heavily populated historic city with a high density of cultural heritage sites would represent a low probability scenario, but one with high physical, social and economic consequences and hence represent a high level of risk. The same flood in a sparsely populated region would represent a low level of risk because of its decreased impact on physical, social and economic factors.

Prioritising risk mitigation options based on essential considerations:

- Effect of a proposed strategy on risks from each and every hazard.
- Cost / benefit associated with both implementation and maintenance stages. This is linked to the availability of human and financial resources.
- Effect of a proposed strategy on risks to one heritage component at the cost of reducing risk to another component, visitors/staff or the environment would also need to be considered.

Additionally, the following issues could be discussed:

- Linking other stages of the disaster risk management process with the assessment stage in order to be able to effectively communicate risks through a plan.
- Significance of citizen participation for developing a comprehensive disaster risk management plan.
- Tools for communication of risk assessment to enable citizen participation.



Graphical representation of evaluation of risks.
Source: Rohit Jigyasu

Teaching Strategies

This stage of the module is best disseminated through the primary case study and the participant case study project, carrying forward the learning of the previous sections. An introductory lecture and secondary case examples may be used for this section in conjunction with the other sections or as a single overview lecture which also introduces the methodology of the next workshop.

Primary Case Study

The primary case study format continues from the previous two sections. The exercise through which participants had familiarised themselves with the site and analysed the risks applicable, now enter into the next stage of the exercise. The pedagogical strategy of 'Learning by Doing' is designed to make participants conversant with practical techniques and approaches, which they are likely to retain in their memories for a long period of time.

The instructor will also use this opportunity to emphasise the collection of appropriate data/information that would help in analysing probability and impact. For this he/she may revisit the data collected by participants for primary case study site during previous workshops conducted for risk identification, analysis and scenario development.

Utilising data for analysing hazard probability

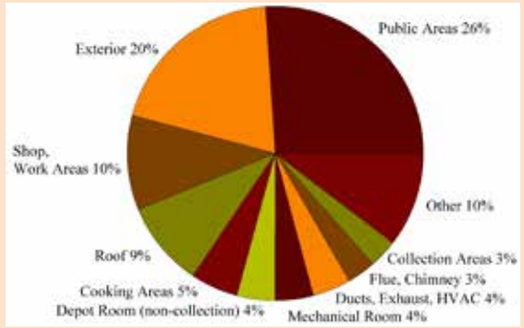
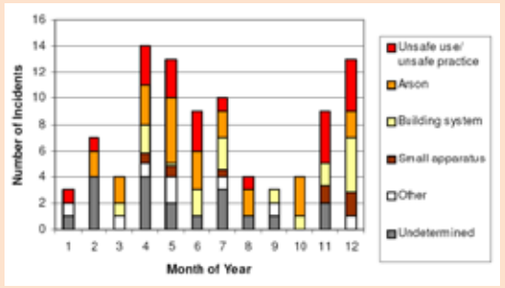


Illustration of a secondary example used to show how data collection can be used to determine probability as part of risk assessment (Rohit Jigyasu, Lecture, ITC 2011 illustrating Stefan Michalsk's study on the probability of occurrence of fires in museums in Canada, from the Canadian Conservation Institute)

Fires in Museums in Canada



According to the secondary and primary data collected:
Fires happen: 55% when museum is open and 45% when closed.
Arson happens: 58% when museum is open, 42% when closed.
97% of fires start outside storage and exhibition rooms

Sample Workshop

Evaluating Risk Levels, Workshop 4, International Training Course 2011

Instructor: Rohit Jigyasu | Duration: 120 minutes

The primary case study was concluded in a workshop where participants used their assessment of the disaster scenarios to assess severity of risks and discuss with the instructors, the severity of impact as well as what possible mitigation measures could be undertaken.

At this stage, detailed worksheets were distributed amongst participants who listed various considerations. Evaluation of risks as low, medium and high is done by participants. Each participant was asked to rank probability, consequence on life and consequence on heritage values at 1, 2 or 3 (from low to high). They were given scorecards that were then used by the lecturer to aggregate scores from low, medium to high risk levels. This workshop could be linked to the risk identification and analysis stage. The instructor can emphasize the collection of the right kind of information/data from primary and secondary sources.

Sample formats used by participants

At the end of the workshop, the instructor facilitated an evaluation of the three scenarios presented by the groups through a scoring game. Each participant was asked to score probability and consequence and a commonly agreed on score was arrived at through discussion.

Worksheets Circulated:

Note the specific disaster risk to the site in one sentence. What are the potential sources/ hazards?

What are the assumptions regarding the vulnerability of the site?

Explain the chain of events for this specific disaster: from causes to the effects. What management systems are in place? What is missing?

Note: This will be based on participant assumptions

How probable do you think this event is for the site? What data can you provide to justify your decision?

LOW/MEDIUM/HIGH

What will be the damage to various elements in the site? Will the whole site be affected or just a part? Could you tell which attributes of the site will suffer damage and to what extent?

CATASTROPHIC/MILD/GRADUAL/NO CONSEQUENCE

What does this damage means in terms of loss in values for each attribute? How do these aggregate to the loss of significance of the site as a whole?

TOTAL/SIGNIFICANT/MODERATE/MINOR

What is the level of risk for this specific scenario?

EXTREME/HIGH/MODERATE/LOW

Options	**Disaster Scenario**	**Possibility** *(low/medium/high)*	**Which Attribute /Aspect of Site would be impacted?**	**Severity of Impact** *(catastrophic/severe/mild/gradual)*	**Potential loss of value /qualifiers** *(total / significant /moderate / minor)*	**Level of Risk** *(Extreme / High / Moderate / Low)*
Option 1						
Option 2						
Option 3						

The risk evaluation will help in prioritising risk mitigation actions. However this aspect will be dealt in the subsequent module.

3.3 Prevention and Mitigation

General Teaching Strategy for the Module

In the previous module the fundamentals of risk assessment of cultural heritage at different scales were explained to the participants. The next stage of the disaster risk management process, and within the course, is to address these risks and minimise them through a series of strategic actions. The link between this module and the previous one needs to be emphasised strongly to the participants through a cohesive pedagogical strategy that correlates risk assessment with prioritisation for risk mitigation strategies. At the same time, it is important to keep in mind that the disaster risk management process is a sequential and cyclic series of steps. In this particular module, as in the previous module on disaster risk assessment, the overall theme of the course becomes especially significant, as it determines not only the specific kind of hazard(s) being addressed, but also the scale and nature of cultural heritage for which mitigation strategies need to be identified.

This module should cover the following aspects of reducing disaster risks to cultural heritage:

- Various approaches for risk prevention and mitigation
- Measures and techniques for risk prevention and mitigation
- Preventing/Mitigating disaster risks from specific hazards (Dependent on the hazards relevant to theme of the course)
- An overview of various natural and human induced hazards and the different strategies applicable to various situations depending on the characteristics of the region in which the site is located. This content would need to respond to a thematic focus or give a broad overview of the kinds of approaches applicable to a wide range of hazards such as earthquakes, floods, tornados etc.
- Risk reduction strategies for different kinds of cultural heritage. Depending on the typology, scale and physical condition of cultural heritage and resulting vulnerabilities to various hazards, risk prevention/mitigation strategies would differ widely. This needs to be taken into consideration while planning the course.

In the International Training Course organised by RitsDMUCH series, which lasts for two weeks, this module generally takes 2-3 days and is often combined in the form of lectures and workshops with the module on Risk Assessment as well as the module on Emergency Preparedness and Response.

9/12(Wed)	9/13 (Thu)	9/14(Fri)
Risk Assessment	**Mitigation (Earthquake, Landslides and Floods)**	**Fire Prevention and Emergency Preparedness**
DMUCH	*DMUCH*	*Ninna-ji* *DMUCH*
9:30-10:00(30) Case Study PJ (Resource Persons)	9:30-10:00(30) Case Study PJ (Resource Persons)	
10:00-11:10(70) Lecture 6 Ecology and Sustainability of Historic Urban Areas (S. MOFFATT)	10:00-11:10(70) Lecture 9 GIS (Geographic Information System) for Disaster Management of Historical City, Kyoto (YANO)	9:30-10:40(70) Lecture 13 Dynamic analysis of Earthquakes and Seismic Performance of Japanese Historical Structures (IZUNO)
11:30-12:40(70) Lecture 7 Disaster Mitigation and Integrated Planning of Historic Cities' (S. MOFFATT)	11:30-12:40(70) Lecture 10 Flood prevention and Mitigation Techniques (SATOFUKA)	10:50-12:00(70) Lecture 14 Disaster Prevention for Cultural Heritage in Kyoto City (Kyoto City FD)
Lunch	Lunch	Lunch
14:00-15:10(70) Lecture 8 Introduction to the Integrated Methodology for Assessing Risks (JIGYASU)	14:00-15:10(70) Lecture 11 LANDSLIDE, Prevention and Mitigation Techniques (FUKAGAWA)	To Ninna-ji 13:30-15:30(120) Site Visit 3 World Heritage Site Fire Prevention Facilities at Ninna-ji Temple (OMORI)
15:30-17:00(90) Workshop 3 Building a Disaster Risk Scenario and Assessing Risk Levels (S. MOFFATT)	15:30-16:30(60) Case Study PJ (Resource Persons)	To DMUCH
17:00-18:00(60) Case Study PJ (Resource Persons)	15:50-17:00(70) Lecture 12 Performance of Historic Masonry Structures (FURUKAWA)	16:00-18:00(120) Case Study PJ First Half Presentation (Resource Persons)
Kyoto	*Kyoto*	*Kyoto*

An excerpt from the timetable of the International Training Course organised by RitsDMUCH in 2012, explaining how Module 3 can be structured with presentations and site visits and combined with lectures from Module 2

Approaches for Risk Prevention and Mitigation

Summary of Content

This section focuses on the various approaches and methodologies for preventing and mitigating disaster risks to cultural heritage. This generally involves one or more of the following approaches

- ***Prevention of hazards:*** Eliminating the source of risk, for instance preventing theft or arson by ensuring security and monitoring of the site.
- ***Mitigation of impact of hazards:*** In cases of unavoidable hazards, for instance, meteorological hazards that include heavy rainfall leading to floods or landslides, tornadoes etc., proactive measures may be undertaken to mitigate the impact of the risk.
- ***Reducing vulnerability of cultural heritage:*** Cultural heritage can be supplemented with robust planning and interventions to reduce its vulnerability to certain kinds of hazards. For example, in the case of earthquakes, structural strengthening of a historic building is possible to ensure its resistance to seismic forces.
- ***Capacity building:*** At each stage of the disaster risk management process, community engagement should be highlighted taking into account varying perceptions of the different stakeholders.

Key aspects to be introduced and discussed

- ***Strategic level mitigation:*** Urban and regional planning measures in and around the cultural heritage site. Planned measures need to be integrated with other existing planning frameworks.
- ***Physical planning measures for mitigation:*** Integrating mitigation strategies within the management of the property and clearly defining buffer zones.
- ***Technical measures for protecting the site*** from the impact of specific disasters.
- ***Using traditional technologies.*** Traditional technologies as opposed to modern scientific techniques of risk reduction

Image Ref. 3.31
Capacity building exercises as a major component of risk reduction. Seen here are residents practicing how to work with a hose to extinguish a fire.
Source: Takeyuki Okubo

should be discussed in detail along with illustrating the applicability of both depending on the context.

- Monitoring systems for mitigating risks. Monitoring and early response are effective mechanisms not only to reduce risk but also help in emergency preparedness (which follows in the next module of the course).
- Prioritisation of risk mitigation options considering effectiveness in regards each hazard present, cost to benefit ratio and the effect of reducing risk on one component on other components.

A policy of minimal intervention should be retained as much as possible; the values, authenticity and integrity of the cultural heritage should be considered while deciding appropriate mitigation measures. Reviews should be done periodically to the disaster risk management strategy to prevent any unintended impact of risk-reduction activities.

Teaching Strategies

Core Lecture

The instructor should explain the basic approaches included in mitigating risks, and how actions may be prioritised depending on various aspects of heritage vs. the impact of disaster and the potential for loss and damage. This should be in connection with the previous module on risk assessment. The instructor may emphasise one particular kind of hazard, and explain case studies which highlight related issues and concerns. The instructor should clearly communicate how cultural heritage can contribute towards disaster prevention/mitigation in various ways.

Thematic Lecture with Secondary Case Studies

Lectures which focus on how a certain approach, policy or strategy has been applied for risk prevention/mitigation may be used to emphasise exemplary approaches or even highlight gaps in existing planning for participants to understand how mitigation strategies fit within the overall disaster risk management and site management. At this stage the instructors may present secondary case studies. Potential site visits could also be introduced in the lecture.

Image Ref. 3.32
Participants of the International Training Course 2012 examining structural models to understand the behaviour of structures in earthquakes and how structures may be reinforced
Source: RitsDMUCH

Site Visits

Potentially, there is a lot of technical knowledge in this section that may be delivered to participants depending on their qualification and existing skill sets. Most of this content may be dealt with in the next section of this module (Reducing Disaster Risks from Various Hazards). However, some general approaches and policies for risk mitigation applicable to cultural heritage could be introduced through a site visit at this stage and then its technical aspects detailed in the next section. The site visit may be used as a basis for a workshop where course participants identify potential mitigation strategies.

Primary Case Study

In the previous module, workshops were designed to focus on assessing disaster risks to a cultural heritage site and creating possible disaster scenarios for detailed risk analysis. This series of workshops could be taken further in this module by using the outcomes of the previous workshop as a basis for providing strategies for mitigating risk. The workshops from previous sections and this module could be combined as a single primary case study based exercise or as series of separate workshops followed by discussions.

In case participants are working on a single running case study through the course, they may be asked by the instructor or coordinator to focus on prevention/mitigation strategies in this module. In that scenario, mitigation strategies can be developed with the assistance of the instructor or coordinator and discussed between participants. The worksheet/ handouts circulated by the instructor through the lectures and presentations could be used by participants as a resource.

Participants' Case Study Project

Participants may progress to the next stage within their selected case study projects, and identify possible approaches for risk prevention and mitigation. They may be helped in this process by resource persons and also through sample formats and worksheets.

Sample Lecture

Disaster Risk Management Policy for Cultural Heritage in Japan

Instructor: Akiko Umezu , International Training Course 12 | Duration: 80 minutes

The objectives of this session were to familiarise participants with the existing statutory frameworks for cultural heritage in Japan and emerging frameworks and policies for urban cultural heritage, with a specific focus on disaster risk management. The instructor introduced the Agency for Cultural Affairs in Japan. She also introduced the various statutory categories of cultural heritage from tangible to intangible cultural property, folk cultural property, cultural landscapes and historic precincts. Using case studies in Japan, she introduced the various steps involved in disaster mitigation at the planning level.

She highlighted the following key issues:

Most Japanese cultural properties make use of perishable, flammable organic materials that make them especially vulnerable to fire damage. Given the seismic activity in the area, the risk of fire as a result of earthquake is great. Therefore, disaster preparedness for cultural properties in Japan is mostly targeted towards fire preparedness and seismic resistance at this point.

The Japanese government has also begun working with property owners and local authorities to prevent arson attacks and fire damage due to negligence. It has also started working in collaboration with property owners to prepared comprehensive disaster management plans for heritage properties.

The following policies were discussed:

Fire disaster (arson), burglary and other natural disasters such as landslides, floods etc.

Since the 1897 Preservation Act for Old Temples or Shrines was enacted the fundamental policy for disaster risk has been fire prevention based on following strategies:

1. Prevention through alarm systems, automatic warning systems, lightning protection systems.
2. Early Detection: temperature detector, flame detector, fire control panel.
3. Early response: fire hydrants, water walls and drenchers, fire extinguishers, underground tanks, gravity tanks.

References : *http://www.bunka.go.jp/bunkazai/pamphlet/pdf/pamphlet_en_03_ver03.pdf*

Secondary Case Study Example

Traditional Urban Configuration Hierarchy of the Open Spaces of Kyoto City, Kathmandu Symposium, 2009

Instructor: Naoko Itaya

A secondary case example was used by the instructor to highlight how traditional urban configurations could assist in risk reduction. The city of Kyoto was used as a case study.

The importance of open spaces within the urban fabric was experienced during the 1995 Hanshin-Awaji Great Earthquake. Kyoto has 32 historic urban units called Cho in which the community still holds their festivals such as the Gion-Festival. These traditional urban units had many different categories of open spaces that formed soft and flexible areas that contributed towards the safety of inhabitants. By the 14th century, the merchants had settled in town houses called Machiya that faced the street with small gardens that served as private open spaces in the back. By the 17th century they needed to defend themselves and the communities organised themselves along streets called Tori. These tori were the semipublic open spaces for the cho. Contemporary urban planning in Kyoto has changed the structure of the city introducing wide roads and fireproof buildings that are 'solid' and 'hard'. The taller buildings are required by law to have setbacks, allowing for the streets to get wider; however there are no semi-public spaces. There exists a conflict between the traditional space structure and contemporary city planning in the historic urban areas of Kyoto. The experiences gathered during the 1995 Hanshin-Awaji Great Earthquake shows the importance of open spaces in reducing disaster risks.

Open spaces played various roles such as providing space for :

- Temporary accommodation tents.
- Rescue camps for medicine, water and others necessities.
- Storage for salvages objects.
- Sites for temporary houses.

The challenge faced today is how to protect historic urban areas by using modern techniques and city planning while at the same time utilising the soft and flexible configuration of the traditional historic urban areas.

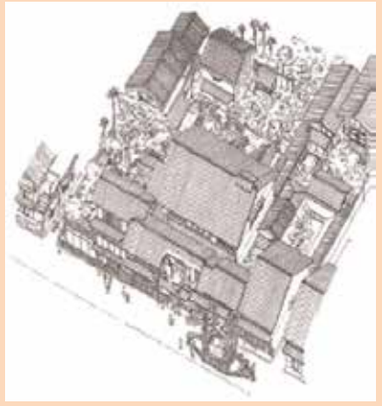


Image Ref. 3.33
Sugimoto Machiya House in Kyoto from Yamazaki, M. (1994), "Kyoto:Its Cityscape Traditions and Heritage", Tokyo:Japan, p63

Reducing Disaster Risks from Various Hazards

Summary of Content

This section details the approaches outlined in the previous section by focusing on their application in specific scenarios related to various hazards.

The various mitigation strategies include:

- Planning and management.
- Interventions for strengthening the structure/ objects or the surroundings.
- Monitoring and observation.
- Detection and early warning systems.
- Early response systems.

These strategies are presented for specific hazards that were introduced in Module 2 (Risk Analysis) and include physical interventions and the use of specific technologies, equipments and systems.

The strategies are tailored to respond to specific types of cultural heritage, namely, historic buildings, vernacular or traditional settlements, historic areas and precincts, archaeological sites, cultural landscapes and movable heritage.

Teaching Strategies

This section is best presented with a thematic focus, using lectures and case studies. A brief introductory matrix may be provided to participants outlining various hazards and their impacts. Detailed reading lists, technical pamphlets and resources as reference material should be circulated amongst participants

Thematic Lectures Using Secondary Case Examples

The instructor can illustrate mitigation strategies and their advantages and disadvantages through secondary examples. These lectures can be closely linked to actual site visits if possible.

Site Visits

The site visit can be used to explain strength and weaknesses of various mitigation strategies and various technologies that are being used in various heritage sites. Based on the site visit, a workshop may be organised for participants.

