UNDRR
UN Office for Disaster Risk Reduction

MCR 2030 Making Cities Resilient

Disaster Resilience Scorecard For Cities

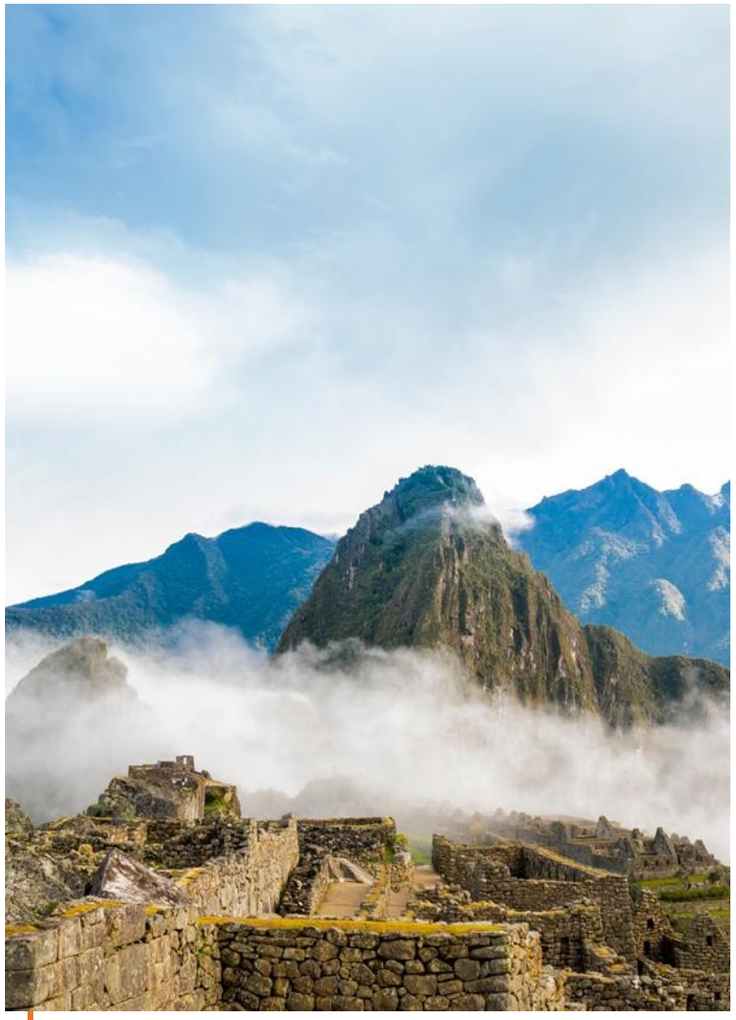
CULTURAL HERITAGE ADDENDUM

MARCH 2026 - VERSION 2.0

Disaster Resilience Scorecard for Cities

CULTURAL HERITAGE ADDENDUM

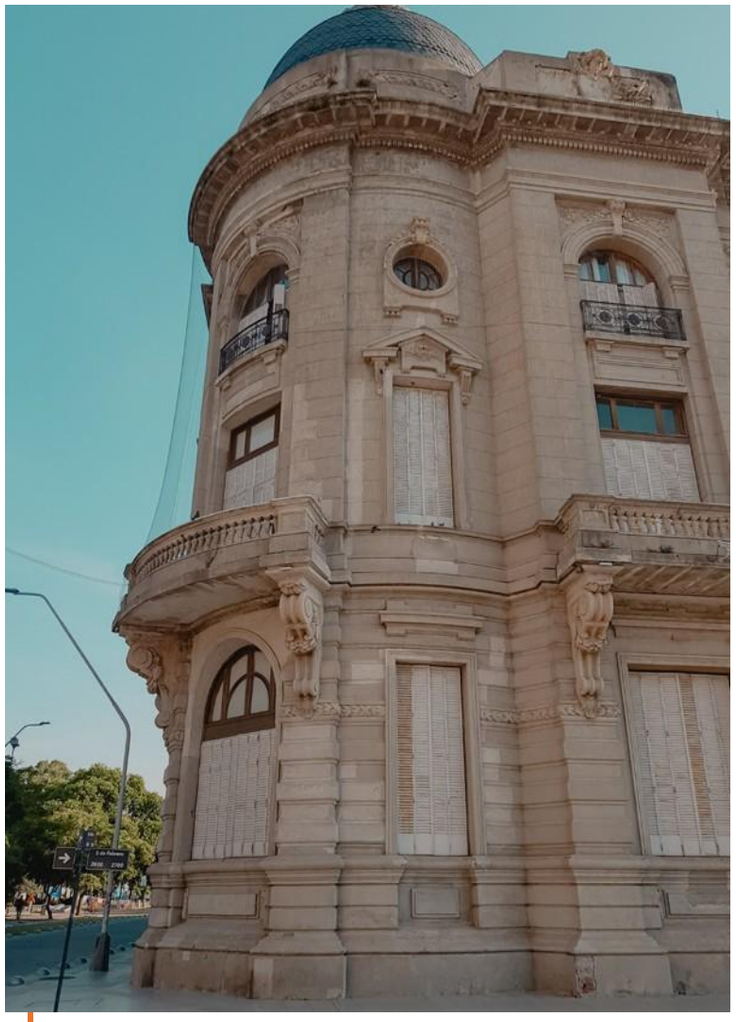
"To protect lives, livelihoods, and cultural heritage, it is important to strengthen the resilience of assets at risk and make cultural heritage management an intrinsic part of disaster resilience." [1]



Machu Picchu - Peru
Photo by Willian Justen de Vasconcellos on Unsplash

[1] *Stanton-Geddes, Zuzana; Soz, Salman Anees. 2017. Promoting Disaster Resilient Cultural Heritage. Washington, DC: World Bank.*

Content table



Santa Fe - Argentina
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Introduction

Cultural heritage (including tangible, intangible, and cultural industries) has a significant potential for reducing disaster risk and actively pursuing sustainable development. While the Sendai Framework for Disaster Risk Reduction 2015–2030 recognizes the importance of including cultural heritage into disaster risk reduction policies, there is still a gap in integrating cultural heritage into national and local disaster risk reduction strategies and vice-versa.

The Sendai Framework calls for integrating a cultural perspective in policies and practices by understanding the impacts on cultural heritage, in all its forms, when specific hazard events occur, and better-identifying risks possibly affecting cultural heritage before disasters occur. It calls for protecting cultural institutions and other historical, cultural heritage, and religious interest sites; engaging with local community cultural networks in managing disasters; and complementing scientific knowledge with traditional, indigenous, and local knowledge and practices in disaster risk assessment. This could be defined as the culture of resilience and the resilience of culture.

We need to understand the impacts of risk on cultural heritage, identify those risks before a disaster occurs, and protect our cultural institutions and other sites of historical, cultural, and religious interest. To better protect lives, livelihoods, and cultural heritage is mandatory to strengthen people's and assets' resilience and make disaster risk reduction an intrinsic part of cultural heritage management. In a post-disaster situation, both tangible and intangible cultural heritage contribute to strengthening identity and social cohesion and inclusion; they operate actively in the recovery process of affected communities.

This Cultural Heritage Addendum to the Disaster Resilience Scorecard for Cities aims to support the development of culture-based and people-centered disaster risk reduction and resilience strategies integrated with cultural heritage and development policies.

The **Disaster Resilience Scorecard for Cities** (the 'Scorecard') is a tool designed to assist countries and local governments in monitoring and reviewing progress and challenges in implementing the **Sendai Framework 2015-2030** at the local level[1]. It is part of the Making Cities Resilient 2030 initiative[2], launched in 2020 by the United Nations Office for Disaster Risk Reduction (UNDRR) and its partners.

[1] *Available at the link: https://mcr2030.undrr.org/disaster-resilience-scorecard-cities*
[2] *https://mcr2030.undrr.org*

This initiative aims to support cities worldwide, raise awareness of disaster resilience, highlight the economic impact of disasters and the need to invest in resilience, develop local disaster risk reduction strategies, and promote knowledge exchange among all concerned institutions, professionals, and citizens.

This Addendum results from a working team that integrates academia, UN entities, resilience partners, and the private sector. Ten heritage cities in Peru piloted the Consultative Version 0.5 as part of a joint project among the UNESCO Office in Peru, the UNDRR Regional Office for the Americas and the Caribbean, and AECOM International Development in 2019-2020. Piura, Trujillo, Lambayeque, Chachapoyas, Lima, Rimac, Arequipa, Ayacucho, and Cusco applied the original scorecard and extended the resilience assessment to include cultural heritage into disaster risk reduction efforts. Findings from these pilots supported further development of this tool and led to the publication of this Addendum in November 2022. Version 2.0, published in March 2026, provides clearer emphasis on key question topics and introduces a structured numbering system, both intended to support and streamline the development of the Excel tool.

Background

Among modern definitions, UNESCO defines **culture** as *"the set of distinctive spiritual, material, intellectual and emotional features of society or a social group that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions, and beliefs."*[3]

Accordingly, **cultural heritage** is the *"sum of those tangible and intangible assets whose cultural and historical value make them essential to preserve as they embody the collective and shared memories and symbolize the identity of a Nation or part of it."*[4] Cultural heritage includes tangible culture, intangible culture, and natural heritage.

Tangible cultural heritage comprises movable and immovable heritage. Following UNESCO's Recommendation on the Historic Urban Landscape[5], tangible heritage includes "monuments" (i.e., single constructions) and urban areas. Some examples of tangible and intangible assets are[6]:

- Urban heritage, infrastructures, historical buildings, and natural landmarks (tangible, immovable).
- Artistic or historical objects (tangible, movable).
- Traditional building methods, techniques, and materials (intangible).
- Traditional, indigenous, and local knowledge, skills, crafts, uses, and dialects (intangible).
- Ceremonies and traditions (intangible).

[3] *Mexico City Declaration on Cultural Policies, Mondiacult. 1982. UNESCO*
[4] *United Nations Educational, Scientific and Cultural Organization; World Bank. 2018. Culture in City Reconstruction and Recovery.*
[5] *UNESCO. 2019. The UNESCO Recommendation on the Historic Urban Landscape. Report of the Second Consultation on its Implementation by Member States. World Heritage Centre.*
[6] *UNESCO Institute for Statistics. 2009. (retrieved from the UNESCO Glossary, http://uis.unesco.org/en/glossary)*

The importance of cultural heritage in building **resilience**, achieving sustainable development, and adapting to climate change has been long-established[7]. Sustained cooperation among stakeholders promotes **cultural heritage resilience and** should also actively engage with local and national level government agencies, private and faith-based institutions, and non-profit organizations. This engagement will allow embedding cultural heritage in both disaster risk reduction and climate change adaptation[8] strategies.

However, there are various definitions of **resilience.**

For UNDRR[9], it is the ability of a system, community, or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management". **Disaster resilience** is defined as "the ability of social units (e.g., organizations, communities) to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimize social disruption and mitigate the effects of future events."[10]

Building disaster resilience relates to a long-term framework where preparedness, response, recovery, and building back better efforts align to diminishing losses to lives and livelihoods, economic assets, and damage to critical infrastructure in case a disaster strikes.

The preparedness efforts relate to increasing risk knowledge. They should include the appropriate mapping and identification of both tangible and intangible cultural heritage assets, a comprehensive understanding of the risk they face, and the engagement and awareness of local groups, communities, and organizations.

In the response phase, it is crucial to raise awareness among first responders of the peculiarities of cultural heritage assets and appropriately train them to carry out rescue activities without damaging the heritage [11]. Additionally, Post-Disaster Need Assessments (PDNA) must consider the cultural context to make recovery efforts more sustainable and effective by re-establishing broken connections among people and between people and their environment[12].

In the **recovery** phase, culture and cultural heritage bring people together and enhance their sense of place, preventing dislocation and speeding the process (not to mention the tourism sector's income)[13]. For this reason, heritage assets should be assessed and restituted to achieve a higher level of safety concerning future disasters (for monuments) and to provide urban rehabilitation based on their significance (for urban areas) without significantly altering their authenticity and unique features[14]. During this phase, collaboration efforts should aim to integrate relevant authorities and actors at different levels. An approach that includes the need to preserve culture and heritage should be pursued. It recognizes culture's potential as a catalyzer of social and economic recovery and promotes safety and sustainability.

A **build back better** approach promotes resilient, sustainable, and efficient recovery, rehabilitation and reconstruction solutions to make communities more robust and more resilient.

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[7] *UNESCO. 1972. Convention Concerning the Protection of the World Cultural and Natural Heritage. 17th General Conference, Paris, France.*
[8] *ICCROM. 2018. 1st Workshop on Resilience. Rome, Italy.*
[9] *UNDRR, 2017. UNISDR Terminology on Disaster Risk Reduction*
[10] *Bruneau M et al. 2003. A framework to quantitatively assess and enhance the seismic resilience of communities. Earthquake Spectra 19:733–752.*
[11] *SiTi. 2018. ResCult - Increasing Resilience of Cultural heritage: a supporting decision tool for the safeguarding of cultural assets. (www.rescult-project.eu)*
[12] *GFDRR. 2017. Post-Disaster Needs Assessments Guidelines Volume B.*
[13] *United Nations. 2015. Third UN World Conference on Disaster Risk Reduction, Sendai, Japan.*
[14] *UNESCO. 2019. Operational Guidelines for the Implementation of the World Heritage Convention. World Heritage Centre.*

Cultural heritage results from long adaptation periods and coexistence with the natural environment and may help to reduce or overcome certain disaster risks[15] Therefore, disaster risk reduction strategies that engage with existing local communities leverage traditional knowledge and pursue inclusion and sustainable development should embed it. However, this aspect may prove arduous in areas where policies/plans for disaster risk reduction and management are lacking, funds may be insufficient, or heritage assets are not labeled/recognized as such[16].

Structure of the Addendum

This Addendum observes the original Resilience Scorecard and aligns its questions to the **"Ten Essentials for Making Cities Resilient**[17]," which offer ample coverage of the issues that cities need to address to become more disaster resilient.

It has 44 questions scored from 0 to 3 that add to those included in the original Scorecard. Therefore they should be filled simultaneously (for information about the Preliminary/Detailed version, please go to: https://mcr2030.undrr.org/disaster-resilience-scorecard-cities).

When questions in this Addendum overlap with those of the original Scorecard, a cross-referencing note is included. Also, as part of the supporting materials, Terminology and References are listed at the end of this document.

