



RISK ASSESSMENT: EARTHQUAKE



PRESERVATION OF BUDDHIST TREASURES RESOURCE is the free online resource for monasteries and communities, with practical information on digital documentation, risk assessment and disaster recovery, safer storage, and preservation of thangka and other treasures. The resource comes from over 50 years of preservation work in monasteries.



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RISK ASSESSMENT: EARTHQUAKE

Introduction

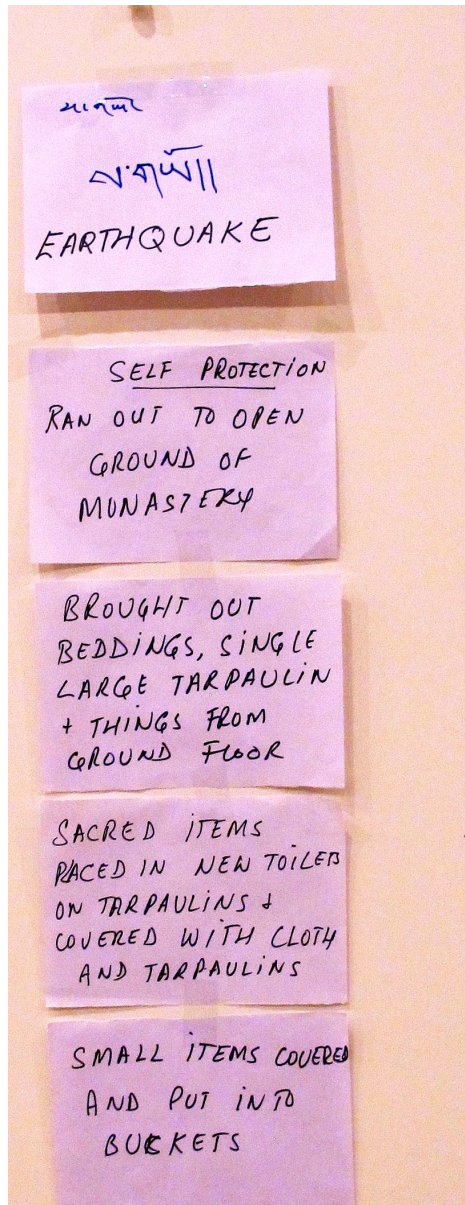
Risk Assessment, Disaster Planning, and Mitigation

Summary

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Risk Assessment: Earthquake

Introduction



Monastics' own experience of how they protected their monastery treasures during earthquakes and tremors

Monastics' own experiences in Earthquake situation:

- Self-protection: ran out to open ground of monastery
- Brought out beddings, large tarpaulin, and things from ground floor
- Sacred items placed in new toilets on tarpaulins and covered with cloth and tarpaulins
- Small items covered and put into buckets

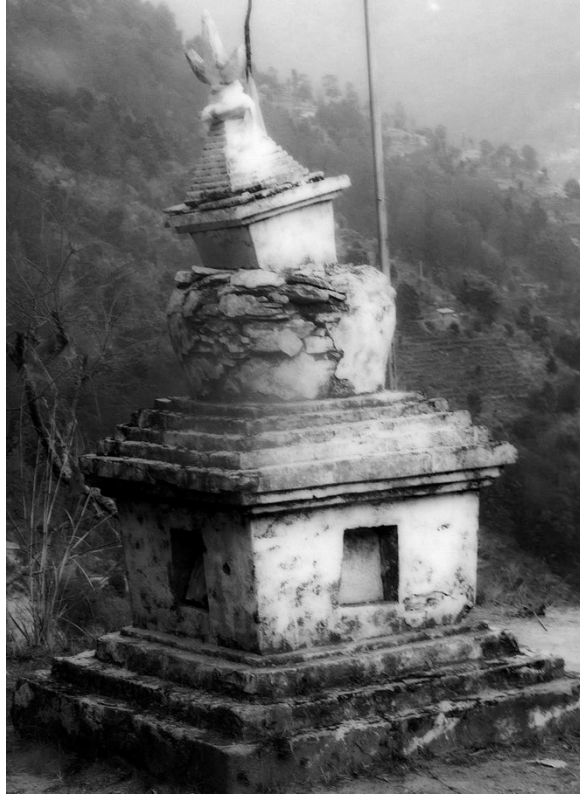


Earthquake-damaged Lhakhang was no longer safe and had to be totally demolished and removed

An earthquake itself is a primary event, but it does not stop there. Earthquakes are usually followed by aftershocks and, often, fires. Social upheaval often happens and there is danger for residents and emergency workers. Then follows a lengthy period of daily disruption due to lack of housing and services, while the rubble is cleared, and new structures are built. Some monasteries and chortens damaged in earthquakes may not be rebuilt for some time due to cost and safety reasons.