Primary Case Study and Workshops

The workshop should be designed to highlight relationships between specific hazards, cultural heritage and its components and mitigation strategies. It should be based on an actual site/ case study to ensure that participants are able to apply their theoretical understanding in a logical manner based on the identification of potential impacts of various hazards on cultural heritage. These could be based on the field observations in the workshop organised in the previous module on risk assessment.

Sample Matrix (Indicative only)

Heritage → / Hazards ↓	Historic Buildings	Vernacular or traditional settlement	Historic Areas or precincts	Archaeological Sites	Cultural Landscapes	Movable
Primary Hazards						
Meteorological						
Hydrological						
Volcanic						
Seismic						
Secondary Hazards						
Floods						
Fires						
Tsunami						
Mass movement						
Human induced Hazards						
Infrastructure failure						
War/ Terrorism						
Planning issues						
Arson or criminal activity						

Type of Mitigation Strategies for various Hazards

Hazard / Mitigation Strategy	Floods	Earthquake	Landslide	Fire	Tsunami	Tornado	Epidemic	Pollution
Planning and Management								
Interventions to Structure								
Interventions to surroundings								
Monitoring								
Detection and Warning								
Early Response								

Sample Thematic Lecture

Flood prevention and Mitigation Techniques, Lecture 11, International Training Course 2011

Instructor: Yoshifumi Satofuka | Duration: 80 minutes

As a result of this session, participants were introduced to the following concepts:

- Understanding of the types of floods that may occur in a country/ region.
- How to predict floods.
- How to mitigate the impact of a flood.
- How to protect historical buildings from the occurrence of floods.

The presentation highlighted through detailed diagrams and case studies the various types of floods as well as mitigation techniques. Diagrams are a simple graphical tool that helps participants retain the information introduced in the session.

The mechanism of a flood was explained.

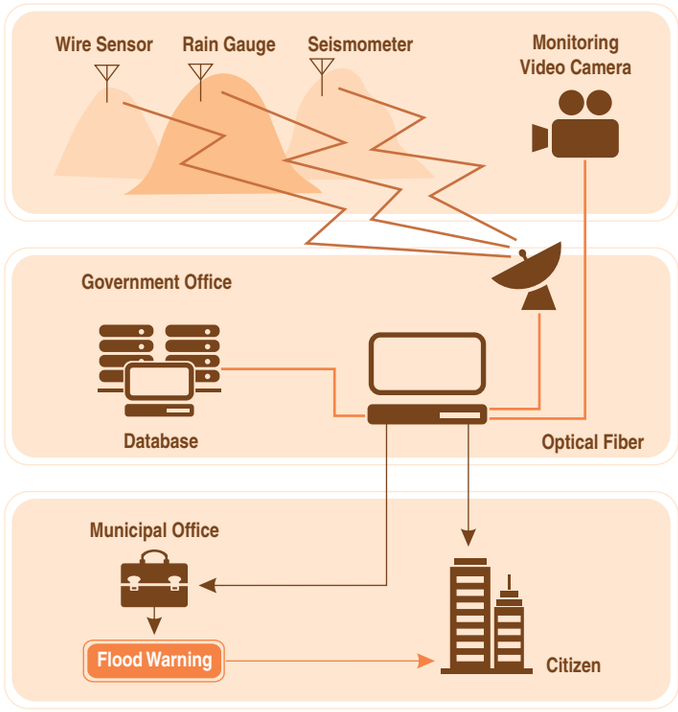
Heavy rainfall over an extended period of time is one of the leading causes of large-scale devastation in various areas. In Japan, the configuration of the ground is very steep and the levels of precipitation are exceedingly high. In the events of fast falling and large-scale precipitation, extensive damage has occurred in the past, and is likely to happen in the future as well. Debris flow is one of the most dangerous phenomena in Japan. There has been extensive damage to life and property in a single event during the rainy season or as the result of a typhoon.

Floods may be classified into the following categories:

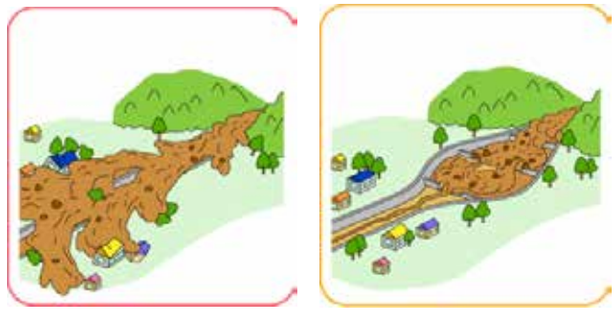
1. Flooding in a mild slope area.
2. Flooding in a steep slope area.

The various techniques to mitigate and prevent damage due to floods were listed:

1. Rainfall runoff control.
2. Flood control.
3. Drainage system development.
4. Land use regulation.
5. Anti-flood buildings and houses.
6. Hazard-maps and flood warning systems.



Monitoring systems for flood
Source: Yoshifumi Satofuka



Movement of soil as a result of heavy rainfall
Source: Yoshifumi Satofuka

Sample Thematic Lecture

Seismic Performance of Japanese Historical Structures, Lecture 6, International Training Course 2011

Instructor: Kazuyuki Izuno | Duration: 60 minutes

This lecture presented an introduction to assessment techniques, investigation into past history of risks and disaster and examination of methods used to assess damage to structures (discussed in Module 2). Based on detailed risk assessment techniques, the instructor also introduced mitigation processes for buildings to be able to resist seismic activity.

The successive stages of the risk assessment module were also briefly discussed through the example of the Kiyomizu - dera.

The session highlighted the need to carefully assess and mitigate risks at the site. He illustrated in detail the difference between static and dynamic ways of testing for seismic performance of buildings and also the advantages of dynamic analysis.

The three modes of disaster reduction for timber buildings in Japan were introduced, namely:

- Earthquake resistant design: Emphasis was laid on improving a building's ductility to resist seismic movement. The addition of stable truss structures, hoop ties and steel jackets was discussed as a possibility.
- Seismic isolation: Lead rubber bearings and high damping rubber bearing examples were illustrated. Historic examples of seismic isolation were also discussed.
- Vibration control: Various kinds of dampers which may be used to control vibrations of a building during an earthquake were discussed. The viscous type, hysteretic type and friction type of dampers were introduced.

Each mode was discussed in detail with several examples from buildings in Japan.

Image Ref. 3.34
Participants of the International Training Course 2012 examining structural models to understand the behavior of structures in earthquakes and how structures may be reinforced
Source: RitsDMUCH

Sample Lecture using Secondary Case Studies

Landslide Prevention and Mitigation Techniques, International Training Course 2011

Instructor: Ryoichi Fukagawa | Duration: 80 minutes.

Examples of slope failures and monitoring and recovery systems in Japan were highlighted by the instructor. Different conditions were explained, and priority based interventions for prevention, mitigation and recovery were listed. As a result of this session, participants were explained the characteristics of slope failures caused by earthquakes and heavy rainfall, typical prevention and mitigation methods for slope failures and be able to understand the advanced techniques for slope failure monitoring systems.

In Japan, natural disasters such as typhoons, heavy rainfall, and heavy snow have occurred because of geographical, topographical and meteorological conditions. Because of this there is a high risk from natural disasters due to earthquakes, heavy rainfall, and typhoons.

The following aspects of landslides were highlighted:

- Differences between a landslide and steep slope failure.
- Characteristics of slope failures caused by an earthquake.
- Important items used to evaluate the safety of a slope in an earthquake.
- Characteristics of slope failures caused by heavy rainfall.

Typical methods of prevention and mitigation for slope failures

Control and emergency countermeasures including methods to control the movement of the slope by changing the natural conditions of topography, soil properties, and underground water flow, amongst others, were explained.

Slope stability monitoring systems in Kiyomizu-dera-temple (this case study was also part of a site visit made by the participants making it easier for them to relate to information). The work that the Geo-hazard Research group of Ritsumeikan University, which has been conducting field measurements in Kiyomizu-dera-temple in Kyoto was described briefly.

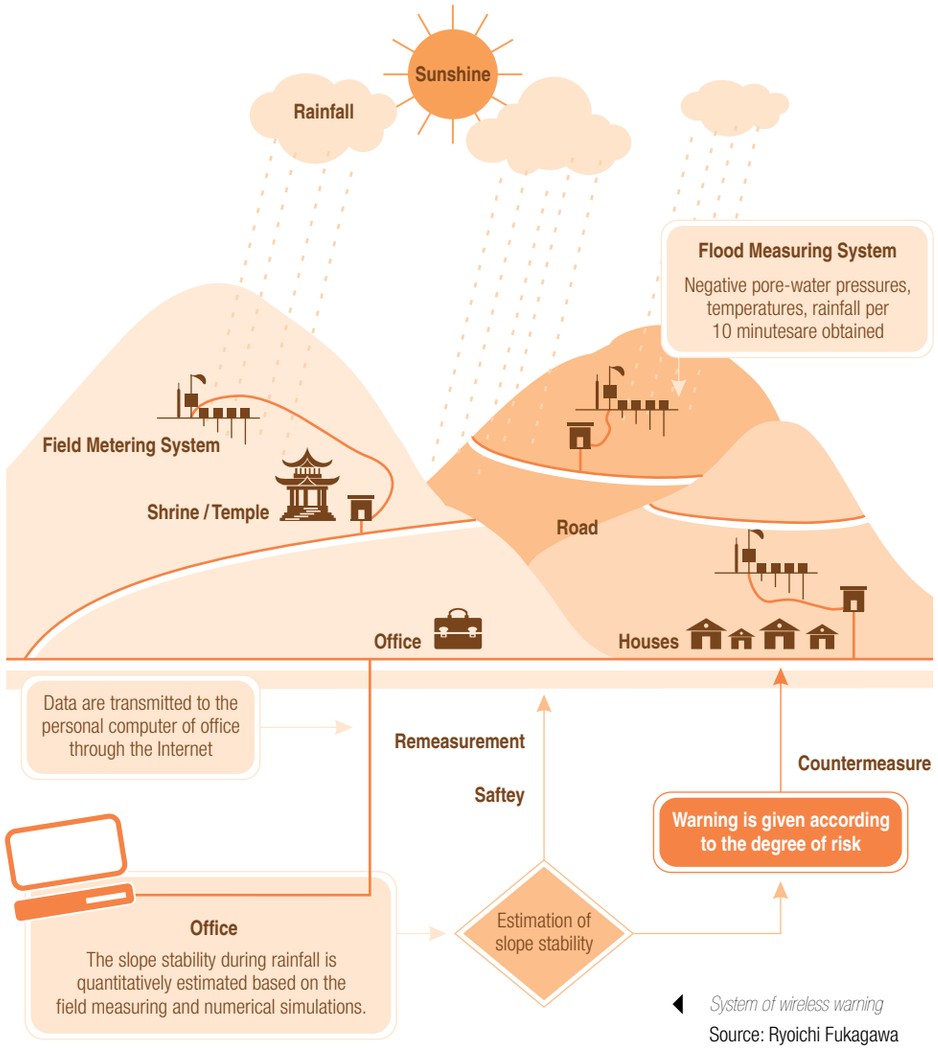
Stone wall damage investigation of Sendai Castle caused by the Great East Japan Earthquake.

Field investigations have been carried out on damage to the stone walls of Sendai Castle caused by Tohoku-Taiheiyooki-Earthquake. The field investigations were conducted by mainly NSWS in-situ testing device, which is an improved device of the Swedish sounding test, and a three-dimensional laser scanning system.

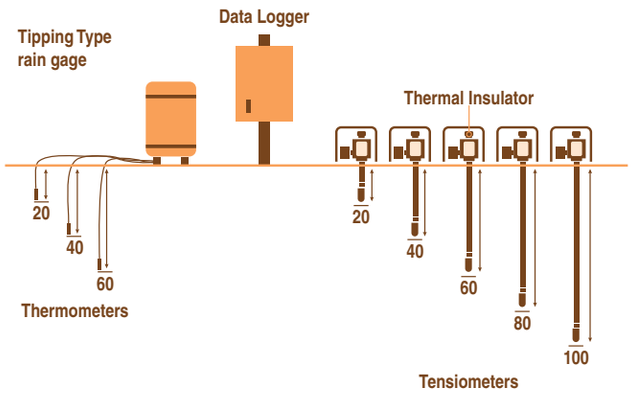
Investigation of debris flow causing heavy damage to Kumano-Nachi-Taisha during Typhoon No.12 in 2011.

The secondary case example of typhoon No.12 in September 2011 was also used to illustrate slope analysis techniques. The typhoon caused severe damage to Kumano-Nachi-Taisha, one of the most significant shrines in the country. The shrine and its surrounding areas experienced record rainfall and the heavy rainfall resulted in the rush of debris flow and the failure of steep slopes. One of the debris flows damaged the Kumano-Nachi-Taisha. The geo-hazard group investigated the debris flow, especially the mechanical profile of the top, and carried out slope stability analysis using different technologies.

Reference: *Kazunari Sako, Ryoichi Fukagawa and Tomoaki Satomi (2011) Slope monitoring system at a slope behind an important cultural asset, Journal of Disaster Research, Vol.6, No.1, , pp.70-79.*



System of wireless warning
Source: Ryoichi Fukagawa



Schema of slope failure monitoring system used in Kiyomizu-dera temple.
Source: Ryoichi Fukagawa

Image Ref. 3.35
NSWS, new in-situ testing device, used in Sendai-jyo-castle
Source: Ryoichi Fukagawa

Sample Thematic Lecture

Planning Process and Project Management; Environmental Water Supply System for Protection of Wooden Cultural Heritages from Post-earthquake Fire, International Training Course 2011, 12

Instructor: Takeyuki Okubo | Duration: 80 minutes.

This lecture explained the planning process and management methods to develop an environmental water supply system (EWSS) for mitigating post earthquake fires. The concept of EWSS opens up possibilities for a sustainable water environment and the restoration of historical cities, maintaining beauty and safety for the benefit of future generations.

The methodology for developing EWSS was highlighted through the following steps:

- Research on characteristics of the region.
- Study of development strategies.
- Development and operational planning of the water system.
- Evaluation of the maintenance plan.

The following secondary case examples of projects and management methods were used to supplement the lecture:
Use of Rivers and Waterways for the Emergency water supply system of Shirakawa, Ono-gun, Gifu.
Use of Waterways and Underground Water for the Emergency water supply system of Kanazawa, Ishikawa.

This lecture stated the need of practical planning for the optimum usage of various kinds of natural water in the Kiyomizu area to develop (EWSS) for disaster prevention. Such uninterrupted water supply systems could be used for fire prevention in historic cities that have a substantial number of wooden structures and thus preserve the historic urban environment.

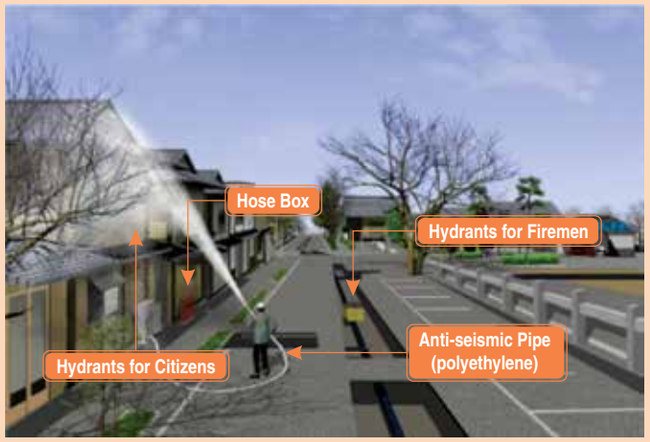


Image Ref. 3.36
EWSS systems in place
Source: Takeyuki Okubo

Primary Case Study

Structural Vulnerability and Capacity of Historic Buildings in Patan Area and their Seismic Retrofitting Techniques, International Training Course 2009. Site: Patan, Kathmandu Valley

Instructors: Kai Weise, Prem Nath Maskey, Rohit Jigyasu, Rohit Ranjitkar | Duration: 60 minutes +180 minutes

Reducing Disaster Vulnerability of Traditional Housing

The workshop intended to introduce the participants to the basic methodology for the structural vulnerability assessment of traditional buildings in the historic town of Patan in the Kathmandu Valley, and applying this to the case study buildings. Each group was given specific structures in Patan. Each group collected data necessary to evaluate the structural condition and seismic performance of traditional buildings. This would include general characteristics, principle materials used, structural systems, building type, use and nature of occupancy, and architectural features that might affect seismic performance.

The groups then evaluated the structural vulnerability of the building. This included the load path system of the building, geometry, condition and performance of individual building elements, vertical discontinuities, mass of the building, openings in walls, characteristics of adjacent buildings and strength related evaluation. Weak and soft stories were identified in structures that may pose a serious risk to the building's safety in the event of an earthquake. Adjacent structures were also documented for their potential impact. A tentative proposal for strengthening the building using traditional material and technology was prepared. Each group presented their findings followed by group discussion.

Image Ref. 3.37, 3.38
Site visits and workshops organised in the Patan area, where participants made detailed observations and analysis on site and prepared proposals on strengthening of traditional buildings in their study area

Image Ref. 3.39, 3.40, 3.41
Participants visiting the site, making observations and undertaking risk analysis as part of a series of workshops organised. They then went on to describe actions and strategies for preventing and mitigating disaster risks, based on sample formats.
Source: RitsDMUCH

Level of impact	Potential impact on	Recommended Actions	Responsible personnel, staff
High	People		
Medium			
Low			
High	Building		
Medium			
Low			
High	Collections		
Medium			
Low			

Participant Case Study Project

Study on The Tombs of Buganda Kings at Kasubi Tombs, Uganda, World Heritage Site. Remigius Kigongo, International Training Course, 2011

Background

The Kasubi Tombs in Uganda are a series of four tombs of the Buganda Kings inscribed as a UNESCO World Heritage Site. The unique architecture of the tombs set it apart as a cultural masterpiece associated with high intangible heritage value. The site is exposed to development pressures and is highly vulnerable to earthquake, wind, and fire. The structures constructed in traditional materials such as wood, grass, reeds and fibres are especially vulnerable to fire.

The participant focused on mitigating and reducing disaster risks to Kasubi tombs through organization, people and facilities as outlined below.