Data needed

Data needed to complete this Addendum will include:

- Cultural heritage management strategies/plans (pre-event, response, and post-event, if any).
- Knowledge of all groups/institutions involved in cultural heritage management (public, private, faith-based, grassroots, non-profits, etc.).
- Knowledge of funds currently employed/available for cultural heritage management (if any).
- Data on vulnerability and exposure of cultural heritage (both tangible and intangible, if any).
- Methodologies used to determine the vulnerability and exposure (in any).

[15] *United Nations. 2015. Third UN World Conference on Disaster Risk Reduction, Sendai, Japan.*
[16] *UNESCO. 2007. Strategy for Reducing Risks from Disasters at World Heritage Properties. World Heritage Committee, Christchurch, New Zealand.*
[17] https://mcr2030.undrr.org/ten-essentials-making-cities-resilient

- Data on tourism and tourists' presence (with variations between peak/low season).
- Knowledge of change in the land use over the year (if any).
- Loss scenarios for a suite of possible hazards (if any).
- Data on insurance coverage for cultural heritage (if any).
- Knowledge of existing codes for new constructions and strengthening of existing ones (if any).
- Data on ecosystem services, their conservation and possible role in DRR (if any).
- Knowledge of population awareness on cultural heritage and strategies currently in use (if any).

Expected impact

The **benefits** of using the Addendum, along with the Scorecard, comprise (but are not limited to):

- Establish an inventory and a baseline of the current level of disaster resilience concerning cultural heritage.
- Increase awareness and understanding of resilience challenges for cultural heritage.
- Identify funding opportunities for cultural heritage preservation, create or strengthen knowledge exchange activities among cities, and engage the private sector.
- Raise awareness within professionals, decision-makers, and civil society, emphasizing professional education and Continuing Professional Development (CPD).
- Enable dialogue and consensus between all stakeholders responsible for cultural heritage protection, disaster risk reduction, and related areas.
- Engage communities (particularly minorities and vulnerable population groups) in the decision-making process related to cultural heritage protection and disaster resilience.
- Raise awareness among decision-makers and the population about the potential socio-economic impacts of tourism (e.g., gentrification, increased inequalities, and reduced business resilience) and the possible ways to manage those impacts.
- Integrate culture and local knowledge into actions related to cultural heritage protection and disaster resilience.
- Enable discussion about priorities for investment and actions based on a shared understanding of the current situation.
- Promote the integration of traditional materials and construction techniques in buildings codes, and identify strategies for strengthening and preserving heritage assets.
- Lead to actions and implementable projects to deliver increased resilience for the city, the community, and its cultural heritage over time.

Acknowledgments

The Addendum was developed by:

- **Johanna Granados Alcala** *(United Nations Office for Disaster Risk Reduction, Regional Office for the Americas and the Caribbean)*
- **Alberto Basaglia, Giulia Cocco, Giuseppe Brando, Enrico Spacone** *(University "G. d'Annunzio" of Chieti-Pescara)*
- **T. Luke Young, Cynthia Benitez** *(AECOM)*

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- **Nicola Tarque** *(GERDIS Research Group, Pontificia Universidad Católica del Perú)*

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Contacts

For additional information on the Addendum, its application, or to suggest possible updates/additions, we encourage you to contact:

https://mcr2030.undrr.org/who-we-are/contact-mcr2030

ESSENTIAL

01

CITY GOVERNANCE - FOUNDATIONS

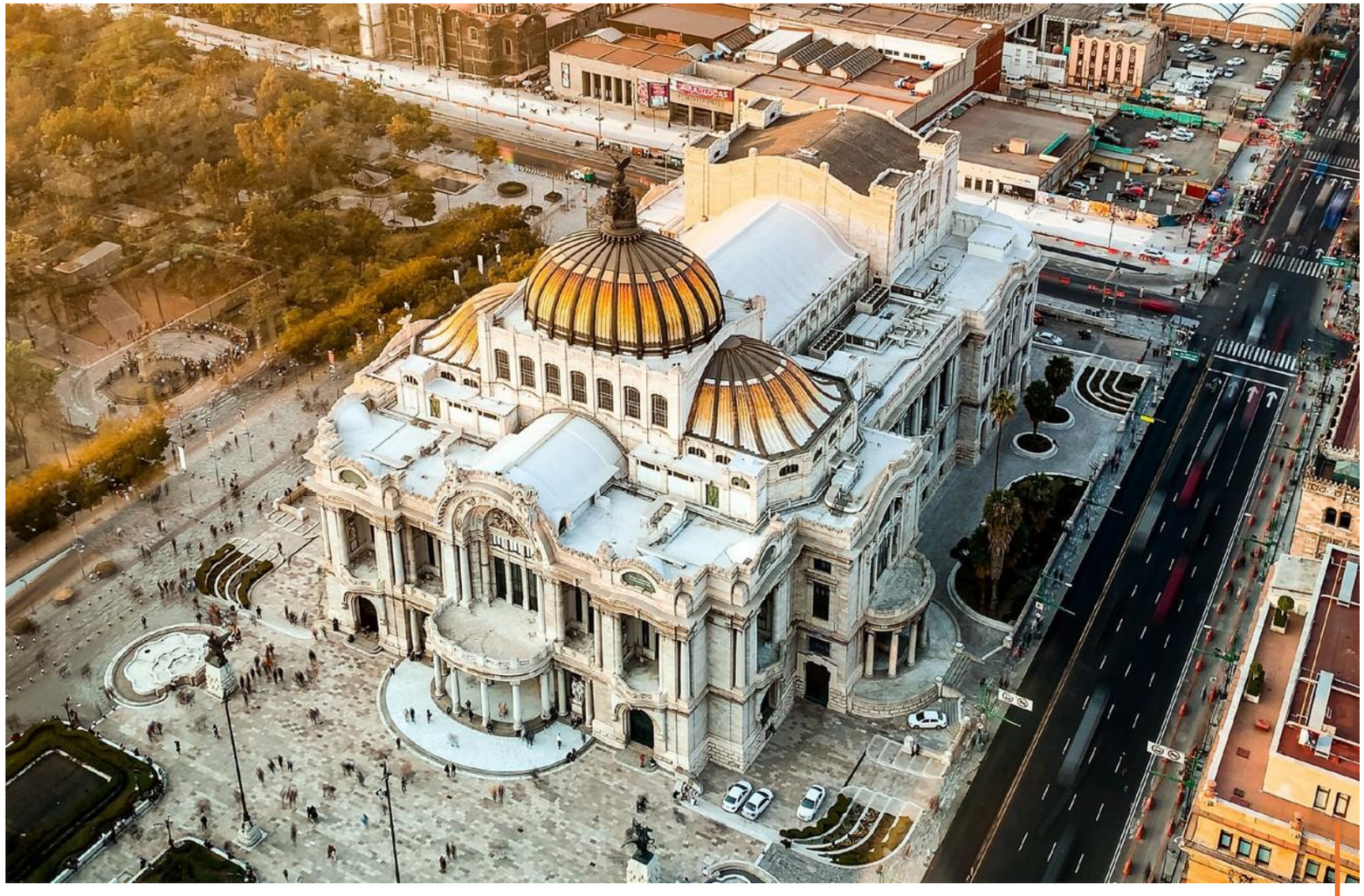
Organize for disaster resilience

ESSENTIAL 1:

Organize for disaster resilience

Put in place an organizational structure to act on reducing Disaster Risks, focused on cultural heritage management.

Ensure that all departments (e.g., branches of governance, stakeholders, and organizations) understand the importance of disaster risk reduction for achieving objectives of their policies and programs based on multisectoral consultation and definition of responsibilities, with the final aim to define coordinated disaster prevention activities for cultural heritage.



Palacio de Bellas Artes - Mexico City
Photo by Bhargava Marripati on Pexels

1.1 PLAN MAKING - INTEGRATION OF CULTURAL HERITAGE IN PLANNING

To what extent does the **city master plan** (or relevant disaster risk reduction/vision plan) acknowledge all forms of cultural heritage, its prioritization and management?

INDICATIVE MEASUREMENT SCALE	
3	**Full acknowledgment, prioritization and management of all forms of cultural heritage. Actions are included directly responding to current and anticipated future risks.**
2	**Acknowledgment, prioritization and management of cultural heritage with only some limitations. Actions are included directly responding to current and anticipated future risks.**
1	**Broad acknowledgment, prioritization and management of cultural heritage Actions not included or with significant shortfalls.**
0	**No acknowledgment, prioritization or management of cultural heritage**

COMMENTS

Cultural heritage may be tangible, intangible, and natural. Tangible heritage is further divided into movable, (paintings and sculptures) and immovable (churches, monuments, and urban areas). Intangible heritage is an expression of traditional community and includes, for example, traditions, ceremonies, arts, creative works and skills. Focusing on the bearers and practitioners, intangible heritage is essential for building resilient cities[1].

The presence/absence of the city master plan (or relevant strategy/plan) is covered by Essential 1 of the Disaster Resilience Scorecard for Cities.

The term "prioritization" relates to the identification of cultural heritage as critical assets, i.e., elements whose functioning is essential for the city, the maintenance of public safety or disaster response.

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

The range of actions/priorities may be defined with the help of the Sendai Framework for Disaster Risk Reduction 2015-2030[3], the World Heritage Resource Manual[4] and the UNESCO Culture | 2030 Indicators[5].

1.2 PLAN MAKING - INCLUSIVE AND PARTICIPATORY CONSULTATIONS

Has the city master plan (or relevant strategy/plan) been developed through **inclusive and participatory consultations** of all concerned groups and institutions in the cultural heritage sector?

INDICATIVE MEASUREMENT SCALE	
3	**All concerned groups and institutions have been engaged/consulted.**
2	**More than half of the concerned groups and institutions have been engaged/consulted.**
1	**Only few of the concerned groups and institutions have been engaged/consulted.**
0	**Concerned groups and institutions have not been engaged/consulted.**

COMMENTS

Concerned groups, institutions, professionals and citizens, such as traditional communities or "grassroots" organizations, may include, for example:

- Organizations responsible for cultural heritage prioritization and management.
- First responders.
- Academia.
- Museums.
- Belief organizations.
- Organized civil society groups.
- Creative sectors.
- Private sector

Efforts should be made to include indigenous groups, marginalized communities and other organized cultural heritage managers and producers.

The master plan (or relevant strategy/plan) should be defined considering a suite of possible "what-if" scenarios to suggest optimal solutions (see 10.2)

1.3 PLAN MAKING - RECOGNITION OF SOCIO-ECONOMIC BENEFITS OF CULTURAL HERITAGE

Are the **socio-economic benefits** of cultural heritage acknowledgment, prioritization and management clearly recognized in the city master plan (or relevant strategy/plan)?

INDICATIVE MEASUREMENT SCALE	
3	Benefits are quantitatively recognized.
2	Benefits are qualitatively but not quantitively recognized.
1	Benefits are broadly recognized but there are significant shortfalls.
0	Benefits are not recognized.

COMMENTS

Cultural heritage is an important source of livelihoods and commercial activity resulting in higher revenues to the city government. It contributes to increase the city revenue (for example, from tourist activities) and to increase social cohesion and engagement leading to higher sense of place which may assist in speeding up the recovery process after a disaster.

The term "prioritization" relates to the identification of cultural heritage as critical assets, i.e., elements whose functioning is essential for the city, the maintenance of public safety or disaster response.

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

Metrics may be defined with the help of the Culture in City Reconstruction and Recovery framework[6], so that these benefits do not compromise heritage values.

1.4 PLAN MAKING - CULTURAL HERITAGE AS AN ENBLER FOR SUSTAINABLE DEVELOPMENT

Does the city master plan (or relevant strategy/plan) acknowledge and promote culture and cultural heritage as an **enabler for sustainable development?**

INDICATIVE MEASUREMENT SCALE	
3	**Full acknowledgment, actions are included.**
2	**Full acknowledgment, but actions are not included.**
1	**Broad acknowledgment.**
0	**No acknowledgment.**

COMMENTS

Culture, cultural heritage, and creative industries are enablers and drivers of the economic, social and environmental dimensions of sustainable development[7].

Sustainable development has an active role in reducing disaster risk[8], furthermore safeguarding culture and natural heritage contributes to achieving inclusive, safe, and resilient settlements[9].

A post-event sustainable recovery should focus and promote a shift towards sustainable development (see 10.3).

Priorities/actions may be defined with the help of the 2030 Agenda for Sustainable Development[7] and the UN-Habitat New Urban Agenda[10] and the ICOMOS Sustainable Development Goals Policy Guidance for Heritage and Development Actors[41].

1.5 PLAN MAKING - CONSIDERATION OF TRADITIONAL DESIGN GUIDELINES

Does the city master plan (or relevant strategy/plan) consider **traditional design guidelines** in the renewal of places?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Traditional design guidelines are considered in all places and are mandatory.**	Places includes site infrastructures, built landscapes and cultural landscapes, such as sacred spaces and scenic vista areas. Traditional design guidelines include, for example, the adoption of traditional material (excluding cases where the material is no longer available or threatened/endangered) and construction techniques. Materials and techniques may be integrated with compatible modern technologies and methods (given that new technology or knowledge is available) to achieve the needed level of safety. Examples of the latter would be reinforcing adobe structures with innovative materials, such as geomesh, or, in extreme cases, keeping the external façade in adobe while interior is refurbished. Design guidelines should aim to the preservation of the cultural heritage[11] and address authenticity[12], as mentioned by the UNESCO Recommendation on the Historic Urban Landscape[13]. This may include also regulations for the dimensions (height, width) and new constructions.
2	**Traditional design guidelines are considered in all places but are not mandatory.**	
1	**Traditional design guidelines are considered only in some places.**	
0	**Traditional design guidelines are not considered.**	

1.6 ORGANIZATION AND COORDINATION

Are entities responsible for cultural heritage management well established, **properly resourced/funded** and have authority to act within an inter-agency framework with those responsible for disaster risk reduction?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Entities are well established, properly resourced/funded and have authority to act.**	The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12]. Funding is needed for organizations to act properly and independently (funding for projects or loss coverage is investigated in Essential 3). Common assessment criteria need to be applied to Local Government and other relevant Disaster Risk Reduction stakeholders to allow better linkages with cultural heritage management entities.
2	**Entities are well established and are properly resourced/founded but do not have authority to act.**	
1	**Entities are well established but lack proper authority and resources/funding.**	
0	**Entities are not well established, therefore may lack inter-agency support.**	

ESSENTIAL

02

CITY GOVERNANCE - FOUNDATIONS

Identify, Understand, and use Current and Future Risk Scenarios

ESSENTIAL 2:

Identify, Understand, and use Current and Future Risk Scenarios

Identify and understand their "most probable" risk scenarios through the definition of all possible hazards and the creation of a complete database on exposure and vulnerability of the built environment and of cultural heritage, considering possible changes over time related to urbanization, climate, tourism activity, and others.