Earthquake-damaged wall painting. Some monasteries removed the damaged paintings and began anew, however, another few attempted restoration.



Earthquake damaged stupa in the countryside awaiting restoration (image Jim Lindsey)

Although earthquakes are natural disasters, there are man-made factors to the damage they cause, including: inadequate infrastructure and preparation; lack of planning and communication; unstable building construction; locating monasteries and communities on terrain that is vulnerable to landslides; and more. All these choices increase damage from an earthquake event. Since they are choices made by people, the choices can be made in a more informed manner for the future safety of those living in earthquake regions. Seismic risk can be calculated for specific geographic locations, and is a pillar for risk mitigation planning. You can research seismic risk for your monastery's area through local governmental departments, often universities update seismic data, and we often use web searches for current information.



Pillar of monastery that was built on a mountaintop. Most of this monastery was damaged so severely it had to be removed and completely rebuilt.



Even though this monastery was well-constructed with concrete, due to its location it suffered severe earthquake damage



Nuns building their own monastery in a traditional, pounded-earth technique. Some people believe that traditional structures are stronger during earthquakes than concrete buildings.



Rebuilding of Main Stupa in Kathmandu, amongst the rubble from the earthquake's destruction

Risk Assessment, Disaster Response Planning, and Mitigation

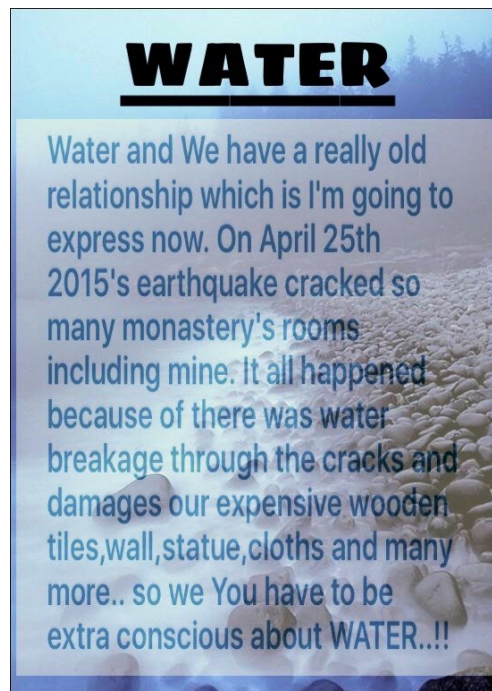
In the past, there was little preparation and planning in order to survive earthquakes. Many people died and many treasures were destroyed. Now, the Risk Assessment, Disaster Response Planning, and Mitigation guide offers methods and materials that will help you, your monastery, and its treasures, as well as your community, to survive the next earthquake.

The appendix provided for you includes all the written resources you need for planning for earthquakes and related disasters.

- Post-earthquake preservation of monastery treasure
- Field-guide assessment forms
- Disaster vulnerability assessment
- A shopping list for disaster supplies and list of supplies which you will need for after a disaster
- A supply list for your command center, because after a disaster you have to have a command center with a command team leader

In earthquakes, both lives and treasures are destroyed. There can be complete destruction: breakage, smoke damage, water damage, land looting. Therefore, it is not only the earthquake damage itself but also the related tremors that cause damage.

Gas tanks may explode, and electrical wiring may spark, causing fires. To put out fires following an earthquake, there can be a considerable amount of water damage to buildings, and what they contain.



Monastery signage about earthquakes and water damage

An earthquake in itself creates great damage. After the earthquake you have damage from fire and water as well as the huge problem of looting. After an earthquake people can come and steal. In your earthquake response planning, you have to plan for all these possibilities. In addition to the earthquake itself, you must prepare for how to decrease destruction caused by fire, water, and loss caused by theft.