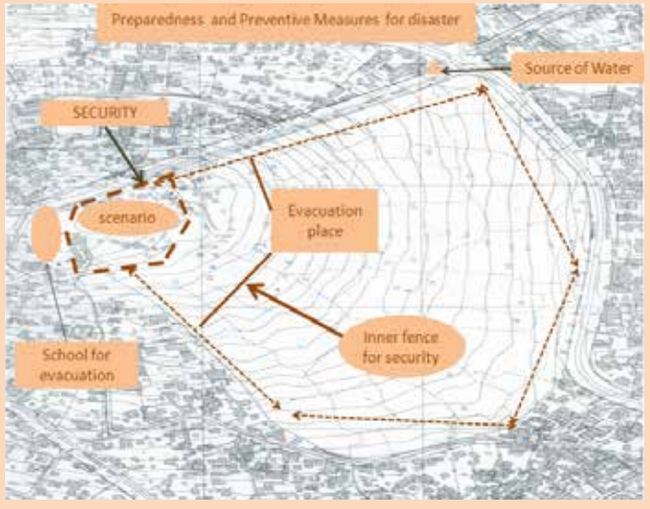


Image Ref. 3.42

Mapping of various interventions for reducing and mitigating disaster risks in the buffer zone

Source: Remigius Kigongo

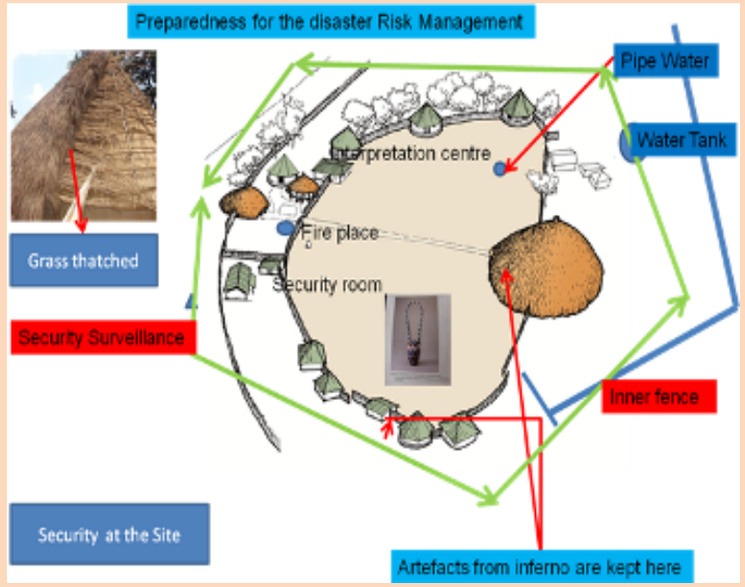


Image Ref. 3.43

Identifying various proposals for disaster preparedness at site level

Source: Remigius Kigongo

Before Fire (Mitigation and preparedness)		
Organisation	Museums, Monuments and Buganda Kingdom	1. Advisory and Supervision. 2. Preservation and Protection of the site and Periodical Reporting on weekly basis. 3. Maintenance, Procurement, wages. 4. Publication for promoting the site.
People	Site Manager	• Supervision, Monitor, Checklist on Disaster Risk, Conservation and Visitor management. • Ensure workers' wages paid and requisition of fund for procurement of equipment. • Staff -12 to 30 support staff.
	Nalinnya Katikkiro	1. Spiritual guardian and chief custodian of the site. Katikkiro assist Nalinnya on cultural affairs.
	Wives	Maintain the cleanness of the floor mats and rituals respectively.
Facilities	Equipment Fire Extinguishers, integrated technology for fire equipment, CCTV, communication systems.	Safeguard and reduction of disaster risk.

3.4 Emergency Preparedness and Response

General Teaching Strategy for the Module

At this stage of the course, participants should befamiliar with the general processesinvolved in preparinga disaster risk management plan and have explored in detail the processes involved in risk assessment and mitigation. This stage in the course addresses the next stage of the disaster risk management cycle, which is responding during a disaster. Effectively this stage deals with the period extending from the minute an event takes place to the time this critical phase is over and things are under control. Responses include evacuation of people and objects in addition to attempts to minimise damage. This stage acts as a bridge between the pre-disaster planning strategies and long term recovery actions.

Broadly, the following topics need to be addressed through this module:

- Assembling and training an emergency team.
- Preparing evacuation routes and emergency signage.
- Provision of emergency equipment.
- Proposals and protocols for evacuation of people and salvage of heritage objects.
- Heritage sites as refuge during disaster.
- Immediate damage inspection and protection strategies.
- Immediate actions after disaster for cultural heritage protection
- Coordination between heritage staff and external agencies

This module could be placed at the intermediate stage of an overview course (TYPE A) or be combined with the first module for an independent series of workshops to train site managers on emergency preparedness and response. Besides lectures and workshops, this module will also have simulation and role-playing exercises to practice emergency response protocols.

9/13 (Thu)	9/14(Fri)	9/15 (Sat)
Mitigation (Earthquake, Landslides and Floods)	**Fire Prevention and Emergency Preparedness**	**Planning for Recovery: Lessons from Kobe**
DMUCH 9:30-10:00(30) Case Study PJ (Resource Persons) 10:00-11:10(70) Lecture 9 GIS (Geographic Information System) for Disaster Management of Historical City, Kyoto (YANO) 11:30-12:40(70) Lecture 10 Flood prevention and Mitigation Techniques (SATOFUKA) *Lunch* 14:00-15:10(70) Lecture 11 LANDSLIDE, Prevention and Mitigation Techniques (FUKAGAWA) 15:30-16:30(60) Case Study PJ (Resource Persons) 15:50-17:00(70) Lecture 12 Performance of Historic Masonry Structures (FURUKAWA) *Kyoto*	*Ninna-ji* *DMUCH* 9:30-10:40(70) Lecture 13 Dynamic analysis of Earthquakes and Seismic Performance of Japanese Historical Structures (IZUNO) 10:50-12:00(70) Lecture 14 Disaster Prevention for Cultural Heritage in Kyoto City (Kyoto City FD) *Lunch* To Ninna-ji 13:30-15:30(120) Site Visit 3 World Heritage Site Fire Prevention Facilities at Ninna-ji Temple (OMORI) To DMUCH 16:00-18:00(120) Case Study PJ First Half Presentation (Resource Persons) *Kyoto*	*Kobe* *To KOBE* 9:30-10:45(75) Site Visit 4 Disaster Reduction and Human Renovation Institution Theater and 3D Lunch 11:30-14:30(180) Lecture 15 Experience of the Great Hanshin-Awaji Earthquake, Risk Assessment (MURAKAMI) Lecture 16 Planning for Disaster Mitigation of Cultural Heritage Training of Heritage Manager (MURAKAMI) **To NADA** 15:00-17:00 Site Visit 5 Former House No.15 in Kobe Foreign Settlement (MURAKAMI) *To Kyoto* *Kyoto*

Structure of Module 4 as part of the International Training Course in 2012, Lectures and site visits related to the cases discussed in the lectures were used for majority of the content in this module.

Planning and Procedures for Emergency Preparedness for People and Heritage

Summary of Content

This module follows up on the previous module of risk prevention and is aimed at introducing the planning process needed for emergency preparedness, various protocols and the procedures which need to be in place in the event of a disaster are introduced to participants. This includes introducing a comprehensive list of emergency preparedness measures in heritage sites and highlighting the importance of team building and coordination among the staff as well as external agencies for response during emergency situations.

Pre-Disaster Planning

Communication and team building

- Identification and communication of disaster risks with all stakeholders.
- Collaboration between departments and disciplines such as heritage authorities, local government bodies, planning officials, disaster risk management authorities, media and outreach professionals etc.
- Creatingan emergency team, coordination with local fire fighting authorities, police, hospitals etc.
- Conducting training exercises for emergency teams,identifying a chain of command, prioritising actions during and immediately after a disaster.
- Community engagement for emergency planning.

Planning for evacuation of people

- Identification of evacuation routes, refuge spaces and implementation using measures such as emergency signage, maps etc.
- Arranging for various kinds of emergency supplies and equipment Ensuring protocols for the evacuation of people.

Planning for salvage of heritage objects

- Pre-disaster documentation and preparing inventories needed for inspections.
- Identifying the sources of risk to a broad range of cultural materials.
- Understanding the levels of control required to mitigate risks to cultural heritage
- Developing skills to handle damaged materials.
- Basic steps for planning response and recovery operations for cultural heritage collections.

Image Ref. 3.44
A firefighting drill in progress at Toji Temple, used as a secondary case study
Source: Yoshinori Machida

Image Ref. 3.45
Citizens participating in firefighting drills as part of a capacity building exercise
Source: Yoshinori Machida

Teaching Strategies

Core Lectures

The instructor can illustrate the various aspects of emergency preparedness and response through established planning, protocols and procedures by means of examples and case studies.Checklists of protocols and procedures applicable in different emergency situations can be circulated. The basic skills needed in order to identify potential evacuation routes, design emergency signage, install equipment for monitoring an effective and timely response and build emergency response teams for a heritage site may be identified in the lecture.

Thematic Lectures with Secondary Case Studies

Thematic lectures may be used to illustrate specific aspects of emergency preparedness .Secondary case studies may be integrated within the lecture presentations to highlights various aspects of emergency preparedness and response. Examples of how site managers have responded to disasters could be used to illuminate best practices as well as highlight possible gaps in management.

Site Visits

Site visits could be useful in showcasing working emergency response equipment and procedures. Specific themes could be explored in depth through site visits, such as demonstration of variousfacilities in place to respond to a fire or a flood in a cultural heritage site or identifying and planning evacuation routes in dense urban fabric. The site visit could also potentially link to a workshop or role-playing exercise.

Primary Case Study - Workshop

Participants could usea primary casestudy as the potential subject of the role-playing exercise and emergency drill/ simulation exercise. Such an exercise would entail participants taking on roles of heritage managers,residents, local police and fire fighting officers etc. Based on the scenario presented to them, they may be asked to determine exact protocols and emergency procedures for a heritage site. Such an exercise could also be linked to the disaster imagination game, from Module 2, depending on the scope of the course.

Participants' Case Study Project

Participants may also use this stage within the course to carry out individual exercises using their selected case studies. This would help them further develop their own disaster risk management plans.

Sample Lecture

Disaster Prevention for Cultural Heritage in Kyoto City, Lecture 8, International Training Course 2011

Instructor: Yoshinori Machida | Duration: 60 minutes

This lecture links mitigation (previous module) with emergency response (current module) as well as the long term recovery process (next module).

The instructorintroduced the history and background of Kyoto city as well as described the various disasters that have taken place in its long history. He also emphasisedearthquakes as a potential disaster, using the example of the Hanshin Awaji Earthquake. The session introduced the Kyoto City Disaster Prevention Plan, which is envisioned to be implemented in cooperation with private citizens, communities and public offices.It also illustrated disaster prevention planning at neighborhood level.

The following disaster prevention measures were discussed in detail:

- Earthquake resistant reinforcement of buildings.
- Protection against fire.
- The cooperation among organisationsworking for the protection of cultural assets.
- Subsidies for setting up fire protection facilities should be provided by the government.
- Measures for prevention of breakage and digital imaging of arts and crafts for repair or reproduction.

Broadly, the countermeasures in the event of a disaster for the protection of cultural assets were described for visitors as well as for movable assets.

Additionally measures for long-term response and recovery were described:

- Surveys and inquiry into the level of damage.
- Requesting aid from the central government or from volunteers.

The recent cooperation agreement between owners of cultural assets and their neighbors (2000~) was discussed. This agreement was drawn up between owners of cultural assets and their neighbours to enable rapid and efficient response to a fire in cooperation with each other.


Image Ref. 3.46, 3.47
Lists and labels for movable cultural heritage to make the process of recovery easier
Source: Yoshinori Machida


Image Ref. 3.48, 3.49
Various response procedures, equipment and initiatives were discussed during the lecture
Source: Yoshinori Machida

Sample Lecture and Demonstration

Emergency Response and Recovery of Movable Cultural Heritage, International Training Course 2011

Instructor: Aparna Tandon | Duration: 60-80 minutes

The session was aimed at promoting better understanding of the sources of risk to a broad range of movable cultural materials during emergency and early recovery situations and the specific considerations that have to be taken into account before mounting response and recovery operations for safeguarding cultural heritage collections. Participants were introduced to various processes identifying 'agents of deterioration' or sources of risk to cultural heritage objects and collections immediately following an emergency situation. The second half of the session addressed specific aspects of recovering cultural heritage collections in the aftermath of a disaster. It includeda discussion of the documentation of cultural artifacts, levels of protection, prioritisationof artifacts for maximum protection, handling procedures and salvage considerations, off-site temporary storages, emergency supplies, specialisedhelp, communications and rapid response teams.

The secondary case example of Haiti was used to illustrate the process. Six months after the earthquake in Haiti, much of the movable cultural heritage in Haiti was in danger of being damaged irreversibly or lost altogether.

The first response of the International Centre for the Studyof the Preservation and Restoration of Cultural Property (ICCROM) to the cultural emergency in Haiti was to strengthen the capacity of the staff of Haiti's cultural institutions for creating saferstorage conditions for the endangered collections. Carried out in partnership with theMinistry of Culture of Haiti and the Smithsonian Institution (USA) within the framework of its Cultural Recovery Project, the three-week courseon First Aid to Cultural Heritage in Haiti was held in Port au-Prince.

Challenges discussed

In the absence of any other form of shelter, putting works of art in a container, on a temporary basis, seemed to be the most appropriate solution. However, the metal containers were not sealed properly, which allowed moisture to seep in. In addition, theywere exposed to extreme weather conditions.

Within six months several works of art inside the containers were infected by mould. Isolating the contaminated works of art and creating another temporary but safe storage spacewas the top priority. The board of trustees of the Centre d'Art, however, expressed serious concerns over the security and the safety of the collection. Following several consultations and after having assessed possible threats and potential benefits, the trusteesallowed the containers to be relocated andunloaded. At the time of the training, four of the fifteen participating institutions had parts of their collections buried under the rubble. The lack of building plans and maps foridentifying the possible locations of buried artifacts added to the complexity of the task. The participants were organisedinto an emergency team and were given specific tasks, ranging from documentation to first-aid treatments and the packing of works of art.

Outcomes discussed

As a direct result of the training, over 1,500 works of art of the Centre d'Art were documented and saved from further damage. In addition, fourteen institutions were able to develop concrete action plans for securing their respective collections. Based on the strategies discussed during the course, they were encouraged to think of at least ten actions that they would implement without additional resources. The most significant outcome, however, isthe formation of a self-reliant and strong team of26 professionals who are workingtogether to recover Haiti's cultural heritage.

References

Heritage Preservation- the National Institute for Conservation.Emergency Salvage Wheel.
Available at<https://www.heritagepreservation.org/catalog/Wheel1.htm>
Canadian Conservation Institute. The Preservation Framework online.
Available at<http://www.cci-icc.gc.ca/tools/framework/index_e.aspx?content=framework>
Getty Conservation Institute. Building an Emergency Plan.
Available at<http://www.getty.edu/conservation/publications/pdf_publications/emergency_plan.pdf>


Image Ref. 3.50, 3.51
Salvaging objects from damaged structures post earthquake in Haiti. The instructor highlighted the importance of documentation of each stage and recording as much information
Source: AparnaTandon


Image Ref. 3.52, 3.53
Salvaging objects from damaged structures post earthquake in Haiti. The instructor highlighted the importance of documentation of each stage and recording as much information
Source: AparnaTandon

Image Ref. 3.54
Practical demonstrationsfor treating movable objects in a post disaster scenario,by instructor Arpana Tandon in the International Training Course 2012.
Source: AparnaTandon

Sample Site Visit

Site:Ninna-ji Temple, Kyoto, RitsDMUCH International Training Course, 2012

Instructor: Hikokazu Omori | Duration: 120 minutes

Background

The Ninna-ji Temple in Kyoto was completed by the Emperor Uda in 888 and consecrated as an imperial temple. In the modern age, several temple buildings were either partially or totally dismantled and repaired; included among these were the Kondo(1914), the Niomon (1938), and the Mieido (1951). The temple is now inscribed as a UNESCO World Heritage Site.

The Kondo (G1), is a large scale structure 7 bays across the front by 5 bays on the sides. It has *shitomido* (top-hinged, swinging windows) on four sides and *hiwada* (eaves constructed with a triple-layer rafter system). Although it has undergone reconstruction, the Kondo is highly valued as historically important due to the fact that it retains the imperial palace style of the Momoyama Period.

Several different facilities for monitoring, fire prevention and response have been provided for the temple. The site visit highlighted these facilities, which included:

- Methods of fire extinction
- Fire alarm systems
- Lightening protection system
- Firefighting system
- Arrangement of fire prevention equipment

Image Ref. 3.55, 3.56
Participants of International Training Course 2011 on a site visit to Ninnaji. The instructor is illustrating the various systems in place for firefighting in place
Source: RitsDMUCH

Primary Case Study

Site: Kiyomizu-dera, Sanneizaka District. Workshop on Role Playing

Each participantwas randomly assigned pre-determined roles to perform for the purposes of the workshop. For the exercise in the International Training Course 2011, the following roles were assigned to participants

- Community leader (Resident)
- Owner of shop on fire (Resident)
- Shop worker (Non-Resident)
- Volunteer (Search & Rescue Team Leader)
- Head priest of the temple (Monk)
- Heritage site manager
- Security officer (private company responsible for protecting the site)
- Local area fire officer
- Local police chief
- Foreign tourist
- Doctor from nearby hospital

The participants were introduced to an emergency scenario in a heritage site described as follows:

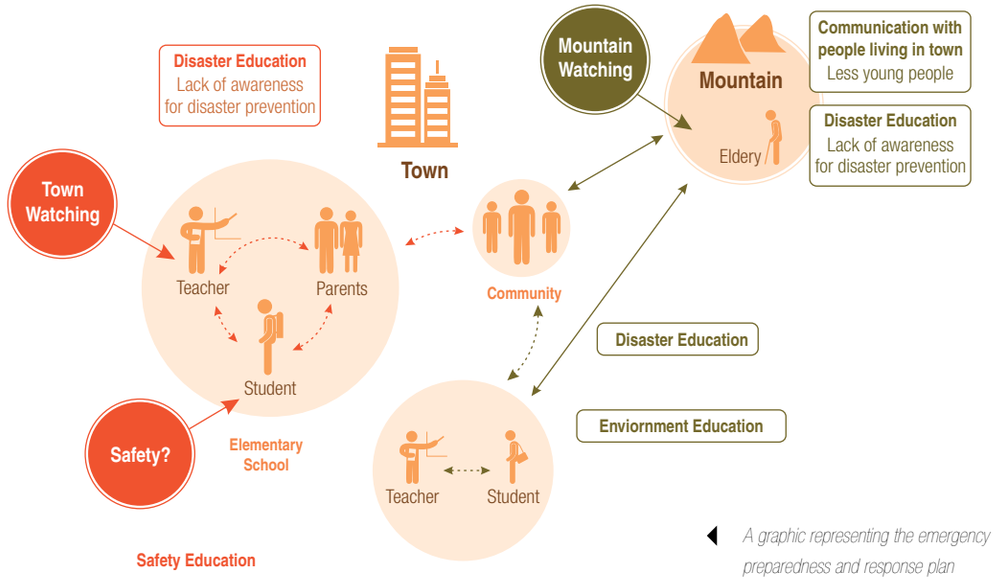
There is a fire in a row of wooden houses in Sanneizaka Historic Preservation District near Kiyomizu-dera. Fire started from a cooking pan in the kitchen of a shop. It spread to cloth materials like curtains and then to timber elements. The whole shop was on fire and it started spreading to adjacent houses. Nearby Kiyomizu-dera is also under grave threat of catching fire if immediate action is not taken.There is limited access to the fire affected area due to the close proximity of houses and narrow access roads. The incident happened during the daytime, when all young people had gone to work and school, and only elderly people were at place. Some domestic and foreign tourists were on the road.

The fire detecting system in the house where the house started was not maintained. Fire extinguishers could not be used immediately. Old people and the foreign tourists could not read the emergency signage.

The participants undertook a role-playing exercise through which they tried to respond to the given scenario, by assuming their respective roles during the emergency situation. This was followed bya de-briefing of the exercise to formulate response plans by deciding upon specific roles and actions by various stakeholders, their sequence, time period and chain of command.

Image Ref. 3.57
A group discussion in progress where various roles have been assigned
Source: RitsDMUCH

STEP 1				STEP 2	
S.No.	Activities	Time Period	Whose Responsibility?	Coordination System	Priority/Sequence



A graphic representing the emergency preparedness and response plan
Source: Teresa VilcapomaHuapaya and Olga Keiko Mendoza Shimada

Participants' Case Study Project

Site: Cusco, Peru, International Training Course 2010

Participants:Teresa VilcapomaHuapaya and Olga Keiko Mendoza Shimada

The City of Cusco was inscribed on the World Heritage List in 1983. It has suffered extensive damage previously in 2007 as a result of an earthquake.