All scenarios must be aimed to provide guidance for management plans.

Ninenzaka - Kyoto, Japan
Photo by Barbara Minguez Garcia

2.1 KNOWLEDGE OF EXPOSURE - TANGIBLE CULTURAL HERITAGE

What is the level of knowledge regarding the **exposure** level of all **tangible cultural heritage** to possible hazards?

INDICATIVE MEASUREMENT SCALE	
3	**Comprehensive knowledge of the exposure with regular updates.**
2	**Comprehensive knowledge of the exposure but no updates.**
1	**Some shortcomings in the knowledge of the exposure and no updates.**
0	**Only generalized knowledge of the exposure and no updates.**

COMMENTS

Exposure relates to the situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas. It recognizes not only the monetary value associated to the heritage but also its social, religious, or artistic role. **Exposure** is a component of disaster risk, and risk preparedness is a mandatory action in the Operational Guidelines for the Implementation of the World Heritage Convention[12].

Hazards or perils include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. Hazards are those identified in the Disaster Resilience Scorecard for Cities Essential 2. This means that risk or armed conflicts, social strife or civil unrest are not included as they are subject to International Humanitarian Law and national legislation. See also the UNDRR Hazard Definition and Classification Review[14].

Tangible heritage includes not only single "monuments" but also infrastructures and urban areas, following the UNESCO Recommendation on the Historic Urban Landscape[13], and moveable heritage[15].

Exposure data should be made available in geographically-based maps, possibly using computer-based tool such as Geographic Information System (GIS) applications.

2.2 KNOWLEDGE OF EXPOSURE - CONSIDERATION OF TRANSIENT POPULATION

Is **transient population** considered when setting out exposure scenarios?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Transient population is considered with its short period variation (daily/weekly).**	**Transient population** includes, for example: • Second-home owners. • Students. • Tourists. • Mass activities, such as festivals or sport events. These groups may significantly increase the population even in short periods of time and therefore lead to higher losses in case of disaster. Transient population should be considered also in emergency response plan (see 9.4).
2	**Transient population is considered with average seasonal variations.**	
1	**Transient population is considered using fixed values for the whole year.**	
0	**Transient population is not considered.**	

2.3 KNOWLEDGE OF VULNERABILITY - TANGIBLE CULTURAL HERITAGE

What is the level of knowledge regarding the **vulnerability** of all **tangible cultural heritage** to possible hazards?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Comprehensive knowledge of the vulnerability with regular updates.**	**Vulnerability** is the susceptibility of undergoing a specific level of damage given a hazard of defined intensity. Tangible heritage includes not only single "monuments" but also infrastructures and urban areas, following the UNESCO Recommendation on the Historic Urban Landscape[13], and moveable heritage[15]. **Hazards** are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. This means that risk or armed conflicts, social strife or civil unrest are not included as they are subject to International Humanitarian Law and national legislation. See also the UNDRR Hazard Definition and Classification Review[14]. Vulnerability definition of historic structures and infrastructures requires, but is not limited to, the following information: • Geometrical information. • Material properties • Structural details. • Maintenance conditions. • Past interventions (if any). • Urban landscape characteristics (including scenic views and vegetation). Vulnerability data should be made available in geographically-based maps, possibly using computer-based tool such as Geographic Information System (GIS) applications.
2	**Comprehensive knowledge of the vulnerability but no updates.**	
1	**Some shortcomings in the knowledge of the vulnerability and no updates.**	
0	**Only generalized knowledge of the vulnerability and no updates.**	

2.4 KNOWLEDGE OF INTANGIBLE HERITAGE

What is the level of knowledge regarding all forms of **intangible cultural heritage?**

INDICATIVE MEASUREMENT SCALE	
3	**The Municipality has comprehensive knowledge of all its intangible cultural heritage.**
2	**The Municipality has good knowledge of its intangible cultural heritage and only a limited portion of it may be left out.**
1	**The Municipality has knowledge of its intangible cultural heritage but there are significant shortcomings in the definition.**
0	**The Municipality has only a generalized knowledge of its intangible cultural heritage.**

COMMENTS

Intangible cultural heritage includes, but it is not limited to:

- Traditional building methods, techniques, and materials.
- Traditional, indigenous, and local knowledge such as skills, crafts, uses.
- Local dialects.
- Ceremonies and traditions.
- Faiths or beliefs.

Intangible cultural heritage may be defined with the help of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage[16] and should comply with the Ethical Principles for Safeguarding Intangible Cultural Heritage[17].

The knowledge may be documented through cultural mapping[18], which encompasses a wide range of techniques and activities from community-based participatory data collection and use of Geographic-Information System (GIS) applications.

2.5 UPDATING INFORMATION ABOUT SCENARIOS, RISK, VULNERABILITY AND EXPOSURE

Does the update process of hazard and exposure information include **tourism** as a potential risk driver?

INDICATIVE MEASUREMENT SCALE	
3	**Tourism is fully included as a potential risk driver and its effects are quantified also with the help of third parties.**
2	**Tourism is fully included as a potential risk driver, but the quantification is still rudimentary.**
1	**Tourism is broadly included as a potential risk driver, with no systematic attempt to quantify it.**
0	**Tourism is not included as a potential risk driver.**

COMMENTS

Cities with cultural heritage may depend on tourism to thrive. Tourism may have great impact on the local economy (see 1.3) but can lead also to:

- Changes associated with gentrification processes or unsustainable development that may decrease resilience.
- The proliferation of inauthentic tourist-focused performances and material-production
- The spreading of diseases, pests and pathogens, if unregulated.

Hazards are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. This means that risk or armed conflicts, social strife or civil unrest are not included as they are subject to International Humanitarian Law and national legislation. See also the UNDRR Hazard Definition and Classification Review[14].

Third parties may include academic/research institutions or other relevant groups in cultural heritage management and risk definition.

ESSENTIAL

03

CITY GOVERNANCE - FOUNDATIONS

Strengthen financial capability for resilience

ESSENTIAL 3:

Strengthen financial capability for resilience

Understand the economic impact of disasters and the need to invest in resilience, identify sources of investment and develop financial mechanisms such as incentives and insurance coverage to support the cultural heritage protection and to enhance resilience.

Identify "double-usage" and cross-disciplinary actions that can enhance resilience dividends or co-benefits.

Sensō-ji - Tokyo, Japan
Photo by Barbara Minguez Garcia

3.1 KNOWLEDGE OF NEW INVESTMENTS MECHANISMS FOR CULTURAL HERITAGE MANAGEMENT

To what extent is the local government aware of all **potential financing and funding mechanisms** for cultural heritage management and is actively pursuing them?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**There is a dedicated responsibility within the city government who has comprehensive knowledge of all potential financing and funding mechanisms.**	A lack of comprehensive knowledge of all possible sources of funding for cultural heritage management may result in DRR policies/actions to go un-funded. Financing and funding mechanisms should consider **double usage** or **cross-disciplinary actions** as those investments that may indirectly increase the resilience of cultural heritage (e.g., a new stormwater system that happens to make historical bridges less flood prone). They are part of the so-called **resilience dividends** which represent the net co-benefit (or co-cost) of investing in the resilience enhancement, in the absence of disaster[19]. The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12]. Alternative financing mechanisms and sources may include: • Government grants, including matching grants. • Planning gains. • Development banks and aid organizations. • NGOs. • Agencies or institutions with direct interest in cultural heritage management (e.g., UNESCO). • Crowdfunding. • Public-private partnerships. • Taxes and surcharges. • Private sector initiatives. • Land value capture mechanisms
2	**There is a dedicated responsibility within the city government, but knowledge of potential financing and funding mechanisms is incomplete or accessing such funds can be too resource intensive.**	
1	**There is no dedicated responsibility within the city government and only low/partial awareness of potential financing and funding mechanisms.**	
0	**Financing or funding mechanisms are not considered.**	

3.2 ADEQUACY AND PROTECTION OF FUNDS FOR CULTURAL HERITAGE MANAGEMENT PROJECTS

To what extent are projects for cultural heritage management **adequately funded** and not likely to be diverted for other purposes?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Projects exist, they are adequately funded and funds are protected.**	The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12]. Cultural heritage projects may include, but are not limited to: • Renovation/strengthening of tangible heritage (churches, palaces, adaptive reuse, paintings). • Promotion of intangible heritage (e.g., traditional uses, costumes, dialects, festivities, arts and cultural industries). These projects lead to higher social cohesion and sense of place which both reflects in better disaster management and recovery, especially for marginalized or impoverished communities (see 7.3). Funding for organizations responsible of cultural heritage management is covered in Essential 1. Funding for post disaster recovery and disaster resilience activities is covered in the Disaster Resilience Scorecard for Cities Essential 3.
2	**Projects exist and are adequately funded but funds are likely to be diverted for other purposes**	
1	**Projects exist but funds are not adequate and are likely to be diverted for other purposes.**	
0	**There are no funds for cultural heritage management projects.**	

3.3 INSURANCE

What is the extent of **insurance** coverage of the city's cultural heritage from "most probable" scenarios?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**75-100% of likely losses is covered by insurance.**	Insurance may come from multiple providers, both public and private. Special attention should be given to museums and galleries and their collections[15]. A "most probable" scenario relates to a disaster-causing hazard with its severity computed at the midpoint of a probability distribution (preferred) or assessed as "typical", through expert judgment and other ad hoc estimation. **Hazards** are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. This means that risk or armed conflicts, social strife or civil unrest are not included as they are subject to International Humanitarian Law and national legislation. See also the UNDRR Hazard Definition and Classification Review[14]. Insurance may contribute to the restitution of the building or the object in its previous or an alternative form.
2	**50-75% of likely losses is covered by insurance.**	
1	**25-50% of likely losses is covered by insurance.**	
0	**Less than 25% of likely losses is covered by insurance.**	

3.4 INCENTIVES

Are there **incentives** for the owners of all tangible cultural heritage to support disaster resilience and adaptation actions?

INDICATIVE MEASUREMENT SCALE	
3	**Incentives cover more than 75% of costs invested.**
2	**Incentives cover between 50-75% of costs invested.**
1	**Incentives cover between 25-50% of costs invested.**
0	**Incentives cover less than 25% of costs invested.**

COMMENTS

Owners refer to, for example, local/central government agencies, faith-based organizations, private institutions, neighborhood coalitions with multiple property owners, non-profit organizations, and other institutional or agency owners.

Tangible heritage includes not only single "monuments" but also infrastructures and urban areas, following the UNESCO Recommendation on the Historic Urban Landscape[13], and moveable heritage[15].

Disaster resilience or adaptation actions may include:

- Strengthening of heritage structure and infrastructures to decrease their vulnerability to natural and man-made hazards.
- Digitalizing and setting up virtual visiting/travel experiences to grant accessibility in case of prolonged closure (for example, a pandemic).

Incentives may be public or private, including:

- Planning mechanisms
- Grants
- Tax exemptions.

ESSENTIAL

04

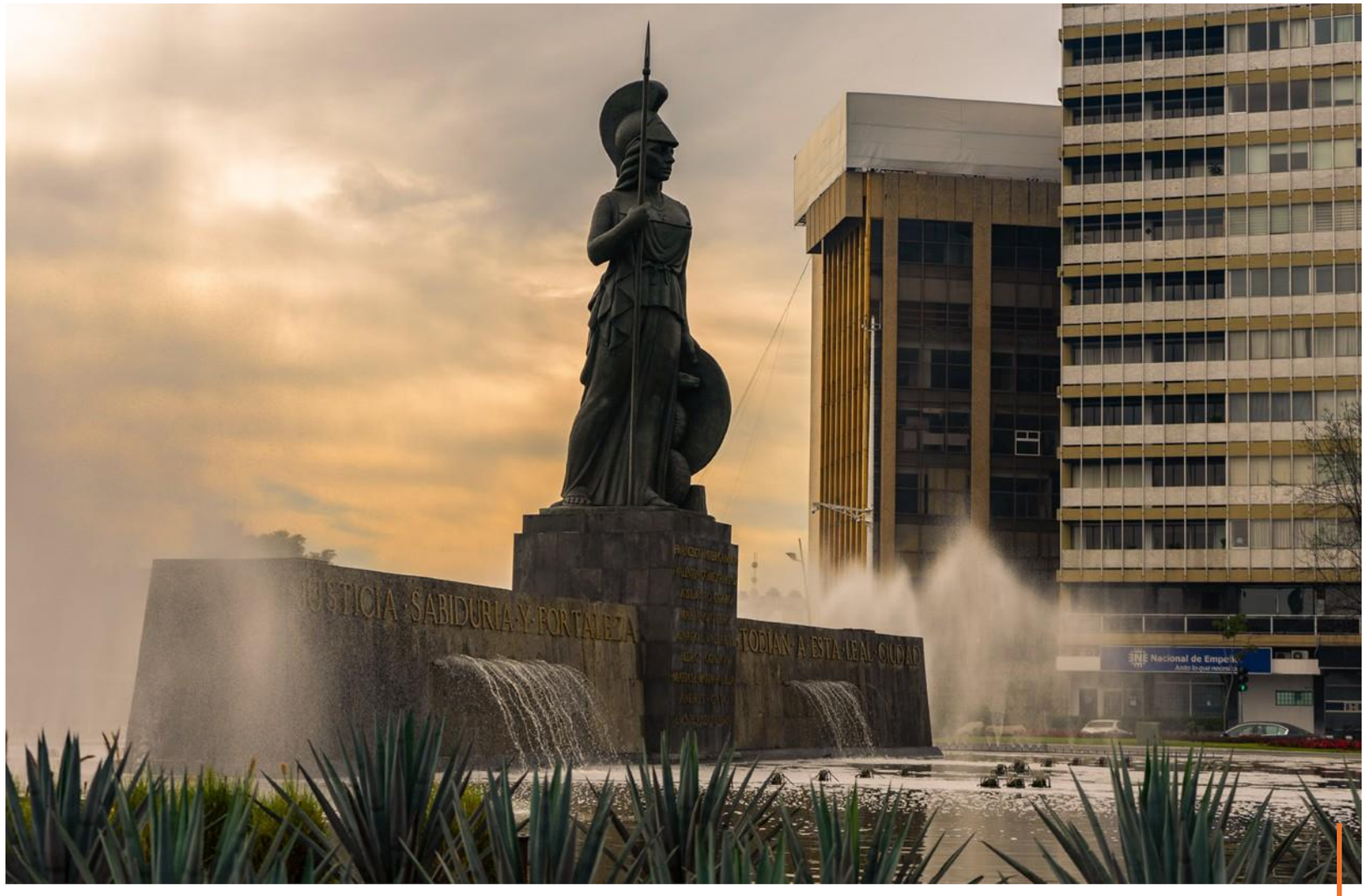
INTEGRATED AND INTEGRATIVE PLANNING

Pursue resilient urban development and design

ESSENTIAL 4:

Pursue resilient urban development and design

Assessing and making the built environment resilient through land zoning and management of urban growth, risk-aware planning, development, and implementation of appropriate building codes to address existing structures with retrofitting interventions and/or to build new construction, **neighborhoods, and infrastructure, using traditional techniques when applicable.**



Glorieta La Minerva - Guadalajara
Photo by Roman Lopez on Unsplash

4.1 LAND USE ZONING OF IMMOVABLE TANGIBLE CULTURAL HERITAGE AT RISK

In the "most probable" scenario, what is the percentage of area occupied by **immovable tangible cultural heritage** at risk of extensive damage?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Less than 5%.**	The term "immovable" is added to clarify the reference only to built structures and infrastructures and not to movable heritage (such as paintings, sculptures, coins, manuscripts). A "most probable" scenario relates to a disaster-causing hazard with its severity computed at the midpoint of a probability distribution (preferred) or assessed as "typical", through expert judgment and other ad hoc estimation. **Hazards** are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. This means that risk or armed conflicts, social strife or civil unrest are not included as they are subject to International Humanitarian Law and national legislation. See also the UNDRR Hazard Definition and Classification Review[14]. Tangible heritage has an immeasurable value and being extensively damaged may make it irrecoverable. This assessment helps defining priorities for preventive actions.
2	**5% - 10%.**	
1	**10% - 20%.**	
0	**More than 20%.**	

4.2 LAND USE ZONING OF CULTURAL HERITAGE PLACES

Does the land use zoning of cultural heritage places promote **balanced, multiple, and heterogeneous uses** for the whole city?

INDICATIVE MEASUREMENT SCALE	
3	**Land use regulations are defined for the whole city.**
2	**Land use regulations are defined only for limited areas (for example, the historic center).**
1	**The importance of land use is acknowledged but not included in the zoning process.**
0	**Land use regulations are not considered.**

COMMENTS

Cultural heritage places include site infrastructures, built landscapes and cultural landscapes, such as sacred spaces and scenic vista areas.

Heterogeneity and multiplicity of land use has a positive impact in disaster risk reduction[20]. Zoning flexibility, for instance, enables for a shift of higher intensity cultural uses or resources to un-threatened areas of the city.

Innovative methods to measure heterogeneity of land use should be examined especially by adapting and applying formula from other disciplines as the Shannon Diversity Index[21,22],

The UNESCO Recommendation on the Historic Urban Landscape[15] is an important mechanism to promote an integrative approach.

4.3 BUILDING CODES AND STANDARDS - USE OF TRADITIONAL DESIGN GUIDELINES

Do building codes include the use and adaptation of **traditional design guidelines?**

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Traditional design guidelines exist and are mandatory.**	Traditional design guidelines include, for example, the adoption of traditional material (excluding cases where the material is no longer available or threatened/endangered) and construction techniques. Materials and techniques may be integrated with compatible modern technologies and methods (given that new technology or knowledge is available) to achieve the needed level of safety. Building codes are usually defined at the national level. Presence and updates of codes is covered by Essential 4 of the Disaster Resilience Scorecard for Cities. Guidelines may be implemented at the local level to preserve of the cultural heritage[11] and address authenticity[12], as mentioned by the UNESCO Recommendation on the Historic Urban Landscape[13]. This may also include regulations for the dimensions (height, width) and regularities of new constructions.
2	**Traditional design guidelines exist but are not mandatory.**	
1	**Traditional design guidelines are broadly acknowledged but not advocated.**	
0	**Traditional design guidelines are not considered.**	

4.4 BUILDING CODES AND STANDARDS - STRENGTHENING OF IMMOVABLE TANGIBLE CULTURAL HERITAGE

Do guidelines exist that address the strengthening of **immovable tangible cultural heritage,** considering its value and peculiarities?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Detailed guidelines exist that consider all heritage peculiarities and the strengthening effectiveness is assessed by a third party.**	The term "immovable" is added to clarify the reference only to built structures and infrastructures and not to movable heritage (such as paintings, sculptures, coins, manuscripts). Peculiarities relates to site-specific characteristics, for example, local materials, design techniques, and local traditions. A third party may be the city/local government technical office or other relevant institution for cultural heritage. For example, public institutions may require the help of private building companies and/or academia or research groups to assist in the assessment process. Guidelines may also indicate the target level of safety, to be achieved with the strengthening.
2	**Detailed guidelines exist that consider all heritage peculiarities, but the strengthening effectiveness is not assessed by a third party.**	
1	**Guidelines exist but are overly simplified and do not consider the heritage peculiarities.**	
0	**Guidelines do not exist.**	

ESSENTIAL

05

INTEGRATED AND INTEGRATIVE PLANNING

Safeguard natural buffers to enhance the protective functions offered by natural capital

ESSENTIAL 5:

Safeguard natural buffers to enhance the protective functions offered by natural capital

Safeguard natural buffers to enhance the protective functions offered by natural ecosystems. Recognize value and benefits from ecosystem services, identifying, protecting, and monitoring them as part of risk reduction strategies for cities.

Control the urban development and climate changes considering green and blue infrastructure and the contribution of traditional knowledge and communities in their maintenance.

Al Ula Old Town, Saudi Arabia
Photo by Barbara Minguez Garcia

5.1 ECOSYSTEM SERVICES

Are ecosystem services acknowledged as **natural heritage** and managed as critical assets?

INDICATIVE MEASUREMENT SCALE	
3	**Ecosystem services are acknowledged as natural heritage and managed as critical assets.**
2	**Ecosystem services are acknowledged as natural heritage and managed as critical assets, but prioritization is made to those with a disaster risk reduction role.**
1	**Ecosystem services are acknowledged as natural heritage but not always managed as critical assets.**
0	**Ecosystem services are not acknowledged as natural heritage.**

COMMENTS

Ecosystem services are acknowledged as natural heritage when they represent the culture, history, or religion of the city. This identification and can be done with the help of the UNESCO Recommendation on the Historic Urban Landscape[15].

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

Critical assets are those elements whose functioning is essential for the city, the maintenance of public safety or disaster response.

Ecosystem services[23]:

- Provide food, fresh water, fuel, and fiber.
- Serve as climate, food and disease regulation, and water purification.
- Are part of the nutrient cycling and soil formation.
- Are cultural services (aesthetic, spiritual, educational, and recreational).
- Are sources of revenue (for example, sand dunes camping, fishing and hunting licenses, safari)

Ecosystems include:

- Sand dunes, coastal wetlands, mangroves, or reefs
- Forestation
- Natural overflow channels, sandy soil soak-zones, and marshes
- Lakes, rivers, and aquifers
- Water-tables
- Trees and greenery.

The integration of green and blue infrastructure into city policy and projects is covered is covered by Essential 5 of the Disaster Resilience Scorecard for Cities.

5.2 INTEGRATION OF TRADITIONAL KNOWLEDGE IN ECOSYSTEM SERVICES

Is **traditional knowledge** considered in the management of ecosystem services?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Traditional knowledge is used and adapted after its effectiveness has been validated by third parties also through the engagement of the community and/or local experts.**	Traditional, indigenous, or local knowledge is supported by, and embodied, in local languages, cultural values, beliefs, rituals, community laws, and governance systems[25]. The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12]. Strategies for the management of ecosystem services may be defined with the help of the IUCN Urban Protected Areas[24]. Third parties may include academic/research institutions or other relevant groups in cultural heritage management and risk definition. Scientific literature includes example on how traditional knowledge can be integrated in the management of ecosystem services[26,27].
2	**Traditional knowledge is used and adapted but its effectiveness has not been validated.**	
1	**Traditional knowledge is recognized but not used.**	
0	**No awareness of traditional knowledge.**	

ESSENTIAL

06

INTEGRATED AND INTEGRATIVE PLANNING

Strengthen institutional capacity for resilience

ESSENTIAL 6:

Strengthen institutional capacity for resilience

Ensure that all formal and informal institutions relevant for city's resilience have the capabilities they need to lead and participate in heritage disaster risk management.

Define effective communication strategies to inform the population and develop a data-sharing mechanism with private institutions and other cities to define common strategies for increasing cultural heritage resilience.

Sunset in Tegucigalpa - Honduras
Photo by Nan Palmero on Flikr

6.1 SKILLS AND EXPERIENCE

Does the local government know the **available key skills, knowledge, and experience** in disaster risk and resilience of cultural heritage (i.e., inventoried in the last 1 year)?

INDICATIVE MEASUREMENT SCALE	
3	**There is a complete inventory, and it is regularly updated.**
2	**There is a complete inventory, but it is not regularly updated.**
1	**There is only a partial inventory, and it is not regularly updated.**
0	**There is no inventory.**

COMMENTS

Availability of skills and experience in disaster risk and resilience is covered in Essential 6 of the Disaster Resilience Scorecard for Cities.

The update is needed to keep up with the progress of skills, experience, and knowledge to fill any possible gaps.

Skills will include planning, culture, history, cultural heritage, social fabrics, beliefs, business management, communication, including digital technologies, for disaster response.

Knowledge refers to operating knowledge of relevant institutions dealing with cultural heritage management and city infrastructure(s) housed in cultural heritage places.

Experience refers to direct experience of the types of perils the city and its cultural heritage face (see Essential 2) and the capabilities of the city and its population to withstand and/or recover from these.

Some skills, knowledge or experience may be purchased from specialist consultancies, or supplied on a one-time basis by aid agencies.

6.2 EDUCATION AND AWARENESS PROGRAMS IN SCHOOLS

Does the local government promote education and awareness programs on local history and cultural heritage in **Schools?**

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Schools have structured and mandatory programs.**	Schools refers to institutions from primary until secondary education. Structured programs may include weekly hours in Schools or classes dedicated to local history and cultural heritage. Occasional programs may include, for example, dedicated hours/days of visits to become acquainted with the city's cultural heritage. Both structured and occasional programs may benefit from activities of creative sector to deliver the message. Activities aimed to integrate/interlink culture, heritage, education and youth sectors are part of the process to build democratic citizenship[28].
2	**Schools have structured but not mandatory programs.**	
1	**Schools promote occasional programs, but they are not mandatory.**	
0	**Schools do not promote any program.**	

6.3 EDUCATION AND AWARENESS PROGRAMS IN HIGHER EDUCATION

Does the local government promote education and awareness programs on disaster risk and resilience of cultural heritage in **Higher Education?**

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Higher Education has structured and mandatory programs.**	Higher Education may include Universities, Research Institutes and Technical Training colleges. Structured programs may include, weekly hours or course dedicated to cultural heritage management. Occasional programs may include, for example, dedicated hours/days or seminar within the year or design studios dedicated to disaster risk scenarios. Both structured and occasional programs may benefit from activities of creative sector to deliver the message. Activities aimed to integrate/interlink culture, heritage, education and youth sectors are part of the process to build democratic citizenship[28].
2	**Higher Education has structured but not mandatory programs.**	
1	**Higher Education promotes occasional programs, but they are not mandatory.**	
0	**Higher Education does not promote any program.**	

6.4 DATA CAPTURE, PUBLICATION AND SHARING

To what extent is **data on disaster risk and resilience of cultural heritage** mutually shared among organizations involved and departments within the city/local government?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Information is fully shared through a unique database which enables navigation.**	Information may include, but not limited to: • Cultural heritage data. • Demographic data. • Land use. • Tourism flow. Organizations may include: • Community organizations. • Museums and galleries. • NGOs for cultural and natural heritage. • Emergency management and critical asset management teams. Departments may refer to Engineering, Planning, Transportation, Water, Energy, Police, and others. Sharing of information regarding the city's resilience is covered in Essential 6 of the Disaster Resilience Scorecard for Cities. Data should also include the successes ('what went well') and failures ('what went wrong') in past disaster responses, as this is an opportunity to prevent future impacts[29].
2	**Information is fully shared but there is not a unique database.**	
1	**Information is partially shared and there is not a unique database**	
0	**Information is not shared.**	

6.5 LEARNING FROM OTHERS

Are **knowledge exchange activities** regularly carried out to learn from what other cities, states, and countries (and companies) do for disaster risk and resilience of cultural heritage?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Knowledge exchange activities regularly occur (say, annually).**	These activities are focused on learning and improving aspects and planning on cultural heritage management covered in Essential 1. Learning activities should aim to include local, national and international experts. Learning might be via a direct exchange with peer cities (see for example the EU Town Twinning program[30] and City to City Exchange[31]), or through Universities, industry groups, national cultural heritage management forums, institutions, city groups and NGOs.
2	**Knowledge exchange activities occur frequently but not regularly or may be in the context of other meetings as a side-effect.**	
1	**Knowledge exchange activities occasionally occur, but the tend to be ad-hoc.**	
0	**Knowledge exchange activities do not occur.**	

ESSENTIAL

07

INTEGRATED AND INTEGRATIVE PLANNING

Understand and strengthen societal capacity for resilience

ESSENTIAL 7:

Understand and strengthen societal capacity for resilience

Cultivate an environment for social connectedness which promotes a practice of mutual support through the recognition of the role of cultural heritage and education in disaster risk reduction by means of training programs and support to community groups, particularly considering the most vulnerable population groups.

Antigua Guatemala - Guatemala
Photo by Angello Pro on Unsplash

7.1 COMMUNITY OR "GRASS ROOTS" ORGANIZATIONS

To what extent do **community or "grass roots" organizations** participate in cultural heritage management activities?

INDICATIVE MEASUREMENT SCALE	
3	**Organization(s) covering almost all population groups (including every neighborhood, irrespective of wealth and other demographics) participate.**
2	**Organization(s) covering approximately half of population groups participate.**
1	**Organization(s) covering approximately a quarter of population groups participate.**
0	**There is no participation.**

COMMENTS

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

Traditional **communities or "grass roots" organizations** are composed of citizens in a society or organization, especially amongst informal or marginalized groups, serving as advocate to spur changes at the local, national, and international level. Efforts should be made to encourage flexible and inclusive participation.