Earthquake

- Lives and treasures destroyed
- Complete destruction
- Breakage
- Smoke damage
- Water damage
- Looting

Fire follows earthquakes, creating further problems. For example, the head Geshe of a monastery located high up on a hill said that during a major earthquake he was trapped in his office in his monastery. He was looking down over the valley during the earthquake and he saw houses and monasteries exploding because their gas tanks and electrical wiring exploded. He looked down and he saw fires exploding. Not only were buildings falling down but there was fire all over the valley. Fire in itself is a real problem, but it is also a problem after an earthquake.

Here are practical suggestions for what you can do about preventing more earthquake damage to your monastery treasures. Follow your emergency plan with team protocol as much as possible. These are basic elements of an emergency plan for monasteries:



Basic Elements of Emergency Plan for Monasteries and Communities

1. People First
2. Who Do You Call?
 - Who is in charge?
 - Emergency phone numbers
 - Full monastery residence list, to text, WeChat, WhatsApp, etc.
3. Who Should Salvage Collections?
 - Monastery Treasures Salvage Team (trained previously)
4. Where to Bring Damaged Treasures
 - Another monastery?
 - Your monastery dining room, classrooms, etc.
5. What Do You Salvage First?
 - Decide your priorities, preferably before an emergency
 - Mark the location of these priority treasures on floor plans
6. Where Are the Emergency Supplies?
 - Stockpile supplies before an emergency occurs
 - Mark the location of supplies on floor plans
 - Contact local vendors for additional supplies
7. Who Provides Security During an Emergency?
 - Monastics, community members, or government?
8. What Information Technology Will You Need to Replace?
 - Survey your hardware and software currently in use
 - Store monastery files in "cloud" or duplicated offsite
9. Do You Have Insurance?
10. Who Has the Plan?
 - Make a list of who has copies of your Emergency Plan
 - Update Emergency Plan and Team

Train yourself in protecting each other through CERT and other trainings available through nonprofit and governmental agencies.

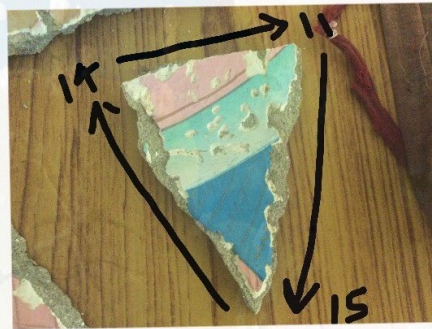
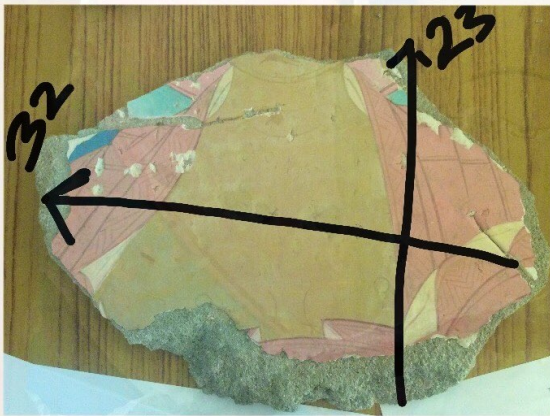


Monastics are training in emergency techniques to save lives. We can adapt these techniques to save monastery treasures.

- Enter the monastery only when it is safe after the earthquakes and tremors have stopped, then protect monastery treasures
- Know where the most valuable lineage treasures are located within the monastery; hopefully your pre-disaster documentation will provide comprehensive information including a map and pictures
- Learn how to carry them so that they are properly supported and more damage does not occur. This is described in the Emergency Response chapter of this resource.
- Identify where to carry them, to a safe place that is secure
- Keep every broken part of every treasure



Document the fragments and damaged treasures you have collected



THIS IS A PIECE OF 20 YEARS OLD WALL PAINTING FROM OUR MONASTERY WHICH HAS BEEN BROKEN ON APRIL 25TH 2015'S EARTHQUAKE!!

It is important to collect each damaged and displaced part of treasures. They are an important part of the history and contain blessings of the monasteries.

What can you do to protect yourself after an earthquake? You train in protecting each other. In other words, learn about basic emergency response for people. You want to think of people first and treasures second. I know that often in disasters monks have run back into a monastery when it is burning or when there is an earthquake to save their master's treasures and there has been death and disfigurement from that. People first. Then, you find out when the museum, monastery, or library building is safe to go back into before you run into it to save things in an organized way, following the instructions of a team leader.