The disaster scenario created by the participants was an earthquake of magnitude 8 which would have a severe impact on the physical fabric of the city with the loss of life and cultural properties. The earthquake would also set off landslides leading to further damage. The objective of the Disaster Risk Management Plan would be to contribute to reducing the effects of the disaster. Mitigation and preventative actions would need to be carried out.

The mitigation measures would include appropriate government policies, land use, building guidelines, evacuation plans, drills, maintenance and monitoring procedures and technical measures for the strengthening of monuments. The Emergency Team would be comprised of the three main stakeholders (the Municipality of Cusco, the National Institute of Culture and the National Institute of Civil Defence) as well as the fire brigade, police force, the community and volunteers. In the Emergency Preparedness and Response Plan the evacuation routes and safe areas were identified. The rescue routes were identified along with the locations of fire hydrants.

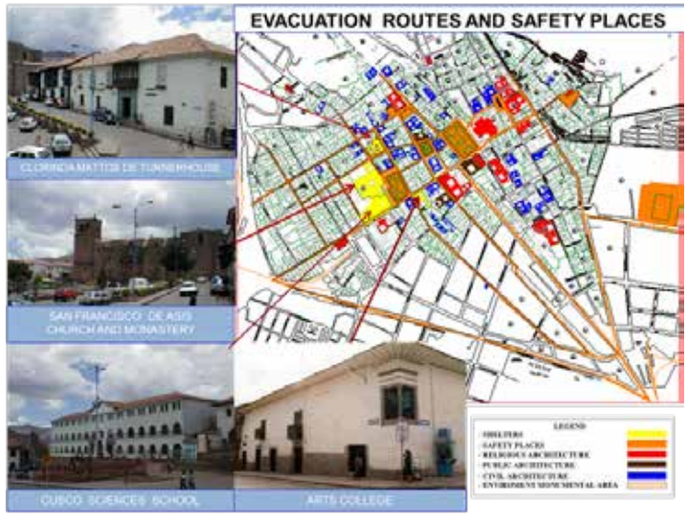


Image Ref. 3.58
Evacuation routes and safe places highlighted on a map of the area
Source: Teresa Vilcapoma Huapaya and Olga Keiko Mendoza Shimada

Study Project, International Training Course.

Site: Taj Mahal, India | Participant: Janwij Sharma

The TajMahal, Agra is a UNESCO World Heritage Site in a complex urban environment, surrounded by high-density settlement. Though the likelihood of a natural disaster such as earthquake or flood is low, the vulnerability of the site is very high due to the high amount of visitor traffic. The participant identified crowd management as one of the most critical issues which needed to be addressed as part of the response and recovery procedures.

Crowd Management – Response and Recovery

A key vulnerability in Taj Mahal is the possible scenario of mobbing and difficulty in managing crowds. Given, the single entry and exit point to the site, sudden evacuation becomes a major challenge from within the mausoleum and at the entry points. One of the first remedial measures for these issues is to limit the entry of people into the main mausoleum and deploy expert personnel at entry and exit. Appropriate signage should be provided along the circulation routes. In the long term, strategies for circulation and movement and personnel should be implemented for crowd management.

The participant then went on to mark out evacuation routes and relief spaces, based on his experience and knowledge of the site and the series of disaster risk management workshops held during the International Training Course organised by RitsDMUCH 2011.

Image Ref. 3.59
Schematic diagram indicating local hospitals to immediately rush the injured in the event of a disaster.
Source: Janwij Sharma

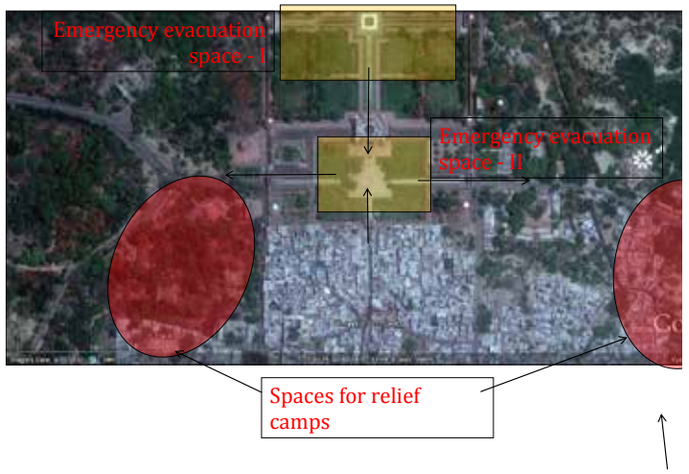


Image Ref. 3.60
Schematic diagram indicating evacuation spaces and areas demarcated for relief camps
Source: Janwij Sharma

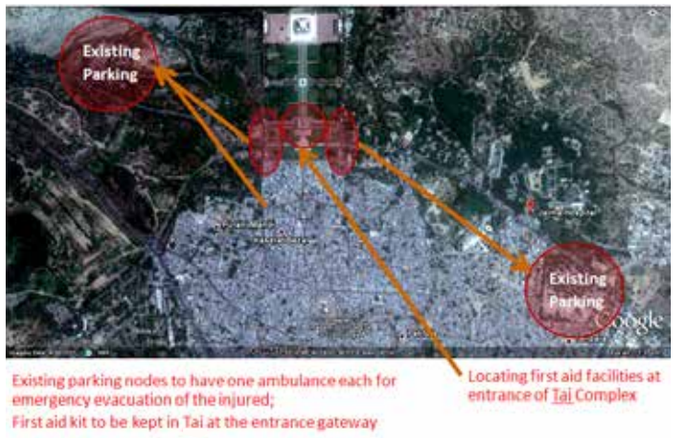
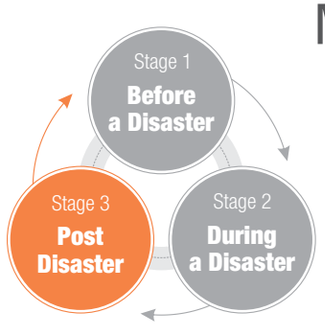


Image Ref. 3.61
Parking nodes and location of first aid facilities in the site
Source: Janwij Sharma

3.5 Recovery and Rehabilitation

General Teaching Strategy for the Module



This module explores actions that are involved in post disaster recovery and rehabilitation of cultural heritage. This include not only assessments of the impact of the disaster but also long term planning initiatives for recovery and ensuring that future disaster risks are minimised as much as possible. This stage follows up on the emergency preparedness and response module (Module 4), and links the disaster risk management process back to the first stage (Module 2). It is therefore imperative to ensure that this module cohesively sums up the learning of the course to equip participants to be able to develop their own disaster risk management strategies.

Some of the key aspects of this module include

- ***Post disaster risk assessment*** including short-term threats as well as long term risks. Physical damage, institutional failures and lack of human resources are some of the issues that may be need to be addressed.
- ***Detailed damage assessment*** and impact of the disaster needs to be undertaken in a systematic manner to enable post disaster recovery. The instructor should introduce the formats, procedures and information needed for damage assessment. This should be linked with the immediate damage assessment conducted during the previous module.
- ***Linking with larger institutional networks*** and programmes for post disaster recovery and rehabilitation at international/national /regional levels.
- Understanding the ***significance of intangible cultural heritage*** for post disaster recovery.
- Technology for repair, retrofitting and ***restoration of cultural heritage***.
- ***Linking recovery with mitigation*** through development of human resources and planning measures.

This module covers a broad range of actions to be undertaken in the post disaster recovery phase and can be delivered as a series of core lectures focusing on general approaches/ procedures to introduce participants to the subject. Themes such as community participation, long term recovery of cultural heritage in developing countries and its role in generating financial resources can be addressed in detail using secondary case examples. In the International Training Course organised by RitsDMUCH, it is normally spaced over 2-3 days, interspersed with participants working independently on their own case study projects. This module should also include a site visit to the disaster affected area to make the participants understand real challenges and initiatives for post disaster recovery of cultural heritage on ground both from short and long term perspective.

There is the possibility of teaching this module independently in a region recovering from a disaster.

For example, ICCROM organised a three week course in Haiti in partnership with the Ministry of Culture of Haiti and the Smithsonian Institution (USA) within the framework of its Cultural Recovery Project. This course focused exclusively on capacity building for professionals in cultural institutions in Haiti, to equip them to protect their own movable heritage. (Refer to lecture in module 4)

9/15 (Sat)	9/16 (Sun)	9/17 (Mon/Holiday)	9/18 (Tue)	9/19 (Wed)
Planning for Recovery: Lessons from Kobe	**Self-Study**	**From Response to Recovery: Great East Japan Disaster**	**From Response to Recovery: Great East Japan Disaster**	**Policy for Risk Management**
Kobe *To KOBE* 9:30-10:45(75) Site Visit 4 Disaster Reduction and Human Renovation Institution Theater and 3D *Lunch* 11:30-14:30(180) Lecture 15 Experience of the Great Hanshin-Awaji Earthquake, Ris k Assessment (MURAKAMI) Lecture 16 Planning for Disaster Mitigation of Cultural Heritage Training of Heritage Manager (MURAKAMI) To NADA 15:00-17:00 Site Visit 5 Former House No.15 in Kobe Foreign Settlement (MURAKAMI) *To Kyoto*	*Self-Study* *Lunch* *To Tohoku*	*Tohoku* *To MinamiSanriku-cho* 10:00-11:10(70) Lecture17 Issues and Challenges for recovery of historic areas following East Japan Disaster (R. SHAW) *Lunch* 12:30-15:30(270) Site Visit 6 Tohoku area affected by the East Japan Disaster (HIRAOKA, TAKEDA) 16:00-18:00(120) Special Lecture1 Coordination of Site Level Stakeholder with National and International Agencies for Post Disaster Recovery (HIRAOKA, TAKEDA) +Discussion (Resource Persons)	*Tohoku* 10:00-12:00(120) Special Lecture 2 Relocating Communities for Post Disaster Recovery (ISHIKAWA) +Discussion (Resource Persons) *Lunch* *To Kyoto*	*DMUCH* 9:30-10:00(30) Case Study PJ (Resource Persons) 10:00-11:10(70) Lecture18 Emerging Polices for Disaster Risk Management of Urban Cultural Heritage in Japan (ACA Japan UMEZU) 11:30-12:40(70) Workshop 4 Role Playing Exercise :Emergency Response Procedures (JIGYASU) *Lunch* 14:00-15:10(70) Lecture 19 Lessons from Integrated Management Plan for Kathmandu World Heritage Monument Zones (K.WEIZE) 15:30-18:00(150) Case Study PJ (Resource Persons)
Kyoto	*Sendai*	*Minami Sanriku*	*Kyoto*	*Kyoto*

An excerpt from the structure of Module 5 of the International Training Course, 2012. Lectures and site visits related to the cases discussed in the lectures were used for majority of the content in this module.

Damage Assessment

Summary of Content

In the event of a disaster, the assessment of damage to cultural heritage is the first step towards post-disaster recovery. Damage assessment includes analysing the degree of damage to cultural heritage as a consequence of the disaster as well as analysing new risks to heritage which may have emerged as a result of disaster. The complete process involved in documenting, assessing and communicating post disaster damage to heritage needs to be explained to the participants.

Key aspects to be introduced

- ***Timelines for carrying out preliminary assessment and detailed assessment of damage to structures:*** Often it is not possible to undertake surveys and documentation immediately after a disaster because of lack of access, safety issues and lack of resources. Timelines need to be planned out for implementing assessment for various stages of the recovery process.
- ***Procedures and methodology for carrying out damage assessment:*** The exact procedures for carrying out damage assessment can vary depending on the scale of disaster as well as the size of heritage site. The general methodology beginning with observations up until detailed documentation and analysis of physical condition of affected site or object forms part of the disaster risk management plan.
- ***Compiling the data in a meaningful way to inform the process of post disaster recovery actions:*** Compiling and recording of data and analysis is important not only for carrying out long term repairs and restoration but also serves as a useful resource for the site managers to review and update the disaster risk management plan. The collected data could potentially be needed to raise funds or generate other resources and needs to be compiled in a simple yet effective manner.
- ***Formats of documentation and assessment of damage:*** Formats for documentation and assessment of damage follow some basic principles and can be adapted to different scenarios. The instructor should circulate some basic formats for participants as reference material.

Image Ref. 3.62

Sample of a visual catalogue used for damage assessment

Source: Yasumichi Murakami

Teaching Strategies

Core Lecture

The instructor may introduce the process of documenting and assessing post disaster damage, including how to plan timelines and resources for documentation, the recording and compiling methods etc. The instructor can circulate various templates and formats for documentation, recording and assessments. Through secondary examples, this lecture can be used to illustrate what kinds of information are necessary for such an exercise.

Secondary Case Studies

(to supplement core lecture or as thematic lecture)

The introductory lecture can be linked to a thematic lecture as part of a larger presentation, focusing on a specific disaster scenario or geographical region.

Primary Case Study

A site visit, which may be linked to a workshop as part of a primary case study for this module, may be organised for participants to engage them in the damage assessment process. For instance, participants in 2011 International Training Course organised by RitsDMUCH were given a series of lectures on the Hanshin Awaji Earthquake that was linked to a site visit the following day.

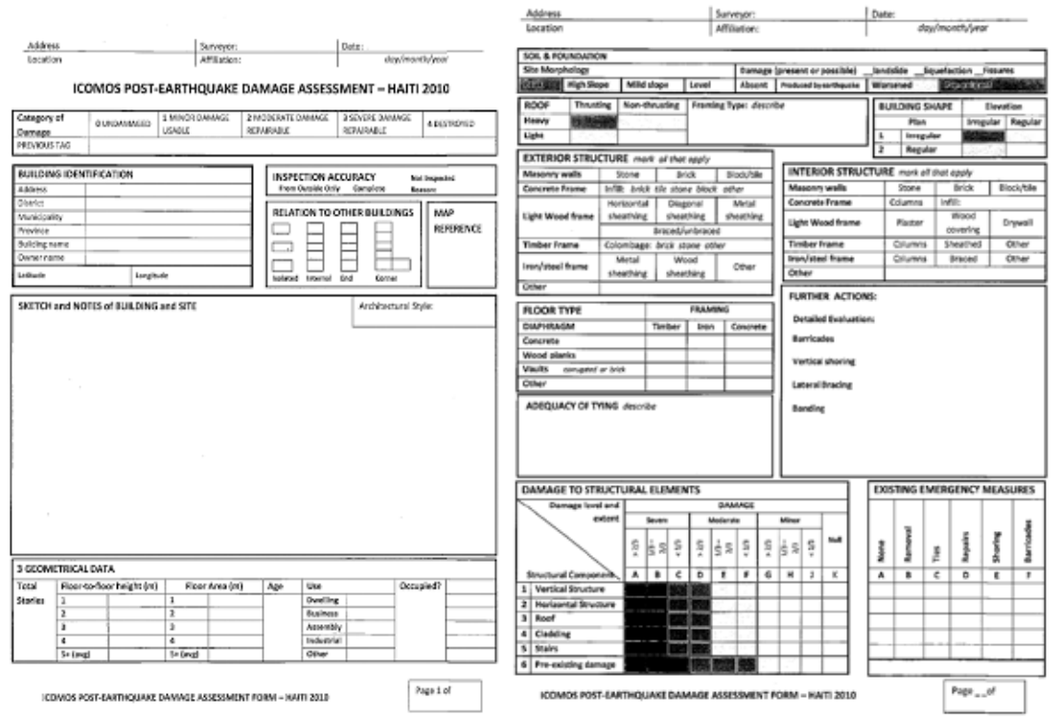


Image Ref. 3.63

Formats for damage assessment shown to participants of the ITC 2010 session (Extracts from ICOMOS forms used in Haiti, 2010)

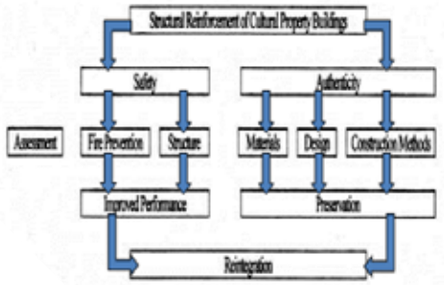


Image Ref. 3.64
Introduction to the post disaster recovery process for cultural heritage indicating the role of assessment and right, a sample format for recording post disaster damage to cultural assets at an urban scale
Source: Yasumichi Murakami

Sample Thematic Lecture (PART 1)

Experience of the Kobe Earthquake also known as the Great Hanshin Awaji Earthquake (1995): Damage Assessment, International Training Course 2011

Instructor: Yasumichi Murakami | Duration: 80 minutes

This lecture used the example of the Kobe earthquake and its impact on heritage in the region. The teaching strategy for this section was twofold; with a lecture presentation highlighting a case example and a site visit/ workshop that illustrated how exactly to carry out a damage assessment exercise. Participants could map out the process for their sites in the event of any potential disaster.

Background

The Kobe earthquake was a major earthquake that struck a highly developed metropolitan city. Various types of damage to the cultural heritage had never been anticipated before, and therefore could not be addressed by the Law for the Protection of Cultural Properties.

The instructor explained the causes for extensive damage to certain types of buildings, in this case, specifically to timber buildings, especially dwellings built in the poor conditions immediately after World War II. He explained the reasons for this as the result of:

- Poor foundations and sills.
- Insufficient diagonal bracing.
- Inadequate connecting elements.
- Insufficient areas of solid wall.
- Heavy roofs.

During the first week of the earthquake, any systematic survey of damage to cultural properties was impossible. A survey of designated cultural properties was launched a week after the earthquake, and a full-scale survey of undesignated cultural properties was begun after about a month.

The preliminary survey method that was followed to assess the damage in the earthquake was summarised as:

1. Understanding the gradation of damage from the epicenter.
2. Assessing the geographical range of the damage.
3. Interviewing locals to assess situation and extent of the damage.
4. Begin process of assessment and budgeting based on information gathered.
5. Preparation of support teams and planning out a way forward.

In the course of the assessment stage, it was found that different types of historic structures behaved differently in the earthquake. The findings were summarised, based on typology and material of heritage.