They may be active in the cultural heritage management plans or day-to-day activities but willing and able to play a role based on the input of their members (for example, churches, chambers of commerce, youth organizations, food kitchens, neighborhood watch, day centers).

They need to be accepted as legitimate and fostered with training programs to increase cooperation among each other and with the local government.

7.2 BUSINESS CONTINUITY PLANS

What percentage of businesses directly associated with cultural heritage have a **documented continuity plan** that has been reviewed within the last 12 months?

INDICATIVE MEASUREMENT SCALE	
3	**Almost all businesses.**
2	**Approximately half of all businesses.**
1	**Approximately a quarter of all businesses.**
0	**None of the business.**

COMMENTS

Businesses may include also cultural institutions, non-profit groups, and other culture-producing organizations.

A business is directly associated if, for example, it will stop generating revenue when heritage is damaged or made inaccessible.

Furthermore, business closure or prolonged interruption may affect employees who may need the salary to thrive and may be also laid off. These aspects negatively impact the disaster recovery.

A **Business Continuity Plan** is a written document that describes how your firm intends to continue carrying out critical business processes in the event of a disaster[32].

Continuity plans should include adaptation strategies to deal with periods of prolonged uncertainty or closure, such as a pandemic.

7.3 CITIZEN ENGAGEMENT TECHNIQUES - COMMUNICATION STRATEGY

Does the city/local government have an **understandable and clear communication strategy** on the importance of cultural heritage management that is effectively disseminated to the population?

INDICATIVE MEASUREMENT SCALE	
3	**There is a structured communication campaign.**
2	**Frequent messages but not a structured campaign.**
1	**Occasional messages but not a structured campaign.**
0	**The population is not informed.**

COMMENTS

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

Media platforms may include:

- Print – books, newspapers, leaflets, fliers.
- School and college teaching material.
- TV – advertisements. Documentaries, news.
- Radio – as for TV.
- Web – websites, advertisements, podcast content on city websites.
- Mobile – as for web but also social media – Twitter, Facebook, YouTube, Instagram and others, or newly created app(s) for City's cultural heritage management information.
- Posters – on buildings, buses, trains, city offices.
- Artistic and cultural expression.
- Cultural centers, cinemas and libraries.
- Other traditional non-digital forms of communication networks and notifications.

Efforts should be made to deliver early warning in all language/dialects in use within the city (see Essential 6 of the Disaster Resilience Scorecard for Cities).

Activities aimed to integrate/interlink culture, heritage, education and youth sectors are part of the process to build democratic citizenship[28].

7.4 CITIZEN ENGAGEMENT TECHNIQUES - ACTIVE PUBLIC PARTICIPATION

How effective is the city/local government engaging the population to **actively participate** in cultural heritage management?

INDICATIVE MEASUREMENT SCALE	
3	**Cultural days regularly occur (say, annually).**
2	**Cultural days occur frequently but not regularly or may be in the context of other activities as a side-effect.**
1	**Cultural days occasionally occur, but they tend to be small scale or limited events.**
0	**Cultural days do not occur.**

COMMENTS

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

Cultural days may be characterized, for example, by capacity building activities, guided tours, visits to the city heritage sites, monuments, museums and galleries, and other activities including educational programs.

Communities, groups and, where appropriate, individuals concerned shall benefit from the actions taken to raise their awareness in particular on the importance of their intangible (but also tangible and natural) cultural heritage[33].

Activities aimed to integrate/interlink culture, heritage, education and youth sectors are part of the process to build democratic citizenship[28].

Efforts should be made to host events/activities in all language/dialects in use within the city (see Essential 6 of the Disaster Resilience Scorecard for Cities).

ESSENTIAL

08

INTEGRATED AND INTEGRATIVE PLANNING

Increase infrastructure resilience

ESSENTIAL 8:

Increase infrastructure-resilience

Assess the capacity and adequacy of critical infrastructure systems based on risks identified in Essential 2, with the final aim to retrofit, adapt or replace unsafe infrastructure o reduce morbidity and mortality, the loss of service for cultural facilities and the recovery time in "most probable" and "most severe" risk scenarios.

Süleymaniye Mosque from Galata Bridge - Istanbul, Türkiye
Photo by Barbara Minguez Garcia

8.1 ESSENTIAL SERVICES HOSTED BY CULTURAL HERITAGE

What percentage of the total number of structures and infrastructures belonging to the city's cultural heritage host **essential services?**

INDICATIVE MEASUREMENT SCALE	
3	**Less than 5%.**
2	**Less than 10%.**
1	**Less than 20%.**
0	**More than 20%.**

COMMENTS

A structure or infrastructure belonging to the city's cultural heritage requires additional attention because of its value (see 1.1) and may be more prone to damage.

Essential services include but are not limited to:

- Health Care and Public Health.
- Law Enforcement, Prisons and First.
- Responders.
- Food and Agriculture.
- Energy.
- Water and Wastewater.
- Transportation and Logistics.
- Government and Public Works.
- Communications and Information Technology.
- Education.
- Artistic and creative activities.
- Critical Manufacturing.
- Chemical, Hazardous and Nuclear Materials.
- Financial Services.
- Defense Industrial Base.
- Commercial Facilities.
- Construction-Related Activities.

Essential services are covered in Essential 8 of the Disaster Resilience Scorecard for Cities.

8.2 TOURISM - EXPECTED LOSS OF SERVICE FOR VISITATION ACTIVITIES

What is the expected loss of service for **visitation activities** from "most probable" risk scenarios?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Less than a day.**	Loss of service is defined as the mean ('average') downtime for all visitation activities or as a weighted mean, using the maximum number of guests for each activity as weight, provided that this information is available. A "most probable" scenario relates to a disaster-causing hazard with its severity computed at the midpoint of a probability distribution (preferred) or assessed as "typical", through expert judgment and other ad hoc estimation. Hazards are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. Despite that visitations (e.g., tourist based or related activities) are not deemed as essential services (see 8.1), they may significantly contribute to the city economy and therefore to post-disaster recovery (see 1.3 and 8.3).
2	**Less than a week.**	
1	**Between a week and a month.**	
0	**One month or more.**	

8.3 TOURISM - EXPECTED DECREASE OF CITY REVENUE FROM TOURISM LOSS

What is the expected **decrease of the city revenue** associated to the loss of tourism from "most probable" risk scenarios?

INDICATIVE MEASUREMENT SCALE	
3	**Less than 5%.**
2	**Between 5% and 10%.**
1	**Between 10% and 20%.**
0	**More than 20%.**

COMMENTS

City revenue is considered the total annual budget of the city/local government, and does not refer only to the city and its heritage being damaged, but also to heritage places being not accessible for tourists or workers (in tourist-based or related activities, see 7.2 and 8.2).

A "most probable" scenario relates to a disaster-causing hazard with its severity computed at the midpoint of a probability distribution (preferred) or assessed as "typical", through expert judgment and other ad hoc estimation.

Hazards are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires.

In case information on the city revenue are difficult to acquire, the score could be measured in a simplified way as the % decrease in number of tourists.

8.4 EXPECTED LOSS OF SERVICES FOR PLACES OF WORSHIP

What is the expected loss of service for **places of worship** in the city from "most probable" risk scenarios?

INDICATIVE MEASUREMENT SCALE		COMMENTS
3	**Less than a week.**	Loss of service is defined as the mean ('average') downtime for all places of worships or as a weighted mean, using the maximum number of believers for each place as weight, provided that this information is available. In case that worship, rituals and other forms of intangible heritage can be delivered in different locations, even temporarily, loss of service is not considered. A "most probable" scenario relates to a disaster-causing hazard with its severity computed at the midpoint of a probability distribution (preferred) or assessed as "typical", through expert judgment and other ad hoc estimation. Hazards are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires. Places of worship may act as shelters and prove useful for post-disaster recovery, not only for their religious function (say, mourning losses and finding the will to move forward) but also for their role in representing the city identity, thus preserving the sense of place and reestablishing ties within the community. Places of worship can be used also as spaces commercial products and community gathering.
2	**Between a week and a month.**	
1	**Between a month and a year.**	
0	**One year or more.**	

ESSENTIAL

09

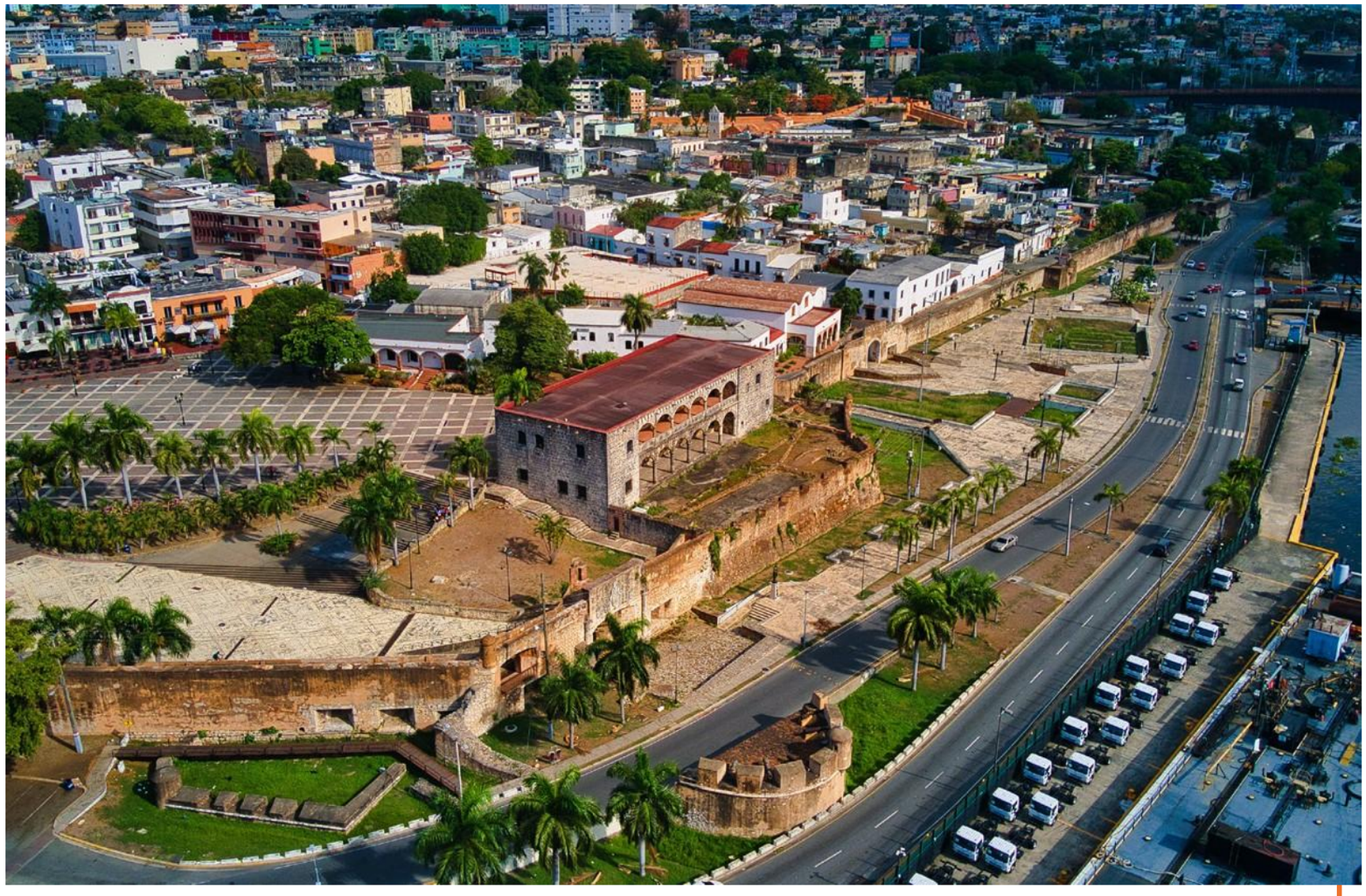
RESPONSE PLANNING AND RATIONAL APPROACHES

Ensure effective disaster response

ESSENTIAL 9:

Ensure effective disaster response

Ensure effective disaster response by installing detection and monitoring equipment and early warning systems, developing community mobile apps, and guaranteeing a coordination among all organizations involved in emergency response, verifying that staffing capacity and emergency response preparedness are sufficient.



Alcázar de Colón - Santo Domingo
Photo by Venero Encarnación Martínez on Unsplash

9.1 INTEGRATION OF TRADITIONAL KNOWLEDGE IN EARLY WARNING

Are efforts taken to integrate **traditional knowledge** into early warning systems to possible hazards?

INDICATIVE MEASUREMENT SCALE	
3	**Traditional knowledge is fully integrated for all possible hazards and its effectiveness is assessed by a third party.**
2	**Traditional knowledge is fully integrated for all possible hazards, but its effectiveness is not assessed by a third party.**
1	**Traditional knowledge is broadly integrated for some of the hazards.**
0	**Traditional knowledge is not integrated.**

COMMENTS

Traditional, indigenous, or local knowledge is supported by and embodied in local languages, cultural values, beliefs, rituals, community laws and practices, and governance systems[25] and also reflects creative works that may assist in all forms of early warning systems and communications.

Traditional knowledge can be integrated into early warning systems and raise awareness on possible hazards[34], by engaging the community or "grass roots" organizations. This may also increase the reach of warning.

A third party may be the city/local government technical office or other relevant institution for cultural heritage, academia or research groups.

Hazards are those identified in the Disaster Resilience Scorecard for Cities Essential 2 and include, but are not limited to, tsunamis, hurricanes, earthquakes, floods, and fires.

Presence of early warning systems is covered in Essential 9 of the Disaster Resilience Scorecard for Cities.

Efforts should be made to deliver early warning in all language/dialects in use within the city (see Essential 6 of the Disaster Resilience Scorecard for Cities).

In case traditional knowledge was not adopted by the local community in early warning system, this question should not be considered for the total score.

9.2 PRE-EVENT PLANNING AND PREPARATION

Do the **emergency response plans** consider the heritage peculiarities and prioritization within the city to ensure an effective response?

