



NATIONAL DISASTER MANAGEMENT GUIDELINES

MUSEUMS

May-2017



NATIONAL DISASTER MANAGEMENT AUTHORITY
GOVERNMENT OF INDIA

National Disaster Management Guidelines

Museums

National Disaster Management Authority
Government of India

National Disaster Management Guidelines for Museums

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प्रधान मंत्री
Prime Minister

MESSAGE

I am happy to learn that the National Disaster Management Authority has brought out comprehensive guidelines for disaster risk management in museums across India.

I am told, these guidelines are in alignment with the Sendai Framework for Disaster Risk Reduction 2015-2030. I am sure, this document will go a long way in establishing new benchmarks for the safety and security of our museums. The guidelines are an integral step towards maximising the potential of heritage in India.

On this occasion, I extend my best wishes to NDMA.



(Narendra Modi)

New Delhi
15 May, 2017

राजनाथ सिंह
RAJNATH SINGH



गृह मंत्री
भारत
नई दिल्ली-110001
HOME MINISTER
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NEW DELHI-110001

MESSAGE

I am happy to note that the National Disaster Management Authority (NDMA) has undertaken the exercise of preparing National Disaster Management Guidelines for Museums and an informative document that would be of immense benefit to Museum across the country.

The role played by NDMA is very crucial and important. I am sure that the guidelines when put into action would result in tackling the natural disaster more effectively and swiftly.

I congratulate NDMA in its endeavour that aligns itself to the Sendai Framework for Disaster Risk Reduction 2015-30, which will enhance the capacity of Museums to reduce disaster risks and be better prepared to respond to disasters in the future.

(Rajnath Singh)

किरेन रीजीजू
KIREN RIJIJU



गृह राज्य मंत्री
भारत सरकार
MINISTER OF STATE FOR
HOME AFFAIRS
GOVERNMENT OF INDIA

MESSAGE

Disaster Risk Management in India has undergone a paradigm shift in recent years moving from a reactive, relief-based approach to an approach that is proactive and aims to prevent the creation of new risks, and reduce existing risks by implementing mitigation measures. Such an approach also ensures that when disasters do occur, we are better prepared to deal with the consequences both in the short terms by mobilizing efficient response and in the long term by "building back better".

As someone who is deeply invested in the cause of disaster risk reduction, I would like to acknowledge the commendable efforts made by National Disaster Management Authority (NDMA) in laying out the national framework for disaster management across the country. The Authority has issued a series of guidelines on different aspects of Disaster Risk Management. I am happy to know that NDMA has now extended this work to cover "museums".

Museums are central to shaping India's cultural identity as they present the diverse heritage and knowledge within the country to its people. I am pleased to note that the different aspects that this document addresses pertain to the protection of cultural and institutional values embodied by a museum. This document draws goals from international frameworks such as the Sendai Framework for Disaster Risk Reduction 2015-2030, while being firmly situated within the existing legislative and institutional context of India.

I am confident that these Guidelines will facilitate Ministries, Institutions and independent museum professionals in ensuring that Museums across India are disaster resilient and adhere to the highest standards of safety. I appreciate the efforts made by NDMA in producing this important document and urge all stakeholders to work together for our museums.

Kiren Rijiju

17th May, 2017
New Delhi.



राष्ट्रीय आपदा प्रबंधन प्राधिकरण
National Disaster Management Authority
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Government of India

Foreword

The preparation of guidelines which address different aspects of disaster risk management, whether they are hazard or theme based, is an integral part of the mandate of National Disaster Management Authority (NDMA). Within this mandate, responding to the increasing catastrophic impact to museums due to disasters, it was decided to undertake the process of developing National Disaster Management Guidelines for Museums. With the formulation of a Core Committee – which included museum experts, concerned ministries and departments, and other stakeholders, the nine-step process of preparing guidelines was initiated in 2015. After an initial exercise on identifying specific issues that concern disaster risk management in museums, accompanied by a series of consultative workshops in the Indian Museum and the Victoria Memorial Hall, Kolkata and the National Museum, Delhi, the structure of the guidelines was developed and formalised.

The purpose of these guidelines is to serve as template for museums to develop their own disaster risk management plans and strategies through risk assessment, risk reduction measures, preparedness and emergency response measures and planning for post-disaster recovery. The objective is not to be prohibitive, but rather enable museum professionals to integrate disaster risk management within the overall management of museums, collections and visitors.

The draft guidelines were prepared after a series of meetings and consultation workshops, including a workshop held at the Salar Jung Museum, Hyderabad and circulation among the Core Committee members for their expert review. After updating the document, the guidelines were disseminated for wider consultation and supported with a training programme organised in collaboration with Tata Institute of Social Sciences and Wildlife Institute of India in Mumbai. Reviews and suggestions were received from multiple ministries, departments and individual museums, which were incorporated after due discussions.

We take this opportunity to express our deep appreciation of the commitment of various stakeholder groups who extended their willing support and cooperation to our efforts. We are grateful to the members of the Core Committee for their expertise.

Shri Kamal Kishore
Member, NDMA

Dr. D.N. Sharma
Member, NDMA

Lt. Gen. N.C. Marwah (Retd.)
Member, NDMA

Shri R.K. Jain, IAS (Retd.)
Member, NDMA

I would like to acknowledge the invaluable contributions of all the expert members of the Core Committee who have shaped the National Disaster Management Guidelines for Museums. This document is the result of extensive consultation carried out through meetings, training workshops and programmes, informal feedback sessions and a long active dialogue among various professionals and stakeholders as well as people who participated in the various consultation workshops and activities.

On behalf of NDMA, I would like to express our sincere thanks to the representatives of the Ministries and Departments concerned, particularly Smt. Riddhi Mishra (Deputy Secretary, Ministry of Culture), Shri Surendra Thakur (Under Secretary, Government of India) and Dr. Urmila Sant (Director, Archaeological Survey of India). I would also like to thank Dr. Jayanta Sengupta (Secretary and Curator, Victoria Memorial Hall), Prof. Manvi Seth, (Dean and Head of the Department, National Museum Institute), Smt. Manjari Agrawal (Research Fellow, NMI) and Shri R. K. Singh (Joint Director, National Institute of Disaster Management), who provided invaluable institutional support as well as professional expertise.

Eminent professionals such as Dr. Rohit Jigyasu (UNESCO Chair Professor, R-DMUCH, Ritsumeikan University, Kyoto), Dr. Anshu Sharma (Director, SEEDS, New Delhi), Shri Jyotindra Jain (Independent Museum Expert), Shri Pramod Kumar K. G. (Managing Director, Eka Cultural Resources and Research), Aparna Tandon (Project Specialist, ICCROM), Shri R.N. Singh (Independent Expert on Contemporary Arts) and Mrinalini Venkateswaran (Independent Museum Expert) helped shape the technical aspects of the document.

We have been able to revise multiple drafts of the guidelines only after testing them out in various museums. To this end, two-day workshops were held in the Indian Museum and the Victoria Memorial Hall in Kolkata and the National Museum in New Delhi. We carried out a workshop at the Salar Jung Museum in Hyderabad with institutional support from Dr. Nagender Reddy (Joint Director, Salar Jung Museum). We also jointly organised a training programme in collaboration with Jamsetji Tata School of Disaster Studies, Tata Institute of Social Sciences and Wildlife Institute of India held at the T.S. Rahman Institute in Mumbai with site studies in Chhatrapati Shivaji Maharaj Vastu Sangrahalaya and Bombay Natural History Society. In particular, we would like to thank Prof. Janki Andharia (TISS) for initiating this dialogue and activity, as well as the dedicated faculty and staff of all collaborating institutions. Dr. Sabyasachi Mukherjee (Director, CSMVS), Ms. Nilanjana Som (Curator, CSMVS), Shri Ajay Kochle, (Assistant Director-Administration, CSMVS) and Shri Rahul Khot (Curator, Bombay Natural History Society) were key facilitators of the site studies. We would like to extend our gratitude to the staff and management of these museums for both organising and participating in these initiatives. Shri Anupam Sah (Head of Art

Conservation, Research and Training at CSMVS Museum Art Conservation Centre) provided some practical insight into conservation issues with respect to museum collections as well as collections storage and management concerns.

In addition, the Committee Members visited the following museums to understand their disaster risk management challenges and explore how these guidelines may address them. Visits were made to the Fort Museum in Chennai, facilitated by Smt. K. Moortheswari and Smt. Neeti Anil Kumar; the Jharkhand State Museum, Ranchi hosted by Smt. Nirmala, the Nalanda Museum in Nalanda which was facilitated by Shri Manoj Saxena and the Puducherry Museum. Case studies for the guidelines also included the Manav Sanghralaya, Bhopal where our Committee Members interacted at length with Dr. B. Shankara Rao, Col. Nitinraj Dehpade and Shri Divakar Mukherjee. The City Palace Museum in Udaipur, facilitated by Shri Nikhil Tamboli and Shri Omkar Adhikari was also a valuable case study. We gratefully acknowledge the hospitality and the enthusiasm of the staff and management of all these museums.

This exercise has been spearheaded by Shri Kamal Kishore (Member, NDMA) who has pursued this initiative since its conception and ensured its timely completion. Members Shri R.K. Jain, Lt. Gen. N.C. Marwah and Dr. D.N. Sharma provided regular inputs and encouragement and actively participated in the various Committee Meetings. Special thanks are due to Shri Rajiv Mehrishi (Union Home Secretary, Ministry of Home Affairs) for his constant support in this exercise as well as other endeavours by NDMA.

The writing of this document was anchored by Ms. Vanicka Arora, (Consultant-Heritage Management, NDMA) who worked assiduously incorporating inputs from a wide range of stakeholders. Dr. Pavan Kumar Singh (Senior Research Officer, NDMA) and Shri Pankaj Kumar (Under Secretary, NDMA) provided administrative support and coordinated inputs from stakeholders. Various staff members of the Policy and Planning Division at NDMA have been instrumental in facilitating the preparation of the guidelines for which I am grateful.



Dr. V. Thiruppugazh,

Joint Secretary (Policy and Plan), NDMA

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The National Disaster Management Guidelines for Museums have been developed with a vision that:

Museums should be safe and secure spaces for the people that engage with them and for collections that contribute to their value as cultural institutions and markers of local, regional or national identity, by increasing their resilience through sustained efforts towards disaster risk management.

These guidelines should be seen as a template for museum professionals to develop their own disaster risk management plans and strategies through risk assessment, risk reduction, emergency response and post-disaster recovery. The objective is not to be prohibitive, but rather enable museums to streamline disaster risk management within the overall operation of a museum. Each step of the disaster risk management process has been addressed stage-wise in the document.

The first chapter introduces museums in India, their scope and typologies as well as the specific issues they face with respect to disaster risks. It also describes the multiplicity of legislative frameworks with respect to museums and sets out the aims and objectives of the guidelines. Finally, it outlines a national action plan and implementation strategy. The second chapter describes the specific considerations needed prior to undertaking disaster risk management for museums and sets out the broad framework for actions.

The third chapter focuses on identification of hazards and vulnerabilities and carrying out risk analysis for museums, focusing on buildings, infrastructure and surroundings; security, management and collections, display systems, storage and conservation laboratories. It looks at multiple scales of disasters and associated risks, creating disaster risk scenarios and evaluating the potential impact of these risks in order to prioritise actions.

The fourth chapter discusses disaster risk prevention, reduction and mitigation linking back to the previous chapter. It lays out indicative actions for each aspect of reducing disaster risks, through interventions at multiple levels. The fifth chapter looks at planning for emergency preparedness and response for museums outlining approaches for evacuation of people as well as objects and collections, linking with emergency responders through well-organised emergency teams.

The sixth chapter describes post-disaster assessment, recovery and rehabilitation processes. It outlines the basic procedures for documentation and assessment of objects and collections, emergency stabilisation procedures and considerations for temporary storage. It also highlights the importance of setting up a business plan for recovery and linking rehabilitation with risk reduction.

Finally, the seventh chapter sets out the various kinds of training and capacity building initiatives that are integral for raising awareness and ensuring that museum professionals as well as disaster management professionals are equipped to respond to disaster risks for museums. An extensive bibliography of references has been provided for further reading as well as a series of indicative checklists for each stage.

It is strongly recommended that the framework and actions that have been set out within this document are approached in a systematic and timely manner in order to ensure the safety and security of museums for the people that engage with them as well as the collections and objects that they contain.

ASI:	Archaeological Survey of India
CISF:	Central Industrial Security Force
DDMA:	District Disaster Management Authority
ICCROM:	International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOM:	The International Council of Museums
ICOMOS:	International Council on Monuments and Sites
IMD:	India Meteorological Department
INTACH:	Indian National Trust for Arts and Cultural Heritage
MoC:	Ministry of Culture
MEA:	Ministry of External Affairs
MoUD:	Ministry of Urban Development
NDMA:	National Disaster Management Authority
NIDM:	National Institute of Disaster Management
NCSM:	National Council of Science Museums
NDRF:	National Disaster Response Force
NMI:	National Museum Institute
SDMA:	State Disaster Management Authority
UN:	United Nations
UNESCO:	United Nations Educational Scientific Cultural Organisation
UNISDR:	United Nations International Strategy for Disaster Reduction

Note: This glossary has been compiled with references from the UNISDR's terminology database and from ICOM and ICOMOS accepted terminologies.

Acceptable risk: or tolerable risk, the extent to which a disaster risk is deemed acceptable or tolerable depends on existing social, economic, political, cultural, technical and environmental conditions.

Comment: In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or “accepted practice” which are based on known probabilities of hazards and other factors.

Accession (also Accessioning): The formal acceptance of an item into a collection and its recording into the holdings of the museum and generally includes a transfer of title.

Capacity: The combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals.

Capacity development: The process by which people, organisations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.

Cataloguing: Assigning an object to an established classification system and having a record containing such things as identification, provenance, accession and catalogue numbers and location of that object in the collection storage area.

Climate change: (a) The Inter-governmental Panel on Climate Change (IPCC) defines climate change as: “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land use”. (b) The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”.

Conservation: All efforts designed to understand cultural heritage, know its history and meaning, ensure its material safeguard and, as required, its presentation, restoration and enhancement (ICOMOS, 1994).

Also,

Concerned with the transmission of cultural heritage, with its significant values intact and accessible to the greatest degree possible (Getty Conservation Institute, 2008).

Cultural Heritage: Cultural heritage is understood to include monuments, groups of buildings and sites of cultural value as defined in article one of the World Heritage Convention.

Article 1

For the purposes of this Convention, the following shall be considered as 'cultural heritage':

monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;

groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;

sites: works of man or the combined works of nature and of man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological points of view (UNESCO, 1972).

The belief systems, values, philosophical systems, knowledge, behaviours, customs, arts, history, experience, languages, social relationships, institutions, and material goods and creations belonging to a group of people and transmitted from one generation to another. The group of people or society may be bound together by race, age, ethnicity, language, national origin, religion, or other social categories or groupings (Getty, 2010).

Cultural significance: Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or groups (ICOMOS Australia, 2004).

Disaster: A serious disruption of the functioning of a community or a 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.

Exposure: The presence and number of people, property, livelihoods, systems or other elements in hazard areas (and so thereby subject to potential losses) is known as exposure (UNISDR, 2009b and IPCC, 2012).