With earthquakes, people come first. Safety first, and the tremors that follow earthquakes can be unpredictable. Often, following the earthquake and tremors, monks feel safe to return to monasteries that are still standing following the initial quake. However, the tremors following can cause collapse, even though the structure appears to be sound. Structural damage to your monastery and community buildings also depends on the type of building; many current monasteries are concrete

structures, whereas in the past they could have been made of wood or beaten earth. Recently, monasteries and meditation centres in urban areas are being located in tall office buildings.

Earthquakes damage things outside of buildings and they also cause damage inside. One temple was all right outside but inside everything was completely ruined.



Earthquake and tremor damage inside a monastery with shattered glass



Nuns inspect statues inside of traditional wooden shrines



Statues within traditional wooden shrines can move around and fall over during earthquake and tremors. You can make them more secure with a base and padding that won't be seen in the case

These suggestions were made by monastics and come from their own experience following traumatic earthquake events:

Earthquake Suggestions from Monastics in Nepal Monasteries in Their Own Words

- Heavy chandeliers can be replaced with lighter ones
- Styrofoam can be scooped and lined with soft cotton for stable placing and storing statues
- Styrofoam can be used as back support (colour matching background) to prevent statues moving during an earthquake
- Lightweight storage boxes with good quality styrofoam scooped for placing individual items and lined with cotton
- “One Child One Light” project in India is a good source of inexpensive solar lights
- Monastery wall fragments (with paintings) can be numbered, wrapped in cotton cloth, and stored in dry place for use later either to place back or use as reference for new painting



After the earthquake damage was cleaned up in this monastery, the damage to the main Buddha statue remained, because its head was turned due to the earthquake's strength

In many monasteries there are large lighting fixtures. During an earthquake, it often happens that they fall down and can hurt people and cause great destruction. Many monasteries have large, glass chandeliers hanging with lots of crystals. During a large earthquake these chandeliers fell down and hurt people, with the crystals scattering. Heavy chandeliers can be replaced with lighter ones, or the strength of the connection to the ceiling can be increased (an inexpensive suggestion).

One monastery that rebuilt after a major earthquake chose sturdy wooden ceiling lights, firmly attached to the ceiling, and with LED lights within. This sturdy design was used to prevent the lights falling down and harming people during the next earthquake.



Earthquakes and tremors can cause the large and heavy chandeliers that decorate monasteries to fall down. Both people and treasures can be seriously damaged.

Often in monastery storage rooms, treasures are not protected but are placed on shelves or in boxes. If you store them safely, when you have tremors, they will not be damaged. Styrofoam can be very useful: a cavity can be carved out of the styrofoam, lined with cotton, and the treasure "nested" in it. This can keep statues and other treasures in place. You can also use styrofoam for huge statues. In some of the monasteries, the largest, most valuable statues fell over and broke.



Local merchants may sell stable storage and support materials

You can sometimes locate styrofoam or other inexpensive pieces of packing materials from local merchants; try to find chemically stable materials, not cardboard or other paper products. One monastery thought of painting the recycled styrofoam the color of the shrine so that its bright white color was muted when placed behind treasures to support them.



This picture shows how a museum has created low-cost and safe storage in an earthquake zone by carving out Styrofoam for the treasures to rest in. During severe tremors the treasures will stay in place and not fall off the shelf



This is an example of a simple support you can create to place around the base of statues. It is made from Tyvek (used in building construction and easy to find in local markets) and filled with sand or other weight .

There are also solar lights so that every monk and nun can have a light that doesn't require a battery or electricity. They are very inexpensive. Using these solar lights during an earthquake when there's no power, everyone will have light. These lights are good for an emergency but also good to save on power bills for every monastery and school because every time it gets dark you just switch on this little light and every student, monk, and nun can read. And it's free from the energy of the sun. For example, there is a company called "One Child, One Light" and they have solar lights for \$5 or less each. You can give one to everyone in your workplace, monastery or school and you can use them all the time. During the day, put them in the sun and at night you do not need electricity. During an earthquake when there is no electricity, no power, and therefore no light, you will have been using these and recharging them every day anyway. They are amazing resources. In addition to solar lights, wind-up torches (flashlights) can be used immediately and located throughout the monastery close to fire-extinguishers, and in entranceways.



Monk recharges his solar light every morning outside of his room. In some monasteries, monkeys would take it, so it could be recharged inside of the window facing towards the sun.

When wall paintings are damaged, and fragments fall, they can be numbered and wrapped up carefully.