INDICATIVE MEASUREMENT SCALE	
3	**Peculiarities and prioritization of heritage within the city are fully considered and have been tested (possibly in real emergencies).**
2	**Peculiarities and prioritization of heritage within the city are fully considered but have not been tested.**
1	**Peculiarities and prioritization of heritage within the city are broadly considered but there are significant shortfalls.**
0	**Peculiarities and prioritization of heritage within the city are not considered.**

COMMENTS

Peculiarities may include, for example, the irregular layout of roads in the historic center or older areas, which are sometimes unpaved and/or too narrow for emergency vehicles to pass. These aspects may delay the carrying out of rescue activities, and therefore have to be considered by ensuring relevant equipment and developing an appropriate protocol.

Prioritization may include a list, defined by the city/local government, of all heritage objects (i.e., movable) that first responders should deal with on a given order, as well as most suitable buildings to be used as temporary deposit (e.g., providing adequate conservation conditions).

Moreover, rescue operations must be carried out considering the intrinsic fragility and value of cultural heritage in order not to cause additional damage.

Existence of emergency response plans is covered in Essential 9 of the Disaster Resilience Scorecard for Cities.

9.3 RESPONDERS TRAINING

Are **first responders** aware and trained of specific attention required by cultural heritage while carrying out emergency operations?

INDICATIVE MEASUREMENT SCALE	
3	**Mandatory training and drills are provided.**
2	**Mandatory training is provided, but capacity is not tested.**
1	**Training is provided, but it is not mandatory.**
0	**No training nor drills are provided.**

COMMENTS

First responders include:

- Citizen groups (e.g., grassroots organizations).
- Civil Protection Department.
- Police forces.
- Firefighters.
- Healthcare personnel.

Presence of adequate staffing capacity is covered in Essential 9.3 of the Disaster Resilience Scorecard for Cities.

Training is essential to ensure an effective response (see 1.4) and should include the development of "preparedness capacities and emergency plans, in addition to security, preventive and remedial conservation, and the restoration of museum objects"[15,35].

Signage may be used to ensure recognition and identification of cultural heritage, see for example the UNESCO Blue Shield emblem[36].

9.4 TOURIST PREPAREDNESS

Does the city/local government have means to safely **evacuate transient population** during emergencies?

INDICATIVE MEASUREMENT SCALE	
3	**Signage is used to mark "safe" buildings and gathering areas. Information on transient population is collected with the cooperation of visitation activities. Newly created app(s) are available.**
2	**Signage is used to mark "safe" buildings and gathering areas. Information on transient population is collected with the cooperation of visitation activities.**
1	**Signage is used to mark "safe" buildings and gathering areas.**
0	**No, there is no signage or means to safely evacuate transient population.**

COMMENTS

Transient population includes, for example:

- Second-home owners.
- Students.
- Tourists.
- Mass activities, such as festivals or sport events.

These groups may significantly increase the population even in short periods of time and therefore lead to higher losses in case of disaster (see 2.2).

Following the example of the Blue Shield emblem[36], signage may be used to mark those buildings that are deemed "safe", i.e., whose probability of collapse is negligible, using international icons and local languages. These buildings may serve as shelter for both the local and transient population. Assignment of these "safe havens" should be the responsibility of the city/local government, Civil Protection Department, or similar Authorities, or with the support of public and private groups (e.g., Academia).

Gathering areas are those spaces that serve to initially collect the displaced population, treat injuries, and begin the distribution of relief supplies. Areas should be "safe" for people of multiple cultures, with peculiar attention to vulnerable or marginalized groups.

Information on transient population should be used to prepare notice boards which are effective the more details they include (at least: name, age, photo). To speed up the set-up of notice boards, the realization of a database to cross check information between the Authorities and visitation activities could be employed.

Newly created app(s) should include a map of the suggested evacuation routes, closest safe havens and gathering areas in the city, as well as the possibility to launch a "rescue signal" that can be collected by the rescue organizations.

9.5 SHELTERS AND RELIEF SUPPLY NEEDS

Are efforts taken to define the **disaster relief supply needs** in order to be culturally appropriate for the local population?

INDICATIVE MEASUREMENT SCALE	
3	**Yes, through the engagement of community or "grass roots" organizations.**
2	**Yes, but without the engagement of community or "grass roots" organizations.**
1	**Yes, but there are significant shortfalls.**
0	**No, efforts are not taken.**

COMMENTS

Traditional **communities or "grass roots" organizations** are composed of citizens in a society or organization, especially amongst informal or marginalized groups, serving as advocate to spur changes at the local, national, and international level. Efforts should be made to encourage flexible and inclusive participation.

Integrating local culture in the definition of shelters and disaster relief supply may be done with the help of the Culture in City Reconstruction and Recovery framework[6] and the PDNA Guidelines Vol. B[37].

Disaster relief supply are divided into three categories that are: food, shelter, and non-food items, including for example, personal hygiene, clothing, bedding and kitchen sets[38].

Adequate delivery of relief supply is covered in Essential 9 of the Disaster Resilience Scorecard for Cities.

ESSENTIAL

10

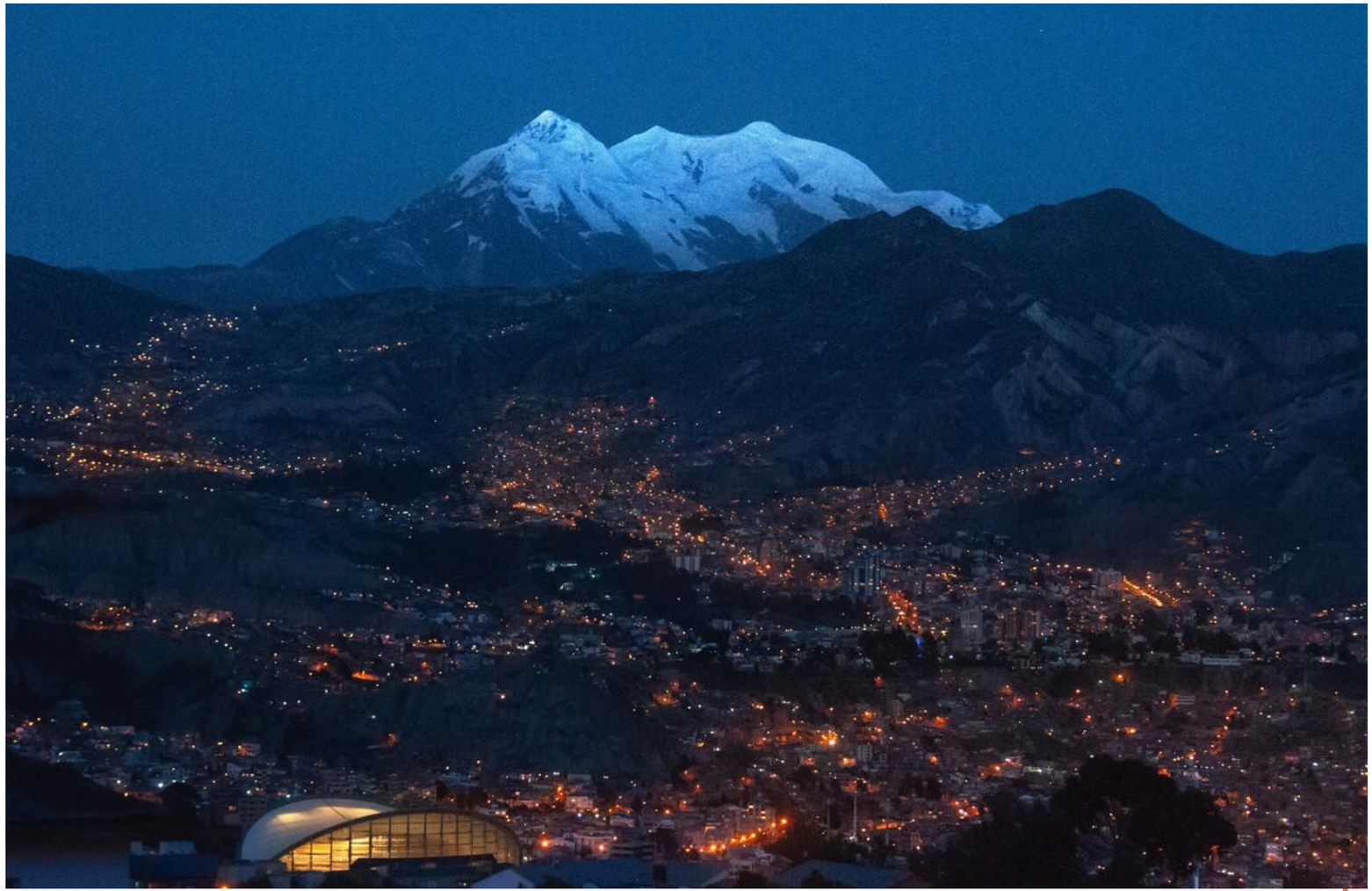
RESPONSE PLANNING AND RATIONAL APPROACHES

Expedite Recovery and Build Back Better

ESSENTIAL 10:

Expedite Recovery and Build Back Better

Ensure a post-event recovery plan is adopted that considers the restoration of cultural heritage, economic sectors, climate change and reconstruction processes according with the concept of Building Back Better and incorporating where possible traditional materials and techniques.



La Paz - Bolivia
Photo by Rodrigo Gonzalez on Unsplash

10.1 PRE-EVENT PLANNING FOR POST-EVENT RECOVERY - CULTURAL HERITAGE IN POST-DISASTER NEEDS ASSESSMENT

To what extent do the comprehensive **post event recovery plans** acknowledge all forms of cultural heritage, its prioritization and management in the definition of the Post-Disaster Needs Assessment (PDNA), opportunities, and economic reboot?

INDICATIVE MEASUREMENT SCALE	
3	**Full acknowledgment.**
2	**Acknowledgment, but with some shortfalls.**
1	**Broad acknowledgment.**
0	**No acknowledgment.**

COMMENTS

Cultural heritage may be tangible, intangible, and natural. Tangible heritage is further divided into movable (paintings and sculptures) and immovable (churches, monuments, and urban areas). Intangible heritage is an expression of traditional community and includes, for example, traditions, ceremonies, arts, creative works and skills. Focusing on the bearers and practitioners, intangible heritage is essential for building resilient cities[1].

Presence of comprehensive post event recovery plans is covered in Essential 10 of the Disaster Resilience Scorecard for Cities.

The term "prioritization" relates to the identification of cultural heritage as critical assets, i.e. elements whose functioning is essential for the city, the maintenance of public safety or disaster response.

The term "management" encompasses the protection, maintenance, and revitalization of cultural heritage, which has a positive role in reducing disaster risk, see UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties[2] and UNESCO 2019 Operational Guidelines for the Implementation of the World Heritage Convention[12].

Addressing culture and cultural heritage in post event recovery plan may be done with the help of the Culture in City Reconstruction and Recovery framework[5], the Matrix for the Compilation of Case Studies[39], and the PDNA Guidelines Vol B[37].

10.2 PRE-EVENT PLANNING FOR POST-EVENT RECOVERY - INCLUSIVE AND PARTICIPATORY CONSULTATIONS

Has the **post-event recovery plan** been developed through inclusive and participatory consultations of all concerned groups and institutions involved in the cultural heritage sector?

INDICATIVE MEASUREMENT SCALE	
3	**All concerned groups and institutions have been engaged/consulted.**
2	**More than half of the concerned groups and institutions have been engaged/consulted.**
1	**Only few of the concerned groups and institutions have been engaged/consulted.**
0	**Concerned groups and institutions have not been engaged/consulted.**

COMMENTS

Concerned groups, institutions, professionals and citizens, such as traditional communities or "grassroots" organizations, may include, for example:

- Local government responsible for cultural heritage prioritization and management.
- Academia.
- Museums.
- Belief organizations.
- Organized civil society groups.
- Creative sectors.

Efforts should be made to include indigenous groups, marginalized communities and other loosely organized cultural heritage managers and producers.

Post event recovery plans should be defined considering a suite of possible "what-if" scenarios to suggest optimal solutions (see 1.2).

10.3 PRE-EVENT PLANNING FOR POST-EVENT RECOVERY - CULTURAL HERITAGE RECOVERY AND ECONOMIC REBOOT PLANS

Are efforts taken to **integrate** comprehensive post event recovery and economic reboot plans with all forms of cultural heritage and **surrounding areas?**

INDICATIVE MEASUREMENT SCALE	
3	**Yes, and beyond the city area.**
2	**Yes, but only in the city area.**
1	**Some efforts are taken but only in the city area.**
0	**No, plans are independent.**

COMMENTS

Cultural heritage may be tangible, intangible, and natural. Tangible heritage is further divided into movable (paintings and sculptures) and immovable (churches, monuments, and urban areas). Intangible heritage is an expression of traditional community and includes, for example, traditions, ceremonies, arts, creative works and skills. Focusing on the bearers and practitioners, intangible heritage is essential for building resilient cities[1].

Disaster, in particular catastrophic ones, may serve to alter or adapt many existing conditions in the city. For this reason, they may be used to promote significant changes that would not be possible in regular times[40].

For this scope, culture and cultural heritage are also enablers for sustainable development (see 1.4)[41].

Moreover, post event recovery and economic reboot plans should be coordinated with adjacent localities in case redevelopment must include relocation (considering for example increasing frequency of disaster due to climate change).

10.4 BUILD BACK BETTER - INTEGRATION OF TRADITIONAL DESIGN GUIDELINES

Are **traditional design guidelines** integrated with the concept of Build Back Better (BBB)?

INDICATIVE MEASUREMENT SCALE	
3	**Traditional design guidelines are fully integrated in BBB concepts and are mandatory.**
2	**Traditional design guidelines are integrated in BBB concepts but are not mandatory.**
1	**Traditional design guidelines are broadly integrated in BBB concepts.**
0	**Traditional design guidelines are not integrated in BBB concepts.**

COMMENTS

The concept of Build Back Better[42] (BBB) relates to the use of recovery, rehabilitation, and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment[43].

Adoption of BBB concepts is covered in Essential 10 of the Disaster Resilience Scorecard for Cities.

Traditional design guidelines include, for example, the adoption of traditional material (excluding cases where the material is no longer available or threatened/endangered) and construction techniques.

Materials and techniques may be integrated with compatible modern technologies and methods (given that new technology or knowledge is available) to achieve the needed level of safety.

Examples of the latter would be reinforcing adobe structures with innovative materials, such as geomesh, or, in extreme cases, keeping the external façade in adobe while interior is refurbished.