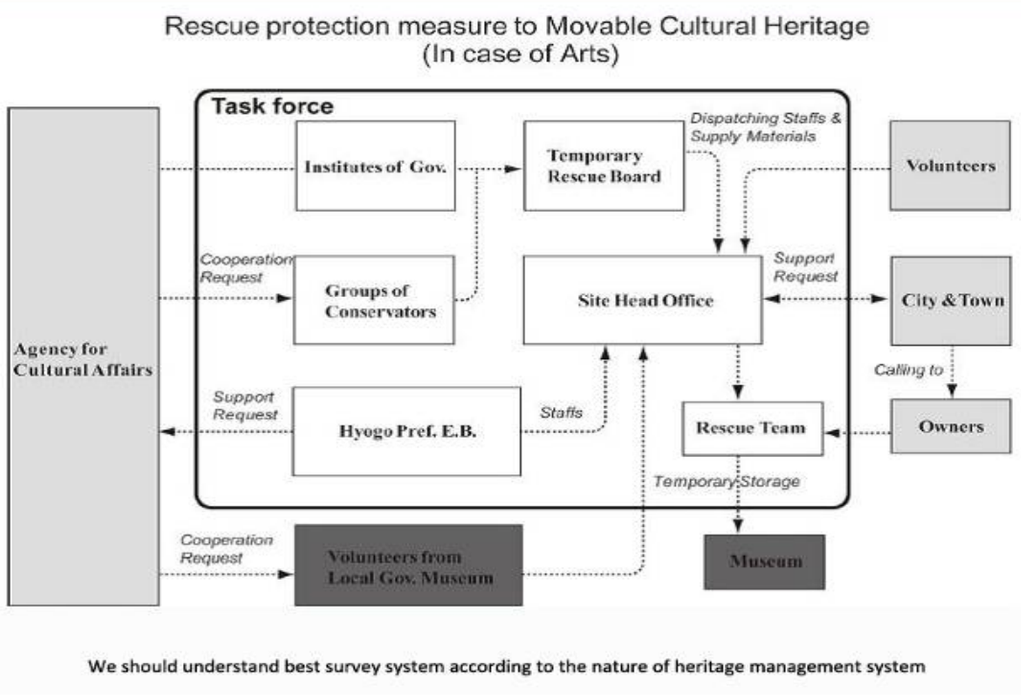


Image Ref. 3.65
Rescue protection measures to movable cultural heritage
Source: : Yasumichi Murakami

Participants' Case Study Project

Site: Eskigediz Heritage Site, Turkey, RitsDMUCH International Training Course 2011

Participants: Zeynep Gul Unal Meltem Vatan Kaptan

This case study wascarried out by the participants of the International Training Course held in 2010, aimed at formulating disaster risk management plan for sites. Participants imagined a disaster scenario for their sites and developed a plan for damage assessment and post disaster recovery

Background

The historic town of Eskigediz, located in Turkey's Kütahya Province, is highly vulnerable to earthquake. Various monuments, buildings, ruins and public squares are registered as cultural heritage. Detailed inventories of the buildings were prepared in 2003 and 2005.

Disaster Scenario Building and Response

The disaster scenario developed by the participants visualised an earthquake that led to rock fall and fires. Buildings collapsed, people were injured and there were fatalities. The electricity, communication and water supply was cut off. The roads were blocked. Panic and chaos followed.

Building Inspections

The building inspections would need to consider the risk levels before the disaster and the damaged state and usability after the disaster. The first step would be to gather qualitative data through visual inspection.

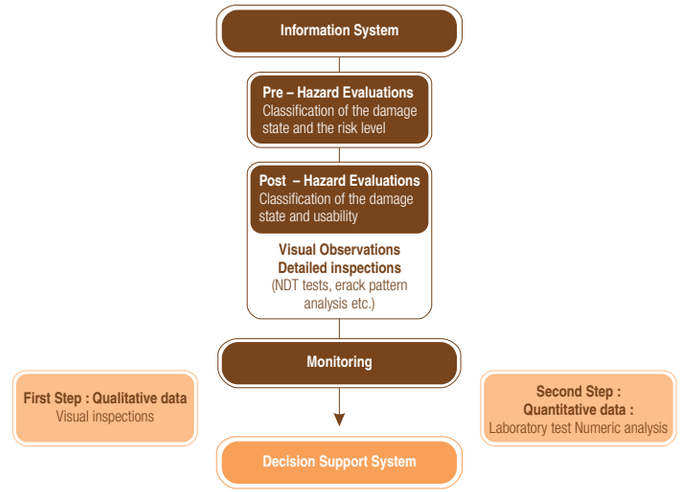
- General information: Construction period, building function, earthquake zones and GIS maps.
- Physical information: Topography, plan typologies.
- Photographic information.
- Construction material.
- Collapse mechanisms.
- State of damage.

The second step would involve quantitative data through laboratory tests and numeric analysis. The damage assessment would be categorised as: safe for use (ranging from no damage to slight damage), unsafe for use (moderate to heavy damage) and dangerous for use (severe damage to total collapse).

This would be followed by post disaster recovery with short-term activities such as revising the preservation plan, cost estimation for repairs, restoring damage and the development of a rehabilitation plan. The long-term activities would include phase wise implementation of a rehabilitation plan, establishing a disaster research institute, using natural sites for health tourism and using endemic flora as economic sources. The proposed pilot project entailed the development of a system for building assessment after a disaster. This would require the Heritage Damage Assessment Task Force to gather data from the field. The damage would be considered through processing the data, analysing it and coming to a decision for a new conservation and restoration plan for the historic buildings and sites.

Excerpts from the disaster management strategy prepared by participants focusing on information and monitoring systems and categorizing heritage based on condition and usability

Source: Zeynep Gul Unal Meltem Vatan Kaptan



DAMAGE ASSESSMENT

CATEGORIES BASED ON SAFETY AND USABILITY

Excerpts from the disaster management strategy prepared by participants focusing on information and monitoring systems and categorizing heritage based on condition and usability

Source: Zeynep Gul Unal Meltem Vatan Kaptan

POSTING CLASSIFICATION	USABILITY	DAMAGE STATE
SAFE FOR USE	Usable With Possible Restrictions	1-2 = None - Slight
UNSAFE FOR USE	Unusable Retrofitting Required	2-3 = Moderate - Heavy
UNSAFE FOR USE	Unusable	3-4 = Severe - Total

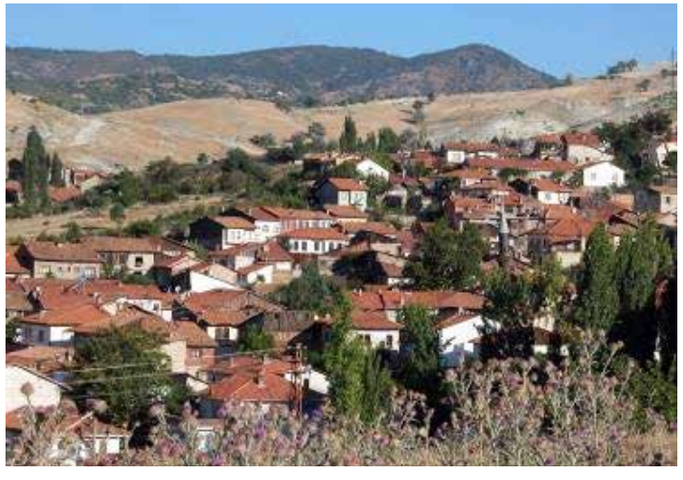


Image Ref. 3.66

A traditional house in Eskigediz Village, and an overall view of the village

Source: : Zeynep Gul Unal

Post Disaster Recovery Planning

Summary of Content

This module focuses on the larger context of post disaster recovery, the local, regional and international networks which facilitate recovery, how funds can be raised, and the various processes involved in planning for both a short term and a long term recovery. It takes into account the post-disaster assessment of damage highlighted in the previous module and highlights potential interventions once the damage has been fully assessed.

Key aspects to be introduced and discussed:

- ***Long-term measures*** to ensure that the rehabilitation process is initiated at the quickly and that future disaster risks are minimised as much as possible.
- ***Raising resources***, both financial and human, through the larger institutional network at local, regional, national and even international levels as necessary.
- ***Understanding the significance of the tangible and intangible values*** associated with cultural heritage and using it as an asset for recovery. Preserving the heritage value of the sites, following a minimal intervention policy as far as possible and including local stakeholders in this process.
- ***Reviewing site management*** as well as local and regional planning and management systems.
- ***Raising community awareness*** and participation in the recovery process.

Teaching Strategies

Core Lecture

The instructor should introduce the short term and long term prioritisation of recovery processes. This lecture may be specific to a certain context and scenario relevant to the country/region. It may be a combination of a presentation, which gives a broader background of heritage and disaster management networks internationally, regionally and nationally that can be utilised for recovery, along with a more focused lecture supplemented by secondary case studies.

Thematic Lectures with Secondary Case Studies

The thematic lectures could either be combined with the core lectures of this section or extend across the entire module using specific case studies relevant to the local context to illustrate various stages of the post disaster recovery process.

Site Visits

Visits to different sites could also be used to illustrate the comparison between short-term post disaster recovery actions and a sustained long-term plan. The 2012 International Training Course organised by RitsDMUCH highlighted both long and short term strategies to the participants through the case studies of the Kobe earthquake of 1995 and the more recent earthquake and tsunami in the Tohoku region of northeastern Japan in 2011.

Thematic Workshops

Planning for disaster recovery of cultural heritage

A workshop may be designed and organised to supplement the knowledge and understanding of the participants for the immediate, short term and long term considerations for post disaster recovery for their respective case study sites and plans for recovery. The participants could work in teams. An imaginary disaster scenario may be presented to them to use as a reference. Potentially, this could be linked to previous workshops involving risk analysis and mitigation. Based on a detailed worksheet, they may be asked to prioritise actions and activities for recovery, address resource usage and identify potential networks and agencies which may be engaged for different activities.

Sample Thematic Lecture

Experience of the Kobe earthquake (PART II): Actions taken during Restoration Period after the Hanshin Awaji Earthquake, International Training Course, 2011

Instructor: Yasumichi Murakami | Duration: 80 minutes

This lecture uses the example of the Kobe earthquake and its impact on heritage in the region. This is a continuation of the lecture given in the previous sub-module (Damage Assessment) and highlights the actions that were undertaken by local and national authorities

During this section of the lectures, the instructor focused on the sequence of actions that were undertaken during the restoration period after the earthquake.

1) Initial Period: Need for surveys of Historic and Cultural Resources

In this phase a system to survey devastated area through cooperation between industry, government, academia, and private sectors was established. It also revealed the importance of prior preparation of a location map for effective survey.

2) Recovery Period: Long Term Changes in Management of Cultural Properties

i) Funding

In post disaster recovery of cultural properties, a perspective of 'community property' was first introduced in Japan. Undesignated cultural properties (historic buildings, etc.) were supported through efforts of the private sector. For repairing designated cultural properties and undesignated cultural property, a budget for almost 400 properties in total was reserved from the restoration fund. In addition the Foundation for Cultural Heritage and art Research raised fund throughout Japan with the intention of building nation-wide assistance in line with increasing the awareness of preservation of cultural properties.

ii) Human Resources

Shortage of human resources revealed the defect of the cultural property preservation strategy in Japan, which only targeted designated cultural properties.

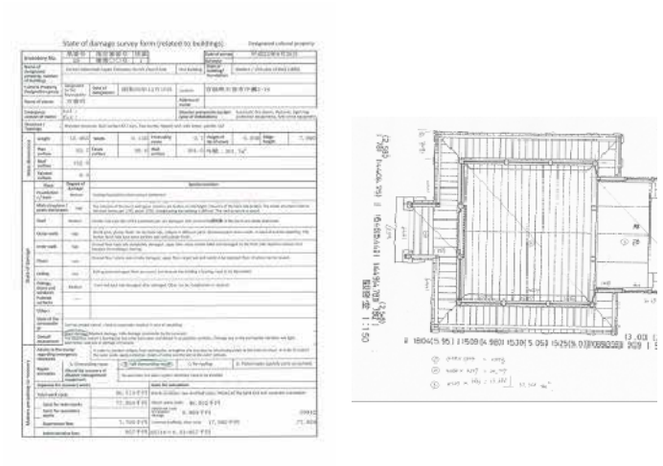


Image Ref. 3.67
Detailed survey diagrams and formats prepared by experts in the Kinki the Great East Japan Earthquake and Tsunami, 2011
Source: Yasumichi Murakami

Thematic Workshop Type 1

Planning and Design Interventions for Rehabilitation of damaged traditional settlements. Site: Minamisanriku-cho Site visit and Workshop, International Training Course organised by RitsDMUCH in 2012

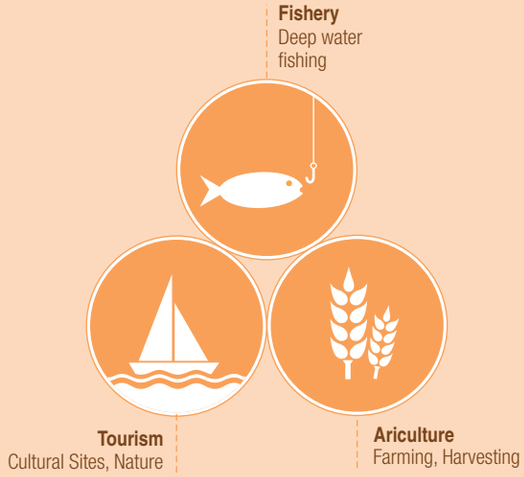
Instructor: Rohit Jigyasu, Naoko Itaya

Participants visited the districts of Minamisanriku –cho that had been extensively damaged due to the Great East Japan Earthquake and Tsunami in 2011. Based on their observations on site, they were asked to conceptualise planning and design interventions for rehabilitation of the settlements damaged as a result of the disaster.

Image Ref. 68
Participants visiting the Minamisanriku-cho; the area affected by the Great East Japan Earthquake, 2011
Source: RitsDMUCH

Participants: Rosli Bin Haji Nor, Ni Lei Win, Sang Sun Jo, Sibel Yildirim Esen, Usman Shamim produced the following schemes: **Proposals prepared by participants, through diagrams and maps**

Image Ref. 69
Workshop in progress with participants mapping their observations and analysis on a map
Source: RitsDMUCH



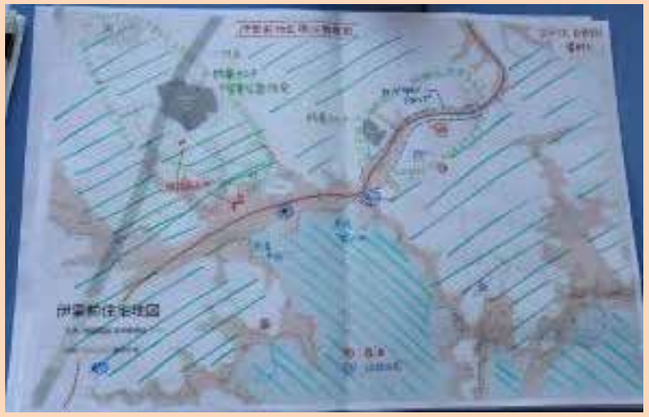


Image Ref. 3.70
Observations of participants mapped out
Source: Rits -DMUCH

Thematic Workshop Type 2

Recovery Plan for a Case Study Site

In cases where the organisers do not have access to a primary case study area where disaster has taken place and recovery and rehabilitation is underway then the primary case study site used for previous workshops or one of the participants case study sites may be chosen to prepare a recovery plan for one of the scenarios developed by the participants in Module 2.

Format based on the International Training Course series.
Participants may be asked to consider the following:

- What are various kinds of recovery activities that may be needed in immediate, medium and long-term phases?
- What kind of human and financial resources are needed for each of these activities?
- Which international, national and local bodies and networks need to engaged for each of these activities?
- Based on the considerations identified, participants are asked to pinpoint the resources and technical help needed from provincial/national government and the international community, and also asked how they would communicate these needs.
- The workshop concludes with participants' presentation followed by discussion.

Sample worksheet for prioritising recovery activities

Priority Level	Recovery Activities	Actors to be engaged (Stakeholders)	Human Resources Needed	Financial resources needed (no/low/medium/high)
Immediate (high priority)				
Short Term (medium priority)				
Long term (low priority)				

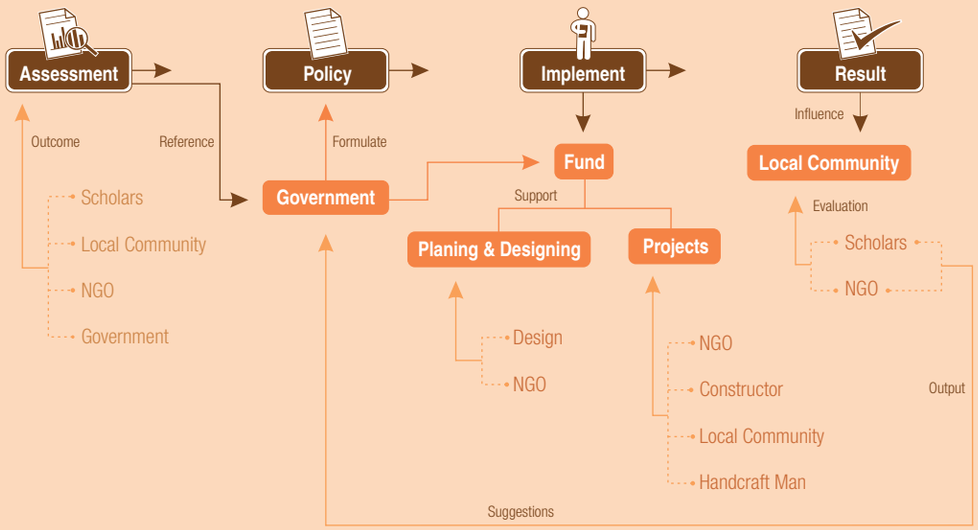
Participants' Case Study Project

Site: Tao Ping Qiang, China

Participant: Wang Yu, International Training Course, 2011

Background: The village of Taoping is located in the Sichuan province of China and dates back over 3000 years to the Shang Dynasty. It has a unique defense and underground water system as well as outstanding design and construction skills responding to the undulating topography.

The participant analysed that the village was vulnerable to earthquakes, floods and landslides as well as fire based on historic data and topographical maps. He went on to identify various vulnerabilities to the site and its built fabric. Furthermore, he identified the various management systems in place for disaster risk management in the area. After imagining various disaster scenarios in the village, the participant outlined a detailed process of recovery, illustrated below.



A diagram illustrating the process of recovery for the site of Tao Ping Qiang, China, prepared by one of the participants as part of the International Training Course 2011.
Source: Wang Yu

Repair and Restoration of Cultural Heritage

Summary of Content

This section highlights the role that repairs and conservation of heritage plays in post disaster recovery, and how tangible and intangible values of cultural heritage may be utilised as an asset. It emphasises minimising intervention and preventing demolition of heritage structures as far as possible. It stresses maintaining a delicate balance between safety considerations and maintaining values, authenticity and integrity of cultural heritage.

Key aspects to be introduced and discussed

- ***Role of heritage in recovery*** and rehabilitation in a post disaster scenario.
- ***Prioritising various approaches of repair,*** restoration and retrofitting based on the analysis of physical condition.
- ***Use of traditional skills and technology*** for repairs and restoration.
- ***Preserving the values, authenticity and integrity*** of cultural heritage through a policy of minimal intervention.
- ***Using heritage as a tool to facilitate psychosocial recovery*** from a disaster.
- ***Technologies*** used across various regions for post disaster repairs and restoration.

Teaching Strategies

Lectures and Secondary Case studies

The instructor can use several case examples or a single case study linking to previous sections in this module to highlight the importance of protecting the values of cultural heritage while giving due consideration to safety during post disaster recovery.

Primary Case Study / Site Visit

The lecture may be supported by a site visit to an area where such activities are either underway or completed to highlight various aspects of repairs, restoration and retrofitting. The focus should be on approaches as opposed to giving lessons on technical skills, which may generally not be under the scope of a programme of this nature.

Sample Lecture

Damage Assessment and Post Disaster recovery Planning, International Training Course 2011

Instructor: Yasumichi Murakami | Duration: 80 minutes

Using a running case study of the Kobe earthquake, several core principles of repair and restoration of cultural heritage were communicated to the participants. This lecture is a continuation of the lecture given in the previous sub-modules. It highlighted the various issues that rose post disaster related to the built heritage as well as the various actions undertaken.

Two critical issues were highlighted during the planning for recovery of heritage buildings in Kobe:

- Enhancement of Seismic Resistance (retrofitting).
- Harmony between heritage values and safety.

It was concluded that based on priority, the following approaches would be undertaken in order of preference:

1. Additions using traditional techniques and traditional materials.
2. Additions using traditional techniques and techniques derived from them, as well as a combination of traditional and modern materials.
3. Additions using modern techniques and modern materials.
4. Replacements using modern techniques and modern materials.