In one monastery, the few remaining fragments of their historical wall paintings were documented and kept as monastery treasures



Earthquake Advice and Experience from Monastics in Their Own Words

- Supports can be created to help prevent statues from moving during earthquakes.
- Monastery wall fragments (with paintings) can be numbered on the back, photographed (bearing same number), wrapped in cotton cloth, and stored in a dry place for use later (either to place back or to use as reference for new painting). Simple undyed cotton cloth used for storage can be purchased in the market. The cloth is then soaked in boiling water to get rid of chemicals from manufacture (such as formaldehyde), and then dried in the sunshine.
- Could consider new painting on framed canvas instead of directly on the wall.
- If plastic is used for wrapping treasures, wrap in cotton first, and then use better-quality plastic.
- Making the Dharma symbols on top of the monastery in alternative materials to solid heavy concrete; could be an option that helps to prevent injury and death during future seismic activity.
- Heavy older glass and metal chandeliers can be replaced with lighter ones.
- Creation of bases for statues to limit damage during future seismic activity.
- Lightweight, strong storage boxes with good-quality internal supports created for placing individual items. These boxes can be carried out of the monastery by a prearranged plan wherein the most valuable treasures are identified.

Summary

Earthquakes and tremors occur in certain regions. You can save lives and treasures both in your monastery by conducting risk assessments and creating your Emergency Plan in advance. Although advice and information from international earthquake experts is included in our appendix, some of the best and most practical suggestions and solutions come from monks and nuns in monasteries who have personal earthquake experience. You can find more about specific low-cost and simple prevention and remediation techniques in other chapters of PRESERVATION OF BUDDHIST TREASURES RESOURCE, such as Documentation, Wall Paintings, Storage, Fire, Water, etc.

Thank you to funders for ***Preservation of Buddhist Treasures Resource*** including The Pema Chodron Foundation, Khyentse Foundation, Shambhala Trust, Shelley and Donald Rubin Foundation, Anne Thomas Donaghy, Henry Ming Shen, and many more.

EARTHQUAKE LINKS AND PDF FOR FURTHER INFORMATION:

An Overview of Seismic Damage Mitigation for Museums

Jerry Podany

This paper, presented at the International Symposium on Advances of Protection Devices for Museum Exhibits, April 13-17, 2015 Beijing and Shanghai, China, provides an overview of the developments and methodologies used for the mitigation of earthquake damage to museum collections as illustrated by case studies at the J Paul Getty Museum in Los Angeles California.

<https://www.academia.edu/12052553/>

[An_Overview_of_Seismic_Damage_Mitigation_for_Museums](https://www.academia.edu/12052553/An_Overview_of_Seismic_Damage_Mitigation_for_Museums)

https://www.iiconservation.org/sites/default/files/news/attachments/6654-iic-itcc_2015_notes_seismic_mitigation_for_museum_collections_jerry_podany.pdf

Objects Recovery and Mitigation

www.archives.gov › preservation › conservation › obje...

Aug 15, 2016 - by Jerry Podany Conservator of Antiquities, J. Paul Getty Museum Why would an archives or library ... by Jerry Podany ... "All the ceramics have fallen in the exhibition case after the earthquake and I can not open the case...". <https://www.archives.gov/preservation/conservation/objects-recovery.html>

Contents Fragile! Earthquake Damage Mitigation for Museum Collections and the Role of Science Academies in Advancing this Effort

<https://www.academia.edu/35768597/>

[CONTENTS_FRAGILE_EARTHQUAKE_DAMAGE_MITIGATION_FOR_MUSEUM_COLLECTIONS_AND_THE_ROLE_OF_SCIENCE_ACADEMIES_IN_ADVANCING_THIS_EFFORT](https://www.academia.edu/35768597/CONTENTS_FRAGILE_EARTHQUAKE_DAMAGE_MITIGATION_FOR_MUSEUM_COLLECTIONS_AND_THE_ROLE_OF_SCIENCE_ACADEMIES_IN_ADVANCING_THIS_EFFORT)

-Advances in the Protection of Museum Collections from Earthquake Damage Podany 2006 Getty

-When Galleries Shake Podany 2016 Getty <https://shop.getty.edu/products/when-galleries-shake-earthquake-damage-mitigation-for-museum-collections-978-1606065228>

Nepali Times
1-7 May 2015 #756

Editorial

Shaking things up

What undermined our ability to deal promptly and adequately with search, rescue and relief was first and foremost a failure of politics.