Hazard: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Hazard List

- Avalanche: snow avalanche, snow slide
- Cold Wave: extreme weather, extreme temperature, cold temperatures
- Cyclone: hurricane, tropical storm, tropical depression, typhoon
- Drought: deficiency of precipitation, desertification, pronounced absence of rainfall
- Earthquake: seismic, tectonic
- Epidemic & Pandemic: epidemic: bubonic plague, cholera, dengue, non-pandemic diseases, typhoid; pandemic: H1N1, HIV, smallpox, tuberculosis
- Fire
- Flood: inundation; includes: flash floods
- Heat Wave: extreme weather, extreme temperature, high temperatures
- Insect Infestation: locust, plague, bees
- Landslide: debris flow, mud flow, mud slide, rock fall, slide, lahar, rock slide and topple
- NBC - Nuclear, Biological, Chemical: biohazard risk, chemical contamination, nuclear radiation risk
- Storm Surge: coastal flood, wave surge, wind setup
- Storms, cloudbursts
- Technical Disaster: chemical spill/leak, explosions, collapses, gas leaks, urban fire, oil spill, technical failure
- Terrorism, armed conflict and war
- Tornado: waterspout, twister, vortex
- Tsunami
- Volcano: crater, lava, magma, molten materials, pyroclastic flows, volcanic rock, volcanic ash
- Wild Fire: bush fire, forest fire, uncontrolled fire, wildland fire

Mitigation: The lessening or limitation of the adverse impacts of hazards and related disasters.

Museum: A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.

Natural hazard: Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Preparedness: The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

Prevention: The outright avoidance of adverse impacts of hazards and related disasters.

Public awareness: The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards.

Recovery: The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

Reconstruction: Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric (ICOMOS Australia, 2004).

Residual risk: The disaster risk that remains even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained. The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery, together with socioeconomic policies such as safety nets and risk transfer mechanisms, as part of a holistic approach.

Restoration: The process of restoration is a highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and authentic documents. It must stop at the point where conjecture begins, and in this case moreover any extra work which is indispensable must be distinct from the architectural composition and must bear a contemporary stamp. The restoration in any case must be preceded and followed by an archaeological and historical study of the monument (ICOMOS, 1964).

Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material (ICOMOS Australia, 2004).

Risk: The combination of the probability of an event and its negative consequences.

Risk assessment: A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Value: The positive characteristics attributed to heritage places and objects by legislation, governing authorities, and/or other stakeholders. These characteristics are what make a site significant, and they are often the reason why society and authorities are interested in a specific cultural site or object. In general, groups within society expect benefits from the value they attribute to the resource (Getty Conservation Institute, 2004).

Vulnerability: The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.



Section 1

Introduction



- 1.1 Museums in India
- 1.2 Disasters and their Impact on Museums
- 1.3 Existing Legislative Frameworks- An Overview
 - 1.3.1 Framework for Museums in India
 - 1.3.2 Framework for Disaster Risk Management in India
- 1.4 Vision, Approach and Objectives
- 1.5 Scope of the Guidelines
- 1.6 How to Use the Guidelines
- 1.7 Action Plan and Implementation

Introduction

1.1 Museums in India

According to the International Council of Museums (ICOM) Statutes, adopted by the 22nd General Assembly in Vienna, Austria on August 24th, 2007:

A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.

Museums are repositories of diverse heritage, both natural as well as cultural, and as institutions they make significant contributions to the socio-cultural development of a community. Museums, through the objects and collections they house and display, contribute to regional, state and national identities. As cultural institutions, museums have a long history dating back to around 200 BC, with the earliest examples seen in Greek civilisation. Over centuries, the scope and nature of museums expanded from presentation of private collections of artefacts and oddities to institutions that promoted learning through objects collected and presented with a meaningful narrative.

In India, the concept of a museum as is widely accepted today was introduced as a colonial construct. Indian museums show a great range and diversity of collections and themes. The contemporary museum in India has evolved from formats introduced during the colonial period in the early nineteenth century. However, the act of displaying collections, oddities, antiquities and objects of aesthetic value predates the British in India and can be traced to various formats *chitrashala* (picture room) or *ajaib-ghar* (house of wonders), the Jain *bhandara* and so on. These were

collections that were primarily a result of sustained patronage by royal families, nobility or religious institutions. British scholars and antiquarians in India began to set up their own collections and eventually the need to house these objects led to establishing a makeshift arrangement in the Asiatic Society Premises in Kolkata. Eventually, these were housed in the Indian Museum, one of the first public museums in India, which opened in 1814 (Thapar, 2014). Many centrally administered museums still follow established Western typologies, though recent trends are showing innovative ways of displaying regional histories and cultures in ways that are very context specific.

Recent years have seen museums management evolve into being focused on the visitor or the audience base. Interpretation and communication have taken the centre-stage and the museum profession has evolved significantly. In India, the number of museums has increased from 746 in 2009 to 833 in 2013 (INTACH, 2013). Of this, 142 are administered by the Central Government, either directly through the Ministry of Culture (MoC) or through the Archaeological Survey of India (ASI) or other ministry departments. A further 300 museums are administered by State Governments. Additionally, the National Council of Science Museums (NCSM), an autonomous society under the Ministry of Culture administers 48 Science Centres / Museums / Planetariums spread all over India.

There are over 54 categories of museums, based on the nature of theme or collections. Furthermore, museums may often be aligned to larger institutions or heritage sites such as University Museums or Site Museums under the ASI. Certain museums are governed by other Ministries as well such as the Ministry of

Environment, Forest and Climate Change, the Ministry of Tourism, the Ministry of Railways, the Department of Science and Technology and so on. Due to this diversity in scale, management, theme and geographical locations, the management of museums, specifically aspects of disaster risk

management present unique challenges. An excerpt from the Indian National Trust for Arts and Cultural Heritage (INTACH) Directory of Museum highlights some of the leading categories of museums based on management and collection type.

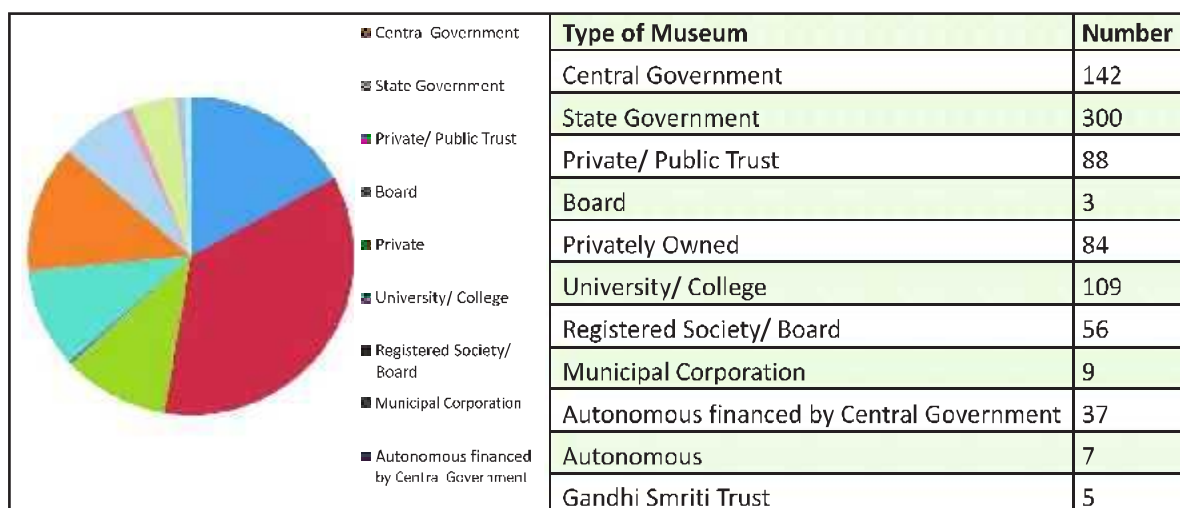


Figure 1 Types of Museums based on Management (Source: INTACH, 2013)

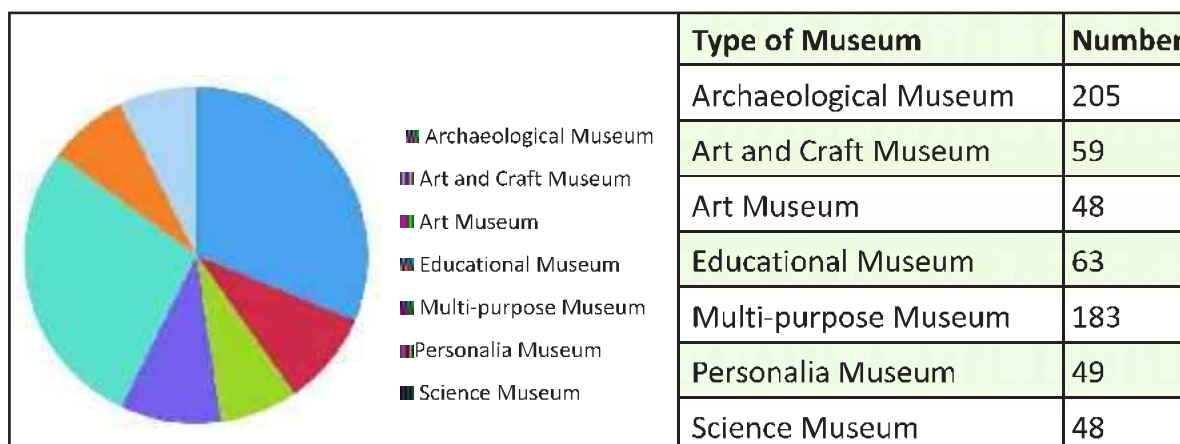


Figure 2 Types of Museums based on theme (Source: INTACH, 2013)

Together these seven types of museums account for almost 80% of all museums in the country.

The geographical distribution of museums in the country also varies significantly. While Uttar Pradesh boasts of 88 museums, Nagaland has only two.

1.2 Disasters and their Impact on Museums

The frequency of disasters and their consequent impact to lives, property and livelihoods has seen an unprecedented rise in recent years (UNISDR, 2009). A rapidly urbanising world, increasing population,

climate change etc. has increased the vulnerability of nations, especially developing countries such as India.

Natural disasters like the recent floods in Paris in 2016 posed a major threat to its iconic Louvre and Musee d'Orsay Museums. The Gorkha Earthquake that devastated Nepal in 2015 caused damage to the building and collections of the Chhauni National Museum in Kathmandu. The impact of disasters on museums over the past few years within India has been particularly severe. The building and collections of Sri Pratap Singh Museum in Srinagar, Jammu and Kashmir were damaged extensively in the 2014 floods. The archive buildings at Rajkot and Junagadh and the museum and library buildings in Bhuj suffered extensive damage in the 2001 Bhuj Earthquake.

However, not all disasters have natural causes. The armed conflict situations in Syria, Egypt, Turkey and Mali, to name a few instances, have often resulted in concerted attempts to destroy cultural institutions like museums, often as an act of destroying national identities.

On April 26th 2016, the National Museum for Natural History in New Delhi was gutted by a massive fire that destroyed not just the building but a large section of the Museum's collection and library, including many artefacts that were exceedingly rare. Fires and floods remain the leading causes of loss in museums across the country. Unfortunately, these events are just a few in a long list of human induced disasters that have resulted in widespread, often irreversible damage to museums across the world.

These events present some of the unique challenges faced by museums in case of a natural or human induced disaster. Unlike other public institutions, disaster risk reduction measures in museums are ignored due to lack of resources and awareness, or a lack of priority. ***Some specific challenges of disaster risk management in museums are briefly listed:***

1. Museums contain a diversity of individual objects and collections, ranging from

archaeological finds to organic material, which have vulnerabilities that are difficult to address with standardised approaches.

2. In the aftermath of a disaster, the focus is on saving human lives, recovering infrastructure and habitat and rehabilitation of communities so aspects of cultural heritage, such as museums, take a backseat.
3. The collections in a museum require specialised planning approaches at each stage of the disaster risk management process, from the understanding of risk to its reduction (or mitigation), to its eventual treatment in a post-disaster scenario.
4. Museums are often housed in historic buildings, where the structure and envelope itself is of great value, but potentially structurally more vulnerable. Some museums are also housed outdoors, or in hard-to-access regions and sites, which increases their vulnerability.
5. In general, museum management and staff are unaware of basic measures for disaster risk reduction and for emergency preparedness and response, and their overall capacity is limited.
6. Museums are at greater risk from human-induced activities such as arson, theft, terror since they are often associated with regional or national identities.
7. In post-disaster scenarios, lack of specialised equipment and personnel may cause further damage to objects and collections in salvage and recovery operations. Lack of assigned areas for temporary storage further adds to post-disaster losses.
8. Lack of post-disaster recovery plans that include museums at the district and state levels often result in museums not being assigned funds or resources for reconstruction or rehabilitation.

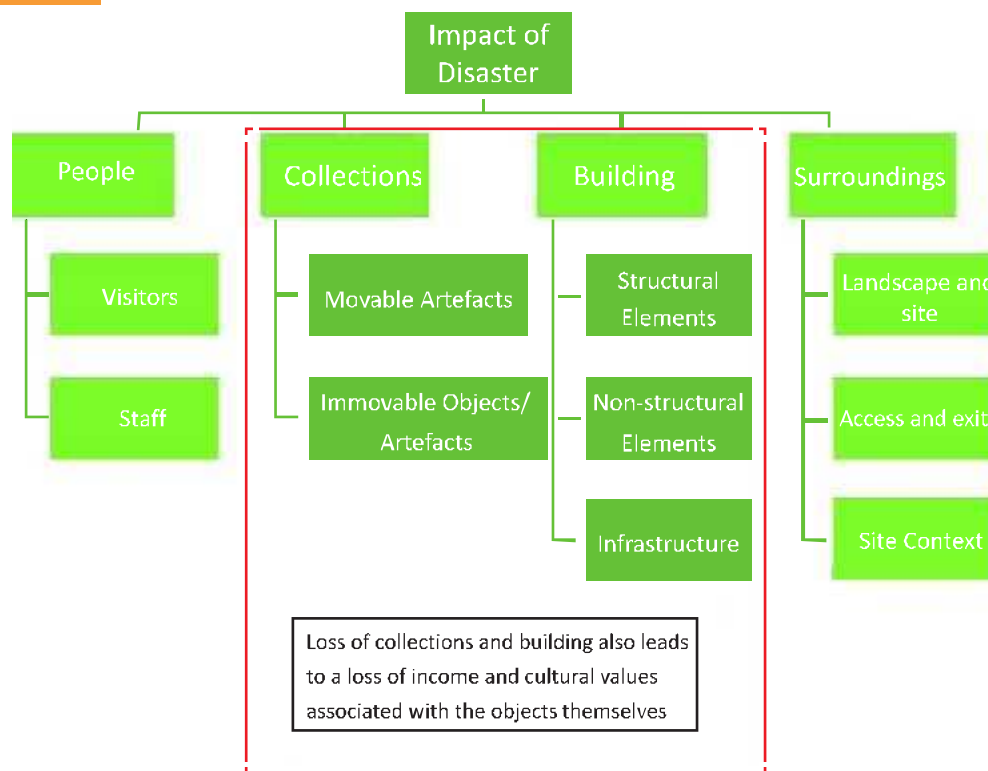


Figure 3 Impact of Disasters on Museums

However, latest international approaches mark a significant shift towards the inclusion of cultural heritage as an aspect to be considered within the ambit of disaster risk management. In 2005, the Hyogo Framework for Action (UNISDR, 2005) mentioned the potential role of 'traditional and indigenous knowledge and cultural heritage' and the need to account for culture in disaster risk reduction processes. A decade later, the Sendai Framework¹ for Disaster Risk Reduction (UNISDR, 2015) shows the level of progress made in this area. It identifies the role of heritage in Priority Areas 1 and 3, and specifically highlights the need **“To protect or support the protection of cultural and collecting institutions and other sites of historical, cultural heritage and religious interest;”** (Priority 3, Action (d))

Furthermore, it is essential to recognise the role of cultural heritage and cultural institutions within the overall agenda for sustainable development.

