

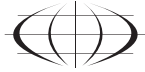


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# FIRST AID TO CULTURAL HERITAGE IN TIMES OF CRISIS

1

Handbook

# FIRST AID TO CULTURAL HERITAGE IN TIMES OF CRISIS

## 1. Handbook

*For coordinated emergency preparedness and response  
to secure tangible and intangible heritage*

Aparna Tandon

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*Cover photo courtesy of Rohit Jigyasu*

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## FOREWORD

Culture is recognised as a driver for development. Yet, years of development gains can be wiped out in a moment when disaster strikes, setting communities back with tragic consequences. Nonetheless, in a setting of suffering and loss, stories of resilience in which culture plays a central role have emerged. This has encouraged the scientific community to look more closely into the interplay between cultural traditions and coping mechanisms.

The credo of the Prince Claus Fund – that culture is a basic need – resonates closely with ICCROM’s own tenet of conserving culture and promoting diversity. It is with this in mind that the two organizations have come together to develop a resource that will help to include the voices of the primary stakeholders, the community, in the recovery of places and objects of significance. This in turn helps them to build resilience against future disasters.

One of the key challenges we face is that considerations for cultural heritage are not formally included in most national and local emergency response systems. However, first responders will tell you that they are inevitably involved with the rescue of heritage, at times to avoid that locals endanger their own lives in trying to save it, and other times because they are acutely aware of the significant role that heritage plays in overcoming loss and trauma.

Culture cannot wait. Both ICCROM and the Prince Claus Fund stand by this belief. In 2010, ICCROM launched the First Aid to Cultural Heritage in Times of Crisis course together with the Italian Ministry of Culture and several other partners. This expanded to include the Smithsonian Institution and the Prince Claus Fund, which has been instrumental in strengthening the network of “cultural first aiders” and funding participant initiatives so as to ensure that positive outcomes multiply.

This book is intended to codify the First Aid processes and further stimulate research, activity and awareness. The creators of this book are cognisant of the fact that every emergency teaches us a new lesson and enables us to continue closing gaps in knowledge and practice. The information represents multiple points of view in an attempt to spark inclusive discussions on this subject and broaden the conversation.

Without a doubt, disaster risk reduction is a development question. Our hope is that this Handbook and Toolkit, with their practical suggestions, will open new pathways for preserving culture that start with development and end with resilience.

**Webber Ndooro**  
Director-General, ICCROM

**Joumana El Zein Khoury**  
Director, Prince Claus Fund for  
Culture and Development

## PREFACE

### Why safeguard cultural heritage amidst a humanitarian crisis?

**Culture cannot wait.** Barely one month after the devastating earthquakes of 2015, worshippers and flower sellers could be seen amongst the rubble of fallen temples in the historic Durbar Square of Kathmandu, Nepal. Braving the aftershocks, they were there to seek solace in everyday religious rituals and resume their normal practices – making it clear that, in order to reduce the vulnerability of the Nepalese people to future earthquakes, it is the ancient temples and city squares of Nepal that must be secured and stabilised first.

A year later, while conducting post-earthquake search and rescue operations, firefighters in Italy assisted the local community in evacuating a painting of the *Madonna Addolorata* – the Grieving Madonna – from a church in Norcia before it collapsed completely in a subsequent earthquake two months later. The firefighters prioritised the rescue of the painting because they understood that, for the people of Norcia, the Madonna symbolised continuity and resilience, as she was known to have survived previous earthquakes.

Selfless and voluntary acts to safeguard cultural heritage during humanitarian crises are not limited to disasters. Communities trapped in violent conflicts have been known to prioritise the protection of their cultural heritage even when personal security is at risk. Photographs, documents, religious and personal artefacts, traditions and buildings – anything that connects people to one another, and which offers a sense of identity, or means of making a living, becomes more valuable amidst destruction and displacement. It is therefore essential that the protection and recovery of cultural heritage not be delayed, or separated from the humanitarian assistance provided during and after an emergency, especially when the overall aim is to help people to overcome trauma and resume normal daily practices.

## Why this Handbook?

Securing cultural heritage during large-scale and multilayered humanitarian crises is challenging for many reasons. One major reason is the lack of consideration for cultural heritage within national and international emergency management systems. Other reasons are encompassed in such questions as: if multiple cultural sites are affected, where does one start? Who can provide access? Who can assist? When is the right time to intervene? How should one intervene?

This Handbook and its Toolkit explain 'cultural heritage first aid': the immediate and interdependent actions taken to stabilise and reduce risks to endangered tangible and intangible cultural heritage, with the aim of promoting its recovery. Through a field-tested, three-step framework, it establishes when and how to protect endangered cultural heritage, and indicates all those who could assist in such operations. The steps and workflows provided can be adapted to different types of emergencies and their specific contexts.

This handbook aims to serve as a:

- Reference to train cultural first aiders, emergency responders and volunteers.
- Tool to improve the emergency preparedness and response plans of cultural heritage institutions.
- Guide to assist in implementing first aid operations in conjunction with humanitarian relief and recovery.

It identifies aspects of cultural heritage first aid, the coordinated implementation of which could help reduce the affected population's vulnerability. By doing so, we hope to advocate for the inclusion of cultural heritage first aid in international, national and local emergency response and humanitarian relief systems.

This resource and its accompanying toolkit are a work-in-progress, and the creators are interested in receiving feedback so that we can continue to ensure relevance to the field and quality information for those who need it most.

### **Aparna Tandon**

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## Handbook navigation

Please find below a few tips to help you navigate your way through this Handbook and its accompanying Toolkit.

### BOOK TABS

On top-right-hand side of every page you will find interactive tabs, which help you to jump to a desired section of the handbook.

### HYPERLINKS

**Blue and bold:** Links to specific sections in the document.

**Orange and bold:** Links to the glossary.



**TIPS:** Experience-based advice.



**CAUTION:** Attention required to avoid unforeseen threats and/or mistakes.



**READ MORE:** Further reading.



**CASE STUDY:** Challenges encountered in specific cases, or good practices or lessons learned in the field.



**INTERACTIVE:** Try out the exercise or activity.



# INTRODUCING CULTURAL HERITAGE FIRST AID



## What is cultural heritage first aid?

The immediate and interdependent actions taken to stabilise and reduce **risks** to endangered **cultural heritage** during and after an **emergency** are collectively defined as cultural heritage first aid. The immediate cause of such an emergency may be a **natural** or **man-made** hazard, or a combination of both. First aid includes the **analysis** of an emergency situation and its likely effects on cultural heritage; **on-site damage and risk assessment**; and **security and stabilisation**.

The overall aim of first aid is to promote the recovery of affected cultural heritage, in turn facilitating the recovery of the communities connected to it.

Within an institutional emergency or crisis response plan, cultural heritage first aid forms part of emergency response procedures. In many cases, especially in the aftermath of large-scale disasters, cultural heritage first aid is often initiated only after the officially-declared emergency phase is over. Nonetheless, prior preparation and coordination will still help to ensure quick and effective cultural heritage first aid, should an emergency arise.



*Emergency stabilisation of a temple in Kathmandu, Nepal, 2015. Photo: ICCROM.*



## How can we provide first aid for different types of cultural heritage in emergencies?

This Handbook outlines a three-step action framework for providing first aid for all types of cultural heritage in multiple locations.

The framework is based on ICCROM's international and multi-partner course on **First Aid to Cultural Heritage in Times of Crisis (FAC)**, extensive field experience, and interdisciplinary collaboration with professionals worldwide.

As no two emergencies are the same, the actions described within the framework are to be tailored to individual contexts.



### CULTURAL HERITAGE FIRST AID ACTION FRAMEWORK



Each step of the framework has a separate workflow that can be broken down into smaller actions.



### Step 1: Situation analysis

Situation analysis provides understanding of the wider context of the emergency. It enables first aiders to develop a context-specific plan for on-site actions. An in-depth situation analysis is carried out at the end of the emergency phase in order to determine mid- to long-term needs for the **recovery** of **cultural heritage**.



### Step 2: On-site damage and risk assessment

On-site **damage** and **risk assessment** allows the identification and recording of damage caused and risks posed to cultural heritage in the aftermath of a **disaster**. The outcomes of this step help to determine priorities for on-site actions.



### Step 3: Security and stabilisation

Security and **stabilisation** includes actions that help to contain damage and reduce risks, taking affected heritage one step closer to recovery. In this stage, the actions for tangible and intangible heritage vary.

**Documentation**, ongoing **risk management**, **communication** and **coordination** with other **first responders** are essential for the successful implementation of the steps outlined in the framework. The workflows described within this framework help to identify the areas of joint action between cultural first aiders, local communities, emergency responders and humanitarian organizations.

The actions taken to secure and recover cultural heritage should align with the humanitarian principles of humanity, neutrality, impartiality and independence. To support this ideal in practice, this Handbook suggests the following set of guiding principles, which adhere to those prescribed for humanitarian relief.





# The guiding principles for cultural heritage first aid



## 1. People-centred first aid

Prioritising people's needs and enhancing their ability to secure and recover their own heritage is integral to the design and approach of the First Aid Framework.



Heritage places are often used to provide refuge to displaced people during crises. Cultural heritage first aid should take such needs into consideration and facilitate relief work. Moreover, statistics indicate that, in most disasters, local communities are the first to respond and secure their cultural heritage. For example, during the 2012 conflict in northern Mali, privately held ancient manuscripts were kept safe through traditional intercommunal networks. Often, communities have time-tested coping mechanisms and a wealth of knowledge (e.g. traditional building methods), which should be utilised in reconstruction and recovery.



## 2. An inclusive attitude and respect for diversity

First aid should embrace an inclusive outlook to assist in the recognition of elements that constitute the cultural heritage of the disaster-affected area.



As individuals and as professionals, cultural heritage first aiders can unintentionally make subjective value-based judgements, leading to the selective recognition of cultural heritage, and increasing existing inequalities in the affected area. For example, traditionally, institutional responses have focused on protecting iconic or monumental heritage, while vernacular heritage has been largely overlooked.

## 3. Context-specific response

Understanding the wider emergency context is crucial for providing effective cultural heritage first aid.



Every emergency has a certain context. Contextual analysis allows the immediate needs of the main actors and their respective capacities to protect cultural heritage to be identified. Assessment of the context also helps to identify risk factors that could cause greater damage to cultural heritage in a given crisis. For example, lack of security can increase the risk of systematic looting of cultural heritage sites during violent conflicts.

## 4. Interlock culture with humanitarian assistance

First aid to cultural heritage should be provided in conjunction with humanitarian relief and recovery.



Acknowledging that, in any crisis situation, saving human lives is the number one priority, but also that people affected by disasters have the right to receive assistance to ensure the continuity of their cultures, the First Aid Framework emphasises the interdependence of cultural and humanitarian responses. Actions for securing cultural heritage should therefore be initiated in coordination and close cooperation with relevant government and humanitarian relief agencies, e.g. cash-for-work programmes launched by humanitarian organizations could be used to sort debris and salvage objects and building fragments at cultural sites.



## 5. Do no harm

First aid actions should prevent further damage and promote recovery.



One of the main cultural heritage first aid objectives is to prevent further damage by assessing, mitigating and preparing for other risks. For example, while setting up a bombproof temporary storage for cultural collections, ensure that it is not exposed to risks such as flooding or looting.

### Who can give permission to initiate cultural heritage first aid?

In most cases, the custodian of the affected cultural heritage gives permission for initiating first aid operations. Custodians may take many forms, for example a national or local government institution, or a religious trust.

However, the custodian is not the sole authority. During an officially-declared emergency, priorities for **response** are defined by the agencies in charge of managing the incident.

The emergency management laws of a country play a large role in determining who, or which agency, has the overall authority to initiate response actions and provide access to the affected area(s). Therefore, prior clearance and coordination with the agency in charge of organizing the overall emergency response, and the permission of the custodian, are required to initiate cultural heritage first aid operations.



*In the immediate aftermath of the earthquake, clearing operations underway in Kathmandu, Nepal, 2015. Photo: Tapash Paul/Drik.*





For an officially-declared emergency, the designated state authority will usually appoint an **emergency response coordinator**, or an **incident commander**, who will set up the **emergency management system** according to a pre-defined procedure. For example, in India, the National Disaster Management Authority coordinates the response to all natural and man-made disasters under the **2005 National Disaster Management Act**.

Depending on the needs and scale of the hazard event, emergency responders, such as civil defence units, Red Cross volunteers, police and the military, work within the emergency management system of a country to secure lives, restore means of communication and transportation, and fulfil other basic needs.

For a **major emergency**, the national government may seek assistance from another country, or from the international community, under the leadership of the United Nations (UN). The UN directs humanitarian responses through the Inter-Agency Standing Committee (IASC), which is composed of key humanitarian **actors** from the UN and international agencies. Within 48 hours of the onset of an emergency, the IASC classifies it according to scale, complexity, urgency, and existing local **capacity** for managing the situation, based on an initial assessment.

In the event of a **Level 2** or **Level 3** emergency, the UN will activate a coordinated, multi-agency (UN, intergovernmental and non-governmental organizations) response, grouping humanitarian aid into thematic **clusters**. Such emergencies often indicate that local authorities and their capacities to respond have been critically affected. In these situations, local government will work in coordination with international agencies to perform activities, such as assessments and funding appeals within a cluster. Currently, culture is not included within this cluster system.

In the event that an emergency is declared to be complex, UN humanitarian aid may incorporate military and/or police operations into a peacekeeping mission.

**See references on page 151.**



## Who can plan and implement cultural heritage first aid?

A cultural first aider can plan and implement first aid operations in coordination with emergency responders, humanitarian professionals, heritage owners and volunteers.

A cultural first aider is someone who has received prior training in safeguarding endangered cultural heritage during, or immediately after an emergency. Providing cultural heritage first aid during **major or complex emergencies** involves balancing the competing needs of food, water, shelter, security and identity. A cultural first aider must therefore be able to cope with physical, mental, environmental, and task-specific work demands.

S/he should have the knowledge and skills to assess, document, secure and stabilise different types of cultural heritage in diverse emergency contexts. S/he should be able to work in multidisciplinary teams. Cultural first aiders might be drawn from local communities, emergency response agencies and cultural heritage institutions.

Read the qualities listed on the next page and identify someone from your institution or local community who would best fit the role of a cultural first aider.

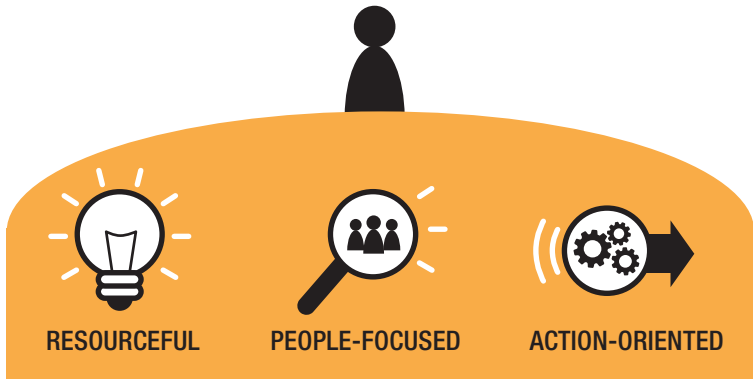


*Cultural first aiders in Port-au-Prince, Haiti, 2010. Photo: Aparna Tandon, ICCROM.*





## The three main qualities of a cultural first aider



### Resourceful

- understands the diverse forms of cultural heritage
- knowledgeable of the emergency context
- strong analytical and critical skills



### People-focused

- an active listener
- understands and respects existing social structures beliefs and values
- team player
- sensitive to human needs
- capable of building trust



### Action-oriented

- positive 'can do' attitude
- creative problem solver
- quick thinker with physical stamina

## Why is it important to coordinate cultural heritage first aid with the overall emergency response?

During an emergency, priorities for relief and recovery are identified through pre-organized national or international emergency management systems. Based on the priorities identified, aid is then channelled through these systems. To ensure safety and security, access to the affected area is strictly controlled.

In order to gain access to the affected area and ensure that cultural heritage is considered a priority, it is important to coordinate cultural heritage efforts within the overall emergency response. Failure to do so may increase the risk of the affected heritage being damaged or destroyed.



### Making the case for coordinating cultural heritage first aid: Haiti

In the months following the Haiti earthquake in 2010, the *Institut de Sauvegarde du Patrimoine National* (ISPAN) undertook an exercise to tag and stamp damaged historic buildings in affected areas. Lacking sufficient capacity (in terms of funds and manpower) to secure and stabilise the buildings, the Institute aimed to prevent the demolition of the buildings and take measures to safeguard them, according to their importance, function and use.



Stamping of heritage structures in Jacmel, Haiti, 2010. Photo: Aparna Tandon, ICCROM.





This exercise was carried out in parallel with structural evaluations conducted by the Ministry of Public Works and supporting UN agencies. Full coordination was not possible, mainly because the recovery or protection of cultural heritage was not included in either the national or international emergency response. As a result, many historic structures were declared unsafe and were eventually demolished.

[See references on page 153.](#)



*Stamped heritage building in Jacmel, Haiti, 2010. Photo: Aparna Tandon, ICCROM.*



## When is it appropriate to provide cultural heritage first aid?

During an emergency, the first priority is to save lives and ensure security. Once such operations are complete, cultural heritage first aid can be activated. Nonetheless, on-the-ground coordination mechanisms with various emergency and humanitarian actors must be set up prior to an emergency and should be given due consideration in the emergency preparedness plans of local governments and cultural heritage institutions. In practice, the right time for initiating first aid varies and depends on the following factors:

- The nature and scale of emergency: in the case of a **major** or **complex emergency**, involving extensive damage and loss of life, first aid operations might be delayed.
- Access to affected areas: in the event of an armed conflict or nuclear incident, access to the affected area will be severely limited, which may, in turn, delay the activation of first aid.
- The scale of damage caused to cultural heritage and/or its significance for **stakeholders** (e.g. its local, national, international significance): where damage is extensive, the need for outside assistance could delay operations. Similarly, for highly significant cultural heritage, such as a World Heritage site, external experts may be required to carry out inspections before any action can be taken.
- Local capacity and preparedness: where there is local capacity in terms of trained personnel and resources, and coordination mechanisms with emergency management institutions are also in place, it is easier to initiate cultural heritage first aid immediately following the life-saving operations.



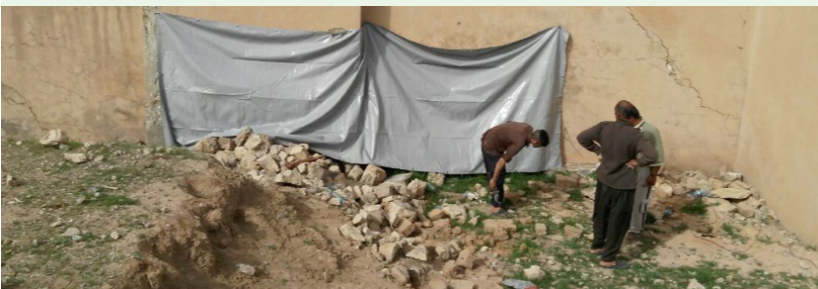


## Initiating cultural heritage first aid operations: Italy and Iraq

As mentioned earlier, the right time to activate cultural heritage first aid depends on the nature and scale of the emergency. For example, after the first earthquake that struck the mountainous region of central Italy on 24 August 2016, search and rescue operations lasted ten days; only after that period, did the Italian Department of Civil Protection, in collaboration with the Ministry of Culture, undertake an initial assessment of the damage caused to the immovable and **movable cultural heritage** in the area.

In northern Iraq, an assessment of the cultural heritage sites that had been intentionally destroyed in 2014 could not be carried out until six months after the liberation of the city of Mosul. Lack of access to the occupied areas and uncertain security conditions following liberation in late 2016 significantly delayed the implementation of cultural heritage first aid in the affected sites.

See references on page 153.



Top: Earthquake in central Italy, 2016. Photo: Aparna Tandon, ICCROM.  
Bottom: First aid operations at Nimrud archaeological site, northern Iraq, 2017. Photo: Layla Salih.





**CONSIDER** that an emergency has been declared in your area. The situation is unclear, as reports of damage are still coming in. Preliminary reports suggest damage to cultural heritage in multiple locations, and extensive losses are predicted. The diverse and rich cultural heritage in your area is tied to the national identity of your country. Concerned about the potential loss of history, you would like to provide first aid.

**Where do you start?**

Read on to find out.

# STEP ONE SITUATION ANALYSIS





## What is a situation analysis?

Gathering reliable information during an emergency can be challenging, especially when it is disjointed and collected from unconfirmed sources. Therefore, before taking action to secure cultural heritage, take the time to assess the situation, analyse the information gathered, and prepare a strategy for providing first aid. Failing to do so may lead to the incorrect prioritisation of affected heritage, increased damage to heritage, and even put lives at risk.