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It is difficult to imagine that things will ever be 'normal' in Nepal again after this catastrophe, but 'normalcy' does inevitably return over time.



Photo: Gopen Rai

Devastating natural disasters like these are cathartic, shaking up society so much that they can help settle problems that looked intractable before the event. [The Sri Lankan war](#) and [the Aceh separatist conflict in Indonesia](#) both wound down in the aftermath of [the Indian Ocean tsunami](#) that hit both countries hard ten years ago. There is reason to hope that a crisis of this magnitude will allow Nepal's rulers to also draw a lesson or two, be more far-



NON-STRUCTURAL MATERIALS RELATED TO DISASTER RESISTANT MUSEUMS

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ABSTRACT:

All governmental authorities in the world try to establish new systems in a disaster to mitigate the risks. There are many engineering approaches for the seismic safety of buildings. Lessons learned from many catastrophic disasters that are related to not only structural elements but also non-structural elements are essential to mitigate the loss of life and property. For buildings, one of the most important issues in mitigating casualties is the installation of non-structural materials to existing buildings.

Tasks of governmental organizations are to prioritize regarding several criteria such as: Building replacement or reconstruction in order to establish disaster resistant buildings or to renovate insufficient spaces, building new constructions, retrofitting, reorganization, correction of project problems and redesign projects.

As a first step, a seismic vulnerability survey should be done at the buildings (include buildings stuffs, visitors and objects which are existed at exhibition and storage areas). Earthquake engineers focus both the structural integrity of buildings and of the elements of buildings (such as dividers, decorative elements, furniture, fixtures). Knowledge about the vulnerability of both building and its contents is essential to a successful mitigation plan.

Non-structural risks mitigation strategies are essential for preparing destructive disasters. In addition to understanding the behavior of non-structural materials, elements and systems, museums are selected in this study. The study summarizes a risk assessment model at the museum buildings.

Goals of the study are saving lives (visitors and personnel), museum objects, protecting cultural heritage and properties, the importance of non-structural risk mitigation, increasing the awareness of earthquake engineers and groups who are involved in the construction sector.

The study methodology: Risks of historical museum buildings are defined by non-structural based assessment according to some risk criteria. Existence of non-structural risks in the museums and the importance of their roles in mitigating disaster losses are emphasized.

KEY WORDS:

Non-structural materials for seismic safety, disaster mitigation of museums, historical museum buildings, vulnerability risk analysis.

1. MUSEUMS AND NON-STRUCTURAL RISKS:

Earthquakes are catastrophes which developed suddenly and caused economic and social losses. Disasters may come in a variety of shapes, sizes and intensity including: Fire, Flood, Subsidence, Structural collapse, Chemical leaks, Explosions, Adverse climatic conditions, Civil Unrest [1]

The museum buildings which the article's subject become vulnerable by disasters and artifacts can not compensate and can not return backward with harmful destruction.

The potential earthquake risk as all over the world exists %98 of the area of the Turkey. (North Anatolian Fault Zone (NAFZ) and East Anatolian Fault Zone (EAFZ) have the potential to produce earthquake activity

The city of Istanbul has hundreds of years of history and it is a world heritage. It has many movable and immovable properties. Reducing likely risks of museum and museum artifacts is a study area of earthquake engineering.

Museums preserve, interpret and promote the natural and cultural inheritance of humanity. They have a primary responsibility to protect and promote this heritage as well as the human, physical and financial resources made

4

Seismic Safety of Architectural Heritage in India: State-of-the-Art and Future Challenges

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Keywords: Earthquake, Seismic, Base-isolation, Post tensioning, Risk, Mitigation.