1. The Sendai Framework is a 15-year, voluntary, non-binding agreement which recognizes that the State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders. The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters. (UNISDR)

The United Nations 2030 Agenda firmly acknowledges the need to **“Strengthen efforts to protect and safeguard the world's cultural and natural heritage”** (Goal 11- Make cities and human settlements inclusive, safe, resilient and sustainable)

Our national policy frameworks also mirror this paradigm shift in approach. The National Policy on Disaster Management (2009) also acknowledges the role played by indigenous knowledge systems in reducing risks to disasters as well as the need to emphasise on risk reduction for heritage sites. The National Disaster Management Plan (2016) also acknowledges the role of cultural institutions, including museums.

1.3 Existing Legislative Frameworks- An Overview

1.3.1 Framework for Museums in India

“Any section of the citizens residing in the territory of India or any part thereof having a distinct language, script or culture of its own shall have the right to conserve the same” -Article 29 of the Constitution of India

“It shall be the duty of every citizen of India to value and preserve the rich heritage of our composite culture” - Article 51 A(F) of the Constitution of India

The Constitution of India sets out the primary framework for identifying, valuing and conserving various tangible and intangible aspects of culture. The Apex body for the implementation of this Framework is the MoC, which acts through the ASI, the National Archives of India and autonomous bodies under its overall jurisdiction including seven National Museums and subordinate offices.

The ASI, is the premier organisation for the archaeological researches and protection of the cultural heritage of the nation. Maintenance of ancient monuments and archaeological sites and remains of national importance is the prime concern of the ASI. Besides, it regulates all archaeological activities in the country as per the provisions of the Ancient Monuments and Archaeological Sites and Remains Act, 1958. It also regulates Antiquities and Art Treasure Act, 1972.

The national legislations that apply to cultural heritage in India include the following:

Under the aegis of the ASI

- The Ancient Monuments and Archaeological Sites and Remains Act (Gazette Notification 2010)
- The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and The Ancient Monuments and Archaeological Sites and Remains Rules, 1959
- The Antiquities and Art Treasures Act, 1972 and The Antiquities and Art Treasures Rules, 1973

Most states also have State legislations that apply to State Archaeology Monuments and Sites (A comprehensive list is attached in the Annexure). While some of them also lay out policies and legislations for museums, others are concerned only with the management of sites.

At the same time, no singular legislative framework applies to museums throughout the country.

Government museums may be administered through different Central or State Ministries depending on the type of museum. Private museums are run as institutions, under Charitable Trusts, Universities and so on.

1.3.2 Framework for Disaster Risk Management in India

Under the National Disaster Management Act 2005, the National Disaster Management Authority (NDMA) is mandated to lay down the guidelines for preparation of disaster risk management plans by various Ministries and organisations across the country. The National Disaster Management Act 2005 lays down the institutional, legal, financial and coordination mechanisms for Disaster Risk Management at the national, state, district and local levels.

It is as per this mandate that NDMA has prepared these guidelines. Each Department/Ministry of the Government of India has to prepare its Disaster Risk Management Plan as per the National Disaster Management Act 2005. The Ministry of Culture and other ministries that govern museums are thus mandated to prepare their disaster risk management plans and ensure that organisations working under their aegis also prepare individual disaster risk management plans and undertake all necessary measures to address disaster risk concerns. These guidelines serve as a template for Ministries and institutions to develop their own plans that need approval and review from the NDMA (NDMA 2009). Accordingly, each museum in the country is required to prepare its disaster risk management plan.

In May 2016, NDMA laid out the ***National Disaster Management Plan (NDMP)*** that lays out measures to increase disaster resilience at the national level through sustained action, prioritised into short-term, medium-term and long-term periods. The NDMP works within the Sendai Framework for Disaster Risk Reduction, to which India is a signatory, and provides the framework and direction to government agencies for all phases of disaster risk management cycle.

It is to be noted that NDMA is also in the process of developing the National Guidelines on Cultural Heritage Sites and Precincts that will be finalised within 2017. These need to be referred to in conjunction with the Guidelines for Museums, especially for museums and collections that are housed in buildings or sites of cultural heritage significance.

1.4 Vision, Approach and Objectives

The National Disaster Management Guidelines for Museums will apply to all museums in India, whether centrally controlled or through state governments, or under non-government boards or private individuals and institutions. As part of the Constitutional right 'to value and preserve the rich heritage of our composite culture' and the mandate of the ASI Policy on Museums to 'share India's unique heritage with everyone', it is essential to ensure that

Museums should be safe and secure spaces for the people that engage with them and for collections that contribute to their value as cultural institutions and markers of local, regional or national identity, by increasing their resilience through sustained efforts towards disaster risk management.

These guidelines should be seen as a template for museum professionals to develop their own disaster risk management plans and strategies through risk assessment, risk reduction, emergency response and post-disaster recovery. The objective is not to be prohibitive, but rather enable museums to streamline disaster risk management within the overall operation of a museum. Each step of the disaster risk management process has been addressed stage-wise in the document.

The key objectives of the guidelines are

- To address museum safety through a multi-hazard and inter-disciplinary approach
- To ensure structural safety of the building envelope and functioning of infrastructure, specifically critical infrastructure
- To ensure that all professionals involved in the management of museums, including collections management, building and

infrastructure management and visitor management are prepared to respond to disasters

- To ensure that museums in the country are equipped to develop their own disaster risk management plans

1.5 Scope of the Guidelines

Museums in India may be under the Central Government, the State Governments or administered through various private and public trusts and boards. The provisions laid down by these guidelines are applicable to all museums run directly or indirectly under the government sector and equivalent counterparts run privately. The guidelines are not a substitute for disaster risk management plans, but rather a starting point for management within museums to identify and address specific disaster risks.

1.6 How to Use the Guidelines

These guidelines lay out the basic framework for various Ministries which govern museums as well as individual museums to familiarise themselves with the requirements of a disaster risk management plan. These guidelines are NOT a substitute for a plan itself, and only set out the requirements- both physical and institutional that museums should fulfil in order to reduce disaster risks. Sections 2, 3, 4, 5 and 6 are accompanied by indicative checklists, which set out some of the basic actions to be undertaken at each level of disaster risk management. The bibliography and resource section lists a series of manuals and reference material that is meant to assist museum professionals in their planning endeavour. Section 7 deals with awareness generation and capacity building and should be used to develop exercises at museum level as well as institutional levels.

1.7 Action Plan and Implementation

Some of the provisions for museum safety and collections management that have been detailed in these guidelines need to be undertaken with immediate effect, while the implementation of longer term strategies and changes may require time

and resources. The prioritisation of these actions has been done into short-term (0-1 year), medium-term (1-5 years) and long-term actions (5-10 years).

These actions need to be taken up at multiple scales by various agencies taking responsibility at their respective levels.

Level	Action	Agency Responsible
National	A nationwide survey of museums to assess their current preparedness and availability of resources	MoC in collaboration with NGOs and other cultural institutions and networks
	Create a streamlined Disaster Risk Management Plan for all museums under its aegis	MoC
	Build institutional capacity and include disaster risk management planning within nationally approved syllabi for museum professionals	MoC through National Museum Institute and Other National Museology Programmes
	National Response Forces basic training programmes for handling emergencies in museums	NIDM, CISF, NDRF
	Develop a manual on best practices and detailed guidance which refers to the Indian context should be developed. Interactive APP based tools can also be developed	from NDMA where needed
State	Prepare a network and directory of museums and museum professionals at the State level to ensure a database of trained professionals who can be mobilised during an emergency	State Archaeology Departments/ State Museums to take the lead
	Devise coordinated strategies for museums and streamline museums within State Disaster Management Plans	State Museums and other large-scale museums
District	Identify museums including smaller scale museums, and streamline their concerns within overall disaster risk management plans and build capacity at the district level	District Museums, DDMA
Museum	Develop disaster risk management plans and link it to larger disaster risk frameworks operating at district/ state and national levels	Museums

	Collections to be digitised, prioritised and streamlined into common national, regional or local databases as applicable	Museums
	A roster of training activities and drills that build capacity at the institutional level	Museums
	Audits and maintenance activities at regular intervals	Museums

Figure 4 Implementation Framework



Section 2

Operational Framework and Implementation



- 2.1 Special Considerations with Respect to Objects, Collections and Sites with Heritage Value
- 2.2 Prioritising Actionable Strategies

2.1 Special Considerations with Respect to Objects, Collections and Sites with Heritage Value

In any disaster scenario, human safety must be prioritised over everything else. Therefore, it is imperative to ensure that all museums are designed to respond to existing hazards, both natural and man-made and special attention paid to storage and display of collections. Besides, the structural safety of the building envelope and interiors should also be ensured. Existing museums should be assessed for potential disaster risks and the site and surrounding context, and the building and infrastructure should be upgraded to ensure structure integrity and safety. Clear disaster response strategies should be in place for evacuation of visitors and staff.

However, with respect to historic buildings and collections that have cultural, historic or aesthetic value, upgradation may not be possible without loss of cultural significance or value. The value enshrined within a historic building, site or within the collection is a crucial aspect when planning for disaster risk management in a museum. For this reason, it is important to assess and prioritise both

aspects- values as well as potential risks while developing a plan. With respect to collections and built heritage, a certain degree of risk may be deemed 'acceptable' to maintain its authenticity and value. This is risk deemed acceptable or tolerable depending on existing cultural, technical and environmental conditions.

The Kyoto Declaration² adopted in 2005 states:

Disaster prevention measures should address cultural heritage comprehensively, rather than in isolation, through the planning process and programmes, and in coordination with various cultural institutions, urban planning and other departments. While undertaking disaster mitigation, it is essential to adopt a coordinated multi-agency approach to cultural heritage management, in which measures for risk preparedness are integrated through effective partnerships and appropriate funding.

Understanding how standardised approaches towards retrofitting structures, developing access and exit plans, additions to building for facilitation of critical infrastructure may negatively impact the building and collections is important.

2. Kyoto Declaration 2005 on Protection of Cultural Properties, Historic Areas and their Settings from Loss in Disasters (adopted at the Kyoto International Symposium 2005 "Towards the Protection of Cultural Properties and Historic Urban Areas from Disaster" held at the Kyoto Kaikan on 16 January 2005)

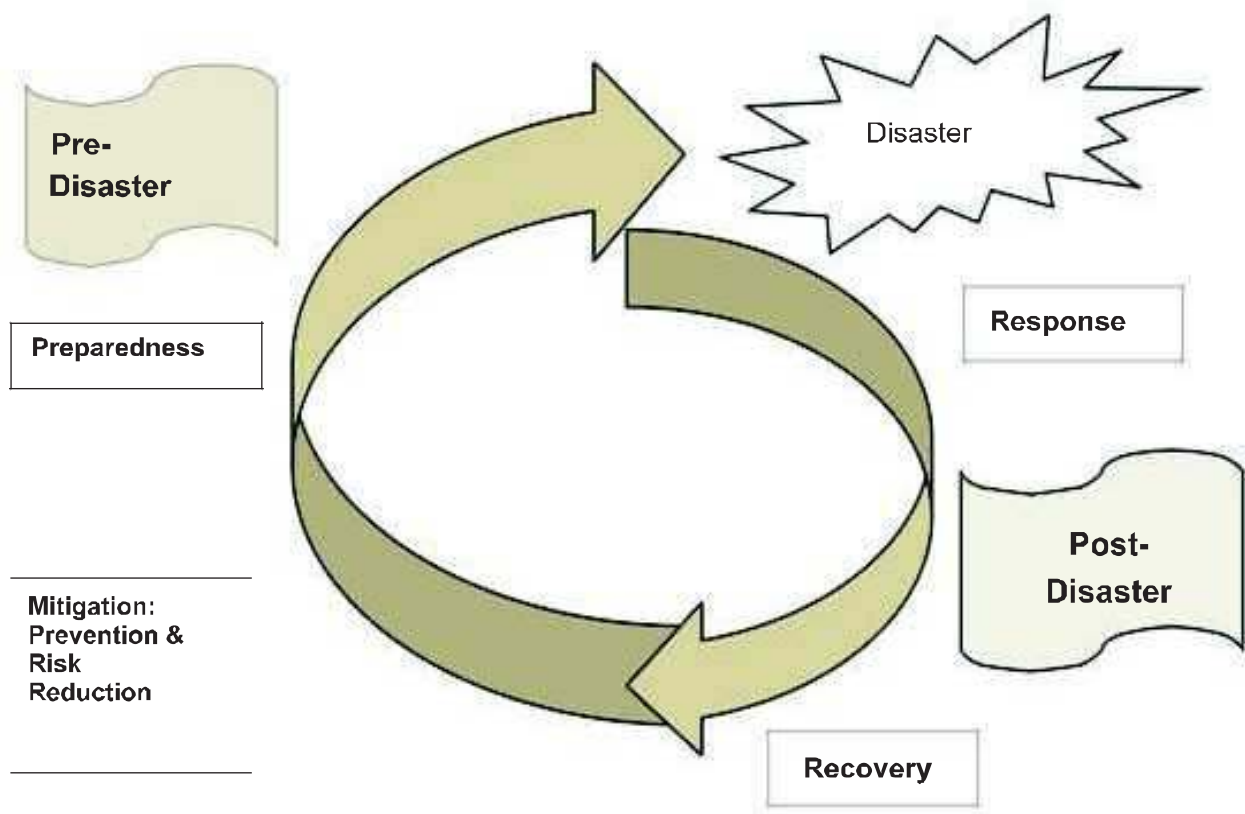


Figure 5 Disaster Risk Management Cycle (Source: National Disaster Management Plan 2016)

2.2 Prioritising Actionable Strategies

These guidelines have been structured using the individual stages of the disaster risk management process, with guidelines indicated for each stage of the process of disaster risk management. It is important to approach disaster risk management as

a continuous cycle that is integrated within the overall management of an institution and streamline these actions within the functioning of the museum.

This same sequence may be used to develop disaster risk management plans for museums.