The systematic assessment of a sudden onset emergency or a gradually unfolding crisis is called a situation analysis. It involves gathering and establishing connections between specific pre- and post-event information in order to inform field actions, and identify immediate needs, as well as the existing capacities to address them.

Situation analysis is a commonly-used tool amongst humanitarian organizations. It is used to define priorities for relief in the immediate aftermath of a disaster, and at the beginning of the **early recovery** phase, to identify long-term humanitarian needs.



*Situation analysis as part of the international course on First Aid to Cultural Heritage in Times of Crisis, Amsterdam, 2015, the Netherlands. Photo: ICCROM.*

## Why undertake a situation analysis for cultural heritage first aid?

In a rapidly evolving crisis, a situation analysis can help to reduce risks and contain, or prevent, damage to cultural heritage. If undertaken at the beginning of a field operation to safeguard cultural heritage, a situation analysis can help to determine the location(s), timing, scale and scope of the operation.

Based on pre-event information about the type(s) and significance of cultural heritage affected, a situation analysis assists in answering critical questions, such as what to **prioritise** and how to intervene. At the same time, it helps to identify the actors and stakeholders who could assist in implementing first aid.

For a conflict-induced emergency, a situation analysis may expand to include an assessment of the conflict, known as **conflict analysis** (see page 38).

Situation analysis outcomes are used to develop a context-specific plan for securing and stabilising affected cultural heritage, which may be adapted as **on-site damage and risk assessments** provide more data (see page 42).



*A church damaged by earthquake in Bohol, Philippines, 2013.  
Photo: Aparna Tandon, ICCROM.*





## How situation analysis helped to contain damage and reduce risks in an unfolding crisis: Kyiv, Ukraine

In February 2014, public protests broke out in Kyiv, Ukraine. In downtown Kyiv, protestors and riot police surrounded several cultural heritage institutions and sites. Based on a situation analysis of the unfolding scenes outside, the first floor of the National Art Museum of Ukraine was evacuated, and valuable artefacts were temporarily moved to a safer location before the protests turned into violent riots. In addition to relocating parts of the collection, the museum staff contacted security forces, urging them to prevent vandalism. These timely actions saved the museum collection from extensive damage, while a neighbouring museum had part of its collection stolen during the riots.

**Source:** Ihor Poshyvailo, Director of the National Memorial Complex of Heroes of Heavenly Hundred - Museum of the Revolution of Dignity, Kyiv, Ukraine. Participant in the International Course on First Aid to Cultural Heritage in Times of Crisis, 2015.



### Who should participate in a situation analysis?

A situation analysis for implementing first aid for cultural heritage can involve, but may not be limited to:

- the teams or institutions implementing first aid;
- the owners or institutions in charge of the affected cultural heritage;
- representatives from the emergency management institutions who control access to the affected area and are in charge of defining priorities for emergency response;
- representatives from local communities;
- volunteers and local NGOs.

## How to carry out a situation analysis for cultural heritage first aid?

A situation analysis workflow for cultural heritage first aid is given below





## Collect information

The first step of a situation analysis for cultural heritage first aid is to collect specific information on the nature of the emergency, its geographical location, the type(s) and significance of cultural heritage affected, the type(s) and extent of damage, and the stakeholders and actors involved.

### Context of the emergency



- 1 Which province, region, or country is involved? Find the exact geo-coordinates of the area concerned.
- 2 What is the primary **hazard** that caused the emergency?
- 3 Which secondary hazards could cause more damage to cultural heritage in the affected area?
- 4 Which social, economic or political **vulnerabilities** could make heritage more susceptible to damage? Example: bad roads could prevent a timely response, or a breakdown in law and order could expose heritage to the secondary hazard of looting.
- 5 What stage of the situation are you in?
  - a. Is it the pre-emergency phase (e.g. an early warning for a volcanic eruption has been issued)?
  - b. Is it at the outbreak of the emergency (e.g. riots have begun, a storm is underway)?
  - c. Is it in the immediate aftermath of a natural hazard event or of a man-made hazard event, such as a bombing incident?



Events in a multi-layered emergency situation do not follow a linear progression. For example, an earthquake may trigger a fire. Similarly, in a prolonged crisis, new conflict may destabilise an existing peace agreement. Therefore, it is very important to correctly identify the stage you are at in an unfolding situation and incorporate contingency planning.



## The cultural heritage affected



- 1 How many, and what type of cultural heritage assets are likely to be affected? If several **cultural heritage assets** are involved, ensure that you have geo-coordinates for all of them. This information can be found from existing **inventories** held by national cultural ministries or national departments of culture.
- 2 What is the **significance** of the affected cultural heritage in the area, and for whom? Is it a listed heritage asset of national or regional importance?
- 3 What are the local beliefs or attitudes that might affect cultural heritage first aid? These may impact the availability of resources and people who can assist. For example, in the aftermath of the earthquake in Nepal in 2015, non-Hindu foreign structural engineers were not allowed to enter the inner spaces of Hindu temples to assess the damage. In order to plan a first aid operation that respects local cultural and social contexts, it is crucial to gain understanding of:
  - a. The religious beliefs in the area.
  - b. The preferred language and forms of communication.
  - c. The role(s) and involvement of men and women in heritage;
  - d. The inclusion or representation of a minority community's heritage within the mainstream heritage sector of that area.
  - e. Expectations for external assistance in recovering cultural heritage.
- 4 What was the condition of the affected cultural heritage before the event, i.e. what was its physical state and what were its vulnerabilities? Had it been restored? Was it undergoing conservation? Was it well-protected? Was it well- documented? This information can be obtained from the institutions or individuals managing the cultural heritage assets of concern.





It is important to identify and document local cultural heritage, before a crisis takes place, so that it is later possible to identify any damage should an event occur. Training in documentation, including how to record damage through photographs, should be given to local institution staff members. (For more information see [on-site damage and risk assessment, page 53](#)).

- 5 Do functional emergency management plans for the affected cultural heritage exist? If so, collect the contact details of the person(s) in charge of coordinating the local response for cultural heritage.
- 6 What type of damage has been caused to cultural heritage assets in the area? Collect information from local known sources.



*In accordance with their religious beliefs, volunteers drawn from the local community ignored their personal safety, and worked barefoot to salvage fragments of quake-damaged Buddhist temples and pagodas in Bagan, Myanmar 2016. Local beliefs and customs will always influence cultural heritage first aid. However before the disaster strikes, efforts should be made to make local communities aware of the risks involved in rescuing cultural heritage without wearing personal safety gear. Photo: Aparna Tandon, ICCROM.*



## Identify stakeholders and actors



- 1 Who are the owners (institutions/individuals/social groups) of the **cultural heritage assets** in the affected area? Collect their contact information and, if possible, establish communication to gather preliminary information about any damage caused to their cultural heritage.
- 2 Who are the people or communities dependent on the cultural heritage assets for their livelihood?
- 3 Who is in charge of coordinating the emergency response and who controls access to the affected area(s)? Collect their contact information to be used later for on-site assessment, if needed.
- 4 Which local communities, volunteer groups or on-site staff can assist in assessing damage and risks, and in implementing security and stabilisation measures?
- 5 Which emergency responders, for example firefighters military or civil defence personnel, are able to assist in implementing first aid for the affected heritage?
- 6 What type of resources can the stakeholders of the affected heritage provide?
- 7 What is the level of cooperation between the key emergency actors and stakeholders?







## Mapping stakeholders and actors

Creating a visual map can be a useful tool to identify and understand the complex relations between stakeholders and actors, and their respective interests and roles in cultural heritage first aid. How? Consider the example on the following page, which identifies stakeholders and actors in the aftermath of a bomb explosion at a religious heritage site in Country A. The backdrop of the incident is an ongoing conflict.

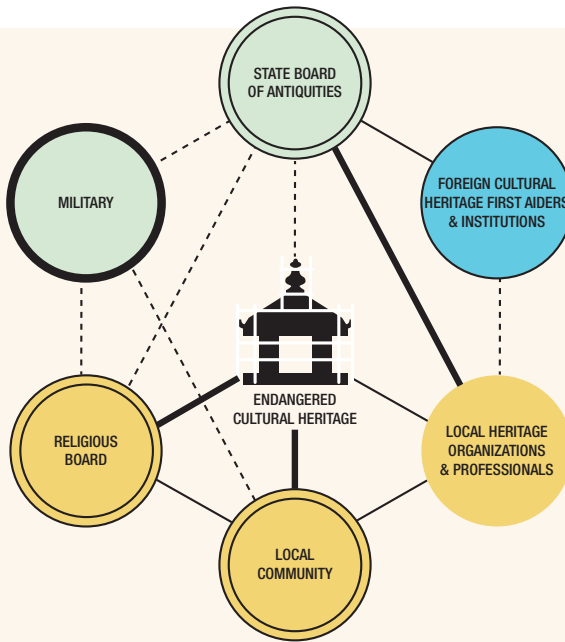
The military of Country A is in charge of peacekeeping and counter-terrorism operations in the affected area. Currently, the military controls access to the site.

The local community members living in the vicinity of the site do not fully trust the military. They are strongly connected to the religious site and want to save it.

Additional **key stakeholders** and **actors** include:

- The State Board of Antiquities, which has the expertise to provide first aid for the damaged buildings and objects at the religious site.
- The Religious Board of the damaged shrine, which has a weak relationship with the State Board of Antiquities, but which must be consulted before the State Board is allowed to undertake first aid measures.
- Foreign cultural heritage organizations, approached by the State Board of Antiquities for funding and technical assistance.
- Local cultural heritage professionals who know the history of the site, and have expertise in assessing damage, and in stabilising and securing damaged heritage.





By mapping all of the stakeholders and actors in a given situation, and identifying their interests and interrelationships, a stakeholder and actor map should help to clarify:

- Who can provide access to the affected cultural heritage site?
- Who can finance first aid for cultural heritage?
- Who can give permission to begin first aid for cultural heritage?
- Who should be consulted and involved at a community level?
- Who can provide the information required for a context-specific response that is sensitive to local needs?

A stakeholder and actor map enables a better understanding of the respective interests and power relations between all stakeholders and actors, which, in turn, helps to avoid potential conflicts and miscommunication.





## Analyse the information

- 1 Analyse the information collected and identify the cultural heritage assets which:
  - a. are most significant;
  - b. are heavily damaged;
  - c. have suffered some damage and are vulnerable to secondary hazards, leading to the risk of further damage if left unattended.
- 2 Identify the cultural heritage assets requiring on-site damage and risk assessment. Cultural heritage assets that are partially or heavily damaged and are at risk of suffering further losses should be prioritised for an on-site assessment. Similarly, assets that are highly significant and are at risk may be short-listed for on-site assessment.
- 3 Consider the type of expertise you will need for **on-site damage and risk assessment** (see page 46), which, in addition to a review of damage and risks, may also require an overall evaluation of the safety of the site as well as its buildings (if any). For example, a post-flood on-site assessment for a historic building and collection may require the assistance of a structural engineer familiar with water-damaged heritage structures, and a collections manager who can assess the damage, as well as risks of decomposition and mould. Equally, a post-war assessment of similar cultural assets may first require a safety check for explosive devices.



Depending on the level and scale of the emergency, assessments on the usability of buildings, such as schools, hospitals and homes in the affected area are carried out as part of the emergency response. These assessments however, do not necessarily prioritise cultural heritage sites and buildings. Therefore, in order to synchronise efforts, ensure that a representative from the institution coordinating the emergency response participates in situation analysis for cultural heritage.



- 4 Based on the information available, analyse the **immediate security actions** (see page 73) required at each site. For example, does the site need to be covered, or should a guard be assigned to protect the area? In the case of intangible heritage, consider the kind of relief-support the practising community needs in order to recover from the emergency.
- 5 Identify the types of supplies and equipment (Toolkit, see page 9) you will require for an on-site damage and risk assessment.
- 6 Using the **stakeholder and actor map**, identify which of the stakeholders and actors could give you permission for on-site work, facilitate access, provide resources, organize logistics and provide expertise for:
  - a. on-site damage and risk assessments;
  - b. security and stabilisation operations at each site;
  - c. evaluation and monitoring of the work carried out at each site.
- 7 Based on the information available about the preferred local language(s), or forms of communication in the affected area, identify **strategies** for communicating with emergency actors, stakeholders, affected communities and media groups.





## Plan for on-site first aid actions

After analysing all of the information gathered, use the outcomes to develop a strategic plan for implementing cultural heritage first aid, outlining the following:

- 1 The predicted time period, size and scope, costs and objectives of on-site operations.
- 2 The roles and responsibilities of the institutions, emergency actors, cultural first aiders and volunteer groups involved.
- 3 The formal permissions and community-based consultations necessary to begin on-site assessments and security and stabilisation measures.
- 4 The **communication plan**: what means of communication will be used? Who will be in charge?
- 5 The preparation and resources required for doing on-site work, including specific pre-event documentation for cultural heritage assets, and lists of emergency supplies and equipment needed for on-site work.
- 6 The type of on-site training or orientation required by volunteers and emergency responders prior to first aid.
- 7 The safety and quality control criteria for implementing first aid.
- 8 The criteria and modes of evaluation: who will do the evaluation? How?
- 9 The monitoring regime: who will do it? What will be the time frame?



Bear in mind that on-site damage and risk assessments will provide more detailed information, which may change or refine the strategic plan for implementing first aid.





## What is conflict analysis?

Conflict analysis is a tool that helps to identify the root causes of a conflict, and to understand the triggers that may turn a latent conflict into a violent one. These triggers may include the intentional targeting of cultural heritage.

### How to carry out conflict analysis?

A three-step method for conflict analysis is summarised below: it is based on guidance provided by the Department for International Development (DFID) in the United Kingdom and can be adapted to identify priorities for the first aid and recovery of cultural heritage.

- 1. Analysis of conflict causes.** To understand the causes behind the conflict, it is necessary to analyse political, social, economic and security-related vulnerabilities. This analysis should incorporate various viewpoints, and include the following elements:
  - a. broad contextual analysis (history of the conflict, physical and demographic features, and structural inequalities);
  - b. a map of the source(s) of the tensions and conflict, which may include cultural symbols;
  - c. the identification of links between sources of tension in different sectors, including the cultural heritage sector.
- 2. Analysis of actors** who influence or are affected by the conflict. This focuses on an analysis of the shorter-term incentives and interests and should include:
  - a. a list of all actors directly or indirectly involved in the conflict;
  - b. analysis of the interests, relations, capacities, peace agenda, incentives for every actor;
  - c. visual mapping.

**Note:** In order to analyse conflicts involving cultural heritage, step two should include mapping of interests and stakes in relation to the affected cultural heritage.





**3. Analysis of conflict dynamics.** This concerns the assessment of the likelihood that a conflict will increase, decrease, or remain stable, as well as the long and short-term triggers involved. It should include:

- a. analysis of the longer-term trends;
- b. assessment of the likely shorter-term triggers;
- c. assessment of factors likely to accelerate or slow conflict dynamics (consider institutions and processes);
- d. development of conflict scenarios.

**Note:** In order to analyse the risks to the affected cultural heritage during **early recovery** (see page 125), this step should include an assessment of how actions taken to recover cultural heritage will be perceived by parties to the conflict.

**See references on page 155.**





## IMPROVE YOUR OWN EMERGENCY PREPAREDNESS!

If an emergency were to occur in your city, and a number of cultural heritage collections and sites were affected:

- a) Who do you think should be involved in carrying out a situation analysis?
- b) How would you contact them?
- c) Do you have a map of your city showing the precise locations of all cultural heritage sites?
- d) Does a priority list classifying the significance of various cultural heritage assets exist?

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## **What follows situation analysis?**

**FOLLOWING AN EMERGENCY** in your area, you have carried out a **situation analysis** with multiple stakeholders, members of the community and relevant emergency actors; you have identified tangible and intangible heritage assets that have suffered damage and/or are at risk of further deterioration.

## **What should be your next step?**

Read on to find out.

STEP TWO

# POST-EVENT ON-SITE DAMAGE AND RISK ASSESSMENT



## What is a post-event on-site damage and risk assessment?

Carrying out a **situation analysis** helps to identify the tangible and intangible heritage assets that require rapid on-site inspections. These are known as post-event **on-site damage and risk assessments**.

The selection of heritage assets for such assessments is based on their respective **significance**, the degree of damage they have suffered and the risk of further damage.

On-site damage and risk assessment involves the visual inspection and documentation of damage and losses. It is useful for the evaluation of immediate risks, which, if left untreated, could cause more harm to cultural heritage. Based on pre-event information, it records the extent of the physical damage and what can be salvaged. Additionally, it assesses losses – for example, the way in which the disaster has affected people, their income and their infrastructure.

It is important to undertake integrated post-event damage and risk assessments for all types of cultural heritage, i.e. **movable**, **immovable** and **intangible**. Failing to do so could lead to an inefficient use of time and resources, and the incorrect estimation of recovery needs. This is essential, as it will inform the **strategic plan** for the implementation of the on-site actions outlined during the situation analysis.



*A team conducting on-site damage and risk assessment at Hanuman Dhoka Palace Museum in Kathmandu, Nepal, 2015. Photo: ICCROM.*

## Why undertake on-site damage and risk assessment?

A first-hand inspection of the affected site(s) allows you to gather further information on the state of the site/building/object that could not be obtained or verified during the situation analysis.

On-site assessment provides the opportunity to:

- Assess the physical nature of the affected heritage within its environment, and identify the required security and stabilisation actions.
- Note the ways the disaster has affected the broader group of stakeholders, e.g. by talking to the community, local leaders, vendors who sold souvenirs on or near the site, or operators of nearby guesthouses.
- Identify immediate risks and their respective mitigation measures.
- Estimate site-specific costs for security and stabilisation actions and full recovery.

On-site damage and risk assessment can be used to secure the necessary funds for cultural heritage first aid and recovery. Such an assessment can inform a **Post-Disaster Needs Assessment** (PDNA): a multi-sector assessment method, which helps affected governments to determine direct effects, long-term impacts and recovery needs in the aftermath of a large-scale disaster.



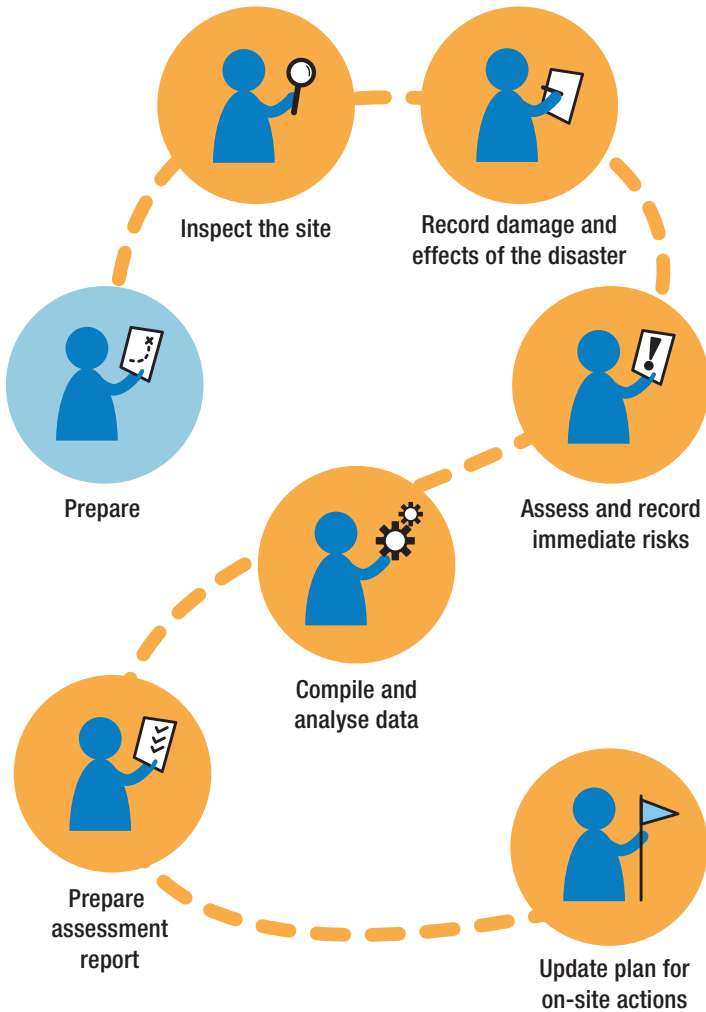
Some countries have their own methods for assessing recovery needs after a disaster. A Post-Disaster Needs Assessment is carried out only when a country requests assistance from international organizations, such as the United Nations.



## How would you undertake an integrated on-site damage and risk assessment?

Below, is a step-by-step workflow for an integrated on-site damage and risk assessment for built, movable (objects and collections), and **intangible cultural heritage**.

### Workflow for a post-event on-site damage and risk assessment





## Prepare

Use the findings of the **situation analysis** as a basis to:

### 1 Obtain permission and contacts

**Obtain permission** from the custodians where applicable, and the emergency response coordinator, or the incident commander, to enter the affected site(s). Obtain the contact information of the staff members or caretakers who have in-depth knowledge of the affected heritage and its condition before the event.