Annually, natural disasters cause loss of life, damage to property, and environment concomitant is damage to the cultural heritage property. In the wake disaster occurrence, containment and response efforts put cultural resources at risk due to ignorance from conservation experts, policy makers particularly in developing countries like India as compared to many counties across the globe. Theoretical and conceptual premises indicate that seismic retrofit leading to preservation of historic structures requires the satisfaction of the requirements of aesthetics, architecture, engineering and technology. Protection of cultural heritage from natural hazards and disasters is remained a neglected issue which has not been adequately accommodated in legislation or in national laws, by-laws and other documents worldwide by and large with a few exceptions. The present prevention and emergency measures are focused on saving human lives which result in total failure to protect cultural heritage assets as observed in Bhuj earthquake of 2001 India. The existing databases regarding cultural heritage in the country are fragmented and incomplete, and do not contain authentic data that is essential for natural hazard risk assessment processes and risk management approaches. Research establishes that conventional strengthening methods, especially those involving 'invisible' intervention, will continue to play an important part in the seismic protection of historic structures. However, the development of innovative technology for wider application is felt for heritage buildings in India. Using the interpretive approach this paper discusses the technical issues pertaining to the seismic retrofit of historic buildings, and explores various practices which are in current use in India for conservation of historic buildings. Based on past experiences it evaluates the feasibility of traditional as well as innovative technologies considering the character of Indian heritage built stock. Present paper endeavors to put forth the key challenges and achievements in heritage conservation with reference seismic environment in India. Considering the vulnerability of heritage buildings from seismic activity it is aimed to explore the measures required to render them strong enough to sustain damages on earthquake occurrence for posterity.



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Original article

Assessment of seismic vulnerability of art objects: The “Galleria dei Prigioni” sculptures at the Accademia Gallery in Florence

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ABSTRACT

The seismic assessment of art objects requires a multidisciplinary approach and the definition of a specific methodology for evaluating the level of safety and the possible interventions necessary for seismic risk prevention, finding a compromise between safety and conservation. This paper describes a first step in this direction, in which the different aspects of the procedure, from knowledge path of the art object to the structural analysis, were studied in the six Michelangelo's statues located in the “Galleria dei Prigioni” (Slaves' Gallery) at the Accademia Gallery of Florence. We showed that the general principles and criteria expressed in the “Italian Guidelines for evaluation and mitigation of seismic-risk to cultural heritage”, which are specifically devoted to masonry constructions, could be profitably extended to other artworks, like statues, starting from historical research, geometrical survey and material characterization, up to the developing of specific methods of analysis. This research could be the base for future studies to be performed concerning the prevention of seismic damage of art objects, including both bare minimum interventions and specific devices, such as isolation systems.

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1. Research aims

The aim of the research was to perform a study of seismic assessment of art objects on display in museums. In particular, a multidisciplinary methodology was proposed and the six sculptures located in the “Galleria dei Prigioni” (Slaves' Gallery) at the Accademia Gallery of Florence were analysed. We hypothesized that the general principles and criteria expressed in the “*Italian Guidelines for evaluation and mitigation of seismic-risk to cultural heritage*” (DPCM2007, [1]), which are specifically devoted to masonry constructions, could be extended to other cultural objects, like statues.

In order to develop this methodology aimed to evaluate the seismic safety level of the art objects, we took the following steps:

- the knowledge path, which involves historical research, geometrical survey and material characterization;
- the characterization of the seismic action of the site;
- the development of specific methods of analysis, according to the characteristics of the objects and to the required level of accuracy.

This research could be the base for future studies to be performed concerning the prevention of seismic damage of art objects,

including both bare minimum interventions and specific devices, such as isolation systems.

2. Introduction

The protection of museum collections against seismic hazard is increasingly gaining the interest of governments and scientists, as their damage could irreparably affect the cultural heritage. Relevant experience in studying and promoting seismic mitigation programs for museum collections has been developed for example at the J. Paul Getty Museum in California [2]. Important efforts to protect art objects also been carried out in some countries of the Mediterranean area, which is a zone prone to earthquakes and famous for its artistic heritage, such as Greece [3,4], Turkey [5,6] and Italy [7,8].

Dealing with this issue requires a multidisciplinary approach in order to formulate a global judgement on the level of risk and to evaluate effective protection strategies, trying to find a compromise between the requisite for safety and the principles of conservation.

An essential step in the assessment of the vulnerability of art objects is to control their global stability condition. To this aim different methods may be applied within the framework of rigid block mechanics, such as dynamic analysis with the integration of the non linear equations of motion [9], or approximated relationships which control sliding and rocking by the seismic Peak Ground Acceleration (PGA) and the overturning by the Peak Ground Velocity (PGV) [10,11].

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CHAPTER 27

PRESERVATION OF HERITAGE STRUCTURES & EARTHQUAKE ISSUES, GUIDELINES AND LESSONS FROM THE PAST

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1 INTRODUCTION

The earthquake on 26th January 2001 in Gujarat caught people totally unaware¹. The quake not only had a devastating effect on life of people in this region, but the calamity also damaged many rich heritage buildings and structures².