Aims & objective of Guidelines :

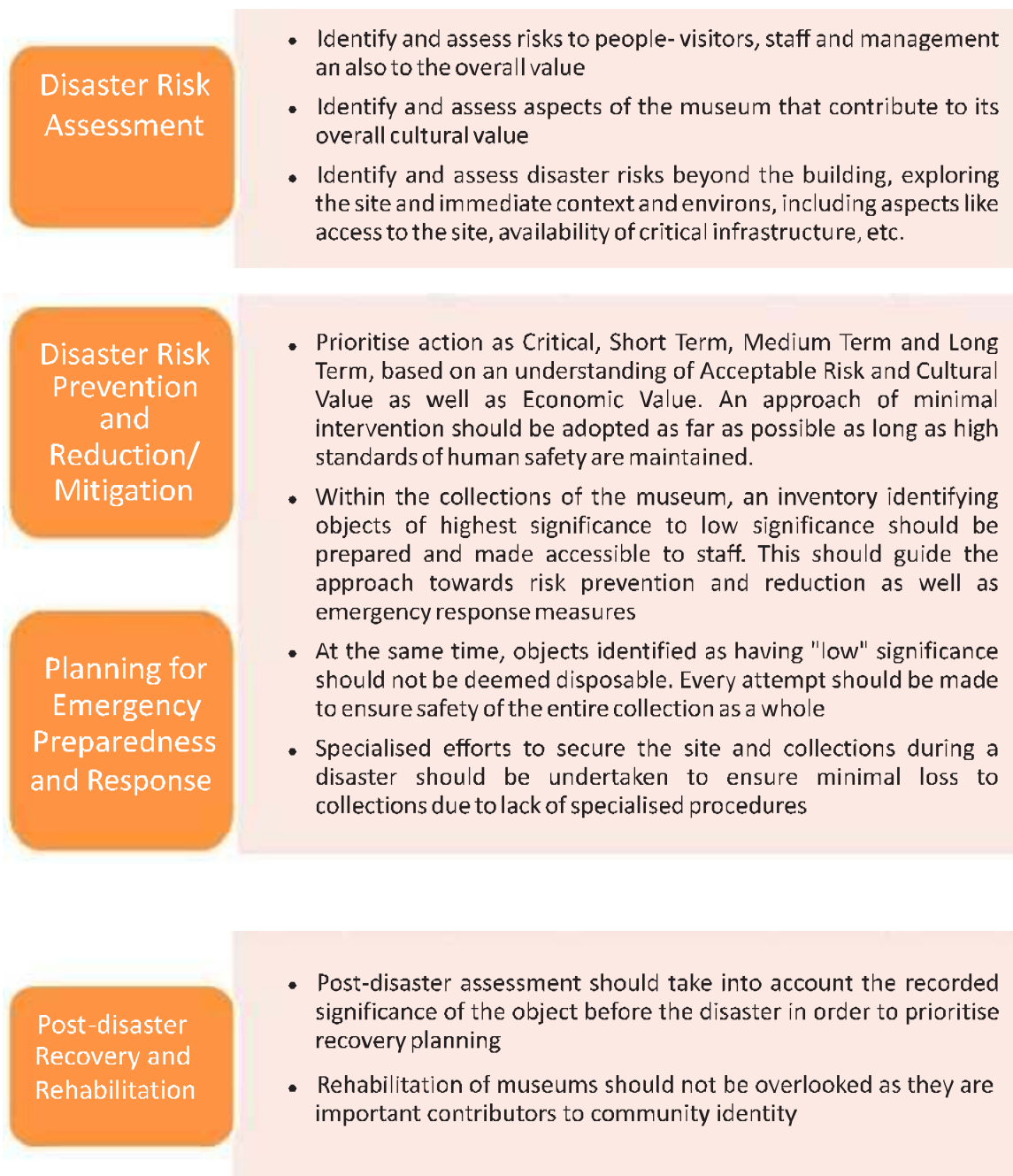


Figure 6 Disaster Risk Management Plan Structure and Sequence



Section 3

Risk Identification and Assessment

- 3.1 Understanding Typologies and Functioning of Museums in India
 - 3.1.1 Spatial Organisation of a Museum
 - 3.1.2 Objects and Collections: Assessing Values for Prioritisation
- 3.2 Approaches and Methodologies for Risk Assessment
- 3.3 Identifying Hazards
 - 3.3.1 Natural Hazards
 - 3.3.2 Human-induced Hazards
- 3.4 Identifying Vulnerabilities
 - 3.4.1 Buildings, Infrastructure and Surroundings
 - 3.4.2 Security and Management
 - 3.4.3 Collections, Display Systems, Storage and Conservation Laboratories
- 3.5 Scales of Disasters and Disaster Risks
- 3.6 Evaluating Risk and Potential Impact

3.1 Understanding Typologies and Functioning of Museums in India

In order to carry out risk identification and assessment at the museum level, the following aspects need to be considered:

1. A comprehensive list of collections, both on display and in storage or in a conservation laboratory should be prepared and updated. This is important in order to prioritise collections of exceptional value, and also to have an account of their current condition.
2. A detailed documentation of the museum building and site, its immediate environment and context. It may be a useful exercise to have a comprehensive database of museums in India that may be integrated into existing hazard maps that are currently available as well as ones that will be available in the future.
3. Museums are complex institutions with areas that require specialised planning. Broadly museums have public display spaces which are freely accessible, storage spaces where the internal environment needs constant monitoring and control, and administrative spaces from where the daily management of the museum is controlled. However, the scale, spatial layout, building size, gallery layout and access are all aspects that are unique to each museum.

3.1.1 Spatial Organisation of a Museum

The spatial organisation within a museum is divided into public, semi-public, private and service areas.

Broadly, each of these areas or zones has the following functions:

- i. Public and common areas
 - Arrival area, entrance lobby
 - Ticketing counter and/or security check
 - Reception/Information desk
 - Cafeteria, museum shop, other commerce
- ii. Display areas
 - Exhibitions spaces
 - Library and archives
 - Auditoriums and seminar halls
- iii. Office and administration
 - Security and control rooms
 - Director, curator, manager, staff offices
 - Lunch rooms, meeting rooms
- iv. Conservation and storage
 - Conservation labs and working spaces
 - Open storage for collections
 - Secured storage for collections

3.1.2 Objects and Collections: Assessing Values for Prioritisation

Within a museum collection, not all objects carry the same heritage value. Values can be historic, archaeological, artistic, scientific, cultural, etc. depending on the nature of the collection. A detailed assessment of individual objects and smaller collections within the museum with respect to their value should be carried out in order to prioritise the collection. Authenticity and uniqueness of the object should also be weighted while assessing values.

In order to carry out an evaluation of collections, it is essential to have a detailed documentation of the collection in the form of inventories that document the object's origin, physical description and condition. Objects may be classified on the basis of their material composition. Broadly these are

- i. **Organic material:** best described as material that was once living such as wood, paper etc.
- ii. **Inorganic material:** mineral derivative, for example, glass, metals, etc.

A large percentage of objects are a combination of organic and inorganic materials, and therefore inherently vulnerable to multiple hazards at the same time.

Some typical organic materials:

- Wood
- Paper
- Textiles
- Animal products
- Plastics
- Plant extracts

Some typical inorganic materials:

- Stone
- Metal
- Glass
- Ceramics

3.2 Approaches and Methodologies for Risk Assessment

According to UNISDR,

Risk assessment: A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

Comment: Risk assessments (and associated risk mapping) include: a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability including the physical social, health, economic and environmental dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios. This series of activities is sometimes known as a risk analysis process.

Identification of risks for a cultural institution would include listing natural and human-induced **hazards** that could potentially have an adverse impact. Further, **vulnerabilities** of the museum- its building, collections, infrastructure and management should be evaluated. Understanding the relationship between hazards and vulnerabilities will highlight the risks for the museum.

The first step towards risk assessment is to identify all the hazards (natural as well as human-induced) and vulnerabilities that apply to the museum. Together, hazards and vulnerabilities provide a picture of the risk.

Broadly, assessment of disaster risks follows the following process:



Figure 7 Risk Assessment Process

3.3 Identifying Hazards

A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Hazards can be identified for a museum from the following sources:

1. History of past disasters in the area along with their severity of impact and recurrence.
2. Hazard maps such as earthquake zonation, cyclones and storms maps, landslide mapping, flood basins etc. that may be provided by NDMA, State Disaster Development Authority (SDMA), District Disaster Management Authority (DDMA) or other sources such as the India

Meteorological Department (IMD), State and City Level Master Plans etc.

3. History of previous emergencies within the museum available in the museum archives or with staff and management or with local authorities such as police and fire departments.
4. Most primary hazards can result in secondary hazards; a brief overview of both is illustrated

Kindly note that this overview is meant to be indicative and not exhaustive.

3.3.1 Natural Hazards

An indicative list of the natural hazards as identified by NDMA has been summarised below. Guidelines exist for specific hazards such as Earthquakes, Floods, Droughts etc. prepared by NDMA in previous years.

Family	Main Hazard	Secondary Hazard	Indian States/ Regions affected
Geo-physical	Earthquake	Landslide, Fire Liquefaction, Surface Displacement, Tsunami	58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity.
	Volcano	Surface displacement, Ash fall, Lahar Pyroclastic Flow Landslide, Fire, Tsunami	Barren Island in the Andamans is the only confirmed active volcano
Hydrological	Flood Landslide Wave Action	Avalanche Coastal Erosion, Coastal flood Debris Flow, Mud Flow Rock Fall, Flash Flood, Flood, Hydrological, Wave Action	Over 40 million hectares (12 per cent of land) is prone to floods and river erosion.

Meteorological	Hazard caused by short-lived, micro-to meso-scale extreme weather and atmospheric conditions that may last for minutes to days	Cyclone, Storm Surge, Tornado, Convective Storm, Extra tropical Storm, Wind Cold Wave, Extreme Temperature, Fog, Frost, Freeze, Hail, Heat-wave Lightning, Heavy Rain, Sand Storm, Dust Storm, Snow, Ice, Winter Storm, Blizzard, Cloudburst	Of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis.
Climatological		Drought, Extreme hot/cold conditions, Forest/Wildfire Fires, Glacial Lake Outburst, Subsidence	5,11,300 sq. km landmass of India is drought prone. 50% of forests in India are prone to wildfires. All the states bordering the Himalayas are prone to Glacial Lake Outburst.
Biological		Epidemics: viral, bacterial, parasitic, fungal, prion infections, insect infestations Animal stampedes	Almost entire country is prone to various epidemics. In July 2016 there were 11,26,661 cases of malaria, 99,913 cases of dengue, 27,553 of chikungunya and 42,592 cases of swine flu across India.

Figure 8 Natural Hazards in India (Compiled from National Disaster Management Plan, 2016 and Existing Hazard Maps for India, NDMA)

3.3.2 Human-induced Hazards

According to the National Plan for Disaster Management, increasing levels of urbanisation and industrialisation within identified high risk zones have increased the overall vulnerability of populations to disasters. The key hazards leading to a possible disaster that can be attributed to human activity are:

1. Chemical, Biological, Radiological and Nuclear Hazards (CBRN)

2. Terrorism, Violence, Conflict

3. Fire

Other hazards include accidents, poor planning and construction, over-population or over-crowding, theft and vandalism, environmentally insensitive practices and so on.

Human-induced hazards may also be identified using the following approaches:

- Records with local emergency responders,

such as fire departments, police departments, local hospitals and medical facilities and records within the site or precinct of previous events caused due to human intervention.

- Local area maps highlighting nearby industries, nuclear plants, possible sources of contamination, sources of pollution, sources of ignition and so on.
- Socio-economic mapping and other demographic information of the precinct to identify any potential sources of conflict among different interest groups or potential volatile situations.

In the context of museums, natural and human-induced hazards lead to the following agents of deterioration for objects and collections (CCI and ICCROM, 2016):

1. Physical forces
2. Fire
3. Water
4. Fluctuating temperature and humidity
5. Pollutants, exposure to light and radiation
6. Pests and biological agents of decay
7. Theft, vandalism etc.

These agents are the direct or indirect consequences of the hazards listed, but may also occur without a larger event. For example, a minor explosion in the vicinity of a museum, may lead to localised tremors, causing objects to fall and get damaged. Or the drainage system of a museum may malfunction, leading to localised flooding.

3.4 Identifying Vulnerabilities

Vulnerabilities may present themselves in the physical condition of the building, its surroundings and infrastructure, the condition of collections and their storage, in circulation and management of the building etc. Some potential vulnerability may be avoided while designing and planning for a new museum, whereas existing museum buildings and

sites can be upgraded based on identified vulnerabilities.

3.4.1 Buildings, Infrastructure and Surroundings

The building envelope itself, including structural and non-structural elements, can contribute to its overall vulnerability as well as the condition, location and upkeep of basic infrastructure, such as drainage, electrical and water supply, IT and telecommunications and so on. The location of the building and its planning may also be factors. Some actions that may be undertaken to identify existing vulnerabilities are listed:

1. All new museum buildings, additional blocks added to existing buildings should be evaluated for their planning and connectivity with respect to their immediate surroundings and neighbourhood.
2. In case of an existing building, a structural assessment by a specialist should be carried out to identify structurally vulnerable sections of the building. The building's age, its structural system and non-structural components should be clearly understood and communicated. Regular structural audits should be conducted for buildings older than 50 years. Structural Elements (SE)s may deteriorate over time or not adhere to existing BIS standards and therefore increase the vulnerability of the museum.
3. Materials and finishes of the building should be documented and assessed. Even superficial damage to the building can become dangerous in the event of a disaster. Non-Structural Elements, such as projections, fixtures and fittings, cabinets, storage boxes, etc. may contribute greatly to increased vulnerability of the museum.
4. Surrounding context of the building should also be examined for vulnerabilities that may impact the building, its access or its

infrastructure during a disaster. For instance, a museum located in the middle of a historic precinct may be difficult to access during a widespread disaster. Emergency vehicles may be unable to access the museum due to its location.

5. Localised site conditions such as the presence of big trees, transformers, unavailability of adequate parking areas, widths of access for emergency vehicles etc. may increase risks.
6. Issues of drainage and water supply should be identified and the condition of infrastructure such as electrical wires, transformers etc. should be documented.
7. Access, circulation and planning of the building during visiting hours as well as when the museum is closed.
8. Museums generally have a storage area where collections that are not on display are housed. These may be more vulnerable to certain hazards based on their location within the museum complex and accessibility during an emergency. As these areas are also not generally accessed regularly, they may develop issues due to lack of monitoring and use.

3.4.2 Security and Management

Issues in the planning, management and staffing of the museum also contribute to its vulnerability. Some key aspects to assess for vulnerabilities in security systems and visitor management are:

1. Number of museum staff available for public areas, for security and for assistance of visitors, especially the differently abled, children and elderly.
2. Number of trained staff who are familiar with the building, collections as well as emergency procedures. Emergency procedures include not only familiarity with evacuation routes and basic first-aid and emergency response but also with

protocol for the protection of collections and an understanding of their value.

3. Monitoring of visitors, an understanding of optimum number of visitors and controlling visitor access during peak periods.
4. Background verification of staff and security personnel.
5. Coordination between gallery staff, curators and security staff.
6. Entrances and exits to the museum and their security, both manual and electronic. Special attention should be paid to security of objects of high value and their display.
7. Maintenance and upkeep of the museum; how often is the building and collections assessed for physical and infrastructure issues, how often is critical infrastructure installed and so on.
8. Regular contact and communication with emergency responders such as the police, the fire department and local hospitals.
9. Often the link between the museum and its surroundings is compromised during a disaster. So, it is important to assess preparedness of the museum's evacuation and emergency response in a larger framework of the neighbourhood and urban precinct level.
10. Museums are constantly undergoing upgradation, changes in exhibition and acquisition of new objects and collections etc. These changes in the overall day-to-day regime of the museum may increase its vulnerability. Changes to Structural Elements or Non-structural Elements, additions and alterations to the building itself, changing exhibition formats, additions or changes to infrastructure expose the museum and its collections to additional risks.

3.4.3 Collections, Display Systems, Storage and Conservation Laboratories

Understanding the full scope and nature of collections as well as the systems of display and storage is the first step towards identification and prioritisation of risk. Most objects are a composite of multiple materials that make them vulnerable to a number of different hazards. Collections are also presented thematically based on age or geographical regions, which make it difficult to predict their behaviour in the case of a disaster. The first steps towards identifying vulnerabilities in a collection are:

1. An up-to-date inventory of all the objects on display, in storage and undergoing conservation. The inventory should be accompanied by a detailed acquisition register and a catalogue. This applies even to temporary exhibitions which may be on loan from partner museums or institutions.
2. The catalogue should contain details of material, physical condition as well as records of previous treatments / conservation efforts.
3. The location of all objects should be assessed with respect to their size and material. For instance, an object that is extremely heavy should not be located at a height as it presents a falling risk. Therefore, a floor plan indicating locations of objects should be available in order to assess vulnerabilities and evaluate potential risks.
4. Micro-climatic conditions, fluctuations of moisture and temperature, activities of pests and biological agents should be documented, since they impact the integrity of the collection.
5. The mechanisms of display and storage can significantly impact the overall risk of

disaster to an object and should be documented and assessed for vulnerability to structural/mechanical damage, fire or water related damage etc. Seismic vulnerability due to improperly stored objects and lack of anchoring of large and fragile objects on display are issues which can lead to significant losses. Similarly, flammable objects stored in areas with inadequate fire safety mechanisms, lack of heat and smoke sensors, fire doors, etc. are at risk.

6. The location of a collection, with respect to the rest of the building can also contribute to its overall vulnerability.
7. Objects undergoing conservation should also be assessed for increase in vulnerability due to exposure to air and moisture, proximity to chemicals, etc.
8. Conservation laboratories, especially those dealing with potentially hazardous chemicals and points of ignition should be assessed for chemical and fire risks.