### 2 Prepare team. Gather and prepare a team to conduct the on-site damage and risk assessment. The team should be created according to the nature of the hazard event, the scale of the emergency, and the type of cultural heritage affected.

In the event of a large-scale emergency, assessment can be undertaken at multiple sites by volunteers and professionals drawn from various fields, such as architecture, (structural) engineering, museum studies, object conservation and anthropology. Depending on the nature of the emergency, and damage caused, military personnel and emergency responders, such as structural safety engineers can participate in such assessments. Additionally, in the event of a major or complex emergency, they can provide logistics support for carrying out an assessment.

It is important that the teams carrying out the assessments have been trained to provide consistent documentation, including:

- a. uniform use of assessment forms and floor/sketch plans to record damage and risks;
- b. photos in predetermined and standard shots (long shots or close-ups) to indicate a specific type of damage or loss;
- c. pre-defined and accurate application of the degrees of damage found, i.e. major, moderate or minor, alongside a description of the damage that has been caused to the objects, structures and intangible heritage;



- d. use of previously agreed-upon formats for compiling damage and loss data that can easily be understood by emergency actors, stakeholders and donors.

See the Toolkit on page 15 for some examples of standardised documentation practices, and templates for damage and risk assessment forms.

The orientation for on-site assessment teams should include procedures for ensuring personal safety. Additionally, the volunteers shortlisted for an on-site assessment must be familiar with the social and cultural context of the area, and should be able to communicate with the affected community in their own language.

### 3 Gather pre-event data

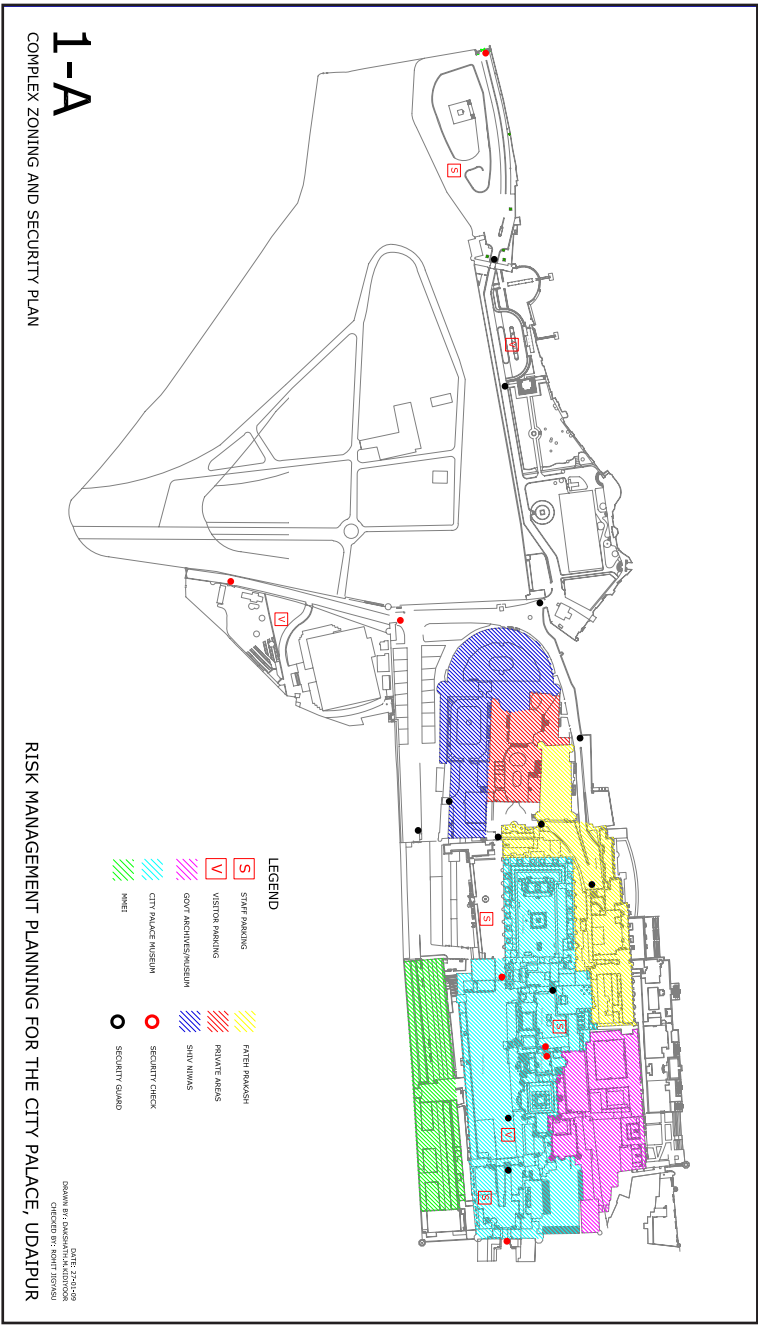
Gather the following pre-event documentation:

- a. A map which indicates the geo-coordinates of the affected cultural heritage.
- b. Site map (Toolkit, page 11), or latest satellite image, if available.
- c. Where applicable, collect floor plans, otherwise prepare a sketch plan.
- d. Site-based inventories, describing the type, number, and location of buildings, objects and intangible elements.
- e. Pre-disaster photos (primarily long or wide shots) of the affected sites, buildings, objects and intangible heritage.



Note that the type and importance of the data will vary significantly, according to the type of heritage that has been affected. For a single cultural institution, such as a museum, a detailed floor plan and inventory is much more important than a large-scale map with geo-coordinates. Equally, for a disaster affecting a large area, floor plans of individual structures may be too detailed for the purposes of your assessment.





Sample site map of City Palace, Udaipur, India, 2009. Photo: Rohit Jigyasu.



#### 4 Tools and equipment

Collect tools for documenting damage and risks, such as a camera with spare batteries, and an integrated damage and risk assessment form (see Toolkit, page 15), which is context specific and user-friendly.

Gather personal safety gear according to the nature of the hazard event, e.g. for an on-site assessment in a flooded area, ensure that you have waterproof footwear and protective facemasks with microfilters to prevent infections. See the general list of personal protective equipment in the Toolkit (see page 10).

#### 5 Logistics and means of communication

Prepare a budget estimate for the on-site assessment, considering costs related to:

- a. Transportation
- b. Accommodation
- c. Food and drinking water
- d. Safety and security
- e. Means of communication
- f. Equipment for recording data during the assessment
- g. Supplies for initial securing of the site, e.g. ropes, caution tape, signs, signposts, tarps, etc.
- h. Personnel

Once the estimate is ready, secure the necessary funds and make arrangements to put all of the logistics in place.



In the event of a large-scale emergency involving multiple sites, set up a camp office in close proximity to the affected area, to serve as a coordination centre and base of operations for the teams carrying out the on-site assessment.



## 6 Coordinate your plan

Coordinate your plan with other emergency actors and agencies operating in the area. It is important to do so, as structural safety and usability assessments for public buildings may be carried out at the same time. Such buildings usually include museums, libraries, archives and heritage structures. Similarly, emergency management agencies may set up temporary shelters in open spaces within heritage sites. Their work may coincide with on-site assessments and cultural heritage security and stabilisation actions.



Where heritage sites are being used to set up temporary shelters during first aid, consult with custodians to provide guidance on how to use the site safely.





## Inspect the site

- 1 Walk in and around the site and identify whether access to all areas is clear or blocked. Mark the access points on the site plan.
- 2 Identify, mark and, if necessary, prepare safe access routes to the site; especially the entrance up to the point where vehicles can approach and where they can be parked. Also identify safe exits and evacuation routes from the site to safe zones, in case there is a need to get away quickly.
- 3 If there is visible damage to a building consult with a structural engineer. If it is safe to enter, mark a safe internal access route on the floor plan. In case a floor plan is not available, create a sketch plan.



Do not approach a wall within a distance equal to its height before an initial assessment of its stability has been conducted. Keep clear of the gable-end walls of unframed (load-bearing) structures, which are higher than other walls and usually more vulnerable (see photo).



*A gable-end wall, Gujrat, India, 2015. Photo: Rohit Jigyasu.*



- 4 Identify the main structural elements: is it a framed or unframed (load-bearing) structure? What type of roof does it have? This will help to identify the most vulnerable areas of the building and those that cultural first aiders and volunteers need to be aware of.
- 5 With the help of local emergency managers, identify safe work and storage spaces in and around the site that volunteers and first aiders can use to undertake security and stabilisation actions.



*Unframed structure damaged by earthquake, Italy, 2017.  
Photo: Eisuke Nishikawa.*

- 6 Identify and record damage to basic services and infrastructure, e.g. electricity and water supply, etc. If it has not yet been done, switch off water, electricity and gas supplies. Keep in mind that you may need a supply of fresh water and electricity to stabilise objects on-site later.
- 7 Find out if the site has external or unwanted debris, or hazardous waste or chemicals that require disposal. If so, mark its location on the site map. In such cases, specialised professionals trained to manage post-disaster debris and waste disposal must be called in. At the same time, check if the site has broken building parts or fragments of decorative elements, which should be salvaged. Mark their location on the site map.

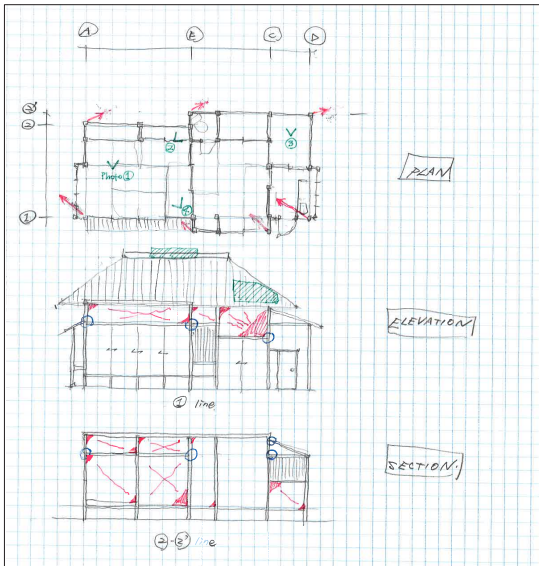




## Record damage and effects of the disaster

### Record damage to immovable heritage

- 1 Mark the damage on a site map in the case of an archaeological site, and on floor plans, elevations and sections in the case of heritage buildings (if available); otherwise, record the damage on a sketch plan. While at the site or building, however, record only the major damage: time will be limited, and it is vital to prioritise response actions to address critical threats, for example, portions of walls that are at the point of collapse due to tilting, bulging, delamination, or large and deep cracks. For more information, refer to the guide on typical damage caused to heritage structures by various hazards in the Toolkit, page 28.



Sample sketch plan, elevation and section, Rome, 2018. Photo: Eisuke Nishikawa.

- 2 In the case of affected building(s): record only the outside damage to the building from a safe distance until the authorised expert gives you permission to conduct an interior survey.
- 3 Take a context photograph of the damage (long or top-to-bottom shot) and note the reference number of the photo on the site map/floor plan. Describe the type of damage, its location and its severity on the assessment form.



- 4 Identify buildings (in the case of a larger site), or rooms (in case of a single building) that have suffered major damages to structural and non-structural elements, and mark their location on the relevant floor plans. Prepare a separate assessment form for each building and use it to describe the type and extent of damage. If possible, take a photograph of the damage and mark its reference number on the floor plan.
- 5 Talk to people who work or live on the site. They may have valuable information about what is underneath the rubble, or about the situation before you arrived on site.
- 6 Record economic losses—for example, losses in revenue or income earned from ticket sales to access a heritage site or museum.

For reference guides and a template for preparing immovable and movable cultural heritage damage and risk assessment forms, see Toolkit, page 15.

### Record damage caused to cultural heritage objects and collections

- 1 Identify and mark the location of the room/area containing damaged cultural heritage objects on a floor plan, if available; otherwise use a sketch plan.
- 2 Use the pre-event **inventory** and your own visual inspection to determine the number of objects damaged, and the materials that they are made from, such as stone, wood, paper or metal. This information should be recorded on your damage and risk assessment form.
- 3 Try to identify the type and extent of damage. For example, record whether the objects are broken and/or deformed. Examine whether the objects are wet, dry, soiled or burnt. Record your observations on the assessment form.
- 4 Record whether the objects are exposed to the environment or hazardous materials, such as chemicals or human waste.
- 5 Take photographs of the damaged objects. If you find them together in one or multiple piles, take one wide shot of each pile. Record the reference numbers of the photographs taken on the assessment form and on the floor plan.





*Damaged sculptures at Hanuman Dhoka, Kathmandu, Nepal 2015.  
Photos: Aparna Tandon, ICCROM.*



### Record effects of a disaster on intangible heritage

Discuss with relevant groups within the community (religious leaders, women's groups, elders, crafts associations, etc.) which intangible heritage has been impacted and how.



Use the findings of the **stakeholders and actors map**, prepared during situation analysis in order to identify relevant groups within the community for such a consultation.

- 1 Guide the community to ensure they do not only take into account major festivals or events. Consider the categories of the **2003 UNESCO Convention for the Safeguarding of Intangible Heritage**: oral expressions (including language); performing arts; social practices, rituals and festive events; local knowledge/traditions; and crafts.

The assessment should include the performance of, access to, and transmission of the affected intangible heritage. All three are strongly interconnected.

- 2 Document the tangible assets that are related to intangible heritage (such as, places, sites, objects, costumes and tools). Tangible assets are the easiest to assess. The same methods can be used as described in the sections above.



Often, damage to tangible assets does not impact upon intangible heritage. For example, rituals may continue elsewhere, or festivals may take place with new costumes. However, do not forget other losses: for example, the loss of access to markets and tools may mean a loss of income for craftspeople.

- 3 Communicate with people, including performers, practitioners, spiritual leaders and elders. The assessment should look at how the bearers of intangible heritage have been affected. For example, a disaster may result in the passing of knowledge bearers or may also lead to displacement, which may complicate the transmission of knowledge or traditions. Displacement may also mean that traditional healers or priests can no longer access sacred sites to perform rituals.
- 4 Identify and assess traditions and knowledge. This evaluation step is the most difficult: it requires a good understanding of how the intangible heritage in question has evolved, which will allow you to estimate the extent of the change brought by the disaster and the effect this may have over time. Very often, rather than losing knowledge or tradition altogether, a disaster may cause intangible heritage to change significantly.

For example, a procession may continue to be organized, but future iterations will not follow the same route. Similarly, local stories may be retold differently, taking elements of recent disaster events into account. It is essential that post-disaster assessments take note of such changes in practices brought about by the disaster. They are not necessarily negative and can indicate the resilience of intangible heritage and its bearers.

For a template for assessing the effects of a disaster on intangible heritage, see the Toolkit, page 22.
















## Assess and record immediate risks

A post-event risk assessment aids immediate risk evaluation during a rapidly changing situation in an emergency. It helps to identify the proactive measures required for risk reduction and preparedness before cultural heritage suffers irreparable loss.

The workflow for assessing risks is detailed below:

- 1 Identify the possible (natural or human-induced) hazards that could pose an imminent danger to lives, and/or which may cause damage to tangible and intangible heritage.

Consider **primary** as well as **secondary** hazards. For example, an earthquake as a primary hazard may trigger secondary hazards, such as a tsunami, flooding, arson or vandalism. If these hazard sources are localised, identify their location in and around the site/building/community.

Primary hazard	Secondary hazard
<b>Natural hazards</b>	
 Earthquake	Fire, landslide, tsunami, liquefaction
 Flood	Landslide, mould/mildew, efflorescence, corrosion
 Tsunami	Fire, floods
 Hurricane/Tornado	Fire, wind damage
 Fire	Water damage, mould/mildew, efflorescence, corrosion
 Volcano	Fire, landslide, earthquake
<b>Human-induced hazards</b>	
 Warfare	Fire, bombardment, demolition
 Terror	Fire, bombardment
 Vandalism	Demolition, theft



- 2 Identify the physical, social, economic, political and attitudinal vulnerabilities, which expose heritage to various hazards.

These vulnerabilities can be identified as described below:

- a. Use the findings of your **situation analysis** to understand how and why the heritage was damaged, and how it may be exposed to secondary hazards. For example, a poorly-maintained heritage structure, which has suffered damage in a hurricane could continue to be exposed to secondary hazards, such as fire and rain damage. The lack of heritage maintenance could stem from a number of underlying social or economic causes, such as a lack of resources, or where the heritage belongs to a minority community.
- b. While recording damage, observe how the nature of the heritage could make it more susceptible to secondary hazards. For example, wet and soiled objects made from organic materials are more prone to mould and pest infestations.
- c. During on-site assessments, record activities in and around the site, or community, which may create or increase vulnerabilities and risks. For example, sheltering people in an open area adjacent to the heritage site could make it vulnerable to looting or vandalism, or a makeshift kitchen set up near the site, could expose the site to the risk of fire.

Conduct interviews with stakeholders and actors at the site to assess their perception of the threats, constraints and needs. Stakeholders and actors may include site managers, custodians, security guards and neighbours.

- d. For intangible heritage, consider the social processes that affect the transmission, accessibility or practice of intangible heritage. For example, knowledge may not have been affected, but large-scale displacement, or a loss of access to markets may mean that, in the medium- to long-term, younger generations will lose interest, or will not be able to learn or adopt a specific tradition from their community.



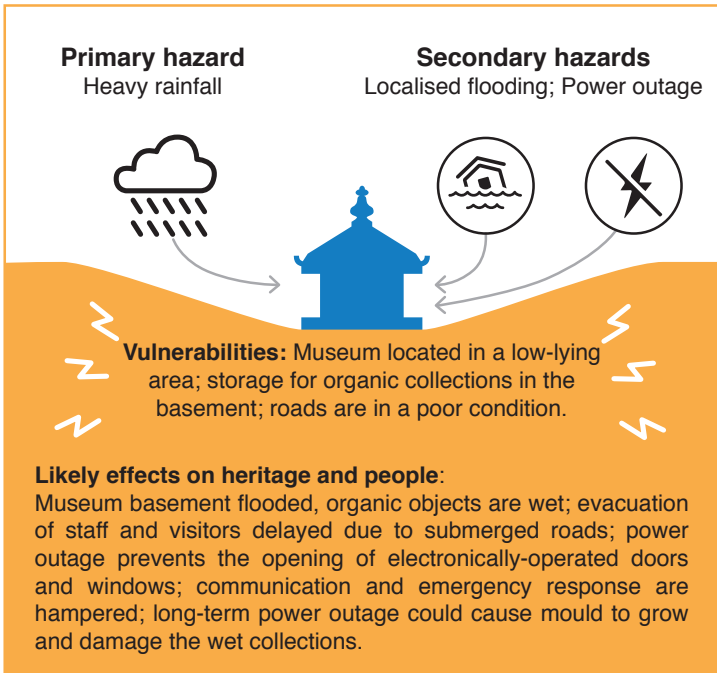
- 3 In order to assess the immediate risks, develop risk statements.

A risk statement explains how primary and secondary hazards might interrelate with vulnerabilities and exposure levels, with an immediate impact on different types of cultural heritage and people's safety.

For example: cracks in the ceiling may cause leaks in the event of heavy rainfall, thereby damaging historic interiors and frescoes directly underneath; or the absence of fencing and security systems may expose a monastery to the risk of looting.

While preparing a risk statement, consider all possible links between **vulnerabilities**, **primary and secondary hazards**, and exposure levels that could increase the negative effects of the disaster (see figure below).

Developing risk statements may therefore take time. This work can be carried out off-site, while you are compiling data.





## Impacts of the Tohoku earthquake and tsunami: Japan

On 11 March 2011, a 9.0 magnitude earthquake struck the north-eastern coast of Honshu, the largest island of Japan. It was followed by large and powerful tsunami, which inundated the coast of eastern Japan and flooded parts of the city of Sendai, including its airport and many traditional settlements. The earthquake also caused damage to a dam, resulting in a flood downstream. The tsunami resulted in oil spills, due to the overturning of containers, which led to fires; it also caused explosions in a nuclear power plant.



*Building collapse caused by tsunami in eastern Japan, 2011.  
Photo: Board of Miyagi prefecture.*

In this case, the earthquake was the primary hazard, and it induced related secondary hazards such as aftershocks, a tsunami, floods, fires and a nuclear accident. Japan's proximity to the sea, and its geo-location expose the country to hazards, such as earthquakes and tsunamis. Additionally, the presence of oil tankers and a nuclear reactor in the area proved to be vulnerabilities, which, in turn, caused fires and nuclear radiation. The combined effect of this chain of hazard events left more than 19,000 people dead, hundreds of thousands





homeless, and vital infrastructure, including roads and power plants, destroyed. Furthermore, more than 700 cases of damage to cultural heritage were recorded. Many heritage buildings suffered minor- to medium-levels of structural damage due to the earthquake. In parts of the affected area, tsunami waves swept away historic and vernacular structures and collections.