Design guidelines should aim to the preservation of the cultural heritage[11] and address authenticity[12], as mentioned by the UNESCO Recommendation on the Historic Urban Landscape[13]. This may also include regulations for the dimensions (height, width) and regularities of new constructions.

10.5 BUILD BACK BETTER - PROMOTE USE OF TRADITIONAL DESIGN GUIDELINES

Does the city/local government promote the **conservation and revitalization** of traditional design guidelines and craftsmanship?

INDICATIVE MEASUREMENT SCALE	
3	**Free and accessible courses and training materials for both professionals and non-professionals are provided.**
2	**Free courses and training materials for professionals are provided. However, they may not be accessible for non-professionals.**
1	**Paid courses and training materials for professionals are provided.**
0	**No, courses and training materials are not provided.**

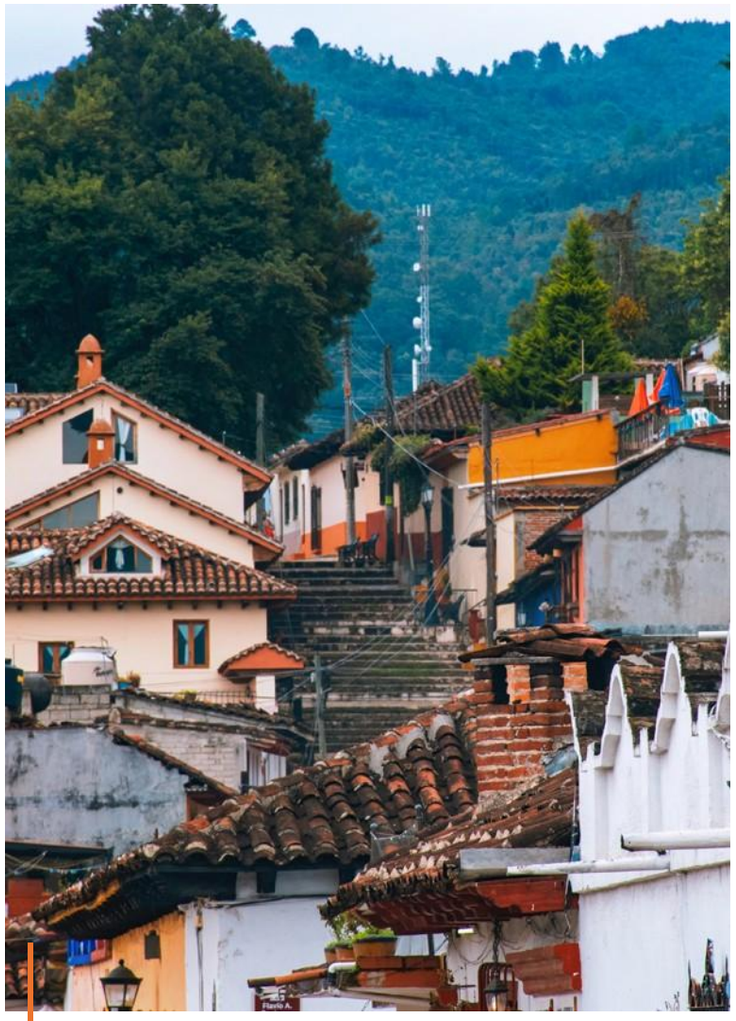
COMMENTS

Traditional design guidelines include, for example, the adoption of traditional material (excluding cases where the material is no longer available or threatened/endangered) and construction techniques.

Materials and techniques may be integrated with compatible modern technologies and methods (given that new technology or knowledge is available) to achieve the needed level of safety.

Training material may include manuals/handbooks or newly created app(s).

Accessibility to non-professionals may refer to a wide use of illustrations, alternative measure unit such as “rule of thumbs”, braille and other digital technologies.



Tuxtla Gutiérrez - Chiapas
Photo by Gabriel Tovar on Unsplash

A P P E N D I X 1 :

Terminology

The majority of the definitions listed in this Glossary are taken from, and align with, definitions in Annex II from the "Recommendations of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction", Open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction (Geneva, 29-30 September 2015, 10-11 February 2016 and 15-18 November 2016). For more details, please refer to the UNDRR Terminology[44].

Affected

People who are affected, either directly or indirectly, by a hazardous event. Directly affected are those who have suffered injury, illness, or other health effects: who were evacuated, displaced, relocated, or have suffered direct damage to their livelihoods, economic, physical, social, cultural and environmental assets. Indirectly affected are people who have suffered consequences, other than or in addition to direct effects, over time, due to disruption or changes in economy, critical infrastructure, basic services, commerce, or work, or social, health and psychological consequences.

Annotation: People can be affected directly or indirectly. Affected people may experience short-term or long-term consequences to heir lives, livelihoods, or health and to their economic, physical, social, cultural and environmental assets. In addition, people who are missing or dead may be considered as directly affected.

Authenticity

The ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful. Knowledge and understanding of these sources of information, in relation to original and subsequent characteristics of the cultural heritage, and their meaning as accumulated over time, are the requisite bases for assessing all aspects of authenticity.

Judgments about value attributed to cultural heritage, as well as the credibility of related information sources, may differ from culture to culture, and even within the same culture. The respect due to all cultures requires that cultural heritage must be considered and judged primarily within the cultural contexts to which it belongs.

Depending on the type of cultural heritage, and its cultural context, properties may be understood to meet the conditions of authenticity if their cultural values are truthfully and credibly expressed through a variety of attributes including:

- form and design, techniques, materials, and substance.
- use and function, traditions, and management systems.
- location and setting.
- language, and other forms of intangible heritage.
- spirit and feeling.
- other internal and external factors.

Attributes such as spirit and feeling do not lend themselves easily to practical applications of the conditions of authenticity, but nevertheless are important indicators of character and sense of place, for example, in communities maintaining tradition and cultural continuity.

The use of all these sources permits elaboration of the specific artistic, historic, social, and scientific dimensions of the cultural heritage being examined. “Information sources” are defined as all physical, written, oral, and figurative sources, which make it possible to know the nature, specificities, meaning, and history of the cultural heritage.

In relation to authenticity, the reconstruction of archaeological remains or historic buildings or districts is justifiable only in exceptional circumstances. Reconstruction is acceptable only based on complete and detailed documentation and to no extent on conjecture.

Build Back Better

The use of the recovery, rehabilitation, and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies, and the environment.

Annotation: The term "societal" will not be interpreted as a political system of any country.

Building code

A set of ordinances or regulations and associated standards intended to regulate aspects of the design, construction, materials, alteration, and occupancy of structures which are necessary to ensure human safety and welfare, including resistance to collapse and damage.

Annotation: Building codes can include both technical and functional standards. They should incorporate the lessons of international experience and should be tailored to national and local circumstances. A systematic regime of enforcement is a critical supporting requirement for the effective implementation of building codes.

Capacity

The combination of all the strengths, attributes, and resources available within an organization, community, or society to manage and reduce disaster risks and strengthen resilience.

Annotation: Capacity may include infrastructure, institutions, human knowledge and skills, and collective attributes such as social relationships, leadership, and management.

Critical asset

The physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society

Cultural days

Cultural days are dedicated days to transmit the past knowledge to new generations with the final aim to raise them awareness about the importance of the cultural heritage protection and the role of population in promoting cultural heritage management. During these days, places of culture are called to play a leading role, being the historical-artistic heritage vehicle of knowledge of the past, of reflection on current events, of inspiration for the future. Guided tours, digital initiatives and visits to the city heritage sites, monuments, museums and galleries may be organized, with the collaboration of local authorities, schools and universities.

Cultural Heritage Management

Cultural Heritage Management has been responsible for the provision and conservation of cultural heritage assets.

Protection and management of World Heritage properties should ensure that their Outstanding Universal Value, including the conditions of integrity and/or authenticity at the time of inscription, are sustained or enhanced over time. A regular review of the general state of conservation of properties, and thus also their Outstanding Universal Value, shall be done within a framework of monitoring processes for World Heritage properties.

Cultural Heritage Management

(CONTINUE)

All properties inscribed on the World Heritage List must have adequate long-term legislative, regulatory, institutional and/or traditional protection and management to ensure their safeguarding.

Common elements of an effective management system could include:

- a thorough shared understanding of the property, its universal, national and local values and its socio-ecological context by all stakeholders, including local communities and indigenous peoples.
- a respect for diversity, equity, gender equality and human rights and the use of inclusive and participatory planning and stakeholder consultation processes.
- a cycle of planning, implementation, monitoring, evaluation and feedback.
- an assessment of the vulnerabilities of the property to social, economic, environmental and other pressures and changes, including disasters and climate change, as well as the monitoring of the impacts of trends and proposed interventions.
- the development of mechanisms for the involvement and coordination of the various activities between different partners and stakeholders.
- the allocation of necessary resources.
- capacity building.
- an accountable, transparent description of how the management system functions.

Disaster

A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic and environmental losses, and impacts.

Annotations: The effect of the disaster can be immediate and localized but is often widespread and could last for a long period of time. The effect may test or exceed the capacity of a community or society to cope using its own resources, and therefore may require assistance from external sources, which could include neighboring jurisdictions, or those at the national or international levels.

Emergency is sometimes used interchangeably with the term disaster, as, for example, in the context of biological and technological hazards or health emergencies, which, however, can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society.

Disaster impact is the total effect, including negative effects (e.g., economic losses) and positive effects (e.g., economic gains), of a hazardous event or a disaster. The term includes economic, human and environmental impacts, and may include death, injuries, disease and other negative effects on human physical, mental and social well-being.

For the purpose of the scope of the Sendai Framework for Disaster Risk Reduction 2015-2030 (para. 15), the following terms are also considered:

- Small-scale disaster: a type of disaster only affecting local communities which require assistance beyond the affected community.
- Large-scale disaster: a type of disaster affecting a society which requires national or international assistance.

Disaster

(CONTINUE)

- Frequent and infrequent disasters: depend on the probability of occurrence and the return period of a given hazard and its impacts. The impact of frequent disasters could be cumulative or become chronic for a community or a society.
- A slow-onset disaster is defined as one that emerges gradually over time. Slow-onset disasters could be associated with, e.g., drought, desertification, sea-level rise, epidemic disease.
- A sudden-onset disaster is one triggered by a hazardous event that emerges quickly or unexpectedly. Sudden-onset disasters could be associated with, e.g., earthquake, volcanic eruption, flash flood, chemical explosion, critical infrastructure failure, transport accident.

Disaster Risk

The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

Annotation: The definition of disaster risk reflects the concept of hazardous events and disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socioeconomic development, disaster risks can be assessed and mapped, in broad terms at least.

It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors.

Disaster Risk Management

Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.

Annotation: Disaster risk management actions can be distinguished between prospective disaster risk management, corrective disaster risk management and compensatory disaster risk management, also called residual risk management.

Disaster Risk Reduction

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contributes to strengthening resilience and therefore to the achievement of sustainable development.

Annotation: Disaster risk reduction is the policy objective of disaster risk management and its goals and objectives are defined in disaster risk reduction strategies and plans.

Disaster risk reduction strategies and policies define goals and objectives across different timescales and with concrete targets, indicators, and time frames. In line with the Sendai Framework, these should be aimed at preventing the creation of disaster risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience.

A global, agreed policy of disaster risk reduction is set out in the United Nations' endorsed "Sendai Framework for Disaster Risk Reduction 2015-2030", adopted in March 2015, whose expected outcome over the next 15 years is: "The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries".

Early Warning System

An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses, and others to take timely action to reduce disaster risks in advance of hazardous events.

Annotations: Effective "end-to-end" and "people-centered" early warning systems may include four interrelated key elements: (1) disaster risk knowledge based on the systematic collection of data and disaster risk assessments; (2) detection, monitoring, analysis and forecasting of the hazards and possible consequences; (3) dissemination and communication, by an official source, of authoritative, timely, accurate and actionable warnings and associated information on likelihood and impact; and (4) preparedness at all levels to respond to the warnings received. These four interrelated components need to be coordinated within and across sectors and multiple levels for the system to work effectively and to include a feedback mechanism for continuous improvement. Failure in one component or a lack of coordination across them could lead to the failure of the whole system.

Essential services

Essential services are the services and functions that are necessary to maintain the health and welfare of the municipality. Without these services, sickness, poverty, violence, and chaos would likely result.

Some examples of essential services are:

- Health Care and Public Health
- Law Enforcement, Prisons and First Responders
- Food and Agriculture
- Energy
- Water and Wastewater
- Transportation and Logistics
- Government and Public Works
- Communications and Information Technology
- Education
- Critical Manufacturing
- Chemical, Hazardous and Nuclear Materials
- Financial Services
- Defense Industrial Base
- Commercial Facilities
- Construction-Related Activities

Evacuation

Moving people and assets temporarily to safer places before, during or after the occurrence of a hazardous event in order to protect them.

Annotations: Evacuation plans refer to the arrangements established in advance to enable the moving of people and assets temporarily to safer places before, during or after the occurrence of a hazardous event. Evacuation plans may include plans for return of evacuees and options to shelter in place.

Exposure

The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.

Annotation: Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.

Hazard

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption, or environmental degradation.

Annotations: Hazards may be natural, anthropogenic, or socio-natural in origin. Natural hazards are predominantly associated with natural processes and phenomena. Anthropogenic hazards, or human-induced hazards, are induced entirely or predominantly by human activities and choices. This term does not include the occurrence or risk of armed conflicts and other situations of social nstability or tension which are subject to International Humanitarian Law and national legislation. Several hazards are socio-natural in that they are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change.

Hazards may be single, sequential, or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency, and probability. Biological hazards are also defined by their infectiousness or toxicity or other characteristics of the pathogen such as dose-response, incubation period, case fatality rate and estimation of the pathogen for transmission.

Multi-hazard means the selection of multiple major hazards that the country faces, and (2) specific contexts where hazardous events may occur simultaneously, cascadingly (one as a consequence of or triggered by the other) or cumulatively over time and taking into account the potential interrelated effects.

Biological hazards are of organic origin or conveyed by biological vectors, including pathogenic micro-organisms, toxins and bioactive substances. Examples are bacteria, viruses or parasites as well as venomous wildlife and insects, poisonous plants, and mosquitoes carrying disease-causing agents. Hazards include (as mentioned in the Sendai Framework for Disaster Risk Reduction and in alphabetical order) biological, environmental, geological, hydro-meteorological, and technological processes and phenomena.