For example

A collection displaying the arts and crafts of a region may contain objects of different types ranging from textiles, metal, wood, paper and so on in the form of everyday utility items and ornate decorative pieces. Each of these objects would be vulnerable to different agents. For instance, the paper, wood and textile objects would be vulnerable to fire as well as water/prolonged moisture when compared to the metal objects. The location of this collection would also contribute to its vulnerability. Flammable items located near electrical supply units or heavy items located near access and exits would potentially add to the risk within the museum during an emergency/disaster.

A reference checklist for risk assessment can be found in the annexure.

3.5 Scales of Disasters and Disaster Risks

The scale of a disaster is an important factor to assess the degree of preparedness and vulnerability of a cultural heritage site/precinct. The High Powered Committee on Disaster Management, in its report of 2001, categorised disaster situations into three 'levels': L1, L2, and L3. The period of normalcy, L0, should be utilized for disaster risk reduction.

Level L1: The level of disaster that can be managed within the capabilities and resources at the District level. However, the State authorities will remain in readiness to provide assistance if needed.

Level L2: This signifies disaster situations which require assistance and active mobilisation of resources at the State level and deployment of State level agencies for disaster management. The central agencies must remain vigilant for immediate deployment if required by the State.

Level L3: This corresponds to a nearly catastrophic situation or a very large-scale disaster that overwhelms the State and District authorities.

With respect to cultural heritage sites and precincts, a localised hazard may also cause an emergency that is beyond the identified coping capacity. These hazards may include man-made hazards like fire, mass violence, etc. In the case of L1, L2 and L3 disasters, emergency infrastructure and response may be severely impacted and the rate of response to the heritage site or precinct may be compromised in this scenario. Therefore, building capacity within the site or precinct is an important aspect of disaster risk reduction.

After identifying and assessing the possible risks to the museum, it is important to rate them according

to **probability** of occurrence and the potential **impact** (Soderlund, 2000). The scale of the event, specifically with respect to the museum must be understood in order to prioritise the potential risk and its impact.

For example

An earthquake with a magnitude of 6 or more within 100 kilometres of a museum will not only cause significant damage to the museum, but also potentially cripple infrastructure, basic as well as critical, and hamper access, rescue and relief operations to the museum's visitors and staff. The recovery of objects and collections in such a scenario would be significantly low on the list of priorities of the local emergency responders. On the other hand, a large fire caused due to accidental reasons in a museum, though devastating for the museum may be addressed with far more efficiency, since the event would be contained within a smaller area. In terms of impact, both events may be similar in scale with respect to the museum, but the response and recovery times may vary significantly.

Planning for an event with a **high probability of occurrence** and a **high level of potential impact** should be prioritised. Risks that will have a detrimental impact on human life should be given the highest priority. Impact to the museum, collections, its archives, storage and infrastructure should be prioritised based on the identification of value of each.

Based on the understanding of risk and its prioritisation, risk reduction measures can be proposed.

3.6 Evaluating Risk and Potential Impact

Based on a detailed understanding of natural and man-made hazards as well as vulnerabilities within the museum and its surroundings, **disaster scenarios** can be envisaged in order to understand the potential impact to lives and the collections. Based on the

probability of occurrence, the scale of impact risks may be prioritised with respect to action required.

A detailed risk assessment should be carried out by a disaster risk expert while setting up a new museum or while developing the disaster risk management plan for a museum. The expert should be equipped to analyse building risks as well as risks to collections and display.

For example

A museum located in a flood prone zone should prepare for a scenario of flooding leading to electrical short circuiting within the

building and causing sparking and a small fire near the control room. This scenario presents multiple hazards happening simultaneously and the risk reduction or mitigation strategy will need to account for responding to multiple hazards in an efficient manner. Scenario building helps museum professionals imagine the potential risks that present themselves and equips them to respond to specific hazards by mitigating the risk or by eliminating it or preparing to reduce its potential impact.



Section 4

Disaster Risk Prevention, Reduction and Mitigation



- 4.1 Context, Site, Building and Infrastructure
- 4.2 Security and Management
- 4.3 Collections, Display and Storage Management

The approaches towards disaster risk reduction in a museum include the following:

- **Elimination or prevention of the hazard:** The source of risk is removed through planning and action. For example, if the hazard is theft or vandalism, the risk may be reduced by increasing security and monitoring in the museum. Natural hazards such as earthquakes, heavy rainfall, etc. cannot be prevented in this manner.
- **Mitigation of the impact of the hazard:** Even though many hazards cannot be prevented, their overall impact can be reduced by strengthening the building, improving access and security and installing critical infrastructure. This is done by reducing the vulnerability of the building, the display and storage systems, and streamlining access and movement patterns.
- **Prioritising Action:** The cultural significance of the collections and heritage building (if applicable) should be prioritised and the impact of any intervention for disaster risk reduction should be analysed before implementation. An approach of minimal intervention should be followed in the case of heritage, whether it is the collection or the building. This may mean a more proactive approach towards constant monitoring and review in the museum.

The following sub-sections give an indicative list of aspects that should be addressed while planning for risk reduction and mitigation. These are broad in scope, and individual museums should carry out detailed risk assessment exercises with inputs from an expert.

4.1 Context, Site, Building and Infrastructure

The site and the building are the final envelope of control for museum objects and collections and should meet the highest standards of risk mitigation and reduction. These are also critical to human safety which needs to be prioritised above all else. Therefore, the site, building and infrastructure need rigorous measures for eliminating and reducing risks.

1. New museum buildings should be planned in areas with good accessibility and connectivity as well as adequate access to critical infrastructure. Within the site, areas should be designated not only for the refuge of visitors in an emergency but also for temporary storage of objects and collections in an emergency. Adequate access and parking for emergency and rescue vehicles should be included in the site layout.
2. New buildings should adhere to the following existing codes and bye-laws that incorporate disaster risk management within their overall ambit. An indicative list is given below:
 - i. The National Building Code, 2016 and 2005 issued by the Bureau of Indian Standards, especially the sub-sections on institutional and heritage structures.
 - ii. Bye Laws issued by Urban Local Bodies
 - iii. Development Controls issued by Local Development AuthorityFurther references include:
 - iv. Model Building Bye-Laws, 2016 issued by Ministry of Urban Development

- v. National Disaster Management Guidelines On Ensuring Disaster Resilient Construction of Buildings and Infrastructure issued by NDMA as well as other guidelines issued for specific hazards, depending on location of museum.
3. With respect to retrofitting existing buildings, if the building is not a designated heritage building, then the same legislative framework applies as new buildings.
 4. With respect to heritage buildings, designated either by the ASI or by State Archaeology Departments or identified as such within the purview of city master-plans, district plans, etc. it may not be possible or advisable to carry out retrofitting as/per standard practices. In such a scenario, the Ancient Monuments and Archaeological Sites and Remains Act, 2010 or State Acts may be applicable. **Nevertheless a structural audit should be undertaken by a qualified specialist in historic buildings.**
 5. Special considerations for designated heritage buildings that are currently in use as museums:
 - i. The structure should be in good physical condition and the infrastructure should be up-to-date.
 - ii. Access and exit points should be examined carefully and upgraded / expanded as needed. Where dimensions of exit passages are less than optimal, other solutions should be explored.
 - iii. Non-structural elements should also be examined carefully for structural integrity and safety.
 6. Entry and exit points should be planned carefully, taking into consideration not only average visitor loads but also peak loads. Vertical circulation should be planned taking into consideration movement of objects and collections along with visitors.
 7. Electrical systems including distribution boxes, lines and power backup systems should be assessed for safety and remedial measures taken, if necessary. All splice joints should be replaced with connectors. All defunct and loose wiring should be addressed, and fail-safe mechanisms installed. Electrical services should be up-to-date and monitored as per a planned schedule. Infrastructure should be routed according to BIS standards and kept out of reach of visitors and the general public.
 8. Water-supply, drainage and sewerage systems should be assessed for leakage risk and remedial measures taken, if necessary. Where water sources are located close to electrical supply sources, the location should be changed or temporarily secured while long-term solutions are sought. Waterproofing of roofing, flooring and paving as well as of external surfaces should be undertaken with care and inspected regularly with increased frequency in cases of museums located in areas which receive heavy rainfall.
 9. Ensure that no hazardous / potentially hazardous / flammable material is accessible to unauthorised personnel or is stored in an area where it can cause damage to visitors and staff in case of an emergency or through tampering. This is especially significant for areas where conservation laboratories are located or where objects are stored. Areas like kitchens and pantries should also be secured.

10. Carry out a fire safety audit by a certified professional and implement recommendations. This exercise should be done on a regular basis, and especially following any changes to the structure or layout of the museum.
11. Surrounding context of the building should also be examined for vulnerabilities that may impact the building, its access or its infrastructure during a disaster. Potential obstructions like big trees, encroachments, informal additions and alterations should be cleared.
12. A detailed roster of maintenance and monitoring actions should be created for the museum and checked regularly by the administration team.
13. Lightning rods, wireless communication equipment and public address system should be installed. Key area lighting should be equipped with emergency backup that is battery operated for emergencies.

4.2 Security and Management

Security and visitor management, and the day to day running of the museums contribute greatly to reducing risks within the museum. Some of the risk mitigation and reduction measures are as follows:

1. All museums must strive for universal access to visitors. This means making the building and museum facilities accessible to differently-abled visitors and at risk groups of visitors such as the elderly and young children.
2. All museums must have designated spaces for emergency vehicles, temporary refuge areas, etc.
3. All emergency routes and refuge areas should be clearly marked on an emergency plan and be available to visitors and displayed in all public areas. Museum professionals and staff members should be familiar with the emergency plan. IS standard signage should be installed in all areas of the museum clearly marking exit routes, evacuation procedures and so on.
4. All water supply, electricity supply and back up points should be marked clearly and members of the administration and security teams should be familiar with these to be able to switch these off when required. An emergency water supply source should be maintained.
5. Carry out a security audit either internally or using an external expert in security systems or risk management. Entrances, exits, vulnerabilities in access, areas that need specialised security should be assessed carefully and recommendations prioritised and implemented.
6. Based on security audit and existing resources additional security measures such as X-ray scanners, metal detectors, handheld scanners, CCTV monitoring, automated door barriers and biometric access control should be installed. This depends on size of museum, location and collection type.
7. Training of security staff for specialised security mechanisms against acts of war, terrorism and conflict should be carried out regularly, particularly in areas with identified threats of widespread violence.
8. Continuous up gradation of awareness and knowledge of the museum staff and security teams should be carried out.
9. Teams of volunteers should be trained and their database should be easily accessible in case of emergency. These can be regional networks that include people familiar with the functioning of a museum. Networks should also be strengthened

between museums so that trained professionals can be requested to assist museums in times of a disaster or an emergency.

4.3 Collections, Display and Storage Management

1. All collections should be documented in digital format with accession codes, reference images, material description and location with an off-site backup. Detailed catalogues and inventories should be maintained for in-house collections as well as loans and temporary exhibitions.
2. All potentially physically hazardous, inflammable, chemically hazardous materials should be stored away from collections, especially vulnerable objects and collections.
3. Heavy objects, fragile objects etc. should be anchored for safety of the object as well as people. They should be displayed at an appropriate height and distance. Anchoring and base isolation should be carried out for all objects identified to be at risk from falling or from mechanical impact. Other earthquake mitigation measures such as shock absorption should be implemented not only in the display areas but also the conservation labs and storage areas.
4. Within the collections of the museum, an inventory identifying objects of highest significance to low significance to prioritise action should be undertaken.
5. Items prone to damage from water should be displayed and stored on upper floors to mitigate risk from flood. Cases should be waterproof, moisture proof and offer a controlled environment.
6. The display systems should be assessed for structural distress, especially those housing heavy or fragile objects. They should also be examined for other vulnerabilities. This should be done on a regular basis.
7. Micro-climatic conditions, fluctuations of moisture, temperature, light and radiation, activities of pests and biological agents should be documented, since they impact the integrity of the collection.
8. Combustible items should be encased in fire retardant casing, with constant monitoring of heat and smoke levels.



Section 5

Planning for Emergency Preparedness and Response

- 5.1 Approaches for Planning for Emergency Response
- 5.2 Monitoring and Alarm Systems
- 5.3 Planning for Evacuation and Coordination with Emergency Responders
- 5.4 Emergency Response Systems
- 5.5 Creating an Emergency Team
- 5.6 Roles and Responsibilities of an Emergency Team
- 5.7 Emergency Supplies and Equipment

5.1 Approaches for Planning for Emergency Response

Planning for emergency response is a crucial part of the disaster risk management process. It enables the

institution to be equipped to respond effectively and efficiently during a disaster and coordinate with emergency responders in order to reduce the impact on life and property. Emergency preparedness includes the following aspects

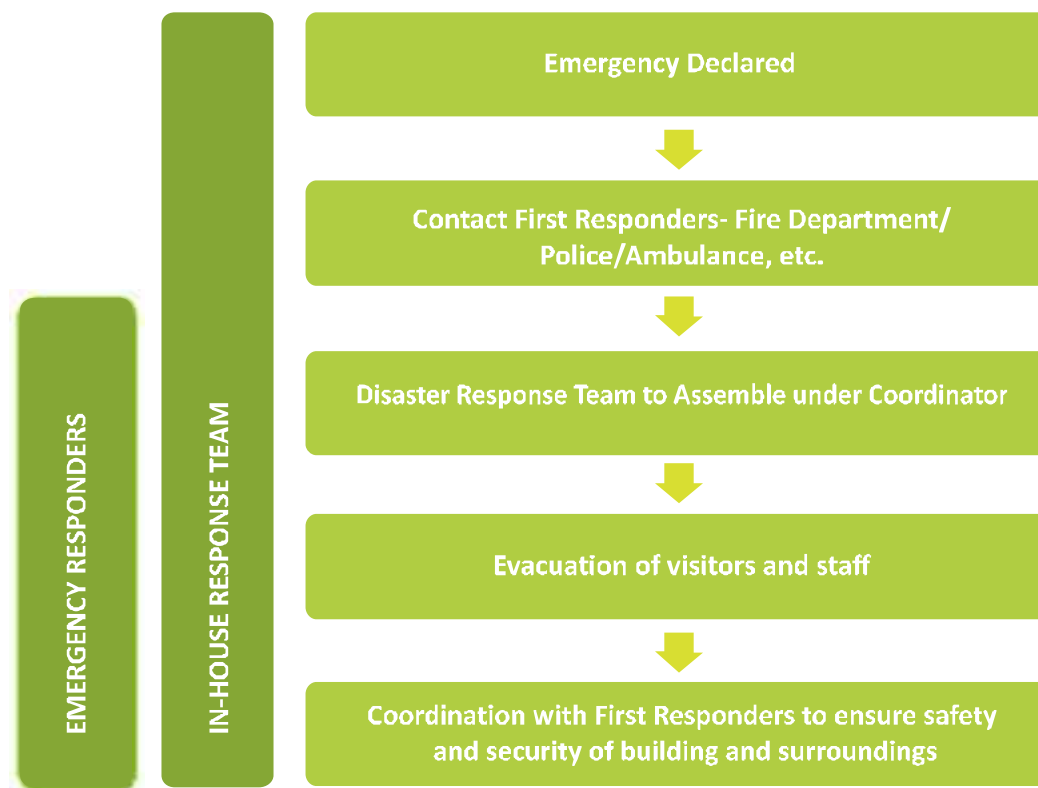


Figure 9 Structure of Roles and Responsibilities of an Emergency Team

- Assembling and training an emergency response team and setting up coordination with external agencies
- Preparing evacuation routes and emergency signage
- Setting protocols for evacuation based on different emergencies and disasters
- Planning for salvage of collections, temporary stabilisation and prioritisation
- Identifying and procuring emergency equipment
- Immediate damage inspection and protection strategies

5.2 Monitoring and Alarm Systems

Constant monitoring and well-functioning alarm systems are the first step towards timely emergency response. Museums need to be equipped with the following systems:

1. Heat/smoke detectors for detecting fire
2. Humidity/indoor environment sensors to detect any significant change in collections areas
3. Security systems including anti-theft and anti-tampering alarms, especially for valuable collections and key areas within the museum
4. Manually operated alarms and public address systems
5. Physical barriers and mechanical barriers protecting objects of high value as well as securing collections and private areas within the museum

In addition, each museum needs to be equipped with a basic security team, the size and specialisation of which will depend on the size, location and nature of collections of the museum. The security team will ensure safety of the visitors and staff and also of the collections during visiting hours, and also when the museum is closed to the general public. Security measures may also include

- X-Ray scanners, metal detectors
- Hand held scanners, under-belly mirrors and scanners for vehicles
- Closed Circuit Television (CCTV) monitoring
- Automated door barriers
- Biometric access control

Basic physical barriers at entrances and exits and locking systems should be provided for in every museum in both public spaces as well as storage and archive areas. These should be monitored regularly.