Further inland, beyond the reach of the tsunami, an archaeological storage site and other movable heritage were damaged by the flood, caused as a result of damage to the dam. Movable heritage was also contaminated by nuclear radiation, which, in turn, delayed its recovery. Power outage in the affected area exposed the wet, organic heritage materials, such as wood and paper, to the risk of mould and other forms of bio-deterioration.

[See references on page 159.](#)

- 4 Identify the level of risk (low, medium or high) for each risk statement, based on the nature and the likelihood of the primary and secondary hazards, and the kind of potential impact to people's safety and to heritage values. For example, following an earthquake, the risk of building collapse during aftershocks, due to structural cracks is high. However, the risk of a collapse in the case of localised flooding, caused by a combination of heavy rains and water leaking through a minor crack in the ceiling of the same building is relatively low.

See the Toolkit, see page 14 for forms and other resources to help you assess immediate risks.





## Compile data

- 1** Systematically digitise the assessment forms and sketches for each type of heritage immediately after the on-site assessments. It will help to prevent data loss and to share information in a readily usable format. You should plan to digitise results at least daily, so be sure to have a digitisation method and workflow in place before the fieldwork commences. Each heritage component or asset should be easily identifiable through a unique identification number (see Toolkit, page 42).
- 2** For interviews with stakeholders: gather notes or transcripts of interviews and store these together with other data. Be sure to mention the name of the source, date and place of interview, and, if possible, a way of contacting the interviewee.
- 3** Download the photographs from your camera and link them to the digital copy of the floor plans through their reference numbers. Alternatively, remove the machine-generated file name or number of the downloaded picture file and replace it with a file name that indicates the place, date, and type of damage in the form of short codes. This is especially critical in case of assessments covering several locations and/or those that are conducted in different stages. Ensure that file names and codes are consistent and understood by all involved in the assessment and data compilation.
- 4** Connect the data contained in the assessment form to the site map, floor plans, and photographs of the damage by compiling one unique file.
- 5** If you were not able to do so at the site, prepare your risk statements and identify the level of risk for each statement.
- 6** Collect, categorise and store all of the data collected from the site in a standardised database to ensure easy access and analysis.





## Compilation and visualisation tool

For built heritage and cultural repositories, a **Geographical Information Systems (GIS)** app installed onto your mobile phone or tablet can be very useful for on-site documentation. Damage and risk assessment forms can be completed off-line within the GIS tool, and photographs can be attached directly, so that all of the forms and photographs can be kept together. Once your mobile phone is connected to the Internet, the forms and photos can then be exported directly to a central database. It is important to note that any apps that you choose to record, compile and visualise data will have to be customised, and your assessment teams will require guidance to use them in the field.

See references on page 158.



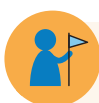
## Prepare assessment report

Based on the site survey, prepare a consolidated assessment report that includes the following information:

- Significance of the heritage assets affected (heritage site/collection/tradition).
- Nature of the disaster or conflict. What happened? When? How did it involve cultural heritage?
- Description of the damage to the built and movable heritage and the effects of the disaster on intangible heritage. This should include a brief description of the type of damage/effect, location (with reference to the base map, site map, and floor or sketch plan, where relevant) and possible causes. Include one photograph to illustrate each item of damage. For intangible cultural heritage, the description could include the details of which aspects have been affected: tangible elements, people, and/or knowledge/tradition.
- Losses (if any), with reference to the people, specific income and/or infrastructure concerned, and the long-term negative effects of the losses on the affected cultural heritage.

- Risk statements based on the identification of hazards, vulnerabilities and consequent risks to the different types of heritage assets.
- Immediate on-site security and stabilisation actions needed for each heritage asset.
- Resources required for securing and stabilising affected heritage assets, along with a defined timeline.

The report must mention the date, author(s), names and contact details of all those involved in the on-site assessments, along with their responsibilities. It should also mention the names of all those who were interviewed during the assessments.



### Update plan for implementing on-site actions

A consolidated damage and risk assessment report can be used to elaborate the plan for implementing the **on-site security and stabilisation actions identified during the situation analysis** (see page 37). It is particularly useful for prioritising site-specific actions – for example, providing a temporary cover to exposed, damaged structural elements. It also helps to determine the kind of resources and expertise required to stabilise each affected cultural heritage asset.



### Post Disaster Needs Assessment (PDNA)

The aim of a PDNA is to conduct a needs assessment and develop a recovery framework, which will feed into joint requests for emergency funding (e.g. humanitarian flash appeals) and can serve as the basis for the establishment of national-level recovery priorities, as well as funds. As a PDNA is meant to inform fundraising appeals, it is usually carried out within four to six weeks of the disaster.

The most direct outcome of a PDNA is a report that consists of two parts: the **needs assessment**, and the **recovery framework**. This report is a collection of different sectoral reports, including one for culture.







A PDNA is a government-led process, conducted together with relevant UN partners. Depending on the context and the impact a disaster has had on government **capacities**, the government may request the UN to take the lead. During assessment, a PDNA relies on broad participation from organizations, communities and individuals; international organizations and experts; local government, affected communities, local leadership (formal, traditional and religious); Chief Security Officers; and the private sector.

In most cases, a PDNA for the culture sector is led by the government and the United Nations Educational, Scientific and Cultural Organization (UNESCO), together with a team of experts from different cultural fields (architects, engineers, museologists, anthropologists, archaeologists, etc.).

A **chapter for assessing culture** has been included under the social component of PDNA guidelines.

### **PDNA and its interaction with steps within cultural heritage first aid.**

How the **situation analysis** and the **on-site damage and risk assessment** interact with the PDNA depends on when each one is implemented. In principle, one can easily feed into the other, whichever one is conducted first. Since neither first aid, nor the PDNA has a fixed timeline, this will vary on a case-by-case basis.

Source: Elke Selzer, School of Oriental and African Studies, University of London, UK.

**See references on page 159.**





## Improve your preparedness for post-event on-site damage and risk assessments of cultural heritage assets.



### Consider the following questions:

- Have you prepared a list of all cultural heritage assets and checked whether a map showing their geo-coordinates exists?
- Do you have specific pre-event information for cultural heritage assets, such as inventories, floor plans, photographs and condition reports?
- Have you prepared a sample damage and risk assessment form, tailored to cover the different types of cultural heritage assets in your area?
- Have you identified the heritage professionals and emergency managers who will be able to undertake damage and risk assessments in your area?
- Have you tested your sample form with the assessment team, and developed a system for data compilation and data visualisation together?
- Have you made institutional arrangements for financing post-event on-site damage and risk assessments?
- Have you liaised with the local institution in charge of emergency management and made arrangements for coordinating safety assessments for cultural heritage sites?

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## **What follows on-site damage and risk assessment?**

FOLLOWING AN EMERGENCY in your area, you and your team of cultural first aiders have carried out a **situation analysis** and **on-site damage and risk assessment** for the affected cultural heritage. Both of these steps were carried out in coordination with relevant emergency actors, and with the participation of the relevant stakeholders and the local community. As a result, you have been able to identify priorities for securing and stabilising structures, objects and intangible heritage.

### **How will you proceed?**

Read on to find out.

STEP THREE

# SECURITY AND STABILISATION



## What are security and stabilisation?

Actions that stabilise the condition of the affected heritage and prevent further damage and loss through risk reduction are collectively termed as security and stabilisation actions.

**These actions are temporary in nature and are intended to provide adequate support to damaged heritage during an emergency until it is possible for full conservation treatments to take place.**

Security and stabilisation actions are context-dependent and do not always follow a particular sequence. Nonetheless, for an intervention to be successful, it is crucial that there is careful documentation of the heritage asset and of the actions taken to stabilise and secure it.



*Emergency stabilisation in practice at a workshop in Shouf, Lebanon, 2014.  
Photo: ICCROM-ATHAR.*

Basic security and stabilisation actions include:

- Erecting a fence around the affected site or collection.
- Providing temporary cover (See Toolkit page 73) for exposed built elements, fragments and objects.
- **Post-event evacuation** of cultural heritage objects to another safer, temporary location.



- **Salvage** of damaged cultural heritage collections, building fragments and decorations. This action includes sorting, stabilisation through surface cleaning, and/or drying objects.
- Providing **safe and secure temporary storage** for evacuated and salvaged cultural heritage materials.
- **Drying** a building or structure in the aftermath of a flood.
- **Shoring** a wall or other load-bearing structural element in order to provide a temporary support.



Security and stabilisation actions for intangible heritage are different from those mentioned above. For intangible heritage, the continuation of the endangered tradition or knowledge system in the immediate aftermath of a disaster or conflict is considered to be more important. For more details, refer to the section on securing intangible heritage.

## Who can implement security and stabilisation actions?

Trained **cultural first aiders** and qualified cultural heritage specialists who have prior experience of securing heritage in emergency situations can identify, prioritise and assist in the implementation of security and stabilisation actions. These professionals include, but may not be limited to: conservators, archaeologists, curators, archivists, structural engineers, conservation architects, anthropologists and intangible heritage specialists.



*UN Peacekeepers assisting in a salvage operation at Le Centre d'Art in Haiti, 2010. Photo: ICCROM.*

**Military personnel, firefighters and search and rescue teams** are often trained to perform emergency structural stabilisation. However, they may lack an understanding of historic structures and their specific collapse mechanisms, so, wherever possible, seek the advice of a structural engineer and a conservation architect. Emergency responders can also facilitate and assist post-event evacuation and salvage operations. In situations where access is limited or structures are unsafe, military personnel or firefighters could help to rescue objects using specialised equipment.

For large-scale implementation, volunteers and members of local communities should be actively involved and trained on-site to perform specific security and stabilisation actions under supervision. Such actions may include documentation, transportation of objects, sorting debris, preparing **shores**, and making inventories.

**Each emergency is different and requires a tailored response.** Therefore, it is vital that even trained volunteers receive some guidance to implement specific actions. Nonetheless, in order to provide timely and consistent first aid, it is essential to train cultural heritage professionals, emergency responders and volunteers before a disaster.





## Cultural heritage first aid training in the Mediterranean: the PROMEDHE project

PROMEDHE (Protecting Mediterranean Cultural Heritage during Disasters) is a multi-partner initiative of the Italian Civil Protection Department, which is financed by the General Directorate of the European Commission for Civil Protection and Humanitarian Aid (DG ECHO). Within the framework of this initiative, ICCROM was invited to train teams comprising a mix of civil protection, civil defence and cultural heritage professionals from five countries in the Mediterranean region. The objectives were to develop capacity and common standard operating procedures for cultural heritage first aid in the aftermath of natural disasters. As a result of the training, participating countries have gone on to conduct national workshops to train civil protection professionals, heritage professionals and other volunteers, enhancing their respective national capacities for implementing cultural heritage first aid on a large scale.

See references on page 165.



*Città di Castello, Italy, 2017. Photo: PROMEDHE and ICCROM.*



## How to implement security and stabilisation actions for movable and immovable cultural heritage?

Security and stabilisation actions for cultural heritage are context-dependent and vary accordingly. Nevertheless, the following actions may assist in the smooth implementation of specific measures, regardless of the type of heritage affected and the nature of the emergency.

### Secure the site

Before taking action to stabilise movable or immovable heritage at a site, you must ensure that it is secure and safe to enter. All personnel must be **informed of the risks** and be provided with the appropriate personal protective equipment (see Toolkit, page 10). The following actions will help to ensure the site is secure and safe to commence work:

- 1 Erect safety barriers.** Once the on-site damage and risk assessment has been completed, cordon off all areas regarded as unsafe, and install safety and security barriers around the affected site or collection.



*Barriers and caution tape help to warn people and secure a heavily damaged church in Philippines, 2013. Photo: Aparna Tandon, ICCROM.*





If there is doubt about the risk of collapse of a structural or overhanging element, create a circular buffer zone around the element, ensuring the radius of the zone is equal to the height of the element concerned.

- 2 Check utilities.** Where applicable, check whether the gas, electricity and water outlets can be safely used on site.
- 3 Post signage.** Install appropriate signage around cordoned-off areas. Signage should be large, clearly visible, and easily recognisable by all personnel.
- 4 Secure pathways.** Identify pathways and access routes and mark them clearly on a site map and floor plan (if available). If safe to do so, remove debris from the path to improve access. This may include the removal of unstable overhanging, non-structural elements, such as roof tiles, chimneys and wooden panels, or securing the floor if there are large holes present.



Before you remove overhanging elements or fragments from a historic structure, make sure you document their position and type, as well as severity of the damage incurred. Take photographs (one close-up and one long shot) and record the location of the elements or fragments on a site/floor map. If in any doubt about the removal of structural elements, ask a structural engineer how to do so safely.

- 5 Provide temporary cover.** In the event of a structural collapse, both the exposed structures and trapped cultural heritage objects should be provided with a temporary cover until further action can be taken. See how to provide temporary cover in the Toolkit, page 73.
- 6** If left exposed, mortars and organic cultural materials can deteriorate rapidly. Covering an exposed pile of cultural heritage objects is a strictly **temporary measure** that should not last beyond a few days.
- 7 Remove hazardous waste.** Following a natural disaster or conflict-induced event, heritage sites may contain hazardous materials and waste: for example, explosives, chemicals, petroleum, PVC pipes, insulation, or fireproofing materials. In such cases, identify and consult the expert agency responsible for the safe disposal of the material found before taking any other on-site action.





## How to make a flooded site safe

In the event of a flood, the on-site damage and risk assessment should include consultation with the designated floodwater classification experts about the water supply – for example, is it clean (safe to drink), grey, or black? Where the water is classified as grey or black, the risk of biological contamination is high, as it may contain chemicals and/or sewage. In such cases, it is important to decontaminate the site in consultation with experts, and isolate contaminated historical materials by putting them in sealed containers or plastic bags.

[See references on page 162.](#)

### **8** Ensure that wet structures and surfaces are thoroughly dried out.

In the event that a building, structure or decorated surface incurs significant water damage, it is important to dry it out, in order to prevent:

- distortion and rotting of wooden elements;
- cracks in the plaster;
- mould growth;
- staining;
- salt migration.

It is essential not to attempt to dry out old structures too quickly. Rapid changes in moisture levels may damage thin wooden elements, increase salt migration in walls and result in plaster cracks. In order to dry wet structures and surfaces:

- Check and clear blockages from drains to expel water. On sloped surfaces, remove debris that may prevent water from draining.
- Use buckets and pumps to remove trapped water.





Critical damage is more likely in buildings where there has been fast-flowing water (for example, on hillsides or close to a breached dam), where the water level inside the building is (or was) more than 1m high, or if the load-bearing walls are made of raw earth. In this case, ask for the help of a structural engineer to assess the structural damage or the need for structural stabilisation actions before pumping out water.

- Remove mud and debris, as they trap moisture and slow down the drying process. Do not wait for mud and debris to dry. Mud is safer and easier to remove when wet.
  - Avoid cleaning solutions, which trap moisture or obstruct its movement within historic materials.
  - Remove wet carpets and floor/wall coverings.
  - Move furniture away from walls and remove items hung on walls, to accelerate the drying process. Refer to **post-event evacuation** on page 80.
  - If possible, remove metal elements that are in contact with wet plaster to avoid staining and rusting.
  - Ensure the openings you need for drying out the building are not blocked in any way. For more information, refer to Toolkit, page 92.
- 9 Designate** and set up spaces to work and for the temporary storage of cultural heritage objects, fragments and decorative elements.



## Other security and stabilisation actions

With the help of your team, gather the necessary supplies and implement other pre-identified security and stabilisation measures. These may include:

- Post-event evacuation
- Salvage
- Emergency stabilisation of historic structures

See the following sections for detailed descriptions of each of these actions.

You may have to implement multiple security and stabilisation measures at an affected cultural heritage site.

### Post-event evacuation

Post-event evacuations become necessary when a building or structure that is housing cultural heritage objects is declared unsafe for use, but is made sufficiently stable to evacuate objects. It involves the **documentation**, **packing** and **transportation** of objects to a safe temporary location.

Post-event evacuations may involve technical assistance from firefighters and/or military or civil defence personnel, as they are trained to evacuate people from unsafe buildings. However, they require guidance on what to evacuate and from where, as well as instruction on the safe handling of heritage objects.





## Lessons from the post-event evacuation of the Hanuman Dhoka Palace Museum: Nepal

Following the 2015 earthquake in Kathmandu, Nepal, parts of the Hanuman Dhoka Palace, which housed a museum were declared unsafe for use, due to major structural damage. The museum staff requested assistance from the Nepalese Army to evacuate the Golden Throne and other significant artefacts. At the time of the evacuation, no inventory was available to indicate the location of each object. As a result, army personnel had to spend more time than was deemed safe to locate objects that were of great significance. During the evacuation, they encountered difficulties in manoeuvring the Golden Throne through the doorway of the top floor of the building. Consequently, parts of the throne had to be dismantled, before it could be removed from the building.



*Nepalese army personnel evacuating a museum object.*

*Photo: Aparna Tandon, ICCROM.*

The Museum's Director and Documentation Officer were on site to provide assistance and officially take custody of the evacuated objects. Once they had been evacuated from the building, the Golden Throne and other objects were kept in the courtyard of the Palace until a safer location was found days later. The army provided around-the-clock security to guard them.





### Key lessons to be drawn from this experience:

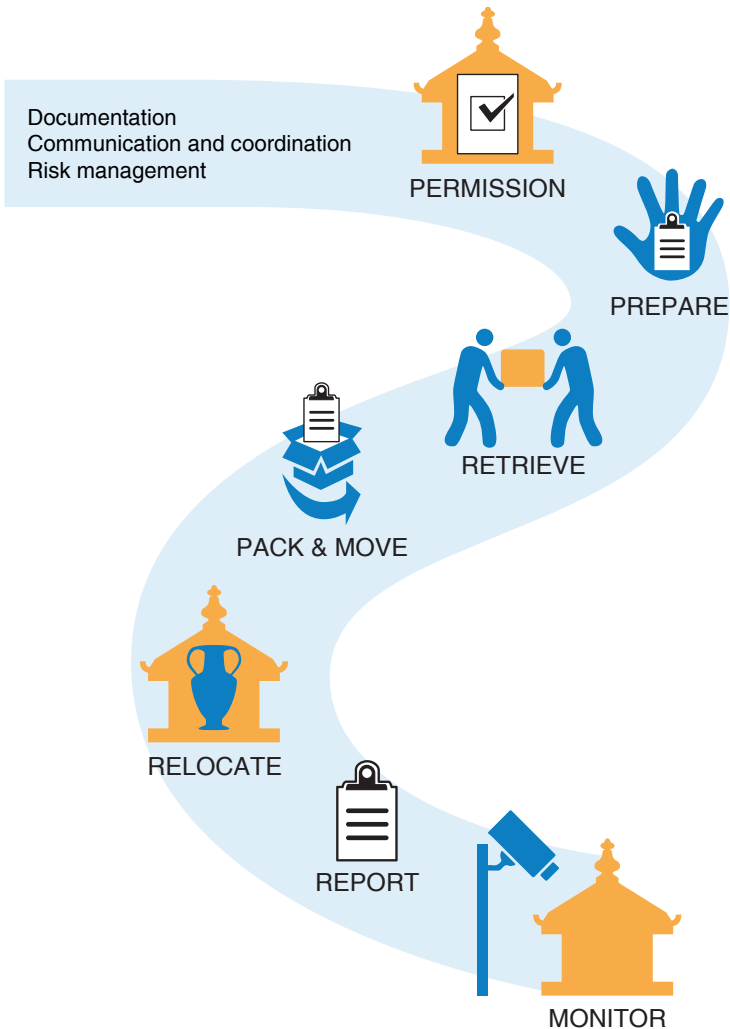
- In order to be better prepared for a post-event evacuation, multiple copies of floor plans, clearly indicating the locations and dimensions of the most significant objects should be made available to first responders. However, to ensure the safety of the objects, these floor plans should remain confidential to those outside of the first responder group at all times.
- An evacuation of cultural heritage objects should be undertaken only if a safer temporary location has been secured and the required logistics for the operation are in place.
- The prior training of emergency responders and heritage professionals in charge of a collection on how to handle, pack, document, and transport objects during an emergency is indispensable.

See reference page 167.



## How to carry out a post-event evacuation?

The following workflow for post-event evacuation has been drawn from the pre-event emergency evacuation handbook, **Endangered Heritage: Emergency Evacuation of Heritage Collections**. Remember that the decision to evacuate objects from an unsafe location should be taken on the basis of a **post-event on-site damage and risk assessment**.







## Permission

Before evacuating cultural property, secure permissions from the custodians, and ensure that they, or staff members, are present on site to give advice and supervise the entire operation.