Each of the above approaches was demonstrated through examples of restoration and retrofitting projects undertaken following the Kobe earthquake.

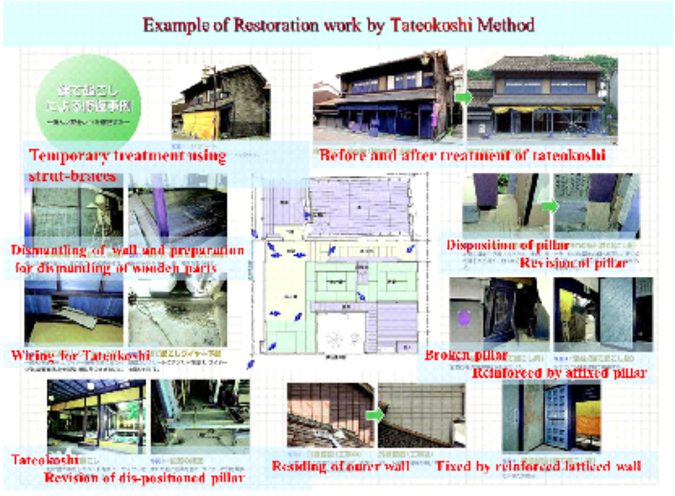


Image Ref. 3.71
Example of restoration work undertaken
Source: Yasumichi Murakami

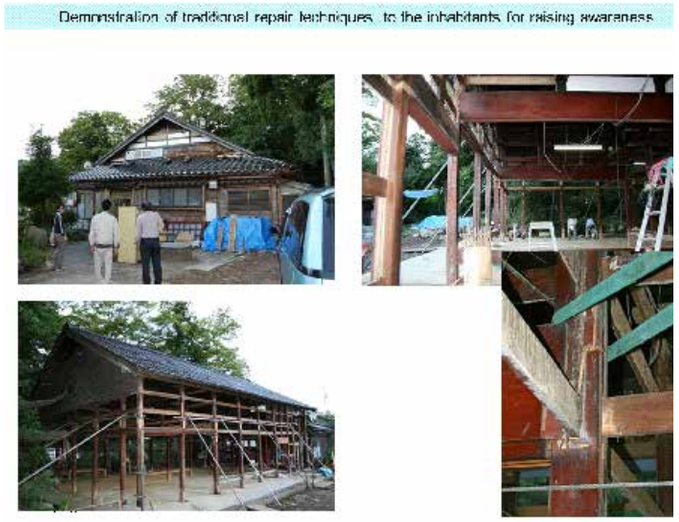


Image Ref. 3.72
Example of restoration work undertaken using traditional techniques
Source: Yasumichi Murakami

Sample Site Visit

Site Visit to Kobe-shi Kitano-cho Yamamoto-dori District, International Training Course 2012
Instructor: Yasumichi Murakami | Duration: 120 minutes

The instructor had introduced the secondary case studies of various structures that had been extensively restored after the Kobe earthquake of 1995. Subsequently a site visit to some of these restored and retrofitted structures was organized. Participants were able to observe the results of a long term process of planning and retrofitting techniques through their visits to these structures that have been restored following the earthquake.

Image Ref. 3.73
Instructor illustrating conservation and retrofitting techniques on site
Source: RitsDMUCH

Linking Recovery to Mitigation

Summary of Content

This section emphasises creating links between recovery and mitigation stages within the disaster risk management framework. It lays special emphasis on the significance of capacity building in post disaster recovery planning. It also emphasises identifying available human resources and evaluating their skills, and supplementing them with the required technical ability needed to respond to disaster risks and potential disaster scenarios.

Key aspects to be introduced and discussed:

- The possibility of linking post disaster recovery to risk mitigation, thus completing the disaster risk management cycle.
- Various kinds of professionals and volunteers who can be potentially involved in post disaster recovery repair and restoration.
- Skills that are needed for conservation and repair.
- The need for focused training in the subject of disaster risk management and especially the need for capacity building of professionals and volunteers who may potentially be responsible for restoring and rehabilitating cultural heritage
- Various checklists and criteria that are need to be communicated to heritage managers.

This content also summarises the lessons from this module and is a useful tool for participants who may often be heritage managers or administrators of institutions in charge of administration of heritage.

Teaching Strategies

Core Lecture

A detailed lecture is essential at this stage to inform the participants on the various approaches of linking post disaster recovery mechanisms to mitigate risks for the future. It should stress on using the experience of a disaster to equip heritage managers and other stakeholders to protect their cultural heritage from future damage due to disaster. It should also illustrate how capacity building and training are essential components of the disaster risk management process in general and that post disaster recovery can be used an opportunity to build capacities aimed at reducing risks from future disasters. It may be linked with a lecture on community participation as well, in Modules 3 and 4 during the course.

Sample Thematic Lecture

Training of heritage managers for post disaster recovery of cultural heritage, International Training Course, 2011

Instructor: Yasumichi Murakami | Duration: 80 minutes (continuation of previous lecture)

Using a running case study of the Kobe earthquake, various actions undertaken for long term mitigation of risks to cultural heritage were illustrated to participants. The training of heritage managers as a means of human resource development and capacity building was also highlighted. This lecture is a continuation of the lecture given in the previous sub-modules. It highlights the training programmes initiated by Hyogo Prefecture for capacity building after the earthquake.

Actions after the Earthquake

- Assessing the state and task of undesignated cultural properties.
- Stimulating the development of region and socio-economic recovery of the local citizens utilizing cultural heritage.
- Increasing awareness of the need for disaster prevention and promoting a system for reducing damage.
- Creating a wide network for disaster support for cultural heritage.

The lecture linked the recovery process to mitigation from future disasters through:

- Measures for improving resistance to disaster.
- Disaster Mitigation measures for Cultural Properties.
- Heritage Protection Measures.

A disaster mitigation system could be established through the process in which post disaster recovery is linked to risk mitigation through following actions:

- Human Resource Development.
- Establishment of an Inventory System.
- Wide-area Disaster Support Framework.
- Focusing on Disaster Mitigation by Personnel Development.

The instructor also used the example of, the Hyogo Prefecture Board of Education's initiative to develop human resources through capacity building.

The project was intended to equip heritage managers with specific skills related to undesignated buildings such as:

- Documenting the historic, cultural, and social value of historic buildings.
- Planning for conservation, maintenance, and utilization of historic buildings.
- Participation in community based town development with consideration of cultural heritage.

Within this lecture, the instructor also highlighted how capacity building was an integral part of recovery and mitigation. He emphasised that with the increasing importance of the role of heritage managers, the number of inquiries from cities, towns, and private organisations has been steadily growing within Japan.

Image Ref. 3.74, 3.75
Traditional Joints and Repair Techniques being taught to heritage managers post Kobe earthquake
Source: Yasumichi Murakami

3.6 Integrating Disaster Risk Management into Overall Planning and Management

General Teaching Strategy for the Module

This modulesummarises the issues initially discussed in the first module and is the concluding module for the course. By this stage, participants should be well versed with the disaster risk management process and be prepared to learn how to integrate the disaster risk management process into overall site planning and management strategies. This module also emphasises the need to integrate disaster risk management within larger management systems at local, regional and national levels, even introducing global cultural heritage and disaster risk management networks such as UNESCO, ICCROM,ICOMOS, UNISDR, and UNDP etc.

The following topics should be addressed through this module:

- ***Linking with heritage management systems at site level.***
- ***Linking with other plans and management systems*** at regional, city and site levels and coordination with relevant organisations.
- ***Engaging with local communities*** and multiple stakeholders.
- ***Utilising various communication tools*** and mediums.
- ***Implementation and Review*** of disaster risk management plans.

The themes that can be explored in this module may relate to a set of national and international policies. For instance, a course may focus exclusively on World Heritage Sites in which case the UNESCO World Heritage Convention would need to be discussed as well as how the disaster risk management plan for such sites would need to respond to a site's Outstanding Universal ValuesThis module is ideally presented during the concluding days of the course, before the final summation and review sessions. However, for shorter courses and seminar programmes, this module could be presented as a single lecture at the end of an overview course (TYPE A) or be combined with the first module for an independent introductory seminar (TYPE B).

9/19 (Wed)	9/20 (Thu)	9/21 (Fri)	9/22(Sat/Holiday)
Policy for Risk Management	**Formulating disaster risk management Plan**	**Formulating disaster risk management Plan**	**Open Jury**
DMUCH	*DMUCH*	*DMUCH*	*DMUCH*
9:30-10:00(30) Case Study PJ (Resource Persons)	Case Study PJ (Resource Persons)	Case Study PJ (Resource Persons)	Preparation of Open Jury
10:00-11:10(70) Lecture18 Emerging Polices for Disaster Risk Management of Urban Cultural Heritage in Japan (ACA Japan UMEZU)			
11:30-12:40(70) Workshop 4 Role Playing Exercise :Emergency Response Procedures (JIGYASU)			11:00-12:00(60) Lecture20 Institutional Initiatives on Disaster Risk Management of Cultural Heritage (ICCROM)
Lunch	*Lunch*	*Lunch*	*Lunch*
14:00-15:10(70) Lecture 19 Lessons from Integrated Management Plan for Kathmandu World Heritage Monument Zones (K.WEISE)	Cont.	Cont.	13:30-16:30(180) Open Jury (All the lecturers)
15:30-18:00(150) Case Study PJ (Resource Persons)			
		Preparation of Open Jury	*17:00-19:00(120)* *Farewell Party*

An excerpt from the timetable in ITC 2012, explaining how module 6 can be structured with case studies, lectures and a concluding session

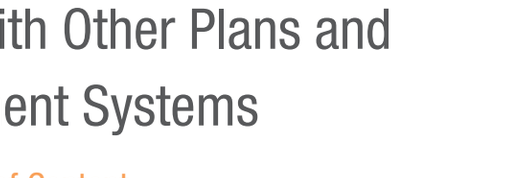
Linking with Other Plans and Management Systems

Summary of Content

planning, participants need to understand the larger framework within which disaster risk management is placed.. The significance of linking disaster risk managementwith institutional frameworks and policies for disaster risk management at the regional, city or local level is highlighted through this section.

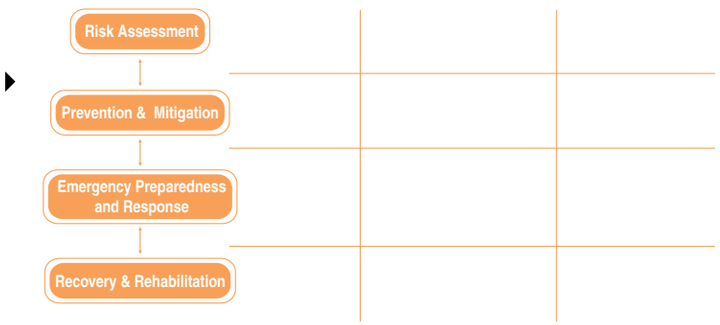
Key aspects to be covered

- Links between risk assessment and identification of values and legal status of protection.
- Links between mitigation, physical planning and building byelaws.
- Links between emergency preparedness and response procedures, site management systems and facilities planning.
- Links between recovery plan of cultural heritage property and inventories and documentation.
- Links between security and site management.



A sample matrix which may be used to illustrate various linkages between management systems of cultural heritage site, disaster risk management of the area/region in which the site is located and the specificdisaster risk management plan for the cultural heritage site

Source: RohitJigyasu



Teaching Strategies

Core Lecture

The teaching strategy for this section is based mostly on delivering core content through lectures with the instructor highlighting the key gaps in coordination between various institutions/departments and the need for establishing connections between disaster risk management and the larger planning and management framework. At this stage, participants are either almost at the concluding part of the course or in the process of completing their individual or group case studies. This module can thus also be used to summarise a major portion of the course for participants when establishing links between disaster risk management planning and the greater purview of policies and management systems for cultural heritage.

Thematic Lectures with Secondary Case Studies

Secondary case studies may be used extensively at this stage to highlight how the disaster risk management plan for a cultural heritage site can potentially link up with other planning and management frameworks at the urban and regional levels. Potentially, thematic lectures for this section could link to a workshop organised as an open forum, where participants may interact directly with various stakeholders involved

Participant Case Study Project

Participants working on individual case studies to prepare a disaster risk management strategy could use the frameworks introduced to them through the presentations and secondary case examples to refine their own work. An open session where the participants discuss their individual sites could be useful to highlight various aspects of this subject.

Sample Thematic Lecture

Integrating Disaster Risk Management into the Management system for World Heritage Monument Zones of Kathmandu Valley, International Training Course, 2010

Instructor: Kai Weise | Duration: 60-80 minutes

The instructor introduced the Kathmandu Valley, inscribed on the List of UNESCO World Heritage Sites in 1979. The site was inscribed on the List of World Heritage in Danger in 2003 following uncontrolled urbanisation and loss of historic fabric. The World Heritage Committee therefore requested the State Party to submit new legally redefined core and buffer zones for the seven monuments zones and to establish an integrated and comprehensive management plan for the area.

The instructor took the participants through the overall management process of urban heritage sites, through the case of Kathmandu Valley. The various site management issues were explained, and the streamlining of management within the overall planning framework was highlighted through the example of Kathmandu Valley. Additionally the need to integrate disaster risk management into the overall planning framework was highlighted.

The need for a collaborative approach to disaster risk management in Kathmandu Valley, due to the complexity of issues involved in this type of zone, was highlighted. Any management process for the area needs to account for various questions, for instance:

- The authorities responsible for construction/ conservation and demolition of structures.
- The nature of existing institutional systems.
- The value of the built heritage to be conserved and the acceptable limits of conservation.
- Funding and financial responsibility.
- Incentives and controls within the management framework.
- Coordination among responsible agencies and departments in the event of a disaster.

The municipal processes dealing with the planning and monitoring of heritage conservation and disaster risk management must be transparent, effective and must include controls and incentives. Links between the two must be strengthened at various levels. Besides the need for representation of the heritage conservation sector in the disaster management council and committees at central and district levels was highlighted. The lecture also stressed the need for engaging communities in the process.

The recent cooperation agreement between owners of cultural assets and their neighbours (2000~) was discussed. This agreement was drawn up between owners of cultural assets and their neighbours to enable rapid and efficient response to a fire in cooperation with each other.

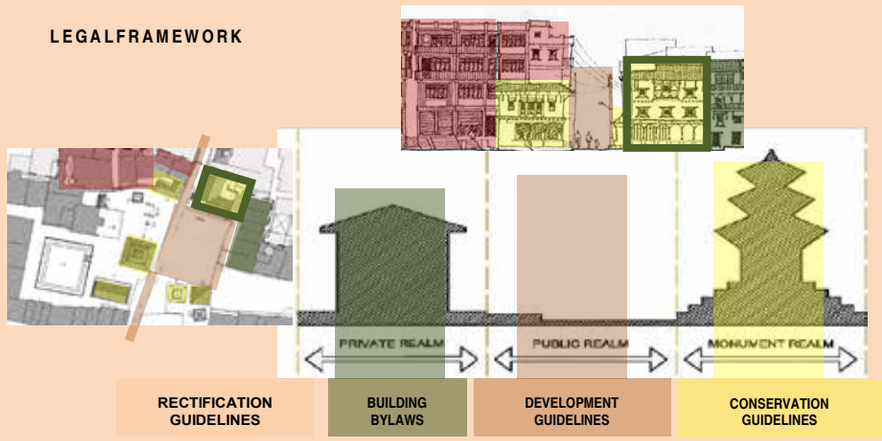


Image Ref. 3.76
Legal Frameworks applicable to the urban fabric in the Kathmandu Valley
Source: Kai Weise

Sample Thematic Lecture

PHILIPPINES: The DRRM Act of 2010 and the Climate Change Act of 2009 - Implementation Issues at the Local Level, Lecture 19, International Training Course 2011

Instructor: Jerry Velasquez | Duration: 60-80 minutes

This session centred onequippingparticipants with the tools for integratingdisaster risk management and Climate Change Adaption (CCA) into existing local planning processes like land use and development planning and also securing and assessing the necessary information for the same on hazards, vulnerabilities and exposure.

Disaster risk reduction and CCA should be rooted in local realities and development processes. For local governments in the Philippines, the authority and system of comprehensive land use planning provides the opportunity for disaster risk management and CCA mainstreaming. With the advent of Disaster Risk Reduction and Management Act of 2010 and the Climate Change Act of 2009, the time and institutions are ripe for this kind of integration. However the latest figures from the Philippines Government show that many cities and municipalities prepare their respective comprehensive land use plans, and most of these have not integrated the tools of risk reduction, except for the simple hazard maps in delineating the use of land resource in their jurisdiction.

Opportunities for promoting protection and management of cultural heritage through the implementation of the Disaster Risk Management and Climate Change Laws were explained to the participants

Community Engagement

Summary of Content

Engaging the community and local stakeholders is an integral aspect of the disaster risk management process. Communities are the core of disaster risk reduction, and community based approaches are increasingly central to national disaster risk reduction plans. Past experience shows that communities are always the first responders in a disaster situation, and take leading roles in post disaster recovery. The roles of communities in pre-disaster preparedness are also very important.

Key aspects to be covered

- Role of communities in disaster risk management.
- Role of communities in building the city's resilience for climate related hazards.
- Understanding and responding to the community and neighbourhoods
- Advantages and limitations of community engagement initiatives
- Role of community members as volunteers for emergency response.

Image Ref. 3.77

Local community set ups vary from place to place. Seen here is a shura system in Afghanistan

Source: Rajib Shaw

Teaching Strategies

Lectures and Secondary Case Studies

This section may be introduced to participants through lecturescomprised of case studies showing different community setups and how they may be integrated as part of a response, recovery and rehabilitation mechanism. Building awareness amongst locals and using them for monitoring their cultural heritage needs to be highlighted.

Primary Case Study and Workshop

A role play exercise in which the participants engage in various roles as different members of a community and other stakeholders may be carried out to illustrate how it is possible to reconcile different priorities through a prolonged process of community engagement.

Sample Lecture

Community Based Approaches and Disaster Risk Reduction, International Training Course, 2010

Instructor: Rajib Shaw | Duration:60 minutes

Using mapping examples of various cities in India, as well as different initiatives in Japan and elsewhere the community participation approach was clearly illustrated through this lecture.
The session focused on community based approaches of disaster risk reduction. It is essential to understand the nature of every community by analysingits dynamics through identification of the leader, the network and hierarchy and the systems through which the community functions. Only then can sustainable mechanisms be defined and implemented.

The essence of Climate and Disaster Resilience Initiative (CDRI) is the concept of risk versus resilience, which follows a three step process:

- Assessment of the possible scenarios.
- Planning and prioritising actions.
- Implementation of the plan.

The prioritisation of actions for the future becomes possible for a large community of diverse stakeholders. The five dimensions of resilience were identified as: physical, social economic, institutional and natural environmental policies. Based on these categories, resilience mapping of a city may be undertaken, in a systematic process of planning and implementation. The potential challenges in applying this methodology were also identified, and finally the session concluded with a discussion on town watching as a participatory tool.