5.3 Planning for Evacuation and Coordination with Emergency Responders

Each museum needs to have a clear plan for evacuation of people during an emergency with the following:

1. Clearly marked exit routes with universally understood emergency signage. Evacuation may use a primary route and/or secondary routes. The evacuation pathway must conform to NBC Code and Standards and must be free from obstruction and remain lit even during the loss of power. All evacuation maps should be displayed at significant locations, particularly public areas in museums.
2. Fire exits, fire staircases and fire towers should be clearly marked and their access must be clear of any obstruction at all times.
3. Assembly/refuge points for people within the site or in the neighbourhood.
4. Adequate training for responding to specific emergency situations where external assistance may be difficult to arrange. This means preparing for large-scale disaster where the existing emergency infrastructure and resources may be directed towards basic services and may be unavailable for the museum.

Evacuation routes should be tested through drills and training exercises and should be universally accessible and clearly marked. Museum staff should be familiar with the evacuation plan and also with procedures to assist visitors evacuate, including special assistance required for differently abled, elderly, children, etc.

Evacuation should be discussed and coordinated with local emergency responders such as the fire station and local police so that in an actual emergency these pathways are clearly communicated to both the evacuees and the emergency responders.

5.4 Emergency Response Systems

Each museum must be equipped with the following:

1. Fire suppression systems that respond to the specific needs of the museum. Standard sprinkler systems or water based systems

may not be effective and may cause more damage to the collections in case of a fire. Foam-based systems may leave behind deposits that damage certain objects. Therefore, it is important to understand the nature of collections as well as the potential ignition sources before installing fire extinguishing systems. All staff and management should be regularly trained in the usage of these systems, which should be easily accessible, regularly serviced and replaced when needed.

- Public address systems and provision for wireless communication in case of loss of telephonic networks and communication. This could include walkie-talkies, hand-held radios and intercom systems.

- Automated security protocol like automated door locking, cut-off for elevators systems and access to potentially hazardous areas within the building, cut-off for electrical supply and water supply systems.

5.5 Creating an Emergency Team

The hierarchy of the emergency team and the allocation of responsibilities should be clear and communicated to all staff members of the museum. Since museums can be of different scales in terms of staffing, the size of the team will vary. The same person/teams may have to assume multiple responsibilities depending on the size of the staff. At the same time, within a larger museum, additional responsibilities may need to be allocated. The in-house emergency team should be in coordination with local and city/village level emergency services.

A basic structure is illustrated below:

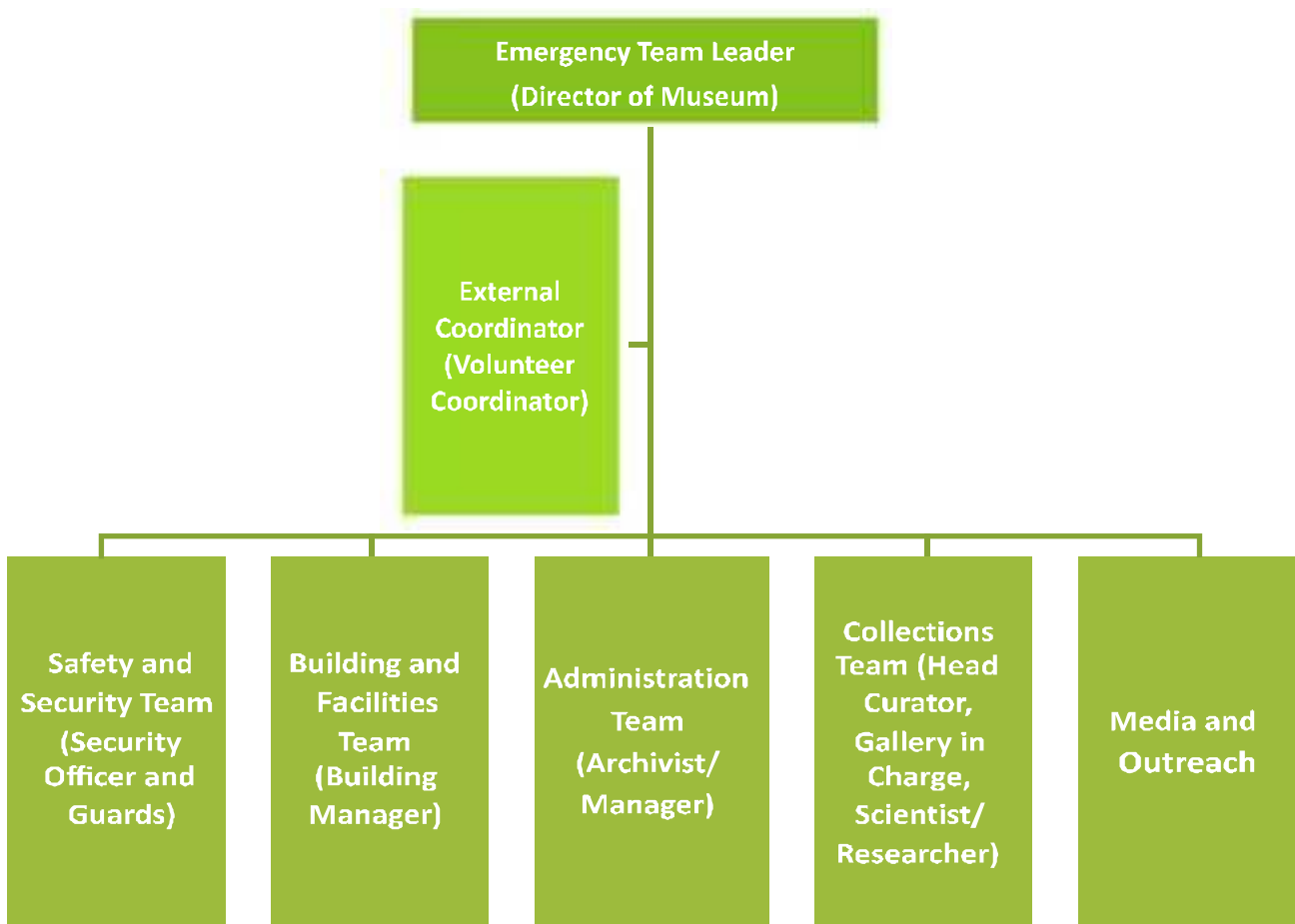


Figure 10 Structure of Roles and Responsibilities of an Emergency Team

5.6 Roles and Responsibilities of an Emergency Team

A clear Emergency Response Protocol should be established that clearly indicates the flow of communication. Roles and responsibilities will be

assigned based on the scale and typology of the museum. Regular drills are required in order to test the capability and preparedness of the team and build capacity over a period of time. A brief indicative summary of the roles and responsibilities of individual teams is given below:

Team Member	Pre-Disaster	During Disaster	Post-Disaster
Emergency Team Leader	<p>Set up an Emergency Response Plan, Evacuation Routes</p> <p>Assign responsibilities to rest of the team</p> <p>Arrange a budget for implementing the plan</p> <p>Carry out regular drills and workshops</p>	<p>Inform emergency responders, initiate evacuation process</p> <p>Ensure updates at regular intervals from in-house team and from emergency responders</p>	<p>Discuss post- disaster strategies with in- house team and other stakeholders</p> <p>Assign resources for initial assessment</p> <p>Use assessment to develop a long - term recovery plan along with fund raising strategy, if needed</p>
External Coordinator	<p>Use workshops and training programmes as an opportunity to develop a trained team of volunteers</p> <p>Record the details of volunteers in a data base</p>	<p>Assess with emergency team leader if external assistance is required</p> <p>Create teams of volunteers and give them adequate briefing for ensuring desired response</p>	<p>Use volunteer team assistance in conjunction within house activities - and check where assistance is most required</p>
Safety and Security Team	<p>Ensure that all members of the security and management staff attend training and drills regularly</p> <p>All security staff should be conversant with the different responses to different kinds of emergencies, and basic CPR and first aid</p> <p>Security members should know locations of valuable collections security systems and backup available</p>	<p>Ensure that evacuation and emergency response protocol is initiated</p> <p>Assist differently abled, elderly, children and women in evacuation</p> <p>Ensure that no visitors enter unauthorised or dangerous areas</p> <p>If space is safe, ensure safety of collections</p> <p>Cordon off building and access in cooperation with local fire/police</p>	<p>Ensure access to building is controlled and that removal and storage of collections is done under supervision to avoid theft or vandalism</p>

<p>Building and Facilities Team</p>	<p>Ensure that building services and building is maintained as per annual, monthly and daily schedules</p> <p>Audits of building services and emergency services should be done regularly</p> <p>All defunct services should be upgraded regularly</p>		<p>Modify (stabilise) the environment (remove wet material, open windows, fans)</p> <p>Arrange temporary storage area, if needed</p>
<p>Administration Team</p>	<p>Ensure that archives and records are safe and a copy is available at a secondary location</p>		<p>Make available all administrative support to collections team and buildings team, and act as a coordinating agency</p>
<p>Collections Team</p>	<p>Ensure that all collections are documented and that locations and accession details of all objects are documented along with backup in digital formats.</p> <p>Collections staff should be familiar with the priority objects within the collection as well as protocol for temporary removal of the objects</p>	<p>Retrieve collections only if there is no direct threat to human life or safety and after being given a clear directive from the emergency responders</p>	<p>Ensure that all damage is documented and photographed</p> <p>Determine what is needed for recovery—volunteers, material and equipment, outside expertise, space, specialised storage or treatment facilities.</p>
<p>Media and Outreach Team</p>	<p>The team should be familiar with the functioning of the museum and the locations and numbers of the collections</p>	<p>Prepare a brief update for media only after verification of key information and authorisation of museum director / emergency team leader</p>	<p>Update media regarding extent of damage, resources required for recovery if needed</p>

Figure 11 Description of Roles of Emergency Team

5.7 Emergency Supplies and Equipment

Each museum should have readily available emergency supplies and equipment for the easy evacuation of people and the retrieval of objects and collections. This list should be compiled based on a detailed investigation into the requirements of the museum. An indicative list is given, below:

1. For Evacuation of People

- Emergency lights, flashlights
- First aid kits
- Masks
- Wheelchairs and stretchers as needed

2. For Salvage of Objects

- Hard hat or helmet
- Safety goggles

- Masks
- Flashlights and Emergency Lamps
- Assorted gloves including standard rubber gloves, acid resistant gloves, heat resistant gloves or mitts
- Assessment forms and clipboards with stationery
- Cameras with spare battery packs and spare memory cards
- Caution tape
- Labels and stick-on tags
- Duct tape
- String and Rope
- Basic toolbox
- Basic storage boxes and packing material



Section 6

Post Disaster Assessment, Recovery and Rehabilitation



- 6.1 Post-disaster Assessment
- 6.2 Basic Procedures for Documentation and Assessment of Post-disaster Damage
- 6.3 Emergency Stabilisation and Temporary Storage
- 6.4 Funding, Partnerships and Business Planning
- 6.5 Linking Recovery to Risk Reduction

Once the disaster response stage has been completed and the museum has been secured and stabilised, the next phase of assessment, recovery and rehabilitation is initiated.

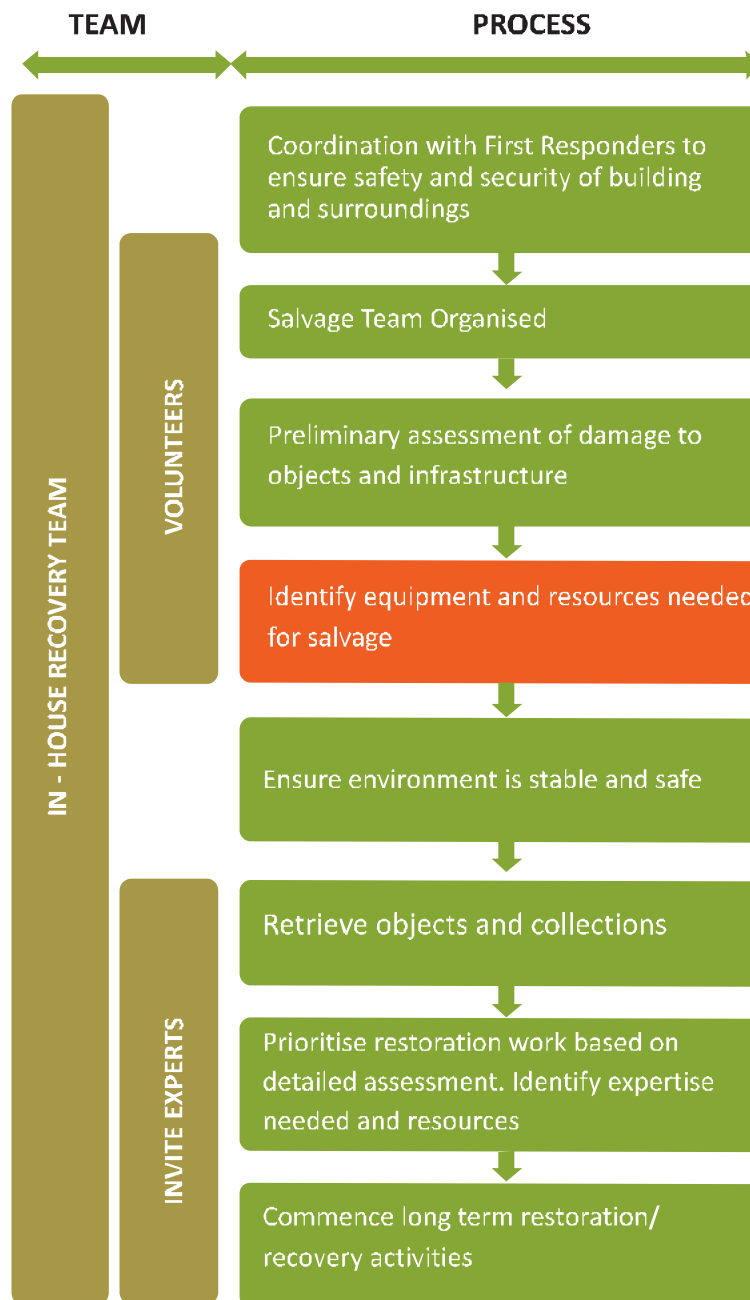


Figure 12 Processes of Post Disaster Assessment, Recovery and Rehabilitation

6.1 Post-disaster Assessment

Once the response phase to the disaster is successfully underway, it is important to take stock of the situation and conduct a preliminary assessment of the impact of the disaster in order to initiate the recovery phase.