**Documentation.** A formal permission document is required, stating that the custodian has given permission for 'x' number of cultural first aiders to evacuate 'x' number of objects and transport them to another safe location (specify the exact location name and geo-coordinates). This document should bear the signature of the custodian, together with other important details, such as the date, time and place.



## Prepare

- 1 Gather a team** for evacuation. It should include all of the officials who are directly in charge of the collection to be evacuated. Elect a team leader, who can explain the scope and the aims of the operation and assign specific tasks to team members. These tasks include:
  - documentation;
  - handling and packing;
  - transportation of objects;
  - organization of the temporary storage space;
  - logistics, such as supplies, food, water, etc.;
  - communication within the team, and with external actors and stakeholders.
- 2** Using the findings from the **on-site damage and risk assessment**, identify and prepare:
  - a. A safe evacuation route for transporting objects within and outside of the affected building.
  - b. A **sorting and packing area**, or room that is large enough to accommodate at least two workstations for sorting, documenting and packing objects.
  - c. A **safe location** for storing the objects temporarily, either on-site or off-site.



When selecting a safe storage space, ensure that:

- it is large enough to accommodate the number of objects that have to be relocated;
- it is clean and does not have any pest or mould infestations;
- it is well-ventilated and is not damp or humid;
- it has been secured against theft and vandalism;
- it is accessible via a route that would allow the safe transportation of objects;
- if needed, objects could be left in the storage space for an indeterminate period.



### 3 Collect information and document

- a. Where available, obtain the **list of priority objects** that are to be evacuated first. Otherwise, ask the documentation team to consult previous records in order to prepare a list of objects, based on value, vulnerability, and ease of handling or transportation. In the event that no such list is available, consult with the custodians or staff members to prepare a list of priority objects. See the Toolkit, page 55.
- b. Obtain copies of the floor plans of the building from which the objects are to be evacuated. Identify and mark the physical locations of the objects to be evacuated on the floor plans, by using existing **location codes**. If such location codes do not exist, or are inconsistent, the documentation team should assign **new location codes**, which are consistent and easy to understand. See page number 42 on how to create location codes in the Toolkit.
- c. Once you have marked the location codes on the floor plans, label spaces and furniture with the location codes, if you have time to do so. Ensure that the labels are clearly visible.



- d. Prepare an inventory for the purpose of evacuation. Previous documentation, if available, can assist in this task. If you do not have a pre-prepared inventory, you can create one, using the template provided.

Entry number	Previous number	Assigned identification number	Type of object	Materials	Dimensions: length, width, height	Weight	Original location code	Photo or floor plan reference number	New location	Photo or floor plan reference number

In ascending numerical order, from 1 to the last object moved, it indicates the number of objects evacuated.

This field is to record the unique identification number assigned to the object for the purpose of evacuation.

Object type: use it to briefly describe the object e.g. illustrated manuscript, sculpture, vessel, etc.

What the object is made of e.g. glass, ceramic, metal, textile, etc.

Fill in the weight of the object. If a weighing scale is not available, use symbols such as + to indicate the weight. For example, if an object can be easily handled and moved by one person use +; similarly, if two persons are required to lift it, use ++ and +++, if special equipment is required for lifting and transporting it.

List the original location code of the object.

This field should be filled in once the evacuation is completed and objects are moved into their new safer location.

All pictures and floor plans should have a reference number.

- 4 **Gather supplies** for packing and transporting collections. For a sample list of supplies, see the Toolkit, page 67.
- 5 **Create workstations** for sorting, documenting and packing objects in the designated on-site safe area (identified in your on-site damage and risk assessment).



## Retrieve



**Document:** before carrying objects to the sorting and packing area, record their location code on a label placed on the support/box used to move the object. Alternatively, one person from the documentation team could accompany the transportation team and record the location codes in the inventory made for the evacuation.



## Pack and Move

- 1 Move the objects to the sorting and packing area; sort the retrieved objects by material type.
- a. Assign a **unique identification number** to every object. This number is different from the location code, as it identifies each individual object within a given location. Number objects in ascending order, or use a combination of letters and numbers.



## How to create a unique identification number

Before moving an object to another location, give it a unique identification number so that you can track its movement during the evacuation operation. Ensure that the numbering system developed for evacuation purposes is simple, uniform and understood by all involved. It could be just numbers in ascending order (e.g. 01, 02), or a combination of letters and numbers (e.g. A001, A002). For further information, see the Toolkit, page 43.

- b. Place a label indicating both the location code and the unique identification number on the secondary support, i.e. the piece of cardboard, tray, or individual box used to transport the object.
  - c. Complete the **evacuation inventory** and record any **accession numbers** (if found on the object), material, size, weight, and any other documentation criteria.
- 2** Carry the objects, together with their labels attached to secondary supports, to the prepared workspace and pack them (See Toolkit page 49). Ensure that a copy of the completed **evacuation inventory** accompanies the packed objects.



*National Museum of Nepal, Kathmandu, Nepal, 2016. Photo: Aparna Tandon, ICCROM.*

- 3** When packing objects, ensure that the labels bearing the unique identification numbers and location codes remain in place. The packing supports should also carry these labels. For more information, refer to the guidelines for packing objects in the Toolkit, page number 48.





*Packing of objects at the National Museum of Nepal, Kathmandu, Nepal, 2016.  
Photo: Aparna Tandon, ICCROM.*

- 4 Ensure that at least one member of the documentation team is tracking the placement of objects in their various boxes by completing a **movement tracking form**. This form is used to ensure that all objects have arrived at the new temporary storage location. Prepare multiple copies of the movement tracking form (see sample below).

#### *Movement tracking form*

Entry number	Box number	Total number of items in a box	Instructions for handling/transportation	Dispatched by	Date left	Courier/vehicle number	Date received	Box number	Total number of items in a box	Received by
1	12	20	Glass: handle with care	Abdel Hamid, curator	25 Jan	xxx256	25 Jan	12	20	xxx store keeper
...	...	...	...	...	...	...	...	...	...	...

- 5 Once all objects are packed, they can be transported to the new location. The package should include copies of the evacuation inventory and movement tracking form.



## Relocate

While a part of the team is engaged in recovering, documenting and packing the objects, others can focus on preparing the temporary storage space.

- 1 Start thinking of the most appropriate way to arrange objects in the new space.



- 2 Assign relocation codes: move available furniture, as appropriate, and assign location codes to cabinets and shelves, to mark the objects' new locations. Make sure this is done before the arrival of the objects. For more information, refer to preparing relocation codes in the temporary storage in the Toolkit, page 41.



*Temporary storage in central Italy, 2017. Photo: Aparna Tandon, ICCROM.*

- 3 It may not be possible to acquire suitable storage furniture, such as shelving units, during an emergency evacuation, in which case, objects should be kept on the floor in their packaging. Use pallets and/or tarpaulin to avoid direct contact between the storage containers and the floor. If you are using wooden pallets, check to make sure they are not infested with insects or mould.



- 4 Formally receive the objects at the new temporary storage using the movement tracking form. Then, check the accompanying emergency evacuation inventory and separate the objects according to material type and size.

Place the packed objects on shelves, or clean pallets and other available furniture. Try to keep fragile objects off the ground and place them at the far end of the room, beyond easy reach. Similarly, large or heavy objects should be placed together at one end of the room, in order to clear space for moving and organizing smaller objects.

- 5 In order to document the physical position of each object in the new temporary storage, note its box number and shelf number under the 'new location' field of the inventory.
- 6 Implement appropriate security measures at the new temporary storage site to prevent theft and vandalism. If needed, post guards.



In areas of active conflict, it is important to monitor the security situation constantly, so that, if needed, there is sufficient time to move the objects to yet another location.



## Report

Give the updated inventory, complete with the new object locations, to the custodians, together with a report summarising the entire evacuation operation. This report should contain: photos documenting the main steps of the operation; details of the materials used to pack the objects; information concerning the costs incurred; and the contact information of the team involved in the evacuation. It should be signed by the team leader who supervised the operation.



## Monitor

Develop a routine for cleaning and monitoring the new temporary storage space, in order to prevent pests, fire, water and any other agents that could cause damage to the objects.



## Salvage

After a post-event evacuation has been completed, damaged cultural heritage needs to be stabilised. Salvage is the systematic recovery of damaged cultural heritage objects, building fragments and decorative elements from a site negatively impacted by a hazard event.

Salvage of movable cultural heritage involves an evacuation process similar to the workflow for post-event evacuation, with the inclusion of additional actions for the triage and stabilisation of cultural heritage material, designed to prevent further damage until professional intervention can take place. In the event of the partial or total collapse of a historic structure, salvage will also include the sorting of debris to recover original stone, brick or wooden elements to be used for future **reconstruction**.

Depending on the emergency, you may find that it is necessary to undertake both evacuation and salvage together; or you may find that nothing is damaged at a compromised site, and that post-event evacuation will be required to decontaminate the site.



*Port-au-Prince, Haiti, 2010. Photo: Aparna Tandon, ICCROM.*







## Salvaging a flooded historic archive: Chile

In June 2016, unseasonably heavy rainfall caused flash floods in extensive parts of Talca, a city 250km south of Santiago. Drainage failure resulted in the flooding of a documentation centre in the basement of a building at the Universidad de Talca that housed an important collection of old manuscripts and original sheet music. The water rose to a height of 50cm before the rain ceased. All of the books and manuscripts located on the lower shelves, and those that were stored in boxes on the floor were saturated, affecting approximately 5000 books and manuscripts in total.

The water was pumped from the basement and the floors dried as soon as possible, before installing fans and dehumidifiers. Due to the large volume of objects affected, the decision was made to freeze them until they could be dried properly. Objects were prioritised according to degree of saturation and arranged so that they could be dried or frozen.

Refrigerated trucks and freezers were borrowed from a fruit export company. Wet books were separated gently and placed in individual plastic bags to prepare them for freezing before arranging them into boxes for storage. The books were then transported in the trucks to the freezer facility, where they were stored for ten months at  $-24^{\circ}\text{C}$ .

The frozen books were removed from the freezers in small quantities and thawed carefully. Eventually, all of the books and manuscripts were thawed and dried. As a result the disaster planning and subsequent quick response, all of the objects were recovered successfully.

Source: María Cecilia Rodríguez Moreno, Chief Curator, Paper and Books Laboratory, National Centre for Conservation and Restoration, Directorate of Libraries, Archives and Museums, Chile.

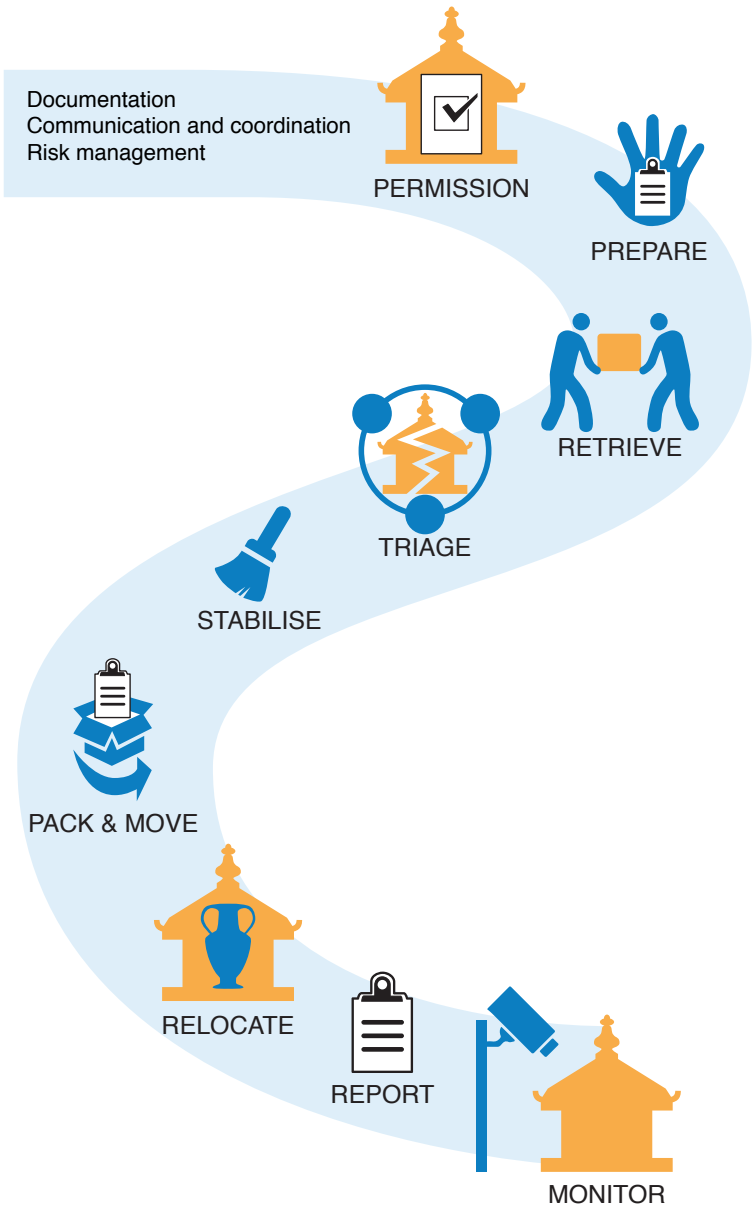
[See references on page 166.](#)

*Interleaving of pages of wet books,  
Centro Nacional de Conservación  
y Restauración, Chile, 2016.  
Photo: Mariela Arriagada.*



# How to undertake salvage?

## The workflow for salvage





## Permission

Consult the relevant stakeholders and secure **permission** (preferably in written form) for the salvage operation and relocation of the salvaged objects to a safer temporary location, on-site or off-site.



## Prepare

- 1 Inform the team:** gather the team that will be involved in the salvage operation and:
  - ensure that all team members understand which areas of the site are off-limits;
  - explain the workflow of the salvage operation;
  - elect a group leader, who will supervise the entire salvage operation.

Divide people into sub-teams and allocate roles according to level of expertise and interest in the task. Tasks include **documentation, recovery of objects, triage, stabilisation, packing, transportation, logistics** and **communication**. If you do not have enough trained people available for the operation, take the time to train volunteers to assist with tasks that do not require specialist knowledge.

- 2 Gather supplies** according to the type of objects to be salvaged, the type of damage incurred, and nature of the hazard event. For example, if the affected objects are made of organic materials and are wet and soiled, materials such as polyester mesh will be required for handling and drying. Use the findings of the on-site damage and risk assessment to select the supplies that you will need. For a general list of salvage supplies, refer to the Toolkit page 70.
- 3 Prepare the space:** set up an area for performing stabilisation treatments and ensure that each workstation has sufficient space for treating the number of objects affected. Each workstation should focus on one type of treatment. For example, do not perform wet-cleaning and dry-cleaning treatments on the same workstation, as you will risk contaminating wet objects with additional dirt, or risk getting dry objects wet, causing more damage.





**4 Document:** prepare a system for documenting and tracking the objects to be recovered. The documentation system should include three main components:

- a. A system for **recording the location** from which the objects are to be recovered. If you have access to the floor plan, use it to identify spaces, using the numbering system given on the floor plan. If the numbering system on the plan is unclear or inconsistent, create new location codes. See how to create a location code in the Toolkit, page 42.
- b. If the building or structure has partially or completely collapsed and the objects are under a layer of debris, lay a grid to map the location of objects. The grid can be made as small or large as required. For multiple areas of debris at different locations within the same site, create as many grids as necessary and assign unique numbers to each grid. Then locate them on a single site map that indicates North. In the case of large archaeological sites, involving salvage at multiple locations, the grid can be plotted on a map linked to a **Geographic Information Systems (GIS) tool**. For more information see Toolkit, page 11.
- c. **A system for numbering the objects** that have been recovered (see the Toolkit, page 43). In order to count and track objects objectively, create a system to assign a unique identification number for each object and its parts.
- d. **A salvage record form.** This form is used to record the number of objects recovered and tracks their movement throughout the salvage operation. It also provides supporting information, such as each object's photo number, original inventory number and floor plan reference number. It can be broken into three parts, which can be completed during three different stages of the salvage operation, namely: (i) retrieval (ii) triage and stabilisation; and (iii) pack and relocate. See the next page for examples.



## 1 RETRIEVAL



Entry number	Original location	Assigned identification number	Previous numbers

In ascending numerical order, from the first to last object moved, it indicates the number of objects salvaged.

This field indicates the unique identification number assigned to the object.



## 2a TRIAGE & STABILISATION

Owner/Institution	Original location code	Type of object	Materials	Dimensions: length, width and height

This field indicates the original location code of the object salvaged. The original location code may refer to a grid number or a combination of shelf, room and floor numbers, depending on the system adopted for assigning location codes.

The 'Type of object' field is used to describe the object briefly.

What the object is made of, e.g. glass, ceramic, metal, textile, etc.

## 2b TRIAGE & STABILISATION

Weight	Photo or drawing reference number	Type of damage	Treatment given (to be filled in during stabilisation)	Stabilisation treatment given by
	<p>"Photo or drawing reference number" refers to the photo/drawing of the object. If there is not sufficient time to take photos of the individual objects at the site, take photos of a group of objects with their identification numbers. Record the number of the photo. This field can be filled in at the triage stage or at the site of temporary storage, depending on the amount of time available.</p>	<p>"Type of damage" briefly indicates the physical condition of the object and the type, as well as extent, of damage it has suffered.</p>		
<p>Fill in the weight of the object. If a weighing scale is not available, use symbols, e.g. use + to indicate one person can move the object, ++ to indicate two people are required to move the object, and +++ to indicate more than one person and specialised equipment will be required to move the object.</p>				<p>This field describes the type of stabilisation treatment given to the object. For example, a wet and soiled object may have to be rinsed before transfer to the new temporary storage. Such treatments, have to be given by conservators and trained cultural first aiders.</p>

## 3 PACK AND RELOCATE

Moved by	Date	Relocation code
		<p>This field indicates the relocation code assigned to an object once it is moved to the new temporary storage. This field is to be filled in once all the objects have been relocated.</p>



## Retrieve

In the event of a structural collapse, historic building fragments and objects may be buried under heavy concrete and other unwanted debris. In such cases, contact the emergency response coordinator, or incident commander for advice on removal. You may require heavy machinery, such as an excavator. Ask for the machine operator's advice and that of a structural engineer to ensure that such actions are safe.



Careful and systematic retrieval of objects from a contaminated environment requires skill and patience. Always work in pairs to avoid personal injury and to prevent further damage to the cultural heritage objects during retrieval.

To retrieve objects from a section of a building, or grid:

- Pick up small, dry, and undamaged objects first.
- Have rigid supports (such as heavy cardboard or wooden flat boards) ready for retrieving and transporting fragile and damaged objects.
- Make sure that there are always at least two people to salvage oversized or heavy objects, and make sure that the object is adequately supported.
- If an object is broken, ensure all the broken parts are retrieved and kept together. For ease of handling, place the object and its broken parts into one container or clear plastic bag.
- Keep the housings (frames, boxes and mounts) of individual objects with their corresponding objects.
- In keeping with your chosen form of documentation, record the number of the original location of the object, assign an object number, and write down the number of objects retrieved.



Remove fragments from grids one cell at a time to avoid mistakes when labelling the location.





*Retrieval of objects in a salvage operation in Port-au-Prince, Haiti, 2010.  
Photo: Aparna Tandon, ICCROM.*



## Retrieval of historic structural fragments and elements

Retrieving fragmented historical structures, surfaces and in situ artworks can be a time-consuming and delicate process. Use the findings from the **on-site damage and risk assessment** (see page 63) to inform the preparation of your workspace and methodology.

Prior to retrieving historic materials on-site, consider the following:

- The types of debris and fragmented materials you expect to find on-site.
- The significance of the original building materials and decorative elements or in situ works of art.
- What pieces of building material are non-essential, or non-authentic to the original structure or cultural heritage? What debris can be reused, or must be replaced, or should be thrown away?
- What **stabilisation** treatments do the fragments need before storage?







In the event that you need to remove historical fragments, make sure that you record their original location before removal. Documentation helps to clarify the original position of the structural elements or in situ heritage in order to reintegrate them into the structure during restoration. It also ensures that fragments are not lost or stolen during the removal. Create a location code (see Toolkit, page number 42), based on the grid from which you retrieved the fragments, and include visual documentation where possible.

Once you have retrieved the fragments, you can follow the salvage workflow used for movable cultural heritage objects.



## Triage

Prioritisation is vital in large-scale salvage operations in which thousands of objects have to be retrieved and categorised for treatment in a short period of time. This can be done most effectively through a system of triage.

Triage of cultural heritage material refers to the sorting and prioritisation of stabilisation actions on retrieved objects, based on three criteria:

- The **degree of damage** to the cultural heritage.
- **Risk of further damage**, if left untreated.
- The **significance** or **value** of the object or structure.

Determining the value of an object is complex. In emergency situations, it is best for a value assessment be carried out during the **situation analysis** (see page 30) and **on-site damage and risk assessment** (see page 42) phases. Such an assessment should be based on existing pre-event institutional records, such as an inventory or **accession register**. Use the Toolkit, page 55 to learn how to undertake triage when the value of the object is unknown.