References:

Joerin J. and Shaw R. (2011): Mapping Climate and Disaster Resilience in Cities, in Shaw R. and Sharma A. (eds.): Climate and Disaster Resilience in Cities, 47-62, Emerald Publisher, UK

Yoshida Y., Takeuchi Y. and Shaw R. (2009): Town watching as the useful tool of urban risk reduction: Case of Saijo, Japan. In: Urban Risk: An Asian Perspective, Shaw R., Srinivas H. and Sharma A., eds., Emerald Publication, 189-206

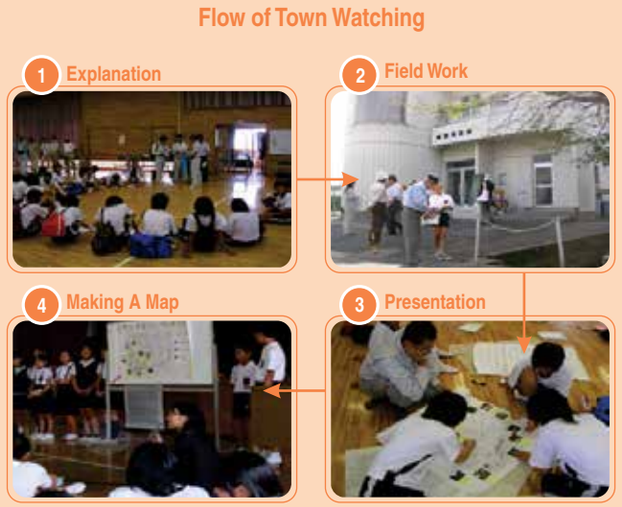
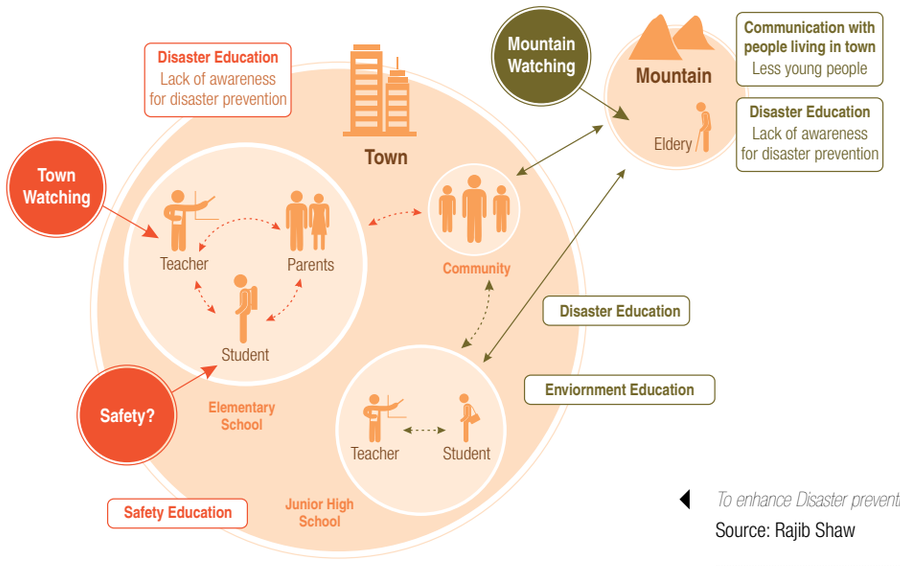


Image Ref. 3.78

The scheme of town watching as a means of disaster prevention, a strategy being implemented at school level in Kyoto

Source: Rajib Shaw



To enhance Disaster prevention network

Source: Rajib Shaw

Communication Tools and Media

Summary of Content

This section explores various forms disaster risk management plan can take, for instance:

- A brochure, poster or pamphlet for community members and local stakeholders.
- A detailed report for state and city agencies.
- A handbook or guide for site managers and other heritage professionals.

This section also takes into account new media such as internet portals and on-line services as well as technologies such as GIS and satellite mapping which may be used effectively to disseminate the plan to a large audience. It covers aspects of updating and reviewing the plan through an active dialogue which may be addressed through workshops and community participation, linking it back to the previous section within the module as well as the final section on implementation of the disaster risk management plan. It discusses the scope and extent for a disaster risk management plan depending on the number of agencies involved, and how to store and access the plan as needed.

Teaching Strategies

Core Lectures with Secondary Case Studies

Lectures on various types of disaster risk management plan formats may be given to participants explaining their relevance in certain contexts. Secondary case studies of various disaster risk management plans and portals may be used to illustrate these.

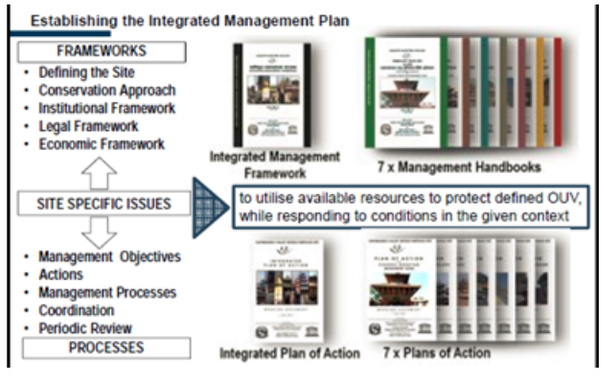


Image Ref. 3.79

For the disaster risk management Plan, Kathmandu Valley, used as a secondary case study for this module, a series of 7 handbooks were prepared and corresponded with 7 plans of action

Source: Kai Weise

Implementation and Review of Plans

Summary of content

The final stage enables participants to better understand the significance of having an implementation strategy for their disaster risk management plans and various aspects of implementation, including financing, judicious use of time and resources as well as the need for constantly updating and reviewing the plan. At this stage participants may be evaluated for their progress, based on the disaster risk management plan they may have prepared or alternatively through a formal interaction.

Key aspects to be covered:

- ***Importance of animplementation strategy and monitoring mechanisms.*** A cohesive implementation strategy should integrate with legal instrument, site management systems and clearly outline the scope of each stage for implementation.
- ***Outline of various activities or projects*** as part of implementation.
- ***Timeframe for their implementation*** and phasing of activities/ actions.
- Identifying financial resources required, and funding strategies.
- ***Identifying existing and additional human resources*** needed for each stage of implementation.
- ***Distribution of responsibilities*** amongst key management agencies and other institutions/departments.
- ***Periodic review*** based on the effectiveness of the plan after implementation as well as in the lightof experience with any additional emergencies.
- ***Training and capacity-building activities.***

Teaching Strategies

Lecture

Lectures comprised of secondary examples of previously existing and implemented disaster risk management plans for heritage sites that highlight the stages in implementation and the various strategies involved and reasons for their successful or unsuccessful implementation.

Completion and Presentation of Participants' Case Study Projects

These may be based on the final set of lectures in this module. Participants could use this opportunity to evaluate their own plans and strategies through group discussions and interactions with the various instructors.

Workshop

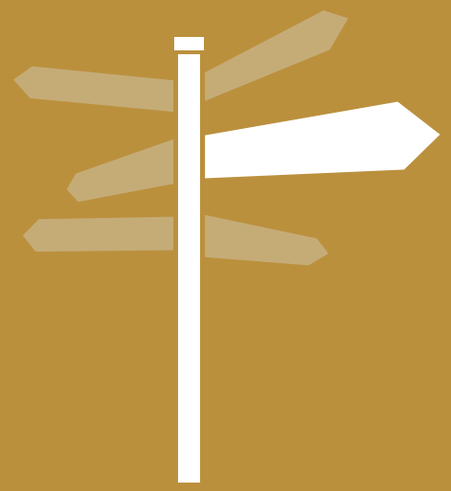
A workshop may be organised to prepare an action plan for implementation of disaster risk management strategies prepared by the participants for primary case study or participants' case study sites. These workshops may also be combined with different modules depending on the length and focus of the course.

Disaster mitigation and risk preparedness management plan

	Short-term : in a year	Mid-term : in 10years	Long-term : in 50years
Government Site office	• Basic extinguish tool • Various manual, education • New facility(hydrant, tank) • Suggest special condition to surrounding shops, etc	• Conservative tree select , prepare adoptable plan • Upbring succession tree and designate as N.H. • Thinning out trees	• In case of rebuilding/repair,consider installation of disaster mitigation facilities • Adoptable restoration plan
Local govern. Police	• Change gas tube to safe material as flexible and safe • Intensify guard system • Monitor ex-convict of fire and arson	• Intensify design guideline on renovation, repair of building refer to related law • Give subsidy in case of traditional housing	• Designate as a traditional village or site
Community NGOs	• Education on disaster, risks, vulnerability, etc • Keep regulation and know heritage's value	• Education to community or neighborhood on their role • More visitors • Install private/public fire extinguishment system	• Sustain its ritual ceremony
Result or Achievement	• Get intensified safety to cultural heritage • Create sense of community	• Community • Traditional circumstance • Strengthen value of the heritage	• Traditional scene of 19th • Traditional residence area • Addition of new cultural heritage value

An implementation diagram for Jongmyo Royal Shrine, Korea was prepared by the participant of the 2012 International Training Course- Sangsun Jo. The shrine is a UNESCO World Heritage Site dating back to the 13th century and is most vulnerable to fires and earthquakes. Given the multiple stakeholders involved in the management of the site, various roles for implementation of the disaster risk management plan were delineated by the participant and assigned to different parties.

Section **4**
Conclusion



4.1 Conclusion of the Course and Evaluation

Depending on the format of the course, the concluding session may consist of the participants presenting their completed case study projects to an expert jury and their peers. This session can be used as a tool to evaluate the progress of the participants and also enable the course coordinators and resource people to receive feedback from the participants. A formal grading system can be implemented, especially for the longer courses that may extend beyond two weeks. The objectives of the course, outlined in Section 1 of this Guide, could potentially serve as benchmarks.

Assessing Participants' Progress

The progress of participants can be evaluated during the course through their participation in workshops, practical exercises and the discussion sessions where each module would be discussed before proceeding to the next stage of the course. Depending on the length of the course and the specific objectives, a more exhaustive evaluation process could be initiated. This would be possible in the training courses extending over a week.

A presentation of a disaster risk management plan prepared by the participants, individually or in groups, encompassing all the modules of the training course could also serve as a tool for evaluation. The preparation of the disaster risk management plan as a primary case study project is not only a useful pedagogical tool, but also a useful tool for evaluating the participants' progress.

In the International Training Course series organised by RitsDMUCH, the participants are also asked to prepare posters highlighting key aspects of their disaster risk management plan. These posters are an important source for raising awareness among the larger audience who are invited to attend the presentation. A public forum may also be organised along with the training course to exhibit these posters and inviting some participants to present their Disaster Risk Management plans.

Image Ref. 4.1

One of the participants preparing the poster based on the Disaster Risk Management Plans for respective case study sites in their home countries.

Source: Rohit Jigyasu

Image Ref. 4.2

Final posters on disaster risk management plans for case study sites from their home countries prepared by the participants.

Source: Rohit Jigyasu

Parameters for assessment of participants based on the disaster risk management plan:

- Clear statement of the main objectives of formulating the plan, the scope, target audience and the agencies responsible for its implementation.
- Description of processes, dependent on different values and risks identified for a specific heritage site or property.
- Identification of each stage in the disaster risk management planning process. A clear idea of time periods, resources and policy frameworks required for implementation.
- Links with the overall planning framework for the heritage site along with regional and national planning frameworks.
- Providing clear, flexible and practical guidance for the site managers, experts and their teams.
- Development of viable pilot projects/activities to be undertaken by the participants

Assessing the Course

At the conclusion of the training course, the organisers should assess its progress; quantitatively, in terms of resource utilisation as well as qualitatively, in terms of how successful the various modules were in achieving the objectives of the organisers and the expectations of the participants. This is an opportunity to ensure that a prolonged exchange of knowledge and skills in this area is initiated and a network of experts and professionals are established at the local, regional and national levels. This exercise also ensures that a database is created for the organisers, that enables them to better design future courses. Such evaluation can be conducted either through detailed discussions at the end of the course or through questionnaires filled out by the participants. The latter approach is sometimes more effective as it allows the participants to articulate their views anonymously.

Sample Format for Assessment and Review of the Course

Section 1: Summary of the Course

Brief report on the progress of the course prepared by organising body.

Section 2: Resource Usage

Human resources used: academic staff, coordinators of the course, managerial and clerical staff. Managers and staff of sites that may have been visited as part of the course should also be enumerated.
Financial resources used: Funding from various sources, which funds were utilised for what purpose.
Material resources used: Resources such as venues, basic material used during the course including stationary, measuring instruments, equipment etc. should be listed

Section 3: Activities

Academic Activities constituting the course with following details on each module:

- Title and expected results for each lecture, workshop, etc.
- Duration.
- Target groups.
- Geographical coverage for partners and participants.
- Intended use of results.

Details of supporting activities which may be held simultaneously or in succession to the course:

- Conferences/ Meetings and Seminars
- Partnerships and exchange courses between institutions and organisations

Section 4: Outcomes

An outcome map of the course utilising feedback from the participants and the lecturers should be used to identify the successes of the course and also the gaps in the teaching process so that these may be addressed in the future. A short-term review should be supplemented by following up with participants and lecturers to assess whether the course had the desired impact envisioned by the organisers. At the conclusion of the course, the highlights of the proceedings along with what was learned could be summarised for generating further discussion on the subject and cementing the network of professionals and experts involved.

Section 5: Future Activities

4.2 Linking the Course to Long Term Capacity Building Initiatives

Fostering Partnerships through Training

One of the key objectives of organising this type of course is building a resource bank of research on the subject and, constructing a robust international scientific network to build institutional capacity over an extended period of time. This may be achieved by ensuring that such courses are organised as a part of a long-term strategy of capacity building.

Some possibilities for integrating the course with other strategies have been listed below:

- ***Encouraging long-term commitments from participants*** in the form of concrete proposals for implementing disaster risk management for cultural heritage and outlining a long-term schedule of activities in their respective regions.
- ***Providing sustained mentorship and support, beyond the scope of a training course.*** This may be through informal and formal partnerships or mentorship programmes where participants receive expert guidance through web-based platforms while setting up disaster risk management strategies. If resources are available, the participants can be again brought together to present their activities during distance mentoring phase and learn from each other's achievements.
- ***Using new technologies and media to stay connected as an active participatory network.*** Social media and the Internet can be used effectively to foster long distance interactions and sustain a vibrant network of professionals. Furthermore, such a system can be used to deliver the course in an adapted format through online portals. This is especially relevant in scenarios where it may be difficult to physically organise a course, due to complex issues on site.

Training Workshop

Disaster Risk Preparedness and Management, UNESCO World Heritage Site of Berat, Albania organsied by UNESCO and ICCROM

Duration: 19 – 24 November, 2011 (5 days on site) | 6 months (Mentorship, offsite) | 3 days (concluding workshop, on site)

The workshop was developed through a participatory methodology and upon the newly issued Resource Manual for Managing Disaster Risks for World Heritage - which focused on one specific approach to the principles, methodology and process for managing disaster risks at cultural and natural World Heritage properties.

Special focus was devoted to risk preparedness for earthquakes and fires, through the participation of highly qualified international experts on such fields of expertise. The objectives were to raise awareness among professionals and responsible agencies for the need to develop appropriate disaster risk management plans, to raise capacity in developing appropriate regimes of risk management in major cultural sites of Albania and to lay the groundwork for the development of a disaster risk management plan in selected cultural sites that could act as a model for other sites both in Albania and in the whole region.

The workshop intended to bring together heritage professionals from Albania and provide them with knowledge on current thinking, methods and tools available for the preparation of disaster risk management plans. This was done through team work exercises that formed the basis for further developing a site management plan by the respective site management authorities. This plan was scheduled to be delivered and presented on the occasion of the final workshop on disaster risk preparedness and management in cultural sites scheduled in Albania in spring 2012.

Trainees were able to rely on adequate coaching support after the end of the training and were presented with a certificate of attendance upon delivery of a draft framework of a management plan on risk preparedness.

Image Ref. 4.3
'World Heritage Town of Berat in Albania: the Site for the International Training Workshop in 2011 and 2012
Source: Rohit Jigyasu

ICOMOS-ICORP E-Learning Course on "Protection of Syria's Cultural Heritage in the times of Armed Conflict" organised in cooperation with ICCROM and DGAM Syria, 7-8 January 2013

During extended periods of armed conflict, it becomes difficult for the international community and experts to know the extent of damage to cultural heritage on the ground and plan for an emergency response. These types of conflict also make it difficult for international experts to participate in the recovery and also to prevent further damage. In such difficult situations, information technology and new media can be harnessed by the international community for building the capacity of heritage managers to monitor and plan for an emergency response.

In 2012 ICOMOS International Scientific Committee on Risk Preparedness (ICORP) planned a programme for the protection of cultural heritage in Syria during the ongoing conflict in the country, which permitted gathering information and creating a database of damaged heritage sites and an exchange of information and knowledge between Syrian professionals and international experts.

Image Ref. 4 .4
Lecturers answering participants' questions during an e-learning course on "Protecting Syria's cultural heritage in the times of Armed Conflict."
Source: Rohit Jigyasu

Abbreviations

DRM Disaster Risk Management

ICCROM International Centre for the Study of the Preservation and Restoration of Cultural Property

UNESCO United Nations Educational, Scientific and Cultural Organization

OUV Outstanding Universal Value

WHC World Heritage Centre

EWSS Environmental Water Supply System

RitsDMUCH Research Center for Disaster Mitigation of Urban Cultural Heritage, Ritsumeikan University

ICOMOS International Council on Monuments and Sites

UNESCO United Nations Educational, Scientific and Cultural Organisation

UNISDR United Nations International Strategy for Disaster Risk Reduction

ICOM International Council of Museums

ICORP International Committee on Risk Preparedness

Technical Terms

Climate change: A change in climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (United Nations Framework Convention on Climate Change; http://unfccc.int/).

Disaster: A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceeds the ability of the affected community or society to cope using its own resources (www.unisdr.org).

Emergency: An unforeseen combination of circumstances or the resulting state that calls for immediate action (Merriam Webster Online Dictionary, www.m-w.com).

Hazard: Any phenomenon, substance or situation, which has the potential to cause disruption or damage to infrastructure and services, people, their property and their environment (Abarquez and Murshed, 2004).

Mitigation: Taking action in the timeframe before a disaster to lessen post-event damage to lives and property. In risk management, many hazards such as earthquakes cannot be reduced, but the risk from that hazard can be reduced, or mitigated, for example by constructing earthquake-resistant buildings, or shelves that prevent objects from sliding off. The former is structural mitigation, the latter is non-structural.

Prevention: Measures taken to reduce the likelihood of losses. Ideally, these measures would seek to reduce losses to zero, but this often is not possible. Key question: How much prevention do you need to undertake?

Recovery: The process of returning the institution to normal operations, which may also involve the repair and restoration of the building or site.

Response: The reaction to an incident or emergency to assess the damage or impact to the site and its components, and actions taken to prevent people and the property from suffering further damage.

Risk: The chance of something happening that will have an impact upon objectives. (Emergency Management Australia, 2000).

Vulnerability: The susceptibility and resilience of the community and environment to hazards. 'Resilience' relates to 'existing controls' and the capacity to reduce or sustain harm. 'Susceptibility' relates to 'exposure' (Emergency Management Australia, 2000).

World Heritage property: World Heritage properties are those defined in Articles 1 and 2 f the World Heritage Convention and inscribed on the World Heritage List on the basis of their outstanding universal value, which is fulfilled through meeting one or more of criteria (i)–(x) in the Operational Guidelines for the Implementation of the World Heritage Convention (UNESCO / WHC, 2008a).

Compiled list sourced from: UNESCO, (2010). Managing Disaster Risks for World Heritage. Paris: UNESCO.