An assessment is first needed of the museum building and site to ensure that the area is safe for entering and carrying out salvage or recovery operations. This assessment should be undertaken by a qualified professional in case there has been structural impact to the building itself or to the essential services.

The following aspects should be considered during the assessment of the collections:

- **Timelines** for carrying out preliminary assessment and detailed assessment of damage: Based on the nature and scale of disaster, the scope of the assessment will vary. This will determine whether a small scale exercise is needed or an exhaustive inventory
- **Procedures and methodology** for carrying out damage assessment. The general approach is to begin with a basic visual assessment and survey followed by a detailed analysis
- **Formats of documentation and assessment of damage.** Formats for documentation and assessment of damage follow some basic principles and can be adapted to different scenarios
- **Compiling the data and findings in a meaningful way** to inform the process of post-disaster recovery actions. The collected data could potentially be needed to raise funds or generate other resources and needs to be compiled in a simple yet effective manner

6.2 Basic Procedures for Documentation and Assessment of Post-disaster Damage

Preliminary assessment can be undertaken with museum staff, trained volunteers and allied professionals. However a detailed damage assessment requires expertise in the area, so for instance structural damage should be assessed by a qualified structural engineer/architect, while collections should be assessed by a conservator or a trained curator.

Documentation and assessment should be prioritised based on the following (Moore 2004):

1. Objects and collections at highest risk
2. Objects and collections which are most accessible
3. Objects that are on the list of priority collections
4. Objects that are the most vulnerable
5. Objects that have suffered greatest impact
6. Objects that have suffered least impact or are relatively stable

The basic procedures involved in post-disaster assessment are (ICCROM):

1. **Assessment of the context.** It is essential to ensure that the building and surroundings are safe for entering and working and that it is secure and basic services to the museum are available.
2. **Evaluating initial assessment.** An overall picture of the site damage will enable the rescue team to list out immediate needs and resources, gather permissions and assistance, set out criteria for salvage procedures and develop the initial plan.
3. **Secure and stabilise museum and collections.** Depending upon the scale of the disaster, it may be necessary to first secure

the building itself before undertaking any salvage operation. Some collections may not be immediately movable and may need to be stabilised in-situ. Drawings of the museum building indicating its condition should be readily available, especially if the building is a heritage structure. The site may be vulnerable to further security threats like vandalism or theft, so additional security may be added.

4. **Salvage or transfer of collections based on initial assessment.** While preparing the disaster risk management plan for the museum, the locations of temporary storage and refuge should be identified and communicated to the staff and management. Based on initial assessment, it may be deemed urgent to remove certain items from their location and shift them to a more secure temporary location. This should be undertaken only if the museum has been deemed unsafe and if a more secure location is available with adequate resources and security provision.
5. **Detailed assessment of the collections.** This should be undertaken by qualified and trained professionals. Detailed assessment should be accompanied with exhaustive documentation, visual as well as descriptive, to keep a detailed record of the condition of the object prior to any treatment.
6. **Damage assessment forms should contain the following information:**
 - Identification or accession number of the object
 - Description of the object, specifically materials and size and any special characteristics
 - Location of the object
 - Basic condition- intact/broken, water damage, fire damage, biological damage, etc.

- A note on whether the object is still at risk. For example, water damage can lead to biological damage if not treated urgently. This will help in prioritising remedial action
- If multiple fragments exist, they should be recorded photographically using a simple scale or grid

6.3 Emergency Stabilisation and Temporary Storage

Based on the post-disaster assessment, objects may be earmarked from emergency stabilisation as well as salvage and careful transfer to a temporary storage facility. Salvage procedures may include sifting through rubble and identifying fragments and relocating them to more secure locations.

If carried out, the stabilisation treatments should be carefully recorded and condition of the object before and after the treatment should be documented visually and through description.

Temporary storage:

Both evacuation and salvage can involve setting up of a temporary storage as the original location might be unsafe. Setting up such a space includes a documentation plan for locating objects and appropriate fixtures and furniture in order to mitigate future risks. This is especially important if timelines for recovery are unclear.

6.4 Funding, Partnerships and Business Planning

Based on the assessment stage, a recovery plan can be drawn up for the museum. The sequence of creating a recovery plan and emergency stabilisation procedures depends largely on the scale of disaster, the extent of damage and the availability of resources. Depending on the impact of the disaster, the museum may need to raise financial resources as well as recruit external agencies for repairs to the building, the display systems and the collections themselves. It is important to prioritise action based on the following aspects:

- **Business recovery and continuity plan:** This kind of plan focuses on getting the museum functional as soon as possible in order to generate revenue and maintain interest of visitors and stakeholders. It may involve focusing recovery efforts on parts that are least damaged to ensure maximum return on investment. Conversely, the focus of the recovery plan may be on the collections with the maximum significance, so as to ensure the objects with the greatest value are preserved for future. The prioritisation of allocation of resources will depend largely on the goals of the business recovery plan, so it is important to involve stakeholders in this process.
- **Funding and Resources:** Funds may be available through government grant schemes, insurance schemes, grant making organisations, private individuals, etc. A clear

business plan with timelines and set objectives will enable the museum to raise the funds needed for its recovery. Apart from monetary assistance, external expertise may also be needed, so a log of volunteers, both trained as well as untrained should be maintained by the museum.

6.5 Linking Recovery to Risk Reduction

The recovery process should be linked directly to the reduction of future risks to the museum. Often, the post-disaster recovery process offers valuable lessons in managing risks and emergencies. The disaster also highlights risks that may not have been assessed accurately during the preparation of the plan; these can be incorporated while updating the plan. The application of various methodologies, capacity building and training as well as involving stakeholders are all aspects that will help improve future planning and initiatives for disaster risk management.



Section 7

Generating Awareness, Training and Capacity Building

- 7.1 Training of Staff and Management
- 7.2 Generating Awareness Among Visitors
- 7.3 Training of Disaster Management Professionals,
Disaster Response Forces
- 7.4 International Cooperation and Exchanges

Regular training and capacity building is an integral component of disaster risk management. All museum staff and management need to be adequately prepared in disaster response measures. This must be a recurring process to ensure that new staff members are initiated and continuity of response protocols is maintained. Volunteers should also be encouraged to participate in such exercises to raise awareness on a larger scale. Institutions for disaster risk management, such as the National Institute for Disaster Management (NIDM) along with institutions for Museology and Conservation Studies such as the National Museum Institute (NMI), should integrate modules that look at the specific aspects of disaster risk management for museums into their curricula.

Before undertaking training in the form of drills or longer programmes, the following activities should be done:

7.1 Training of Staff and Management

1. Undertake risk analysis and risk prioritisation and assess existing capacities of the staff and management.
2. Identify each of the critical functions of staff and design emergency team and structure.
3. Develop standards and protocols for preparedness and response.
4. Identify external resources and partnerships needed in order to carry out specific drills and exercises.
5. Prepare a draft disaster plan and use it as a test for undertaking drills and simulations and update the plan based on the response.
6. Additionally, training and awareness building activities should be undertaken based on specific hazard typologies and specific risks that a museum may face.

Training can be undertaken in the following formats

Programme	Description	Frequency	Participants
Creating a Disaster Risk Management Plan	<p>This training should provide an understanding for the need for an integrated approach to disaster risk management. Participants should be able to undertake risk assessment, incorporate measures aimed at reducing disaster risks, responding to disasters and recovering from them.</p> <p>Participants should be able to implement, monitor and update disaster risk management plans and collaborate with the local community and other stake holders at each stage of the disaster risk management process.</p>	Prior / During Disaster Risk Management Planning Phase, with follow-up workshops	Key administrators of Museums (Director)

Risk Assessment Training	Participants should be able to undertake risk assessment of the building, infrastructure, management and collections.	Annual	Key administrator and all museum staff and curators
Basic Security Protocol Delivery	Basic training about critical infrastructure, security and standard responses.	Once a month	Security staff, managers
Table Top Exercise	A Table Top Exercise is a paper drill intended to demonstrate the working and communication relationships of functions found within the disaster risk management organisational plan.	Once in 3months	Intended primarily for administrators, managers and personnel who could conceivably be placed into an officer's position up on activation of the disaster risk management plan.
Emergency Drill or Workshop at Museum Level	A drill that engages the entire staff and management and prepares the museum for likely disaster scenarios and the appropriate responses Ideally visitors should also be made to participate in this drill to raise awareness and to provide a realistic scenario to staff and management	Once in 6 months	Museum staff and management Museum volunteers, Emergency Responders
Emergency Drill or Workshop at District Level	These drills will be held at a larger scale under District Disaster Management Plans (DDMPs).	According to DDMP	Museum staff, management and visitors
Post- disaster assessment and recovery– Basic Training	This specialised training should enable curators and gallery staff in post-disaster recovery, salvage and assessment procedures in the event of a disaster.	Once a year or once in 2 years	Curators, gallery staff, conservators
Specialised training for - Post Disaster assessment and training	This training aims at building specialised capacity national level among museum professionals	Integrated as smaller modules within a1 year or 2-year degree programme	Conservators, academics, institutions

Figure 13 Capacity Building and Training Programmes

7.2 Generating Awareness Among Visitors

Most visitors to a museum are unaware of its emergency protocol. Clear signage, exit routes and an emergency exit plan that is simple to understand should be provided to every visitor. Visitors should also be given incentives to participate in drills and disaster risk simulation exercises in order to raise awareness. Museums are institutions meant to engage with communities, especially children and youth groups, and they provide a unique platform to discuss disaster risk management with their visitors in innovative ways.

7.3 Training of Disaster Management Professionals, Disaster Response Forces

Emergency responders such as fire fighters, police, NDRF etc. are currently ill-equipped to respond effectively to disasters affecting sites/objects and collections with heritage values which often need specialised handling. Museum security staff such as those deputed by CISF will be the first responders in an emergency, and therefore require specialised training to manage the refuge, stabilisation of objects and collections as well as understand the

correct approaches towards carrying out emergency response. This should be taken up as a part of the capacity building initiatives for emergency responders over the long term.

For example, in case there is a fire in a museum, standardised sprinkler systems or even powder based fire extinguishers may actually cause more damage to the objects than the fire or smoke itself. It is important for the emergency responders to be familiar with the appropriate response procedure with respect to collections, for which they must be trained regularly.

7.4 International Cooperation and Exchange

International cooperation, developing networks across countries especially within the SAARC network is an important aspect of building capacity for disaster risk management of museums. Institutions such as UNESCO, ICOM, ICCROM, ICOMOS etc. can contribute towards training activities, raising awareness and promoting research into this area. In November, 2015, UNESCO adopted the text on the Protection and Promotion of Museums and Collections, their Diversity and their Role in Society. In particular, learning from best practices internationally would benefit museums in India.

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Annexures

1. State-wise List of Museums
2. Museum Typologies and Introduction to Museum Collections
3. State-wise Profile of Museums and Hazards
4. List of National and State Archaeological Acts
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 - 5.1 Risk Assessment Process
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6. Checklists for Emergency Preparedness and Response
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 - 6.3 Checklist for Buildings and Infrastructure Assessment
 - 6.4 Collections Checklist
7. References from the National Building Code

1. State-Wise List of Museums

States	Controlling bodies of museums											
	ASI	Central Government	State Government	Private/Public trust	Board	Private	University/College	Registered Society	Municipal Corporation	Autonomous/ Financed by Central Govt.	Autonomous	Gandhi Smriti Trust
Andaman & Nicobar Islands		2								1		
Andhra Pradesh	4	4	28	4	1	1			1	2		
Arunachal Pradesh			13				9					
Assam	1	1	14	1		1		2		1		
Bihar	4	6	15			2	1	2				
Chandigarh		1	1				4					
Chhattisgarh		1	1				1					
Delhi	5	19		7		2	1	3		3		
Goa	1	2	1	5		4		2		1		
Gujarat	2	3	13	17		2	7		4	1		3
Haryana	1	1	2	1	1	1		1		1		
Himachal Pradesh	1	2	3	1		3	2			1		
Jammu and Kashmir		2	2	1		2	1	4				
Jharkhand		2	3				1	1				
Karnataka	6	11	9	3		2	13	2		2		
Kerala	1	3	13	1		9	1	2		1		
Madhya Pradesh	4	12	24	3		4	4	3	1	1		
Maharashtra		8	12	8		7	2	3	3	2		
Manipur			10	1		11	2	4				
Meghalaya		2	4					2				
Mizoram			4					1				
Nagaland			1					1				
Odisha	2	3	18	1		4	2			3		
Puducherry			2									
Punjab	1	1	10			1	3			1		
Rajasthan	2	6	23	12		4		3				

Tamil Nadu	1	6	35	8		5	10	6		1	2	
Tripura			2			1						
Uttar Pradesh	4	16	22	5		3	31	6		3	1	1
Uttarakhand	1	14	2			1	6	3		2		
West Bengal	3	14	14	9	1	14	8	5		10	4	1

2. Museum Typologies and Introduction to Museum Collections

Types of Collections- Some Examples

Based on Theme

- Archaeological
- Fine Arts
- Arts and Crafts
- Textiles
- Coins
- Natural
- Arms and Weapons
- Jewellery

Based on Material

- Wood
- Paper
- Textile
- Metal
- Ceramic
- Stone
- Glass Terracotta
- Bone/ Skin

3. State-wise Profile of Museums and Hazards

Name of State	Number of Museums	Hazards					
		Earthquake	Flood	Wind Hazards	Tsunami	Cyclone	Landslide
Andaman and Nicobar Island	3	Zone V			High Vulnerability (Indian Tsunami 2004)	High Vulnerability (Cyclone Hudhud, 2014)	
Andhra Pradesh & Telangana	40	Zone III (central and south) & II (north and south west)			High Vulnerability (Indian Tsunami 2004)	High Vulnerability (Cyclone Hudhud, 2014)	
Arunachal Pradesh	13	Zone V	Annual flood in some parts of the state due to Brahmaputra river		N/A	N/A	High vulnerability
Assam	30	Zone V	Annual flood at the time of monsoon		N/A	N/A	
Bihar	26	Zone V (north central), IV (north) & III (south)	Annual flood due to Koshi river		N/A	N/A	
Chandigarh	6	Zone IV			N/A	N/A	
Chhattisgarh	3	Zone III & II			N/A	Vulnerable (Cyclone Hudhud, 2014)	
Delhi	35	Zone IV	Flood at the time of monsoon in the area near Yamuna river		N/A	N/A	
Goa	15	Zone III				Vulnerable because of Coastal boundary	Vulnerable

Gujarat	50	Zone V (north and north-west), Zone IV (Central), Zone III (south and south-west)				Vulnerable (Cyclone Yemyin, 2007)	Vulnerable
Haryana	7	Zone IV (north-east and south-east), Zone III (west)			N/A	N/A	
Himachal Pradesh	12	Zone V (west), rest of the State comes under Zone IV			N/A	N/A	Vulnerable
Jammu and Kashmir	12	Zone V (north west), rest of the State comes under zone IV			N/A	N/A	Vulnerable
Jharkhand	7	Zone III & II			N/A	N/A	
Karnataka	42	Zone III and II				Vulnerable (Cyclone Phyan, 2009)	Vulnerable
Kerala	30	Zone III			High Vulnerability (Tsunami in 2004 and in 2012)	Vulnerable (Sri Lanka Cyclone, 2000)	
Madhya Pradesh	51	Zone III & II			N/A	Vulnerable (Cyclone Hudhud, 2014)	
Maharashtra	45	Zone IV, III & II				Vulnerable (Cyclone Phyan, 2009)	Vulnerable
Manipur	29	Zone V			N/A	N/A	Vulnerable
Meghalaya	8	Zone V			N/A	N/A	Vulnerable
Mizoram	5	Zone V			N/A	N/A	Vulnerable
Nagaland	2	Zone V			N/A	N/A	Vulnerable
Odisha	30	Zone III & II			High Vulnerability (Tsunami in 1999 and in 2004)	High Vulnerability (Cyclone Hudhud, 2014)	