When sorting retrieved cultural heritage material, follow the steps listed below:

- 1 Separate damaged and undamaged objects.** Additionally, separate dry and wet objects. Remove mouldy objects and seal them in plastic bags or containers and keep them away from other objects. Ensure that, while sorting objects, their original location code remains attached at all times.



*Sorting of salvaged objects as part of an exercise during the international course on First Aid to Cultural Heritage in Times of Crisis, Washington DC 2016.  
Photo: ICCROM and Smithsonian Institution.*

- 2 Group objects** according to their **physical condition**, **material type** and the **type of treatment** they require. For example, objects made from paper or textiles that are dry, but require surface cleaning, should be kept together. Similarly, fragile ceramics and glass that are undamaged should be grouped together.



- 3 **Assign a unique identification number** to each object after sorting is complete. Place a label bearing the unique identification number and location code on the secondary support used to handle and move the object.



*A salvaged painting bearing a label that indicates its identification number and original location, Italy, 2017. Photo: Aparna Tandon, ICCROM.*



- 4 **Document.** Fill in the sections of the **salvage record form** (see page 92) that are related to identification, original location, dimension, and condition of the object (see page 93).





If the cultural heritage material needs to be moved off-site for stabilisation and there is little time to complete the salvage record form, ensure that:

- Each object has been assigned a **unique identification number**. See Toolkit, page 42.
- All objects, packages and containers contain labels with their assigned numbers.
- The assigned **unique identification number** see Toolkit, page 42, original location, material type, and weight of the objects are recorded on the **salvage record form** (see page 92).

If the retrieved objects are undamaged, fill in the salvage record form, pack the objects, and relocate them to the prepared designated temporary storage (see **Relocate** on page 103).



## Stabilise

After triage, damaged objects need to be stabilised, which may be done on- or off-site, in a clean and prepared area. Stabilisation treatments help to prevent further damage and deterioration to retrieved cultural heritage materials.



*A work station for stabilisation and dry surface cleaning of objects in Port-au-Prince, Haiti, 2010. Photo: Aparna Tandon, ICCROM.*

There are two steps to stabilisation, described below:

- 1 Surface cleaning.** A hazard event may leave behind dust, soot, dirt and **contaminants**, which, if left on the surface of objects could cause further damage and deterioration. If an object is wet, and has contaminants on it, it may need to be washed in clean water to remove the contaminants.

The type of surface cleaning required depends on the nature of the hazard, extent of damage, and the material(s) that the cultural heritage is made from. Try to understand the material make-up of the object, and how a stabilisation treatment may affect its structural integrity. Think critically and select the most appropriate treatment pathway available for stabilisation.

- 2 Documentation.** Retain the location code and the unique identification number assigned to the object throughout the stabilisation treatment. Fill in the relevant fields of the **salvage record form** (see page 94) once the stabilisation treatment is complete.

Refer to the 'stabilising damaged movable heritage' section of the Toolkit page 57, for a step-by-step guide of the most common stabilisation actions for movable cultural heritage.



## Pack and move

After retrieval, triage, stabilisation and documentation (if done on site), objects must be prepared for relocation and storage.

- 1 Wrap.** Dry objects should be covered with a protective layer, such as foam or a cotton sheet, prior to storage, to protect the object from further damage and secure the object during transit. For tips on handling and packing different types of cultural heritage objects, see the Toolkit, page 49.





In the event that damaged objects cannot be stabilised on site, pack them securely for transportation to the stabilisation area. Take photographs of the objects and affix labels displaying each object's unique identification number. Do this prior to packing, so that each object can easily be identified at the stabilisation site.

Ensure that wet or damp items are carefully wrapped, to avoid contaminating other objects and prevent rapid drying during transportation. If possible, refrigerated trucks should be used for transporting wet objects for freezing or freeze-drying.

## 2 Label and complete the salvage record form

- Label the packed objects with the unique identification numbers assigned to the objects during the previous stage. Make sure that every label is clearly visible and securely attached. Boxes containing more than one object should indicate the number of objects inside, and display a list of the unique identification numbers of each object contained within.
- Complete the **salvage record form** (see page number 92) and the movement tracking form. (see sample below).

### Movement tracking form

Entry number	Box number	Total number of items in a box	Instructions for handling/transportation	Dispatched by	Date left	Courier/vehicle number	Date received	Box number	Total number of items in a box	Received by
1	12	20	Glass: handle with care	Abdel Hamid, curator	25 Jan	xxx256	25 Jan	12	20	xxx store keeper
--	--	--	--	--	--	--	--	--	--	--

- At least one member of the documentation team should track the placement of objects as they are placed into the boxes. At least one copy of each form must accompany the objects to their storage location.
- When placing objects into storage boxes, place heavy items at the bottom, and lighter, or more fragile objects at the top. Do not overpack the box. Once all objects have been packed, they can be transported to the new temporary storage facility.





## Relocate

Similar to the **post-event evacuation** workflow, this step involves moving the objects to a safer, temporary location on- or off-site. While part of the team is involved in salvaging objects, others can assist in setting up the temporary storage space. The storage space must be cleaned and sanitised before objects are brought into the space. Once all of the objects have been moved to the new storage space, enter the relocation codes of the objects into the salvage record form.



*Temporary storage spaces set up in central Italy in order to house objects evacuated and salvaged after the 2016 and 2017 earthquakes. Photo: Aparna Tandon, ICCROM.*



## Report

Prepare a report of the entire operation for the custodians. It should contain:

- a summary of the operation;
- photographs documenting the main workflow steps;
- the type of stabilisation treatments given and materials used;
- the updated **salvage record form** (see page 92);
- the costs incurred;
- needs for recovery;
- contact information of the team involved in the operation;
- name, signature and the contact information of the team leader of the operation.





## Monitor

Set up a schedule for the periodic checking and cleaning of the storage space, in consultation with the custodians.

## Emergency stabilisation of historic structures

The emergency stabilisation of a structure or building involves taking actions that temporarily help to contain damage to built heritage and reduce further risks of collapse or deterioration due to structural failure. These actions are especially important when a structure is sufficiently intact that it can be repaired (in part or entirely), or when the local community wishes to keep using the space around it. Emergency stabilisation of a structure can also be essential when the structure is providing cover for a valuable interior, or valuable immovable heritage, such as murals, graves, or mosaic floors.

It is important to note that these measures will not restore the original safety levels of the structure. It will be necessary to find long-term solutions during transition or the **early recovery phase**.



The emergency stabilisation of structures requires specialised expertise. Do not carry this out without consulting a structural engineer who has knowledge of the heritage structures in the area.

## Why is it important to undertake emergency stabilisation?

If a structure is damaged and left unattended, the risk of further damage or collapse increases, which may endanger lives.

After a hazard event, a structure may fail, or become unsafe for use if:

- its **structural continuity** is affected, and **loads** (whether usual or exceptional) cannot be safely transferred to the ground anymore;





- the partial collapse of the structure induces localised **overloads**;
- internal structural elements are no longer protected from the outside environment, for example, when the internal elements of a wall are exposed due to damage to the wall surface.

Timely intervention is critical after hazard events that are likely to reoccur within a short period of time. For example, it is necessary to implement stabilisation measures after an earthquake, as aftershocks may lead to further damage, and, in some cases, the complete collapse of a structure. Similarly, in a cyclone-prone or a conflict-afflicted area, it is important to secure historic structures as soon as possible.



*Bagan, Myanmar, 2016. Photo: ICCROM.*



## The importance of maintaining structural continuity: Myanmar

On 24 August 2016, a 6.8 magnitude earthquake hit Chauk, Myanmar, causing damage to numerous monuments in the nearby Bagan archaeological area. The earthquake occurred at the very beginning of the wet season. Below are examples of structural damage that were contained using emergency security and stabilisation actions.

### Collapse due to structural discontinuity

Prior to the earthquake, a vault had partially collapsed in Suleimanye Temple, and the overhanging elements that remained had not been stabilised, resulting in structural discontinuity. During the earthquake in 2016, the vault collapsed completely. Such extensive damage could have been avoided, by shoring or removing the vulnerable structural elements in a controlled way.



*Bagan, Myanmar, 2016.  
Photo: Eugénie Crété.*

### Overloading due to debris

Rubble piles created an extraordinary overloading of structures that had already been weakened by the earthquake. It was important to remove the rubble as soon as possible, especially because the risk of heavy rain was high. Rubble traps water, which creates additional overload. A temporary solution in such situations is to protect the rubble with tarpaulin, while preparing for the removal of debris. To be effective, the tarpaulin needs to be securely fastened.



*Suleimanye temple in Bagan, Myanmar,  
2016. Photo: Eugénie Crété.*





## Exposure of indoor structural elements and decorative surfaces

Holes and cracks were found in the roofs and roof waterproofing systems, allowing water to infiltrate the building, causing severe damage. Gutters were found to be broken, or blocked by debris, and were therefore unable to drain water from the roof. Damaged walls, as found after the earthquake, are very sensitive to rain, especially when mud mortar is exposed. Indeed, due to heavy rain, further collapses occurred in the weeks following the earthquake.

Source: Eugénie Crété, *Architecture Environnement et Cultures Constructives – CRATerre, Grenoble.*



*Bagan, Myanmar, 2016.  
Photo: Eugénie Crété.*



*Cracks in the roof of a temple, Bagan, Myanmar, 2016. Photo: Eugénie Crété.*



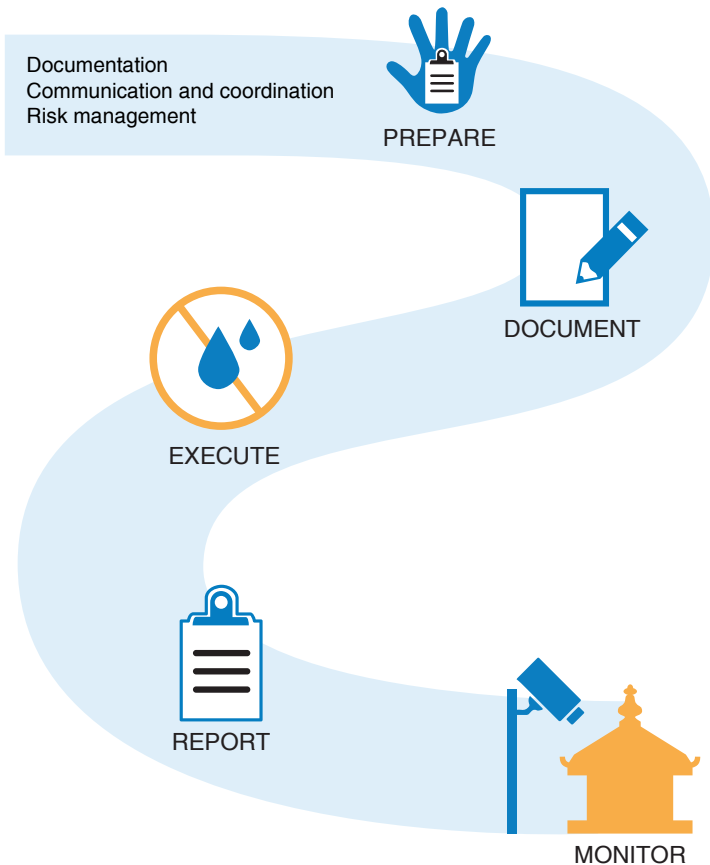
*Holes in the roof waterproofing system of a pagoda in Bagan, Myanmar, 2016.  
Photo: Eugénie Crété.*



## How can you implement emergency structural stabilisation actions?

The following section describes some of the most basic emergency stabilisation actions for historic structures. Before performing any stabilisation action, **ensure personal safety** and **secure the site**.

Illustrated below is a general workflow for implementing various types of emergency stabilisation actions for historic buildings and structures, which also include exposed remains at archaeological sites.





## Prepare

- 1 Secure written permission from the custodians, and where applicable, from the emergency coordinator, to implement emergency stabilisation of a building or a structure.
- 2 Gather a team that includes a structural engineer, an architect, and trained workers and volunteers. Ensure that the architect and structural engineer are familiar with the value of heritage structures and buildings. The team may include a local historian or community member, who has prior knowledge of the specificities of construction style and materials used.

Military personnel and firefighters, who are usually given training on emergency structural stabilisation may participate. In some countries, emergency legislation requires firefighters or military personnel to supervise or execute emergency stabilisation of structures. However, they should be given information about the significance of the building and the heritage elements that need protection.

- 3 Use **damage and risk assessment report** (see page 63), along with relevant site drawings and floors plans, to locate critical structural and non- structural damage. Carry out an in-depth technical assessment of the type of damage and its causes. This assessment may include a survey of the condition of foundations, and different types of loads involved.
- 4 Identify safe spaces for working, storing supplies, and eating. Demarcate these areas on the site map and post appropriate signage.
- 5 If the building is safe to enter, identify in situ decorative elements such as tiled or wooden floors, frescoes and mosaics, which may need to be covered and protected before emergency stabilisation can be carried out. Similarly, identify valuable furnishings such as carpets, tapestries and paintings, which may need to be **evacuated** before stabilising the building.



- 6 Consult with a structural engineer to design the emergency stabilisation measures required and prepare drawings of the same. Based on the design, prepare the specifications of the materials and equipment required to execute your plans.



- 7 Consult with custodians and explain to them the type of emergency stabilisation measure chosen for the building or structure, its expected life span, and the kind of human and financial resources required to implement it. If needed, seek the help of the custodians and local community to **evacuate** (see page 79) valuable objects, and to protect decorative elements in situ.
- 8 Gather supplies and equipment, e.g. wooden planks, ropes, hammers, saws, etc. For more information on the type of supplies and equipment required for specific structural stabilisation measures, see the Toolkit, page 93.



## Document

- 1 Record the exact location, type, and measurements of the damage caused, e.g. cracks, planar distortion and bulging in the plasterwork. Use elevation drawings and floor plans to record the damage.
- 2 Take photos of the damaged areas, including close-up and wide shots. While taking photos, add a metre-range pole or 10cm-measure to establish the scale, and a sign that indicates the date. Record the reference number of photo(s) corresponding to specific damage type on to the floor plan.
- 3 Where necessary, document other important details such as various load types, condition of the ground and so on. Add the relevant drawing of the stabilisation measure to the damage documentation, as collectively, these records help to determine recovery needs.





## Execute

Basic emergency stabilisation measures for buildings and structures are described below. Technical details for executing such measures have been outlined in the Toolkit, page 79.

### 1 Temporary cover

In order to protect sensitive elements from water, wind, the further collapse of surrounding elements, and animal intrusion, use reinforced tarpaulins (doubled-up with wire mesh to improve resistance against falling objects), or corrugated galvanized iron (CGI) or steel (CGS) sheets that have been fixed on to an existing or temporary frame. Identify the most appropriate solution, taking into account locally-available resources, materials and skills. For a step-by-step execution, see the Toolkit, page 73.



*Bagan, Myanmar, 2016. Photo: Aparna Tandon.*

### 2 Basic shoring

**Shoring** is the technique of supporting built elements during repairs, or when a structure is in danger of collapse. It behaves like a crutch and transfers the **load** to the ground.

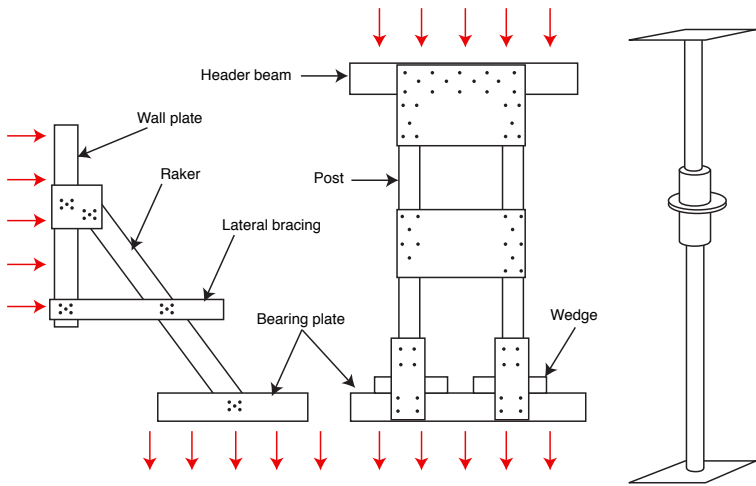
Shores can be used to support:

- load-bearing beams that rest upon a damaged wall or column;
- a leaning, bowing or bulging load-bearing wall in brick, stone or earth, which is structurally unstable;
- a broken lintel of a door or window.



Basic shoring consists of four main components:

1. elements that collect the load (header beams or wall plates);
2. elements, which transfer the load (posts or rakers);
3. lateral bracing that stabilises the system;
4. bearing plates, which spread the load into the ground.



Where possible, pre-construct the shoring in a safe area, which has a clear working space with a flat surface.

Before shoring, remove debris from the area where the bearing plate is to be placed, as a flat surface is needed to spread the load into the ground.



When using metal shores, always use timber planks between the shore and the damaged structure.

Timber is normally used at the top and/or bottom of an emergency shoring system to collect and distribute the load. Additionally, some consider timber to act as an audible or visual warning of increased load as it deforms.





For step-by-step instructions for building a basic wooden shore, refer to the Toolkit, page 79.

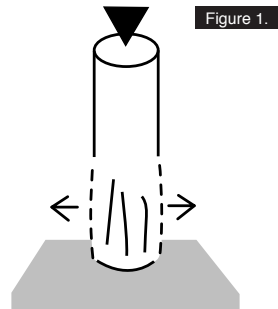


- Do not attempt to shore elements that are more than 3 m high without the expertise of a structural engineer.
- Beware when shoring a masonry wall with weak or damaged mortar. Ask for the help of a structural engineer to design a wall plate that is large enough, or to build enough shores to prop up the whole area.

### 3 Tying structures

Tying a structure improves its vertical load-bearing capacity by providing lateral confinement and preventing further lateral deformation.

At the scale of a whole building, tying helps to reconnect orthogonal walls, providing better resistance against lateral movement. Tying can be carried out using polyester belts, steel cables or steel sections that have been welded or bolted together.



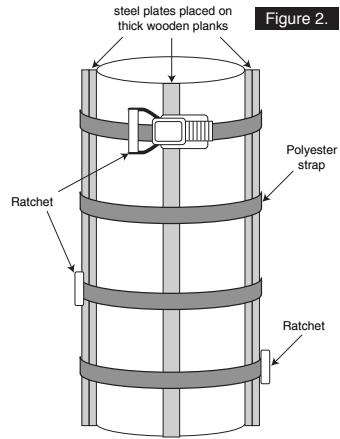
*Drawing adapted from:  
Grimaz, S. et al. 2010. Vademecum,  
STOP. Shoring Templates and Operating  
Procedures for the Support of  
Buildings damaged by Earthquakes.  
Rome, Ministry of Interior – Italian  
Fire Service.*



Never use this technique for collapsing concrete columns.

- a. Prior to implementing structural confinement, consult a structural engineer about its need and design.
- b. Remove debris before confining a structural element.
- c. While tying a structure with polyester confining belts and/or ratchet handles, in order to ensure a snug fit, place timber planks and steel plates on the structure to distribute stresses along the height. Timber planks should be approximately 3 cm thick. They are to be placed between the wall/column and the steel plates.

- d. Install the belts starting with the highest one first (see Figure 2); space them at regular intervals. The spacing distance between the straps should range from 10 to 45 cm, according to the level of damage and the loads to be supported. Distribute the ratchets evenly. For a list of materials and equipment needed for confining a structure with belts, see the Toolkit, page 95.



*Drawing adapted from: Grimaz, S. et al. 2010. Vademecum, STOP, Shoring Templates and Operating Procedures for the Support of Buildings damaged by Earthquakes. Rome, Ministry of Interior – Italian Fire Service.*

#### 4 In situ protection of decorative elements

In situ stabilisation comprises a series of on-site actions that can be taken to stabilise immovable decorative elements and artworks, such as large sculptures, wall or floor mosaics and frescoes.

Emergency stabilisation measures for buildings, such as shoring and confining, can potentially harm in situ elements if you fail to take appropriate steps to protect them. Always get advice from a conservator before undertaking stabilisation actions involving, or in close proximity to, decorative elements.



*Protective and isolating layer between the wall painting and shoring in the church of Freixo de Espada à Cinta, Portugal, 2007. Photo: Esmeralda Paupério.*

Before undertaking emergency stabilisation, ensure that sculptures, tiles, or surfaces are secure in their original location. In order to avoid the direct contact of a shore or confining belt with a decorated surface, you could use unstarched white muslin or another non-dyed soft textile. Similarly, use of foam prevents direct contact. Ensure that the cushioning material is securely fastened so that the risk of it accidentally falling off and abrading the surface of a decorative element is reduced.