In December 2003, a devastating earthquake in Turkey virtually leveled the historic heart of Bam – a 2000 years old citadel. This was the largest mud-brick structure in the world, a wonder of Iran's cultural heritage.

There are similar examples in different parts of the world - Mexico City earthquake in 1985, San Salvador Earthquake in 1986, Kashmir in 1967, California, Japan and Nepal.

Earthquakes are different from other disasters in their capacity to destroy almost instantaneously without warning, causing extensive, often irreparable, damages. Beyond the obvious need to protect human life, we must also take the responsibility of protecting historic buildings and monuments.

2 SIGNIFICANCE OF HERITAGE

Habitat of man with all its components - built and open spaces, activity areas and linkages, form a rich tapestry of his culture. Built over ages with contribution made by each generation, settlements are a living continuum of history, forging a strong linkage between the past and the present. Civilisation's heritage not only consists of major works, such as monuments and works of art, but also of everyday objects, which render a value to the culture. Evaluation of heritage structures, monuments and precincts are based on certain criteria, e.g.,

- Historical – the history of the building or area and its significance. History may include association with an event or a person or a particular period.
- Physical - the architecture of the building or area, stylistic integrity, group or townscape values, uniformity of character, quality.
- Social or economic - use, way of life, commercial viability



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Digital inventory འཕུལ་ཆས་ཐོག་ནས་དངོས་ཐོར་འགོད་པ།

Risk assessment and disaster mitigation ཉེན་ཁ་ཐོན་འགོག་དང་ཇོ་དྲག་གཤོང་ལེན།

Recording digital interviews with elders མི་རྒན་རབས་དང་འཕུལ་ཆས་ཐོག་ནས་བཅར་འདྲི་སྒྲིག་སྤྱད་ལྟེད་པ།

Scientific research ཚན་རིག་ཉམས་ཞིབ།

Current project ད་ལྟོ་ལས་འཆར།

Free online preservation resource for communities and monasteries

དཔལ་ལྷན་དང་སྤྱི་ཚོགས་ཀྱི་ཆེད་དུ་གནའ་དངོས་གཅེས་སྤྱད་ཐབས་ལམ། ཨིན་ཏེར་ནེཏ་ཐོག་རྒྱ་མེད་དུ་ལུས་བ།



PRESERVATION OF BUDDHIST TREASURES RESOURCE is the free online resource for monasteries and communities, with practical information on digital documentation, risk assessment and disaster recovery, safer storage, and preservation of thangka and other treasures. The resource comes from over 50 years of preservation work in monasteries.



Treasurecaretaker.com 0019022221467 treasurecaretaker@icloud.com

PRESERVATION OF BUDDHIST TREASURES chapter about EARTHQUAKES will soon add an enriched Appendix, until then, please contact us directly for this information:

- Pre-earthquake preservation of monastery treasures experience
- Pre-earthquake documentation of treasures
- Pre-earthquake disaster vulnerability assessment
- Field-guide assessment forms
- A shopping list for disaster supplies, and list of supplies which you will need for after a disaster
- A supply list for your command center, because after a disaster, a command center with a command person and hierarchy is essential



Preservation of Buddhist Treasures

RISK ASSESSMENT ཉེན་ཁ་དུམ་ཞིབ།

- ❖ **Pandemic** ཡོངས་ཁྱབ་རིམས་ནད།
- ❖ **Earthquake** ས་ཡོན།
- ❖ **Fire** མེ།
- ❖ **Water** ལྷ།
- ❖ **Theft** ལྷན་མ།
- ❖ **Pests** གནོད་འགྲ།
- ❖ **Temperature and Relative Humidity** རྒྱུ་ཚད་དང་རྩོས་བཅས་ཀྱི་བཞུལ་ཚན།
- ❖ **Human Choices** མིའི་འདམ་ག།
- ❖ **Pollution** འབགས་བཅོག།
- ❖ **Light** ལྷོག་མེ།

EMERGENCY PLANNING AND DISASTER MITIGATION རྩོམ་འཆར་གཞི་དང་རྒྱུན་ལྷན་ཞི་འཇམ།

SAFE STORAGE ཉེན་མེད་དོས་ཁང།

DOCUMENTATION ཡིག་ཆ་ཐོ་བཞོད།