Puducherry	2	Zone II			High vulnerability (Indian tsunami 2004)	Vulnerable (Cyclone Hudhud, 2014)	
Punjab	16	Zone IV (North), Zone III (south)			N/A	N/A	
Rajasthan	48	Zone IV (West), Zone			N/A	N/A	
Tamil Nadu	72	Zone III & II			High Vulnerability (Indian tsunami in 2004)	High Vulnerability (Cyclone Madi, 2013)	
Tripura	3	Zone V			N/A	N/A	Vulnerable
Uttar Pradesh	88	Zone IV (north-east and north-west), Zone III (Central), Zone II & I (South)			N/A	Vulnerable (Cyclone Hudhud, 2014)	
Uttarakhand	28	Zone V (east), Zone IV (west)			N/A	N/A	
West Bengal	77	Zone IV, III & II			Vulnerable because of costal boundary	Vulnerable (Cyclone Aila, 2009)	

Name of Museum		Hazards										Total area	Estd.	Number of Visitors
		Natural Hazards					Human-made Hazards							
		Earthquake	Landslide	Floods		Wind Hazards	Vandalism	Stampede	Fire	Nuclear Hazard				
National Gallery of Modern Art	New Delhi	Zone IV	N/A			Very high damage risk zone (v=50m/s)	Vulnerable		Vulnerable	N/A	1936			
National Gallery of Modern Art	Mumbai	Zone III	N/A			High damage risk zone (v=47 m/s)	Vulnerable		Vulnerable because of the presence of BARC nuclear power plant.	N/A				
National Gallery of Modern Art	Bangalore	Zone III	N/A			Low damage risk zone (v=33 m/s)	Vulnerable			N/A		3.5 acres		
Salar Jung Museum	Hyderabad	Zone II	N/A			High damage risk zone (v=47m/s)	Vulnerable		Vulnerable (November 3, 2006 fire)	N/A		10 acres		
Victoria Memorial	Kolkata	Zone IV	N/A			Very high damage risk zone (v=50m/s)	Vulnerable			N/A	1921	5.7 acres	20 lakhs in 2013-14	
Allahabad Museum	Allahabad	Zone III	N/A			High damage risk zone (v=47m/s)	Vulnerable			N/A	1931			
National Research Laboratory for Conservation of Cultural Property	Lucknow	Zone III	N/A			High damage risk zone (v=47m/s)	Vulnerable			N/A	1976			
National Museum	New Delhi	Zone IV	N/A			High damage risk zone (v=47m/s)	Vulnerable			N/A	1949			
National Museum Institute of History, Conservation and Museology	New Delhi	Zone IV	N/A			High damage risk zone (v=47m/s)	Vulnerable			N/A	1989			
Indian Museum	Kolkata	Zone IV	N/A			Very high damage risk zone (v=50m/s)	Vulnerable			N/A	1814			

4. List of National and State Archaeological Acts

NATIONAL ARCHAEOLOGICAL ACTS

- The Treasure Trove Act, 1878
- The Ancient Monuments Preservation Act, 1904
- The Ancient Monuments and Archaeological Sites and Remains Act, 1958
- The Ancient Monuments and Archaeological Sites and Remains Rules, 1959
- The Antiquities and Art Treasures Act, 1972
- The Antiquities and Art Treasures Rules, 1973
- The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010

STATE ARCHAEOLOGICAL ACTS

- Amendment to Andhra Pradesh Ancient and Historical Monuments and Arch Sites and Remains Act 1960_2001
- Arunachal Pradesh Ancient Monuments, Archaeological Sites, and Remains Preservation Act, 1990
- Assam Ancient Monuments and Archaeological Sites and Remains Act, 1959
- Bihar Ancient Monuments and Archaeological Sites Remains and Art Treasures Act, 1976
- Delhi Ancient and Historical Monuments and Archaeological Sites and Remains Act, 2004
- Goa, Daman and Diu Ancient Monuments and Archaeological Sites and Remains Act, 1978
- Gujarat Ancient Monument and Archaeological Sites and Remains Act, 1965
- Himachal Pradesh Archaeology Monuments Sites Act 1976
- Jammu and Kashmir Ancient Monuments Preservation (Amendment) Act, 2010
- Karnataka Archaeology Monuments Sites Act 1961
- Karnataka Treasure Trove Act, 1963
- Kerala Ancient Monuments and Archaeological Sites and Remains Act, 1968
- Madhya Pradesh Ancient Monuments and Archaeological sites and Remains Act, 1964
- Maharashtra Ancient Monuments and Archaeological Sites and Remains Act, 1960
- Meghalaya Heritage Act, 2012
- Mysore Ancient and Historical Monuments and Archaeological Sites Rules 1965

- Odisha Ancient Monuments Preservation Act,1956
- Punjab Ancient and Historical Monuments and Arch Sites and Remains Act,1964
- Rajasthan Monuments, Archaeological Sites, and Antiquities Act,1961
- Tamil Nadu Ancient and Historical Monuments and Archaeological Sites and Remains Act,1966
- Telangana Heritage (Protection, Preservation, Conservation, and Maintenance) Act,2017
- Tripura Ancient Monuments and Archaeological Sites and Remains Act,1997
- U.P. Ancient and Historical Monuments and Archaeological Sites and Remains Preservation Act,1956
- West Bengal Preservation of Historical Monuments and Objects and Excavation of Archaeological Sites Act,1957

5. Basic Checklists for Risk Assessment

5.1 Risk Assessment Process

Action	Time line
Identify all natural hazards based on meteorological, hydrological, geological data	Disaster Management Planning stage
List of previous disasters and their impact in the area	
Assessment of building and basic infrastructure-identifying vulnerabilities	Disaster Management Planning stage and annually afterwards
Detailed inventory of collections, prioritising value and risk	
Assessment of management and staffing issues	
Prioritisation of risk based on probability and impact	

5.2 Identifying Hazards

Natural Hazards

Name	National Zone	Micro - zonation	Previous event in the area	Potential Impact
Earthquake				
Tsunami				
Cyclone				
Fluvial Flood				
Flash Flood				
Tropical Storm				
Dust storm				
Wild fire/ Forest Fire				
Epidemics/ Pest Attacks				
Others (Specify)				

Human Induced Hazards				
Name	Related Factor	Possibility	Previous event in the area	Potential Impact
Arson				
Conflict				
Terrorism				
Vandalism				
Accident -Chemical				
Accident -Industrial				
Accidental Fire				
Others (Specify)				
Others (Specify)				

5.3 Identifying Vulnerabilities- An indicative checklist

BUILDINGS, SURROUNDINGS AND INFRASTRUCTURE

- Building shows signs of structural distress, like cracks, settlement, etc.
- Building layout makes it difficult to access all areas easily
- Building layout makes it difficult to monitor all areas
- Building is located within a high risk area, where it is difficult for emergency services to gain access
- Building is located at a lower point with respect to its context and drainage is inadequate in the vicinity
- Electrical wires are old, outdated and exposed or electrical system is overloaded
- Electrical distribution system is either exposed or improperly installed
- Drainage from roof and terraces is either inadequate or poorly maintained
- Drainage in wet areas is inadequate or poorly maintained
- Sewage system is outdated, inadequate or poorly maintained
- Ventilation in the building through natural means is inadequate
- Mechanical ventilation is inadequate
- Excessive fluctuation of humidity and temperature inside the museum, especially where collections are displayed and stored
- No monitoring or inadequate monitoring of humidity and temperature
- Inadequate pest control procedures
- Inadequate lighting and no emergency back-up for lighting

- Inadequate signage for visitors
- Access and exit points do not adhere to codes
- Access and exits are either blocked or unreachable
- It is possible to tamper with access into museum especially restricted areas

VISITOR MANAGEMENT AND SECURITY SYSTEM

- Insufficient security staff
- Insufficient managerial staff
- Inadequately trained security staff
- Inadequate automated security system or lack thereof
- No clear chain of command for locking up or opening the museum
- No manual back-up for security in case of emergency
- No protocol in place for emergency response
- No list of emergency contacts
- Background verification of all staff members

COLLECTIONS MANAGEMENT

- Collections are not documented or partially documented
- The location of all objects is not known
- Shelving not braced to earthquake standards especially if museum in identified earthquake risk zone
- Shelves are outdated, overloaded, improperly loaded
- Archival collections not enclosed in weather resistant boxes
- Collections stored on the floor or close to the ground
- Valuable collections stored near windows, ventilators, near drainage points or near flammable material
- No climate control mechanisms in place
- Building is closed for extended periods of time
- No pest control or biological control in place
- Signs of termite, insect, mould, fungal infestation
- Collections stored in the basement
- Collections stored in the attic

CRITICAL INFRASTRUCTURE

- There are no fire detection systems in the museum
- There are no fire suppression systems like fire hydrants, fire extinguishers, sprinklers etc. in the building
- There are no climate monitoring systems in the museum
- There is no evacuation plan
- Evacuation routes are not displayed prominently and publicly
- Elevators have an automated back-up and cut-off systems for emergency
- Fire stairways and doors conform to existing codes
- Emergency supplies are available within museum
- All critical infrastructure is checked and monitored regularly

6. Checklists for Emergency Preparedness and Response

6.1 Checklist for Preparing for Emergency Response

Action	Yes/No/Don't Know
All staff members are aware of their roles and responsibilities in case of an emergency or disaster	
A directory of contacts exists and is displayed at prominent locations with updated contact details	
Initial contact has been made with local emergency responders for familiarising them with evacuation routes and key areas that need attention in an emergency or disaster	
Emergency contact tree exists and is available to staff	
A well-equipped first aid kit is available in the museum and is checked and restocked regularly	
Basic emergency supplies exist such as tarpaulin sheets, cordoning tape, flashlights, gloves, masks, etc.	
Fire extinguishers are in functional condition and staff members are familiar with their usage	
Key areas with valuable collections are secure with backup security arrangements	
Fire detection systems installed in all key areas	
Basic security systems-both automated and manual installed	

6.2 Indicative Checklist for Evacuation

Checklist for Preparing for Evacuation	
Evacuation Plan	Status
A diagrammatic representation of the building layout with exit paths marked for each floor located near main circulation areas	
Exit routes that are simple, clearly represented and easy to understand	
All main circulation paths adhere to National and State Building Standards and Building Bye -Laws and are free from obstruction and are universally accessible as far as possible	

All evacuation plans should have designated refuge areas for people as well as objects within the museum complex and within the vicinity	
Emergency lighting should be provided on main circulation routes	
All emergency exits and fire doors and fire towers should be operational and kept free of obstruction	
Designation of a refuge area where people can gather once they are evacuated	
Procedure for people once they are gathered in the refuge area	
Emergency Signage is installed in identified locations, near emergency exits and adheres to BIS	
All staff members are familiar with the evacuation plan and pathways and the refuge areas	
Evacuation plan has been tested through multiple drills	

6.3 Checklist for Buildings and Infrastructure Assessment

Building Checklist			
Nature of disaster/emergency			
Date and Time			
Is the disaster/emergency ongoing	Ongoing	Complete	
Has the emergency response phase been completed	Ongoing	Complete	
Has the building been declared safe for entry	Safe	Unsafe	Not Examined
Who has declared it safe for re-entry			
What is the extent of damage	Severe	Moderate	Minor
Are there structural concerns	Yes	Don't Know	No
Are there any continuing agents of risk	Smoke	Water	Chemicals
	Heat	Moisture	Gases
	Ashes	Mould	Particulates
	Debris	Pests	Dust
Are all spaces easily accessible	Yes	Don't Know	No

6.4 Collections Checklist

Some basic stabilisation processes have been listed below (Soderlund 2000, ICCROM 2008) Please note, that collection should be assessed and stabilised by experts/trained professionals

Category of Damage	Impact	Possible Stabilisation Treatment
Fire Damage	This may include soot deposition, partially or completely disintegrating material, smoke damage, discolouration, warping, twisting, charring, blistering and water damage due to fire suppression methods, etc	Dry surface cleaning or wet cleaning depending on material, consolidation, etc.
Water Damage	This may include dampness, mud or soiling, swelling, discolouration, rust, erosion, biological damage, etc.	Air drying, freeze drying, ventilation, cleaning, etc.
Structural or Impact Damage	Broken object, cracks, twisting, chipping, lamination, tearing, bending, etc.	Filing, filling, sealant, etc.
Biological Damage	Mould, termites, insect attacks, fungal growth, animal faeces or decomposing matter, swelling, increased heat or moisture, etc.	Non-chemical treatment, chemical fumigation, fungicide or insecticide depending on material, air drying, gentle heat if appropriate
Damage due to vandalism	Marks, scratches, chipping, breakage, etc.	Cleaning, consolidation

Name of Item or Identification or Description					
Accession Number if Known					
Size of Object or sizes of fragments					
Location where found					
Condition					
Primary Cause of Damage	Structural	Fire	Water	Biological	Others
Secondary Causes of Damage	Structural	Fire	Water	Biological	Others
Structural	Stable	Substantial Damage	Partial Damage	Minor Damage	

Fire	Burnt	Charred	Soot/ Ash	Change in state	
Water	Wet/ Damp	Change in state	Mud/ Silt	Swelling	Mould/ Fungus
Biological	Termites	Insects	Fungus	Mould	Other
Others					
Continuing Risk					
Can object be left in present location					
New location assigned					
Special Packaging needed					
Photographic reference					

7. References from the National Building Code

PART 4: FIRE AND LIFE SAFETY

PART 6: STRUCTURAL DESIGN

SECTION 1: Loads, Forces, and Effects, Referenced from IS 1893 (part 1), 2002 year

SECTION 2: Soils and Foundations

SECTION 3A: Timber

3B: Bamboo

SECTION 4: Masonry

Subsection 7: Reinforced Brick and Reinforced Brick Concrete floors and roofs

Subsection 8: Special Consideration from earthquake point of view

SECTION 5: Concrete: 5A Plain and Reinforced Concrete

Subsection 18.3: Imposed Loads, Wind Loads and Snow Loads

Subsection 18.4: Earthquake Forces

Subsection 19: Stability of the Structure

Subsection 20: Fire Resistance

PART 7: CONSTRUCTION MANAGEMENT, PRACTICES, AND SAFETY

SECTION 4: Safety in construction

Subsection 9: Safety in construction of elements of a building

Subsection 10: Safety in Demolition of buildings

SECTION 5: Repairs, Retrofitting and Strengthening of buildings

PART 8: BUILDING SERVICES

SECTION 2: Electrical and Allied Installations

Subsection 4

Subsection 8

Subsection 11

SECTION 3: Air-Conditioning, Heating, and Mechanical Ventilation

SECTION 5: Installation of Lifts, Escalators, and Moving Walks

PART 9: PLUMBING SERVICES

SECTION 4: Gas Supply

Members of Core Committee (Constituted 13th August, 2015)

Shri Kamal Kishore (Chairman), Member, NDMA

Dr. V. Thiruppugazh, Joint Secretary, NDMA

Smt. Riddhi Mishra, Deputy Secretary, Ministry of Culture Director, Nehru Memorial Museum and Library

Dr. Urmila Sant, Director, Archaeological Survey of India

Dr. Jayanta Sengupta, Secretary and Curator, Victoria Memorial Hall, Kolkata

Shri Jyotindra Jain, Independent Museum Expert, New Delhi

Shri Pramod Kumar K. G., Managing Director, Eka Cultural Resources and Research, New Delhi

Dr. Rohit Jigyasu, UNESCO Chair Professor, R-DMUCH, Ritsumeikan University, Kyoto and President, ICOMOS India

Dr. Anshu Sharma, Director, SEEDS, New Delhi

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