You could also use sandbags to prevent contact between a header beam or wall plate and a decorative element, although beware that sandbags in humid climates tend to retain moisture, which may cause further damage. For a general list of supplies needed, see the Toolkit, page 93.



## In situ security and stabilisation of mosaics in the Ma'arra Museum: Syria

In situations of violent conflict, security and stabilisation actions may include extreme and complex operations, such as backfilling exposed archaeological remains, or affixing a protective facing to a wall painting or a mosaic.

The Ma'arra Mosaic Museum, home to one of the most important collections of third-to-sixth century Roman and Byzantine mosaics in the Middle East, was heavily damaged in the ongoing conflict in Syria. Prior to the emergency security and stabilisation actions enacted by Syrian cultural heritage professionals and volunteers the building was in danger of collapse.

Aiming to protect the mosaics from further harm during the conflict, the Syrian team consulted heritage conservation specialists to create a plan to stabilise and secure the mosaics in situ. The holes in the roof were repaired to prevent further deterioration and collapse. Then, in consultation with mosaic conservators, the team applied a layer of glue and cloth designed to keep the mosaic tiles together. Once stabilised, several truckloads of sandbags were laid amongst the mosaics to protect them from further damage. In total, approximately 148 m<sup>2</sup> of mosaics were protected.

Source: Smithsonian Institution. 2015. *Emergency Preservation Activities Completed at Syria's Ma'arra Mosaic Museum*. Washington, DC, Smithsonian Institution.





## Report and communicate

- 1 Prepare a short report describing the emergency stabilisation actions you have implemented for heritage buildings/structures. Include photographs, sketches and a floor map indicating their locations.
- 2 Mention important details such as the evacuation of movable cultural heritage or salvage of historic building fragments carried out during the preparation for emergency stabilisation.
- 3 Provide an account of costs incurred, and a list bearing the names and contact information of the team members who executed the emergency stabilisation of the work.
- 4 The report should contain a monitoring regimen and recommended actions for full recovery and rehabilitation.



## Monitor

Emergency stabilisation measures for structures and buildings are intended to be temporary in nature. It is therefore important to monitor their efficacy until full conservation can begin. For example, shores can become dangerous in the event of collapse and so must be checked regularly (at least once every 12 hours over the first few days) for any sign of distortion or overloading.

Ensure that the posts remain in their original positions. Moreover, the connections and the wedges must remain tight and not become distorted. Watch for any movement in the position of the bearing plate of a shore or for any sign of ground failure. Similarly, make sure that the ends of posts have not become crushed, or that the ends of beams have not split, as these are indications that the shore is overloaded. If cracks appear on a wall plate, then it implies that the plate is not large enough, or that the wall is not resisting the stress induced by the shore.

Where **confining belts** or steel cables have been used to tie a structure, ensure that they are fitted tightly. Check to see timber elements are not moving and that they are being crushed under the stress induced by the belts or cables. Periodically, monitor the timber used in order to detect signs of physical deterioration or damage, e.g. a pest infestation.



In a building which has been flooded, ensure that you regularly record the following:

- a. The humidity of the plaster and/or walls, for which you can use a moisture meter or a multimeter, or you can extract samples, that you weigh before and after drying them in an oven.
- b. The moisture levels in constructions made of earth. You must check for humidity at the base of walls and within the wall itself (the moisture in the wall plaster is not the same as the moisture in its structural part).
- c. The extent of any salt migration or mould growth.
- d. Any distortion of wooden elements.
- e. Cracks or bulging in the plasterwork.

## How to secure and stabilise intangible cultural heritage?

Securing and stabilisation are terms that do not fit logically with intangible heritage. As explained in **on-site damage and risk assessment for intangible heritage**, the evaluation of risk and damage to intangible heritage should include:

- a. Access to,
- b. the performance of,
- c. and transmission of the affected intangible heritage.

Actions that correspond to security and stabilisation are primarily undertaken in relation to the first two levels, which refer to tangible elements associated with intangible heritage and the people as bearers of the tradition. Furthermore, any action taken to secure or stabilise intangible cultural heritage should be based on a clear request from the community affected and its specific needs.

In the case of intangible heritage, the value of the heritage resides in a community's traditions and knowledge systems, and in their practitioners and transmission. As such, the purpose of such measures is different from the purpose of tangible heritage measures. Stabilisation of intangible heritage therefore implies something very different from the stabilisation of immovable or movable heritage.





*Traditional practice of reading religious manuscripts as part of daily rituals in Nepal, 2015.*

*Photo: ICCROM.*

In particular, it relates to:

- Ensuring that a community can continue a specific practice, ritual, etc. in the immediate aftermath of a hazard event.
- Ensuring that the transmission of knowledge and skills can continue until more long-term solutions can be identified.

Security and stabilisation actions for tangible elements and people are listed below:

- 1 **Tangible elements:** these include buildings, sites, objects, tools, costumes, and any material culture associated with an intangible practice. If the **situation analysis** and **on-site damage and risk assessment** (page 43) have identified urgent needs, the same steps can be undertaken as above for built and movable heritage.

Usually, the tangible elements related to intangible heritage are culturally important because they provide a place or a context



for intangible traditions to take place. The stabilisation of tangible elements should therefore be geared towards allowing the continuation of intangible traditions. This may also mean that communities have certain stabilisation preferences. For example, if a place of worship is damaged, the community may prefer a temporary shelter over a struted structure in which they would not feel sufficiently safe to worship.

- 2 People:** in most cases, security or stabilisation measures are limited to identifying where the communities are and how transmission can be ensured. This step may also involve measures, such as documentation, recording or inventorying in order to ensure that there is a visual and oral record in place for use when normality returns. However, especially in cases of large-scale displacement, or where the community has suffered the loss of essential tradition bearers, urgent measures such as documentation through videos or skill transfer training may be required to ensure knowledge transmission.



## Tips for working with intangible heritage

Intangible heritage may also be an important aspect of movable or built heritage emergency measures. Always consider the religious or spiritual importance of buildings and sites prior to undertaking security or stabilisation actions. Involve the local community. Ensure that your actions take more than just the physical aspects of the structure into account. This also applies to cultural objects, many of which may have an important intangible value for the local community. This should be considered when evacuating and salvaging objects.

There is only one way to find out how to deal with these sites, buildings and objects: involve the relevant communities, community members and local leaders, and obtain their advice, cooperation and approval **prior** to undertaking any actions.





## Continuing traditions after Cyclone Nargis: Myanmar

On 2 May 2008, Cyclone Nargis made landfall in Myanmar, resulting in catastrophic destruction and loss of life. Estimates by the United Nations indicate that as many as 2.4 million people were affected in the aftermath of the cyclone.

The cyclone severely impacted primary production centres for traditional crafts and performing arts. One such centre manufactured traditional Myanmar marionettes and held marionette and traditional Myanmar orchestra performances. Already vulnerable, with few practitioners left, the after-effects of the cyclone and subsequent military blockade threatened the total loss of skills and knowledge that had been practised since the fifteenth century, Innwa (AVA) period.



*Training for manipulating marionettes, Mandalay, Myanmar, 2016.  
Photo: Giuseppe Salerno.*

'Myanmar Upper Land I Culture & Travel' was formed to promote traditional performing arts, in particular traditional Myanmar marionette performance. This organization creates performance capacity through social awareness within Myanmar and works to safeguard all aspects of this heritage, including the method of making and manipulating Myanmar marionettes, dancing, music, sculpture, sequin embroidery and painting. In collaboration with the Myanmar Marionette Organization,







an educational DVD, performance workshops, and the first Myanmar International Puppet Festival (2016) were created to transmit skills and knowledge to local communities, in an effort to reduce vulnerability and increase performance capacity and sustainability, which continues to this day.



*Training for marionette performance, Mandalay, Myanmar, 2016.  
Photo: Giuseppe Salerno.*

**See references on page 164.**





## Improve your own emergency preparedness!

If an emergency were to occur in your city, and a number of cultural heritage collections, buildings and intangible heritage assets were affected:

- Would the affected institutions receive timely assistance to secure and stabilise the endangered heritage?
- Do coordination and cooperation mechanisms between cultural heritage institutions and emergency management agencies exist to facilitate access to damaged heritage during **major** emergencies?
- Does a trained team of cultural first aiders and volunteers exist?
- Would they have access to supplies and equipment in bulk to undertake salvage, evacuation and structural stabilisation at multiple sites?
- Would the affected institutions have ready access to safe spaces to set up temporary storage or set up areas for sorting and stabilising large number of objects and building elements?

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## **What comes after first aid?**

FOLLOWING AN EMERGENCY, you and your team have been successful in providing first aid to the affected cultural heritage: you have carried out a **situation analysis** and used its outcomes to undertake an **on-site damage and risk assessment**; based on this assessment, you have **secured and stabilised** both tangible and intangible heritage.

## **What should you do now?**

Read on to find out.

# EARLY RECOVERY



## Early recovery

Cultural heritage first aid is only successful if followed by conservation efforts to restore function and access. Thus, once you have implemented first aid for the damaged cultural heritage, documented the entire process and set up a monitoring routine, the next step is to prepare a consensus-driven action plan for recovery and **rehabilitation**, which involves: detailed condition assessments; conservation treatments (including repair and **restoration**) for tangible heritage; risk mitigation; restoration of livelihoods and services; improved or altered use of cultural heritage following the principles of **sustainable development**, and **'build back better'**. Simply put, the recovery and rehabilitation of cultural heritage entails repairing damage, recovering losses, reducing risks, and restoring the cultural heritage to a better state of conservation, so that, moving forwards, it can be used again, in a sustainable way.

The interim period required for making an action plan for recovery and rehabilitation of cultural heritage after first aid is known as the early recovery phase in the humanitarian sector.



*Durbar square, Kathmandu, Nepal 2015. Photo: ICCROM.*





## How does the humanitarian sector define early recovery?

Early recovery is defined as “a multi-dimensional process, guided by development principles. It aims to generate self-sustaining, nationally-owned and resilient processes for post-crisis recovery” (IASC, 2006, p. 1). Within this definition, individuals are able to take advantage of the benefits of humanitarian actions to embrace sustainable development opportunities and to build resilience. This phase encourages collaboration among agencies from the humanitarian and development sectors. In summary, the early recovery phase is the point where short-term, urgent, ‘life-saving’ interventions are phased out, and long-term development and recovery programmes begin.

### Aims of early recovery in the humanitarian sector

1. Enhance ongoing emergency assistance operations.
2. Encourage and sustain initiatives by affected communities.
3. Establish the foundations for longer-term recovery, creating conditions for future sustainable development.
4. Stabilise and increase local and national capacities, ensuring that local and national authorities can provide stability, revive markets and livelihoods, and also offer services.
5. Prevent the recurrence of crisis through capacity building and vulnerability reduction, and work to increase the resilience of various actors.
6. Provide communities with safety nets.

See references on page 167.



In conflict settings, institutions, governance mechanisms and social relationships are radically transformed. In such situations, other processes related to security and stabilisation, **peace-building**, **transitional justice**, and state- and nation-building, overlap with humanitarian and development issues during the early recovery phase.

Similarly, for cultural heritage, early recovery in post-conflict situations should contribute to conflict transformation, e.g. using the recovery of cultural heritage to engender trust and bridge communal divides.



## Recommended actions during early recovery

The following section outlines actions that could be taken in the early recovery phase to promote the recovery and rehabilitation of damaged cultural heritage. To help to ensure success, it is important that these actions are led by affected institutions within the culture sector and implemented in consultation with relevant stakeholders, actors and local communities.

### 1 Post-first-aid situation analysis

To develop an action plan for the post-crisis recovery and rehabilitation of cultural heritage, it is critical to review and update the **situation analysis** (see page 25) that was carried out prior to planning and implementing first aid.

For a conflict-induced emergency, a post-first-aid situation analysis should be expanded to include a **conflict analysis** (see page 38). This will allow the incorporation of strategies for conflict prevention and peacebuilding in the cultural heritage recovery and rehabilitation process.

In particular, it is important to review the:

- nature and causes of the event that caused the damage to cultural heritage;
- existing social, political and economic vulnerabilities;
- significance and values associated with the affected cultural heritage;
- **mapping of stakeholders and actors** (see page 33), and an assessment of their respective roles and interests in recovery and rehabilitation.





It is essential to consider that the actors involved in the first aid and the recovery phases will invariably be different. New actors may emerge (e.g. development actors), while others, such as firefighters or civil defence personnel will withdraw during early recovery. Moreover, some actors may change their roles and have different tasks during early recovery, compared with those undertaken during the emergency response. For this reason, it is crucial to re-analyse and re-map the stakeholders and actors.

- General condition of the cultural heritage after the implementation of first aid, and the risks it faces.
- Type of conservation treatments and risk mitigation required for the full recovery of the affected cultural heritage.
- The resources required for the recovery of cultural heritage.

## 2 Condition assessment

Use the findings of the **post-first-aid situation analysis** to identify the cultural heritage assets that require a detailed condition assessment for recovery and rehabilitation. Condition assessment aids the identification of priorities for recovery. A post-event condition assessment usually includes an evaluation of:

- the damage caused and income losses incurred (see **PDNA** on page 64);
- the deterioration processes affecting the cultural heritage, for example salt migration and visible colour change due to overexposure to light;
- security and stabilisation actions enacted during first aid;
- existing vulnerabilities and risks, and especially and active deterioration processes that make heritage vulnerable to future disasters.





Post-event condition assessments should be documented within a report containing: detailed photographic documentation of the damage, deterioration and risks; updated inventories; site maps; and floor plans. Include details of the first aid provided, obtained from the documentation gathered during the **security and stabilisation** (see page 68) of the cultural heritage assets.

Such an assessment may include analytical studies, such as strength-testing for different mortars, or the analysis of adhesives and pigments used in a painting. If or where available, use of technological tools, such as **3D laser scanners** or **photogrammetry**, can provide precise measurements, which are important for complete restoration. The level of documentation will depend greatly on the significance of the affected heritage, the extent of the damage and the resources available.

Multidisciplinary teams of professionals, which may include conservators, architects, curators, structural engineers, analytical chemists, anthropologists and historians should be involved in undertaking condition assessments. The composition of the team will depend on the nature of the affected heritage. Consultations with custodians and local communities are crucial for a comprehensive assessment.

### **3 Develop mechanisms for coordination, participation and capacity building**

In the aftermath of large-scale destruction, local cultural institutions and the affected communities may lack specialised skills, supplies, funds, and/or access to institutional mechanisms to recover cultural heritage. The early recovery phase can be used: to ascertain resources needed for recovery; to map local capacities; and to initiate training in order to enhance skills, knowledge and institutional policies.

During the early recovery phase, it is essential to coordinate the plan for recovery and rehabilitation of cultural heritage with the corresponding plans of other sectors, and, at the same time, develop mechanisms to involve affected people. For example, new building regulations or policies regarding land use may be developed, which could be detrimental to the recovery of built heritage and its future use. Similarly, communities may have certain priorities as to which heritage should be recovered first.



Efforts should be made to utilise the traditional skills and knowledge of local communities and to engage them in planning recovery. In fact, the early recovery phase could be used to include the community in the development of options for recovery and the creative reuse of cultural heritage.

You can use the findings of the post-first-aid situation analysis to identify which actors and stakeholders should be involved in cultural heritage recovery.



### **The role of bottom-up, community-based initiatives in the cultural and social recovery of the city of L'Aquila, Italy**

On 6 April 2009, a 6.1-magnitude earthquake hit the Abruzzo region in the Central Apennines, Italy, causing severe damage in the capital L'Aquila and fifty surrounding towns.

In the immediate aftermath, the Italian Department of Civil Protection managed the rescue operations during the emergency phase. People were provided with emergency shelter and the historic city centre was completely evacuated, cordoned-off and declared a red zone due to the extensive damage.

For the people of L'Aquila, the historic core of the city had always served as a vibrant social and economic space where people met, interacted and entertained. The city squares and open spaces were central to their everyday lives and culture. Post-disaster, long-term inaccessibility to these spaces was felt acutely, as people lacked places to interact.

In response, the citizens of L'Aquila organized various community-based initiatives, participating in the recovery of their city and neighbourhoods. One such initiative is 'Viviamolaq', formed by students and graduates of the University of L'Aquila.

Through the reuse of urban spaces and abandoned areas, 'Viviamolaq' supports social, urban and cultural recovery. Its projects are based on environmental and social sustainability principles, and serve as catalysts to enhance social cohesion and collective actions. Participation and collaboration are key to all of





its projects, from the creative planning stage to the construction phase. This was the spirit behind the ‘Restart’ project, which came to life in 2014; ‘Restart’ reused an abandoned public space, located in front of the Department of Human Sciences of the University of L’Aquila, to create an open recreational space for students and the local community. Recycled materials from the reconstruction process (rubble, together with steel and wood previously used to shore up damaged buildings) were put to use to build urban furniture. The integration of the memory of the disaster (recycled materials) into a new project is central to the strength of ‘Restart’: it demonstrates the possibility of recovery and how it is possible to increase resilience and social cohesion in the post-disaster phase.

After observing the success of the community-based recovery responses in L’Aquila, community-based approaches were applied to the post-earthquake response and recovery efforts in Emilia Romagna in 2012, and, more recently, in Central Italy in 2016 and 2017.

Source: Valentina Spano, (MA), Brandenburg University of Technology Cottbus-Senftenberg, former intern, Collections Unit, ICCROM.

[See references on page 167.](#)



*‘Restart’: use of recycled disaster debris from historic city centre of L’Aquila to recreate public spaces. Photo: Valentina Spano.*





## Capacity building for artisans: towards the recovery of small businesses in Haiti

The 2010 earthquake that struck Haiti left a large number of artisans in the country's main crafts centre, Jacmel, without houses, workplaces, tools or materials. The earthquake happened in January, a busy period for artisans, when they prepare for the annual carnival. During this period, many artisans even take out loans to buy sufficient supplies to build elaborate carnival costumes. However, with the collapse of their houses and workplaces during the earthquake, they also lost their stock and completed works, which made it impossible for them to pay back those loans.

During the first aid phase, attention was paid to providing the community with temporary shelter and amenities. However, during the early recovery phase, UNESCO worked with the artisans to rebuild their businesses, by providing them with a communal (temporary) workplace and place to sell their work, as well as with the required materials and tools to resume operations.

Since the market – largely overseas – had not been greatly affected, the support was designed in such a way as to enable the artisans to re-establish operations, with the understanding that all that was needed was for them to overcome the debt and cashflow gap created as a result of the earthquake. As soon as the artisans were able to restart production, most were able to recover.

Source: Elke Selter, School of Oriental and African Studies, University of London, United Kingdom.



*Papier mâché masks waiting to be decorated for carnival in Jacmel, 2012. Photo: Elke Selter.*



*Crafts in Jacmel, 2010. Photo: Elke Selter.*



#### 4 Evaluate the use, function and meaning of cultural heritage

In the aftermath of a disaster, options for the recovery of cultural heritage are influenced by its potential future uses and ability to meet the post-crisis needs of the affected institution or community. Decisions to alter the use or function of cultural heritage can be controversial and should be based upon broad public consensus, which can be established during the early recovery phase.

Similarly, in post-conflict situations, in order to prevent relapse, narratives around contested cultural heritage may need to be made more inclusive, so that marginalised communities are represented. Such attempts should be transparent and involve consultations with the affected communities, and all parties to the conflict.

In many cases, an affected community may wish to create new heritage by turning sites of destruction into memorials; by creating new monuments to the disaster; or by organizing memorial events that, over time, take on the form of new intangible heritage. A recent, well-known example is '**Ground Zero**' in New York City, United States of America. Such new narratives may also involve objects and cultural institutions. The Apartheid Museum and District Six Museum in South Africa are powerful examples of how institutions have served to contribute to recovery and dialogue.

Some communities prioritise the living aspect of cultural heritage and choose to remove all signs of destruction. In such cases, decisions may also be taken to replace the heritage with an entirely new structure. An example is the restoration of the Temple of the Tooth Relic of Buddha in Sri Lanka, which was severely damaged by a bomb in 1998. In other cases, rehabilitation prioritises the material aspect of the heritage and is carried out in such a way that it leaves no evidence of the destruction, e.g. the historic city centre of Warsaw, Poland, after the Second World War. Many efforts, of course, try to reconcile both approaches. In recent years, many technological innovations have been added to the range of options for recovery, resulting in laser projections of the destroyed heritage, e.g. **Bamiyan**, or full-scale 3D printing, e.g. **Palmyra Arch**. See references, page number 167.





## Open Storage: adaptive reuse in the national Museum of Nepal during the early recovery phase

In the immediate aftermath of the Gorkha earthquake in 2015, ten museums, including the National Museum of Nepal, had to evacuate their collections from heavily damaged buildings, which were declared unsafe for use. For security reasons, evacuated collections were temporarily stored in exhibition galleries in the respective museums, which, in turn, led to their partial closure. In the early recovery phase, ICCROM, in collaboration with the Department of Archaeology, and with the support of the Norwegian Ministry of Climate and Environment, conducted training for the staff of the affected museums, to design open but secure storage spaces, serving the twin purposes of rehousing displaced collections and providing new exhibition spaces to attract visitors.