Relevant charters and Recommendations

Convention concerning the Protection of the World Cultural and Natural Heritage, UNESCO, 1972.
http://whc.unesco.org/archive/convention-en.pdf

Final Recommendations of the International Course on Preventive Measures for the Protection of Cultural Property in Earthquake Prone Regions, Skopje, Yugoslavia, 1985. (Stovel, ICCROM, 1998)

Conclusions and Recommendations of the International Workshop on Structural and Functional Rehabilitation of Housing in Historic Buildings in Seismic Regions, Mexico City, 1986. (Stovel, ICCROM, 1998)

Council of Europe, Committee of Ministers, Recommendation No. R(93)9 of the Committee of Ministers to Member States on the Protection of the Architectural Heritage against Natural Disasters, adopted by the Committee of Ministers on 23 November 1993 at the 503rd Meeting of the Ministers' Deputies.
(ICOMOS Heritage at Risk, H@R, 2008)

Declaration of Quebec, Ist National Summit on Heritage and Risk Preparedness, Quebec City, Canada, 1996.
(Stovel, ICCROM, 1998)

The Kobe/Tokyo Declaration on Risk Preparedness for Cultural Heritage, Kobe/Tokyo International Symposium on Risk Preparedness for Cultural Properties, 1997.

Radenci Declaration, Blue Shield Seminar on the Protection of Cultural Heritage in Emergencies and Exceptional Situations, Radenci, Slovenia, 12–16 November 1998. http://www.ifla.org/VI/4/admin/emergcy.htm

Declaration of Assisi by ICOMOS Scientific Committee for the Analysis and Restoration of Structures of Architectural Heritage, 1998. (Stovel, ICCROM, 1998)

Torino Declaration. Resolutions of the First Blue Shield International Meeting, Torino, Italy, 2004.
http://www.ifla.org/VI/4/admin/torino-declaration2004.pdf

Kyoto Declaration 2005 on the 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 Kyoto Kaikan on 16 January 2005);
http://www.international.icomos.org/xian2005/kyoto-declaration.pdf

Recommendations of the UNESCO/ICCROM/Agency for Cultural Affairs of Japan – Thematic Meeting on Cultural Heritage Risk Management, World Conference on Disaster Reduction, Kobe, 2005.
http://australia.icomos.org/wp-content/uploads/Japan-recommendations.pdf

UNESCO / WHC. 2006. Strategy Document for Reducing Risks from Disasters at World Heritage Properties. World Heritage Committee, 30th Session, Vilnius, Lithuania, 8–16 July 2006.
http://whc.unesco.org/download.cfm?id_document=6525

Declaration on the Impact of Climate Change on Cultural Heritage, International Workshop on Impact of Climate Change on Cultural Heritage, New Delhi (India), 22 May 2007. (ICOMOS News, June 2008)

Compiled list sourced from: UNESCO, (2010). Managing Disaster Risks for World Heritage. Paris: UNESCO.

List of Resource Persons

Resource Persons for the International Training Course on Diaster Risk Management of Cultural Heritage organised by RitsDMUCH, Kyoto

ARAOZ Gustavo, U.S.A.
ICOMOS, *President*

BOCCARDI Giovanni, Italy
UNESCO World Heritage Centre, *Chief of Asia and Pacific Unit*

CHIBA Moe, Japan
UNESCO Office in New Delhi, *Programme Specialist for Culture*

CHIOU Shang-Chia, Taiwan
National Yunlin University of Science and Technology, *Vice President*

CHOI Byungha, Korea
CHA Korea (Rep.of)
Appointed expert of Historic Sites

COLE Sue, United Kingdom
National Advice team, English Heritage, London UK, *Senior International Advisor*

CROCI Giorgio, Italy
Faculty of Engineering, University of Rome La Sapienza *Professor*

FUKAGAWA Ryoichi, Japan,
Deaprtment of Civil Engineering, College of Science and Engineering, Ritsumeikan University, *Professor*

FURUKAWA Aiko, Japan
Department of Urban Management, Kyoto University, *Associate Professor*

GILL Victoria, Philippines
ICORP Member, *Consultant, Endangered Heritage, Manila*

HASEGAWA Naoji, Japan
Agency for Cultural Affairs of Japan , *Senior Specialist for Cultural Properties, Architecuture Division*

HIRAOKA Yoshihiro, Japan
Architecure Design Laboratory, Department of Design Information, Miyagi University, *Professor*

ISHIZAKI Satoru, Japan
Disaster Prevention and Crisis Management Office, Kyoto City Fire Department, *Director*

ITAYA (USHITANI) Naoko, Japan, Research Center for Disaster Mitigation of Urban Cultural Heritage(DMUCH), Ritsumeikan University, *Associate Professor*

IZUNO Kazuyuki, Japan
Deaprtment of Civil Engineering, College of Science and Engineering, Ritsumeikan University, *Professor*

JIGYASU Rohit, India
Research Center for Disaster Mitigation of Urban Cultural Heritage(DMUCH), Ritsumeikan University UNESCO CHAIRHOLDER Professor / President of ICOMOS-ICORP, *Professor*

KAISER Colin
UNESCO Office in Kathmandu
Former Head of Office & UNESCO Representative to Nepal

KAMIYAMA Makoto, Japan
Department of Environmental Information Engineering, Tohoku Institute of Technology, *Honorary Professor and Guest Researcher*

KANEGAE Hidehiko, Japan
College of Policy Science (Planning), Ritsumeikan University, *Professor*

KING Joseph, U.S.A.
ICCROM , *Sites Unit Director*

KITAGAWA Daijiro, Japan
ICCROM, *Former Project Manager*

KIYONO Junji, Japan
Department of Urban Management, Kyoto University, *Professor*

KONDO Tamiyo, Japan
Disaster Reduction and Human Renovation Institution
Research Fellow

MACHIDA Yoshinori, Japan
Disaster Prevention and Crisis Management Office, Administrative and Budgetary Bureau, Kyoto City, *Manager*

MAENO Masaru, Japan
Japan ICOMOS National Committee, *Architect, Former President*

MASKEY Prem Nath, Nepal
Department of Civil Engineering, Institute of Engineering,Tribhuvan University, Nepal, *Professor*

MASUDA Kanefusa,Japan
Research Center for Disaster Mitigation of Urban Cultural Heritage(DMUCH),Ritsumeikan University, *Former Professor and UNESCO Chair holder*

MOFFATT Sebastian, Canada
CONSENSUS Institute Inc., *President and CEO*

MORITA Minoru, Japan
Curatorial Board, Kyushu National Museum, *Director*

MURAKAMI Yasumichi, Japan
Hyogo Prefecture Board of Education, *Director of Cultural Asset Division*

NAGAMATSU Shingo, Japan
Disaster Reduction and Human Renovation Institution,
Research Fellow

NAITO-AKIEDA Yumi Isabelle, Japan, Graduate School of Conservation, Tokyo University of Arts, *Part-time Lecturer*

NARITA Masatoshi, Japan
Cultural Asset Protection Office, Board of Education, Sasayama City, *Assistant Manager*

OKADA Atsumasa,Japan
Research Center for Disaster Mitigation of Urban Cultural Heritage(DMUCH) Ritsumeikan University, *Visiting Professor*

OKAMOTO Tomio, Japan
Kyoto City Fire Department Board Member, *First Assistant Chief of Fire Department*

OKUBO Takeyuki , Japan
Deaprtment of Civil Engineering, College of Science and Engineering, Ritsumeikan University, *Professor*

OMORI Hikokazu, Japan
OMORI Architectural Office Exectutive Director, Chief Technical Expert of Cultural Property Building Repair / Restoration, *Expert of Fire-Fighting Equipment*

ORISAKA Kazuya, Japan
Disaster Prevention and Crisis Management Office, Kyoto City Fire Department, *Assistant Manager*

PERÄHUHTA Minna, Finland
Ministry of the Environment, *Senior Architect*

RANJITKAR Rohit, Nepal
Kathmandu Valley Preservation Trust (KVPT) Patan, Lalitpur District, Nepal, *Director*

RICHON Marielle,France
Section for Communication, Education and Partnerships(CEP), UNESCO World Heritage Centre(WHC, *Programme Specialist*

RIDDETT Robyn, Australia
Anthemion Consultancies Melbourne, ICORP Member, *Director*

SAIMOTO Kenji, Japan
Hyogo Heritage Organization, *Director*

SAKO Kazunari, Japan
Deaprtment of Civil Engineering, College of Science and Engineering, Ritsumeikan University, *Associate Professor*

SATOFUKA Yoshifumi,Japan
Deaprtment of Civil Engineering, College of Science and Engineering, Ritsumeikan University, *Professor*

SCAWTHORN Charles,U.S.A.
Graduate School of Engineering, Kyoto University, *Professor, Dr.Eng.*

SHANKER Pratyush, Nepal
Faculty of Architecture, CEPT University, Ahmedabad, India, *Assistant Professor*

SHAW Rajib, Japan
Graduate School of Global Environmental Studies, Kyoto University, *Associate Professor*

SHIMOTSUMA Kumiko, Japan
Agency for Cultural Affairs of Japan, *Senior Specialist for Cultural Properties*

SUBBA Mahendra,Nepal
Department of Urban Development and Building Construction, Ministry of Physical Planning and Works, Government of Nepal

SUMANOY Lazar, Macedonia
ICORP Member, *Chair, Haiti-Macedonia Steering Committee*

SUZUKI Shingo, Japan
Disaster Reduction and Human Renovation Institution,
Research Fellow

TAKAHASHI Akatsuki, Japan
UNESCO Office for the Pacific States, *Programme Specialist for Culture*

TAKEDA Shiro, Japan
Department of Architecture and Urban Design, College of Sceince and Technology, Ritsumeikan University,
Associate Professor

TANAKA Takeyoshi, Japan
Disaster Prevention Research Institute, Kyoto University, *Professor, Dr. Eng.*

TANDON Aparna, India
ICCROM, *Project Specialist*

TIWARI Sudarshan Raj, Nepal
Department of Architecture, Institute of Engineering,Tribhuvan University, Nepal, *Professor, Head of Department*

TOKI Kenzo, Japan
Research Center for Disaster Mitigation of Urban Cultural Heritage(DMUCH), Ritsumeikan University, *Director, Professor*

TSURUOKA Noriyoshi, Japan
Cultural Assets Division, Board of Education, Kyoto Prefecture, *Cultural Property Specialist*

TURNER Michael, Israel
UNESCO Chair in Urban Design and Conservation Studies, Bezalel Academy of Arts and Design, Jerusalem, Israel, *Professor*

UMEZU Akiko, Japan
Agency for Cultural Affairs of Japan, *Senior Specialist for Cultural Properties*

VELASQUEZ Jerry, Philippines, UN/ISDR Asia & Pacific, *Senior Regional Coordinator*

WEISE Kai Ube Prasad, Nepal, Planners' Alliance for the Himalayan & Allied Regions (PAHAR Nepal), *Architect*

YAMASAKI Masafumi, Japan
Department of Architecture and Urban Design, College of Sceince and Technology, Ritsumeikan University, *Professor*

YANO Keiji, Japan
Department of Humanities, Geography Major, College of Letters, *Professor*

YI MyungSun, Korea
Cultural Heritage Risk Management Division, Heritage Policy Bureau, Cultural Heritage Administration of Korea, *Deputy Director*

List of Participants

List of Partcipants of the International Training Course on Diaster Risk Management of Cultural Heritage(2006-2012) organised by RitsDMUCH, Kyoto

2006

KODIRA Poonacha, India
Archaeological Survey of India, Ministry of Culture,
Director (Conservation)

KARANTH Anup, India
United Nations Development Programme (UNDP) India,
Project Coordinator - Urban Earthquake Vulnerability Reduction Project

Sektiadi, Indonesia
Dept. of Archaeology, Faculty of Culture Sciences, Gadjah Mada University, *Lecturer*

AYUATI Manggar, Indonesia
Dept. of Cultural and Tourism, Center for Preservation of Cultural Heritage of Yogyakarta Province, *Supervisor of Rescue on Preservation Division*

QURESHI Fauzia, Pakistan
National College of Arts, Lahore
Head, Department of Architecture, National College of Arts

KHADIM Hussain, Pakistan
Rural Development Policy Institute, *Coordinator, Disaster management Desk RDPI*

JEONG Seok, Korea
Tangible Cultural Heritage Bureau, Cultural Heritage Administration, Republic of Korea, *Government employee of Modern Construction Field*

SHIN Woongju, Korea
Dept. Interior Archtecture, Chosun College of Science and Technology, *Concurrent Professor*

2007

AKHAND A.K.M. Monowar Hossain, Bangladesh
Ministry of Home Affairs, GOVT. of Bangladesh, *Deputy Secretary*

ALAM Md. Rafiqul, Bangladesh
DWIP UNNAYAN SONGTHA (DUS) / Island Development Association, *Executive Director*

QUADRA Eric, Philippines
LGU-Vigan City, *Architect*

CORRALES PEREZ Maria Del Carmen, Peru
Instituto Nacional De Cultura,
Architect of the conservation and Restoration Sub Direction

GIBU YAGUE Patricia Isabel, Peru
Japan-Peru Center for Earthquake Engineering Research and Disaster Mitigation, *Chief of Laboratory of Structures*

HE Cuiyu, China
Protection and Management Bureau of World Cultural Heritage Site- the Old Town of Lijiang, *Staff of Engineering & Project Dept*

CONCEPCION Glen, Philippines
City Government of Vigan,
City Disaster Action Officer and City Environment & Natural Resources Officer

HE Shijun, China
Protection and Management Bureau of World Cultural Heritage Site- the Old Town of Lijiang, *Officer of Protection & Construction Office*

2008

WEISE Kai Ube Prasad, Nepal
Planners' Alliance for the Himalayan & Allied Regions (PAHAR Nepal), *Architect*

RAJBHANDARI Suman Narsingh, Nepal
Nepal Engineering College,
Assistant Professor

FILIPOVIC Ivana, Serbia
Cultural Heritage Preservation Institute of Belgrade,
Architect Conservationist

DORJI Choening, Bhutan
Division for Conservation of Heritage Sites, Department of Culture, Ministry of Home & Cultural Affairs, Royal Government of Bhutan, *Architect*

TENZIN Karma, Bhutan
Tashichhodzong Maintenance Division, Dzongkhag Administration, *Civil Engineer*

NEJATI Mahmoud, IRAN
Recovery Project of Bam's Cultural Heritage Deputy of Research & Technical, *Consultant*

MEHDIZADEH SARADJ Fatemeh, IRAN
Department of Conservation, Iran University of Science and Technology, *Assistant Professor*

2009

YU Rong, China
Wenhua College, Huazhong University of Science and Technology, *Lecturer*

DING Yuan, China
Tongji University, National Historic Cities Research Center
Researcher

THAPALIYA Ramesh, Nepal
World Heritage Conservation Section / Ministry of Culture and State Restructuring, Department of Archaeology, *Architect*

SHRESTHA Suresh Suras, Nepal
Ministry of Culture and State Restructuring, Department of Archaeology, *Archaeological Officer*

BROWN Pauline, Jamaica
Office of Disaster Preparedness and Emergency Management,
Senior Director

BROOKS Audene, Jamaica
Jamaica National Heritage Trust
Senior Archaeologist

CIOCANU Sergius
Moldova Institute of Cultural Heritage of the Academy of Science of Moldova / ICOMOS Moldova National Committee Republica Moldova,
Head Scientific Researcher

SURUCEANU Valeria
Moldova National Art Museum of Moldova, *Curator*

2010

TSHERING Dechen, Bhutan
Division for Conservation of Heritage Sites, Department of Culture, Ministry of Home & Cultural Affairs, Royal Government of Bhutan,
Structural Engineer

MUKAI Junko, Bhutan
Division for Conservation of Heritage Sites, Department of Culture, Ministry of Home & Cultural Affairs, Royal Government of Bhutan,
Deputy Chief Conservation Architect

DWIGHT Alexander G, Palau
Bureau of Arts & Culture, Ministry of Community & Cultural Affiars, *Director, Historical Preservation Officer*

NGIRMANG Sunny, Palau
Bureau of Arts & Culture, Palau Historic Preservation Office,
Palau National Registrar

HUAPAYA Teresa Vilcapoma Peru
Sagrado Corazon University,
Univeristy Professor

MENDOZA SHIMADA Olga Keiko, Peru Ritsumeikan University, Graduate School of Science & Engineering Doctor Course Student, JSPS,
Research Fellow

TERRONES DIAZ Marilene, Peru
Sagrado Corazon University,
Univeristy Professor

GROZDANIC Milica, Servia
Cultural Heritage Preservation Institute of Belgrade, *Director*

MARKOVIC Svetlana Dimitrijevic, Servia
Cultural Heritage Preservation Institute of Belgrade, *Architect -Conservator - Senior Associate*

GUL UNAL, Zeynep
Turkey Yildiz Technical University, Faculty of Architecture, Restoration Department, *Assistant Professor, Dr.*

VATAN KAPTAN Meltem, Turkey
Yildiz Technical University, Faculty of Architecture, Structural Systems Division, *Research Assistant, PHD Student*

2011

RINCON Celina, Colombia
Ministry of Culture Assessor for the Heritage, *Director Office*

NICHOLS Cheryl, Jamaica
Office of Disaster, Preparedness and Emergency Management,
Training Manager

MWAHUNGA Julius, Kenya
Ministry of State for National Heritage and Culture,Deartment of Culture, *Senior Cultural Officer*

KIGONGO Remigius,Uganda
Department of Museums and Monuments, *Conservator Sites and Monuments / Site Manager*

WEI Qing, China
Cultural Heritage Conservation Center, THAD, *Deputy Director*

PEREZ OCEJO Jose Ramon, Mexico
Universidad de las Américas (Puebla, MEXICO),*Part time Teacher*

SHARMAJanhwij, India
Archaeological Survey of India, Ministry of Culture, *Director (Conservation and World Heritage)*

SHIKDER Md.Aamir Hossain, Bangladesh
Bangladesh Municipal Development Fund (BMDF),
Urban Local Body Coordinator

WANG Yu, China (Norway)
Urban Design and Planning Department, Norweigian University of Science and Technology (NTNU),*PhD Candidate*

2012

YEE SHOW Suzie, Fiji
ICOMOS PASIFIKA,
Secretary General

LAKHANI Vikas, India
Gujarat State Disaster Management Authority,
Sector Manager

JO Sang sun, Korea
Heritage Repair Division, Cultural Heritage Administration of Korea, *Research Associate and curator*

BIN HAJI NOR Rosli, Malaysia
Melaka World Heritage Office,
Head of Melaka World Heritage Office

LEI WIN Ni, Myanmar
World Concern Myanmar, Relief Recovery and Development Project in Myanmar,
Communication Officer

McCRACKEN Helen, New Zealand
Ministry for Culture and Heritage,
Policy Adviser-Heritage

SHAMIM Usman, Pakistan
Kuchlak Welfare Society (KWS)
Programme Officer

YAHAMPATH Poorna, Sri Lanka
Central Cultural Fund - Sri Lanka
External Resource Person / Consultant For Director General

YILDIRIM ESEN Sibel, Turkey
Ministry of Culture and Tourism,
Conservation Architect

Holly statue being RESCUED by Cultural assets rescue party

The Great Hanshin-Awaji Earthquake, 1995. Eikonji-Temple, Kawanishi-shi, Hyogo, Japan

Source: Haruo Nakano

Cover Page Image Credits :
Remains of Catholic Basilica after the earthquake in 2011.
Source: Bryan Lintott

Produced & Printed:
NPC Co., Ltd 1-9-19, Tenma, Kita-Ku, Osaka-City,530-0043, Japan