See references on page 167.



*Post-disaster adaptive use: a visible and safe temporary storage at National Museum of Nepal made to rehouse displaced collections and bring visitors back to the museum 2016.*

*Photo: Aparna Tandon, ICCROM.*

## 5 Gather resources

The period between first aid and recovery of cultural heritage should be used to gather resources from different agencies, such as national and local governments, national and international grant-making organizations, and cultural heritage institutions. Reports of post-first-aid condition assessments are especially helpful in articulating post-crisis recovery needs. Involving all possible stakeholders in providing the necessary resources helps to ensure that the processes of recovery and rehabilitation of cultural heritage are driven by locally-defined needs and desires, not by donor priorities.



To promote accountability as well as transparency, it is necessary to set up effective mechanisms for communicating with donors, the government, stakeholders and the general public.

## Conclusion

The three-step framework described in this handbook enhances preparedness for coordinated cultural heritage first aid, which leads to early recovery. However, the assumption that progression between each step is linear, or follows clearly defined timeframes, does not match actual practice. Where a major or complex emergency takes place, cultural first aid for diverse geographic sub-regions may have to be carried out within different time periods. Its implementation is dependent upon safe and uninterrupted access to the affected cultural heritage, and on existing national and/or local capacities.

Moreover, if, during early recovery, cultural heritage remains vulnerable, you may have to replicate first aid in the event of another emergency, e.g. reoccurrence of an earthquake, or relapse of a conflict.

Ongoing risk management, **contingency planning**, coordination between various actors and stakeholders, and capacity building in order to cut underlying vulnerabilities among heritage institutions and local communities, are therefore crucial to making heritage resilient to disasters and conflicts.





# GLOSSARY



### 3D laser scanner

A non-contact, non-destructive device that uses laser light to digitally capture the physical form of an object by reflecting light off the object and triangulating it with a camera lens to create a data set or 'point cloud' based on the surface of an object. 3D laser scanning is a way to capture a physical object's exact size and shape into a digital, three-dimensional representation. It is best suited to the measurement and inspection of contoured surfaces and complex objects that require massive amounts of data for their accurate description, which would be difficult to obtain using traditional methods of measurement. (Historic England, 2018).

Read more: <https://perma.cc/YLM5-LQL2>

### Accession register

An accession register is a permanent record of all objects which are part of a museum's permanent collections. It is the most important document in the museum's documentation system. It contains information about the museum's objects and acts as a formal list of the collections for which the museum is accountable. (Collections Trust, 2018).

Read more: <https://perma.cc/J4GF-WHWN>

### Actor

An organization, community or individual with agency, which directly interacts within a system. An actor is always a **stakeholder**, but not all stakeholders are actors, as they do not necessarily interact directly with the system but maintain an interest in the behaviour and outcomes achieved by actors. (Cockburn, 2001, p. 53).

Read more: <https://perma.cc/8LKF-RYNJ>

### Build back better

The integration of disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment. (UNISDR, 2017).

Read more: <https://perma.cc/3D78-H6DJ>

### Capacity

The combined strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience. Capacity includes: infrastructure, institutions, human knowledge and skills, and collective attributes, such as social relationships, leadership and management. (UNISDR, 2017).

Read more: <https://perma.cc/L88V-8EBA>

### Cluster

A group of humanitarian organizations, both UN and non-UN, responsible for coordinating the main sectors of humanitarian action, e.g. water, health and logistics. They are designated by the Inter-Agency Standing Committee. (Humanitarian Response, 2017).

Read more: <https://perma.cc/TRD5-YFMG>

### Communication

The imparting or exchanging of information by speaking, writing, or using some other medium; the successful conveying or sharing of ideas and feelings. (Oxford Living Dictionary, 2017).

Read more: <https://en.oxforddictionaries.com/definition/communication>

### Contingency planning

Contingency planning is a management tool that analyses disaster risks and establishes arrangements in advance to enable effective and appropriate responses to an emergency and its potential human impact. Contingency planning creates and coordinates courses of action with clearly defined institutional roles, resources, information processes and operational arrangements for relevant actors at times of need. It allows actors to envision, anticipate and solve problems that can arise during disasters. (IFRC, 2017; UNISDR, 2017).

Read more:

IFRC, 2017: <https://perma.cc/W2BZ-U92R>

UNISDR, 2017: <https://perma.cc/L88V-8EBA>

### Confining belts

A strapping or belting system that acts as a corset to prevent damaged walls from collapsing outwards. (Kelley, 2010, p. 10).

Read more: <https://perma.cc/PNF6-CEL9>

### Contaminant

A contaminant in museum collections refers to any chemical or biological material found on museum items that poses a potential hazard to those who use or care for them. The contaminant may be inherent, such as heavy metals that occur in pigments, it may have been acquired later inadvertently, or through treatments such as chemical preservatives and pesticide application. (US Department of the Interior, 2006, p. 1).

Read more: <https://perma.cc/DX5W-UJN8>

## Coordination

Coordination is the “collaboration between stakeholders or actors to improve results or performance, either during a collective endeavour, or in response to a common issue, event or context”. (ICVA, n.d.).

Read more: <https://perma.cc/67A2-74YY>

## Cultural heritage

Cultural heritage may be defined as the expression of the ways of living as developed by a community that are passed on from generation to generation, including customs, practices, places, objects and artistic expressions and values. Often, cultural heritage is characterised as either tangible or intangible. (ICOMOS, 2002).

## Cultural heritage asset

A cultural heritage asset is an item or place whose value is based on its significance within a community or nation’s society, knowledge and culture. Its significance is derived from its aesthetic, historic, scientific, social or spiritual value. A heritage asset may be tangible or intangible. (Resource Planning and Development Commission, 2003).

Read more: <https://perma.cc/CNS7-SZNA>

## Damage

Physical harm that impairs the value, usefulness, or normal function of something. (Oxford Living Dictionary, 2017).

Read more: <https://perma.cc/5XGA-8SYQ>

## Damage assessment

A damage assessment is a preliminary on-site evaluation and documentation of damage or loss caused by an accident or natural event. A damage assessment records the extent of damage, and what can be replaced, restored or salvaged. It can also be used to estimate the time needed for repair, replacement and recovery. It is integral to facilitating an effective and efficient response by emergency responders. (Office of Disaster Management and Preparedness, 2013).

Read more: <https://perma.cc/6PUJ-52Z4>

## Disaster

A serious disruption of the functioning of a community or society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. (UNISDR, 2009, p. 9).

Read more: <https://perma.cc/85M4-6TB9>

## Disaster Risk

The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity. (United Nations General Assembly, 2016, p. 14).

Read more: <https://perma.cc/TR42-CA9D>

## Documentation

Documentation is a descriptive text or visual aid used to define or describe an object, design, specification, instructions or procedure. As an activity, it stands for the systematic collection and archiving of records, in order to preserve them for future reference. (UNECE, 2000, p. 12; Letellier, 2007, p. xv).

Read more:

UNECE, 2000: <https://perma.cc/NG4Z-V7YE>

Letellier, 2007: <https://perma.cc/QW3W-FA9U>

## Emergency

A sudden and usually unforeseen event that calls for immediate measures to minimize its adverse consequences (UNDHA 1992). An emergency can be classified as **major** if it affects a large proportion of the population and is characterized by extensive losses. In such situations, the local government may require outside assistance involving multiple agencies. A major emergency may include wide scale damage to material and non-material cultural heritage for example, the 2015 earthquake in Nepal.

A **complex emergency** refers to a humanitarian crisis that is combined with security risks, political and civil disturbances, and hindrances to humanitarian assistance. Complex emergencies are multi-causal and require coordinated international responses, which go beyond the mandate or capacity of a single agency. Often, complex emergencies have a much longer cycle than sudden onset emergencies.

Complex emergencies can involve the deliberate destruction of cultural heritage such as those witnessed in the recent conflicts in Iraq, Syria, Somalia and Mali. Within the UN system, a **major or complex emergency** is usually classified as a **Level 3** emergency. Once this status has been declared, a mechanism activates that involves the UN system as a whole.

A **level 2 or L2 emergency** is a less severe emergency, and may require some assistance from the UN, whereas **level 1** is a localised emergency, which can be handled by a country without outside assistance.

Read more:

IASC, 1994: <https://perma.cc/973S-7TEU>

IASC, 2012: <https://perma.cc/CQU7-FLK2>

ICDO, 2017: <http://www.icdo.org/en/disasters>

IFRC, 2017: <https://perma.cc/X8XD-HBC6>

UNDHA, 1992: <https://perma.cc/F5AP-ACVD>

### **Emergency response coordinator**

'Emergency response coordinator' (ERC) refers to the person in charge of the coordination of all response and recovery activities during an emergency situation. (Dorge & Jones, 1999, p. 4).

Read more: <https://perma.cc/QZ7N-BRCK>

### **Emergency management system**

A system put in place that enables the organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and rehabilitation. (UNISDR, 2009, p. 13).

Read more: <https://perma.cc/85M4-6TB9>

### **First responder**

A person [...] who is among those responsible for going immediately to the scene of an accident or an emergency to provide assistance. (Merriam-Webster.com, 2017).

Read more: <https://perma.cc/6CW4-VCTE>

### **Geographic Information System (GIS)**

Geographic Information Systems (GIS) are a computer tool used to visualise, question, analyse, and interpret all forms of geographically referenced information to understand relationships, patterns, and trends in the form of maps, globes, reports, and charts. (ESRI, 2018; National Geographic Society, 2017).

Read more:

ESRI, 2018: <https://perma.cc/W3R9-TGSU>

National Geographic Society, 2017: <https://perma.cc/XU43-PRHP>

## Hazard

A phenomenon, substance, activity or condition that is considered dangerous and which may cause loss of life, injury or other health impact, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. (UNISDR, 2009, p. 17). See: **Man-made hazard-induced emergency and Natural hazard-induced emergency.**

Read more:

IASC, 2011: <https://perma.cc/85SP-6HKW>

IFRC, 2017: <https://perma.cc/WP7R-ELK8>

UNISDR, 2009: <https://perma.cc/85M4-6TB9>

## Incident commander

The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources. The incident commander has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site. (FEMA, p. 5).

Read more: <https://perma.cc/CF9H-D462>

## Intangible cultural heritage

Intangible cultural heritage encompasses the practices, representations, expressions, knowledge, skills, instruments, objects, artefacts and cultural spaces that a given community, group or individuals recognise as part of their cultural heritage. It is transmitted from generation to generation and is continually redefined by communities in response to their interactions with their surrounding environments and history; thus, forming a sense of identity and continuity that promotes respect for cultural diversity and human creativity. Such heritage is expressed through oral tradition; customs; language; performing arts; ritual and festive events; popular sports; food and culinary arts; traditional medicine and pharmacopeia; traditional crafts and associated skills of production; and knowledge and practices that concern the natural environment. (ICOMOS, 2002; UNESCO, 2003).

Read more: UNESCO: <http://perma.cc/5ZXN-XCPV>

## Inventory

An itemised list of current assets and resources: such as a catalogue of the property of an individual, [organization], or estate. (Merriam-Webster, 2017).

Read more: <https://perma.cc/V2C8-YBA9>

## Load

The forces to which a structure is subjected due to superposed weight or to wind pressure on the vertical surfaces. (Merriam-Webster.com, 2017).

Based on this definition, it is possible to identify different types of load:

- **Static loads**; these grow slowly and act statically.
- **Dead or permanent loads**; these include massive components of an architectural structure with their own load, e.g. columns, arches, beams, domes. In general, this category includes all the elements that are fixed.
- **Live loads**: these are variable loads connected to the function and purpose of the architectural structure. This category includes people, furniture, snow and others.
- **Dynamic loads**; these act dynamically and grow suddenly, such as wind or earthquakes. They are the cause of many building collapses. (Levy & Salvadori, 1992, pp. 269-276).

## Load path

The path through which the load of a frame structure is transmitted to the foundations. (Jamal, 2017).

Read more: <https://perma.cc/4KQE-XVQP>

## Man-made hazard-induced emergency

Man-made 'hazard-induced' emergencies are events caused by human activities that significantly impact the population and environment. Examples include: nuclear and radiation-based accidents, chemical release, desertification, environmental pollution, conflicts, epidemics and fires. (ICDO, 2017; UNISDR 2018).

Read more:

ICDO, 2017: <http://www.icdo.org/en/disasters/>

UNISDR, 2018: <https://perma.cc/6PKN-W9ND>

### **Natural-hazard induced emergency**

Natural-hazard-induced emergencies are events caused by natural phenomena that seriously affect the society, economy and/or infrastructure of a region. Depending on population vulnerability and local response capacity, natural disasters will pose challenges and problems of a humanitarian nature. Examples include: earthquakes, tsunamis, hurricanes, floods, bush fires, volcanic eruption, landslide and plague. (IFRC, 2017; IASC, 2011).

Read more:

IFRC, 2017: <https://perma.cc/WP7R-ELK8>

IASC, 2011: <https://perma.cc/85SP-6HKW>

### **Overload**

When the load is higher than the load that a certain structure can carry, there is an overload. It can cause a failure of the structure.

Read more:

Merriam-Webster, 2017: <https://perma.cc/3BWH-FSC4>

Levy & Salvadori, 1992: <https://perma.cc/B3XW-HJ4F>

### **Peace-building**

Activities by international or national actors to prevent violent conflict and institutionalize peace, understood as the absence of armed conflict and a modicum of participatory politics that can be sustained in the absence of an international peace operation. (Call & Couzens, 2007 cited in Bailey et al., 2009, p. 8).

Read more: <https://perma.cc/927F-UPE2>

### **Photogrammetry**

Photogrammetry is a method of taking the precise measurements of an object, monument or landscape, through the use of digital photographic information. Reference markers in each frame are used as anchor points to align the images. When used with 3D laser scanning, photogrammetry allows for extremely accurate scanning data. (Cultural Heritage Imaging, 2018).

Read more: <https://perma.cc/Z4YF-WWSW>

### **Prioritise**

Determine the order for dealing with a series of items or tasks according to their relative importance. (Oxford Living Dictionary, 2017).

Read more: <https://perma.cc/2Z4V-2UKN>



### **Reconstruction**

The act or process of depicting, by means of new construction, the form, features and detailing of a non-surviving site, landscape, building, structure or object for the purpose of replicating its appearance at a specific period of time and in its historic location. (Tolles et al., 2002, p. 120).

Read more: <https://perma.cc/6TCW-WUPX>

### **Recovery**

The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and ‘build back better’, to avoid or reduce future disaster risk. (UNISDR, 2017).

Read more: <https://perma.cc/L88V-8EBA>

### **Rehabilitation**

The restoration of basic services and facilities for the functioning of a community or a society affected by a disaster. (UNISDR, 2017).

Read more: <https://perma.cc/L88V-8EBA>

### **Response**

The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected. (UNISDR, 2009, pp. 24-25).

Read more: <https://perma.cc/85M4-6TB9>

### **Restoration**

The act or process of accurately depicting the form, features and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project. (Tolles et al., 2002, p. 120).

Read more: <https://perma.cc/6TCW-WUPX>

## **Risk**

Risks in emergency situations are essentially the potential negative impacts on people's lives, heritage components and associated values. Risks are identified by looking for the potential hazards and existing vulnerabilities of the site/museums and its movable and built heritage components.

Risks are also defined as the combination of the probability of an event and its negative consequences. (UNISDR, 2009, p. 25).

Read more: <https://perma.cc/85M4-6TB9>

## **Risk assessment**

An informed judgement, based on a methodology to determine the nature and extent of risk to cultural heritage by analysing potential agents of deterioration and damage and evaluating existing conditions of vulnerability that, together, could potentially harm exposed people, property, services, livelihoods and the environment on which they depend, and the corresponding heritage values. (Abarquez & Murshed, 2004; UNISDR, 2015).

Read more:

Abarquez & Murshed, 2004: <https://perma.cc/2PU2-V57Q>

UNISDR, 2015: <https://perma.cc/85M4-6TB9>

## **Risk management**

The systematic approach and practice of managing uncertainty to minimise potential harm. (UNISDR, pp. 26–27).

Read more: <https://perma.cc/85M4-6TB9>

## **Scaffolding**

A temporary structure used to support people and materials during the construction or repair of buildings. (el-Habashi, 2016).

## **Shore**

A prop for preventing sinking or sagging. (Merriam-Webster.com, 2017).

Read more: <https://perma.cc/QK5P-TLYX>

## Shoring

The process of supporting a building, or sections of a building with shores (props) that deviate building loads that have lost equilibrium, safely transferring them to the ground without affecting the existing assemblage of building parts and systems. Shoring may be vertical, angled or horizontal. (el-Habashi, 2017).

Alternative definition:

It is defined as a temporary support for instable structures, which can be damaged, collapsed, or partly collapsed, providing the stability necessary to protect the property, workers and the public. "A shoring system is like a double funnel. It needs to collect the load with headers/sheathing, deliver it into the post/struts, and then to distribute it safely into the supporting structure below. (FEMA, 2009).

Read more: <https://perma.cc/WF28-Q5QU>

## Significance

The meaning and values of an item, collection, or tradition and what makes it important. Significance is the historic, aesthetic, scientific and social values that a cultural heritage asset has for past, present and future generations. (Russell & Winkworth, 2009).

Read more: <https://perma.cc/GJ8G-ERAN>

## Stabilisation

An intervention or action intended to maintain the integrity and minimise further deterioration of unsafe, damaged, or deteriorated cultural heritage. It may be used as an interim measure or involve long-term preservation. (US National Park Service, 2015).

Read more: <https://perma.cc/4EVW-LK9W>

## Stakeholder

Stakeholders are the people who have a direct or indirect interest, or who affect, or are affected by, the implementation and outcome of intervention activities. Typically, they include individuals and representatives of communities, institutions and/or organizations and agencies invested in the project area. Stakeholders are usually divided into three main categories; primary, secondary and key. (IUCN, n.d.; IFRC, 2010, pp. 16-17).

- **Primary stakeholders:** are those that are most dependent on, or are connected most directly to the affected cultural heritage and are therefore likely to be affected positively or negatively by any intervention in the project area. Examples are religious communities associated with a particular site; indigenous groups with rights to property; and communities dependent on cultural heritage resources as part of their livelihood.

- **Secondary stakeholders**: are not directly dependent on, or connected to the affected cultural heritage, but have a significant interest in the way that it is managed or utilised. They have an interest in the project but have limited influence and authorisation over resources. Examples of secondary stakeholders are NGOs, educational institutions and the private sector.
- **Key stakeholders**: can significantly influence, or are vital to, the success of any chosen intervention to aid community recovery. Key stakeholders may include government departments and ministries, key resource holders and donors.

Read more:

IFRC, 2010: <https://perma.cc/3Q8E-EU7M>

IUCN, n.d.: <https://perma.cc/EG6K-E3TQ>

### State-building

An internal process to enhance the capacity, institutions and legitimacy of the state, driven by state–society relations. (Bailey et al., 2009, p.8).

Read more: <https://perma.cc/927F-UPE2>

### Structural continuity

A structure is characterised by structural continuity when the structural elements (beams, nodes, columns) are connected so that the load is transmitted, distributed and delivered uniformly throughout the entire structure.

### Sustainable development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (United Nations World Commission on Environment and Development, 1987).

Read more: <https://perma.cc/U3SD-AKMZ>

### Tangible cultural heritage

Tangible cultural heritage is composed of the physical manifestations of culture produced, maintained and transmitted within a society. Imbued with cultural significance. Tangible cultural heritage may refer to:

- a. **Immovable cultural heritage**: places of human habitation including buildings; villages; towns and cities; and structures.
- b. **Movable cultural heritage**: documents and archives; works of art; handicrafts; musical instruments; furniture; clothing items of personal decoration; religious, ritual and funerary objects; tools and mechanical equipment; and industrial systems.

### **Transitional justice**

Transitional justice consists of both judicial and non-judicial processes and mechanisms, including prosecution initiatives, facilitating initiatives in respect of the right to truth, delivering reparations, institutional reform and national consultations. (United Nations Secretary-General, 2010, p. 2).

Read more: <https://perma.cc/A8H5-DPTK>

### **Vulnerability**

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Factors may be physical, social, economic, and environmental. Vulnerability may change significantly within a community and over time. (UNIDSR, 2009, p. 30).

UNIDSR: <https://perma.cc/85M4-6TB9>

The image features a solid orange background. Two white diagonal lines are present: one starts from the top-left corner and extends towards the center, and the other starts from the bottom-right corner and extends towards the center. The word "REFERENCES" is centered in white, bold, uppercase letters between these two lines.

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