Biological hazards are of organic origin or conveyed by biological vectors, including pathogenic micro-organisms, toxins, and bioactive substances. Examples are bacteria, viruses, or parasites as well as venomous wildlife and insects, poisonous plants, and mosquitoes carrying disease-causing agents.

Environmental hazards may include chemical, natural, and biological hazards. They can be created by environmental degradation, physical or chemical pollution in the air, water, and soil. However, many of the processes and phenomena that fall into this category may be termed drivers of hazard and risk rather than hazards in themselves, such as soil degradation, deforestation, loss of biodiversity, salinization, and sea level rise.

Hazard

(CONTINUE)

Geological or geophysical hazards originate from internal earth processes. Examples are earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Hydro-meteorological factors are important contributors to some of these processes. Tsunamis are difficult to categorize; although they are triggered by undersea earthquakes and other geological events, they Essentially become oceanic process that is manifested as a coastal water-related hazard.

Hydro-meteorological hazards are of atmospheric, hydrological or oceanographic origin. Examples are tropical cyclones (also known as typhoons and hurricanes), floods including flash floods, drought, heatwaves and cold spells and coastal storm surges. Hydro-meteorological conditions may also be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances and volcanic eruption material.

Technological hazards originate from technological or industrial conditions, dangerous procedures, infrastructure failures or specific human activities. Examples include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.

Incentives

Tax incentives is one way in which governments can provide important encouragement for the preservation of cultural heritage by the private sector.

As the cultural heritage (movable and immovable) is of intrinsic importance and its preservation is also of economic and social significance, responsible for its conservation deserve support from the wider community. This makes it possible to fill the gaps in public funding which are often inadequate, particularly in countries with a very rich cultural heritage.

Incentives may be use to strengthen heritage structure and infrastructures to decrease their vulnerability to natural and man-made hazards, or digitalizing and setting up virtual visiting/travel experiences to grant accessibility in case of prolonged closure (for example, a pandemic).

These incentives may take the form of reduced VAT, income tax, wealth tax, inheritance tax or gift tax. Other forms of tax incentives can apply to the activities of NGOs and especially to act on an international level where national tax arrangements cannot apply.

Mitigation

The lessening or minimizing of the adverse impacts of a hazardous event.

Annotation: The adverse impacts of hazards, in particular natural hazards, often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques and hazard-resistant construction as well as improved environmental and social policies and public awareness. It should be noted that, in climate change policy, "mitigation" is defined differently, and is the term used for the reduction of greenhouse gas emissions that are the source of climate change.

"Most probable" risk scenarios

A disaster-causing hazard and its severity computed to be at the midpoint of a probability distribution (preferred) or assessed as "typical;" through expert judgment and other ad hoc estimation.

Preparedness

The knowledge and capacities developed by governments, response and recovery organizations, communities, and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.

Annotation: Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery.

Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, the stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal, and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required.

Prevention

Activities and measures to avoid existing and new disaster risks.

Annotations: Prevention (i.e., disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts of hazardous events. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts where, as a result, the risk of disaster is removed. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high-risk zones, seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake and immunization against vaccine-preventable diseases. Prevention measures can also be taken during or after a hazardous event or disaster to prevent secondary hazards or their consequences, such as measures to prevent the contamination of water.

Reconstruction

The medium-and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities, and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk.

Recovery

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

Recovery Plans

Recovery planning is a process that is a part of development planning and comprehensive risk management. As such, it is not just a product or plan in and of itself, but rather it implies a sustained set of actions of various kinds that are intended to make a society more resilient to disasters, not only by reducing the vulnerabilities to prevent the disaster from "hitting hard," but also generating the capacity to "get back up quickly and well" and to adapt to the changed conditions resulting from a disaster that are necessary to continue on the path of sustainable development.

More in details, post-disaster recovery is a complex process, it is multi-dimensional and involves many different institutions. Due to its nature, the process must involve stakeholders from national, regional, and local levels, as well as those from the international cooperation sector.
Planning recovery requires a process of anticipating the events and developing capacities, procedures, responsibilities, and abilities that can be implemented and/or applied in or for a post-disaster context, at any time; but these conditions must be "prepared for" in advance.

Traditional construction techniques

Traditional construction methods are those developed from their place and inhabitants, climate, geomorphological situation, available materials, hazard, needs for comfort and protection, skills and socio-cultural values and ethnic context and the economic system.

Traditional construction techniques can be considered as intangible cultural heritage that should be transmitted from generation to generation. They are fundamental in the reconstruction process to rehabilitate or rebuild infrastructure, housing and facilities that are linked to people culture and identities. This should be achieved without sacrificing the opportunity of improving design attributes such as use, capacity and other functionalities of these assets through the "Build Back Better" approach to respond to resilience needs and a community's evolving priorities.

Traditional materials

Traditional building materials are of natural origin; therefore, they derive from renewable sources. Furthermore, using modern construction methods, it is possible to reduce the number of technological operations during construction process. For these reasons, one of the sustainable construction ways is to prefer the traditional construction materials, such as stone, wood, straw, sheep's wool, fibers – hemp, cork, and clay by the new modern methods of construction.

Traditional (natural) building materials can be used as:

- structural materials - load bearing construction (e.g., wood, stone, rammed earth, straw bales, clay bricks);
- insulation materials (e.g. sheep wool, fibers - hemp, cork);
- complementary materials – realization of plastering, painting, flooring (e.g., clay, cork).

Vulnerability

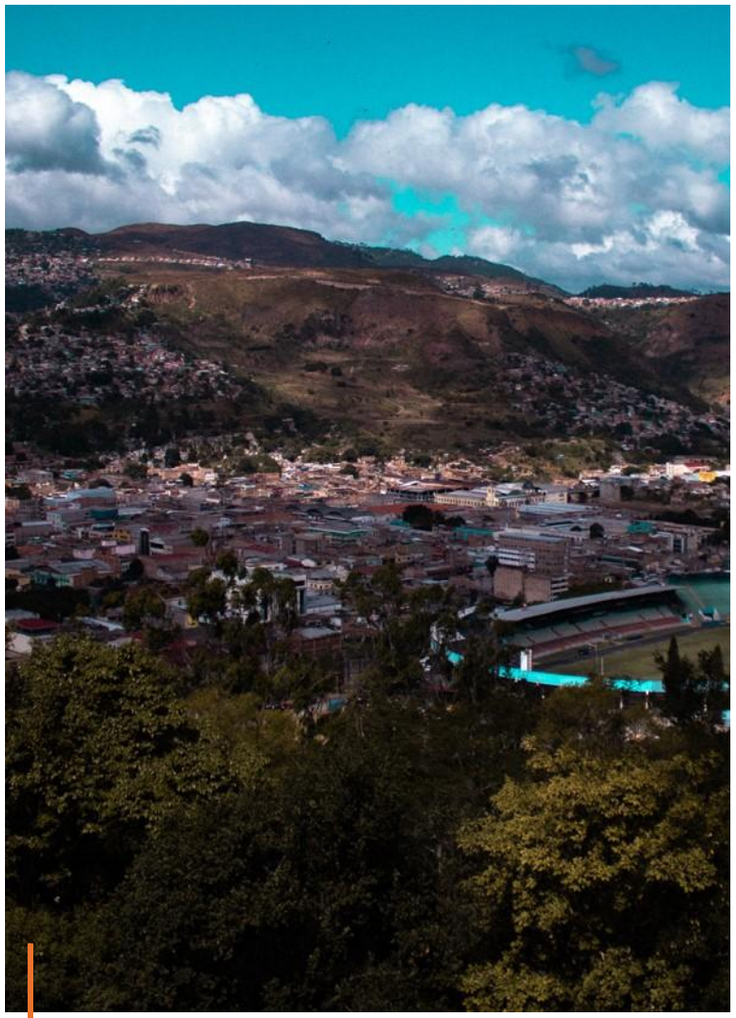
The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Annotation: For positive factors which increase the ability of people to cope with hazards see also the definitions of Capacity and Coping Capacity.

Zoning

Zoning is a planning control tool for regulating the built environment, that control location, size and use of buildings and decides the density of city blocks.

It is a method of urban planning that allow to municipality or local authorities to divide land into zones, each of which has a set of regulations for new development that differs from other zones. Its purpose is to allow local and national authorities to regulate and control urban growth and development, in order to prevent new development from interfering with existing uses and/or to preserve the character of the community.



Tegucigalpa - Honduras
Photo by Heber Barahona on Unsplash

APPENDIX 2:

References

1. UNESCO - 2003 Convention for the Safeguarding of the Intangible Cultural Heritage
https://ich.unesco.org/doc/src/15164-EN.pdf

2. UNESCO 2007 Strategy for Reducing Risks at World Heritage Properties
http://whc.unesco.org/archive/2007/whc07-31com-72e.pdf

3. UNDRR - Sendai Framework for Disaster Risk Reduction 2015-2030
https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

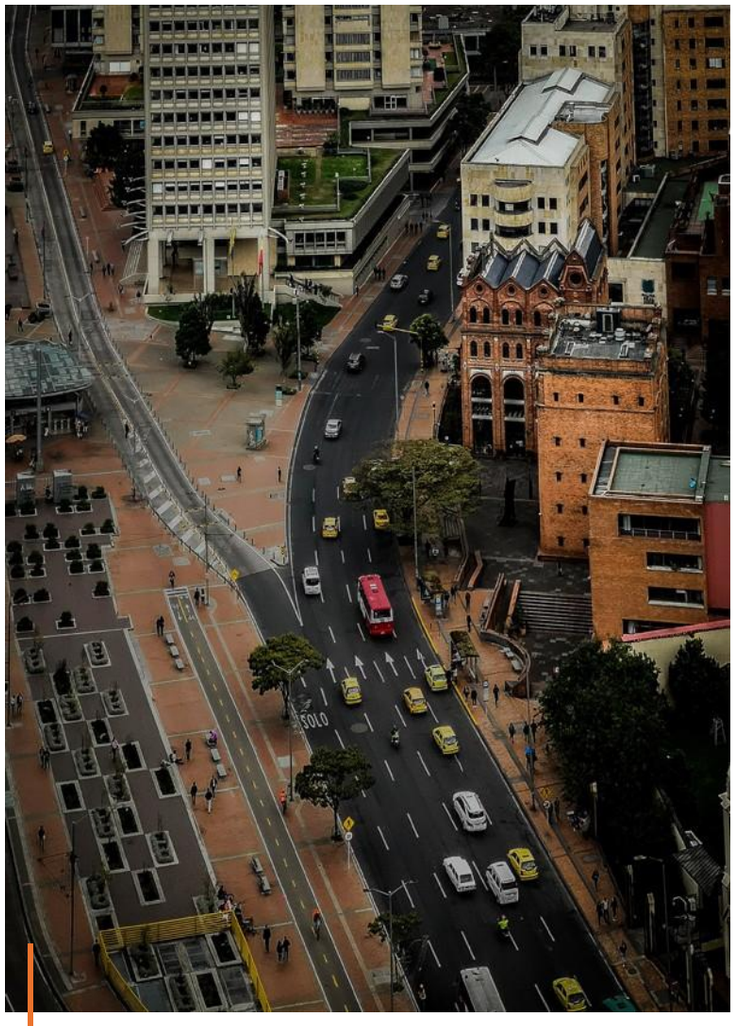
4. UNESCO - World Heritage Resource Manual
https://whc.unesco.org/en/managing-disaster-risks

5. UNESCO Culture | 2030 Indicators
https://unesdoc.unesco.org/ark:/48223/pf0000371562

6. WB -Culture in City Reconstruction and Recovery framework
https://openknowledge.worldbank.org/handle/10986/30733

7. 2030 Agenda for Sustainable Development
https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

8. Natural Hazards and Disaster Justice. Challenges for Australia and Its Neighbours
https://www.palgrave.com/gp/book/9789811504655



Bogotá
Photo by Juan Samudio on Pexels

9. UNESCO - Culture and Sustainable Development: the Key Ideas
http://www.unesco.org/new/en/culture/themes/culture-and-development/the-future-we-want-the-role-of-culture/the-key-ideas/

10. UN Habitat New Urban Agenda
https://unhabitat.org/the-new-urban-agenda-illustrated

11. ICOMOS charter Principles for the analysis, conservation and Structural Restoration of Architectural Heritage
https://www.icomos.org/en/about-the-centre/179-articles-en-francais/ressources/charters-and-standards/165-icomos-charter-principles-for-the-analysis-conservation-and-structural-restoration-of-architectural-heritage

12. UNESCO Operational Guidelines for the Implementation of the World Heritage Convention
https://whc.unesco.org/en/guidelines

13. UNESCO Recommendation on the Historic Urban Landscape
https://whc.unesco.org/en/hul/

14. UNDRR Hazard - Definition and Classification Review
http://undrr.org/publication/hazard-definition-and-classification-review

15. 2015 Recommendation concerning the Protection and Promotion of Museums and Collections
http://www.unesco.org/new/en/culture/themes/museums/recommendation-on-the-protection-and-promotion-of-museums-and-collections/

16. 2003 Convention for the Safeguarding of the Intangible Cultural Heritage
https://ich.unesco.org/doc/src/15164-EN.pdf

17. Ethical Principles for Safeguarding Intangible Cultural Heritage
https://ich.unesco.org/en/ethics-and-ich-00866

18. UNESCO - Cultural Mapping
https://bangkok.unesco.org/content/cultural-mapping

Jardim Botânico Fanchette Rischbieter - Curitiba
Photo by Camila Figueiredo on Unsplash

19. NIST Technical Note 1959. Defining the Resilience Dividend: Accounting for Co-benefits of Resilience Planning https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1959.pdf

20. Banba, Michiko, and Rajib Shaw. Land use management in disaster risk reduction. Springer Verlag, Japan, 2017. https://www.springer.com/gp/book/9784431564409

21. Spellerberg IF and Fedor PJ (2003), A tribute to Claude Shannon (1916–2001) and a plea for more rigorous use of species richness, species diversity and the 'Shannon–Wiener' Index. Global Ecology and Biogeography, 12: 177-179. https://onlinelibrary.wiley.com/doi/10.1046/j.1466-822X.2003.00015.x

22. Suárez M, Gómez-Baggethun E, Benayas J, Tilbury D (2016), Towards an Urban Resilience Index: A Case Study in 50 Spanish Cities. Sustainability, 8(8):774. https://www.mdpi.com/2071-1050/8/8/774

23. UN Environment Programme - Biodiversity and ecosystems https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/cities/biodiversity-and-ecosystems

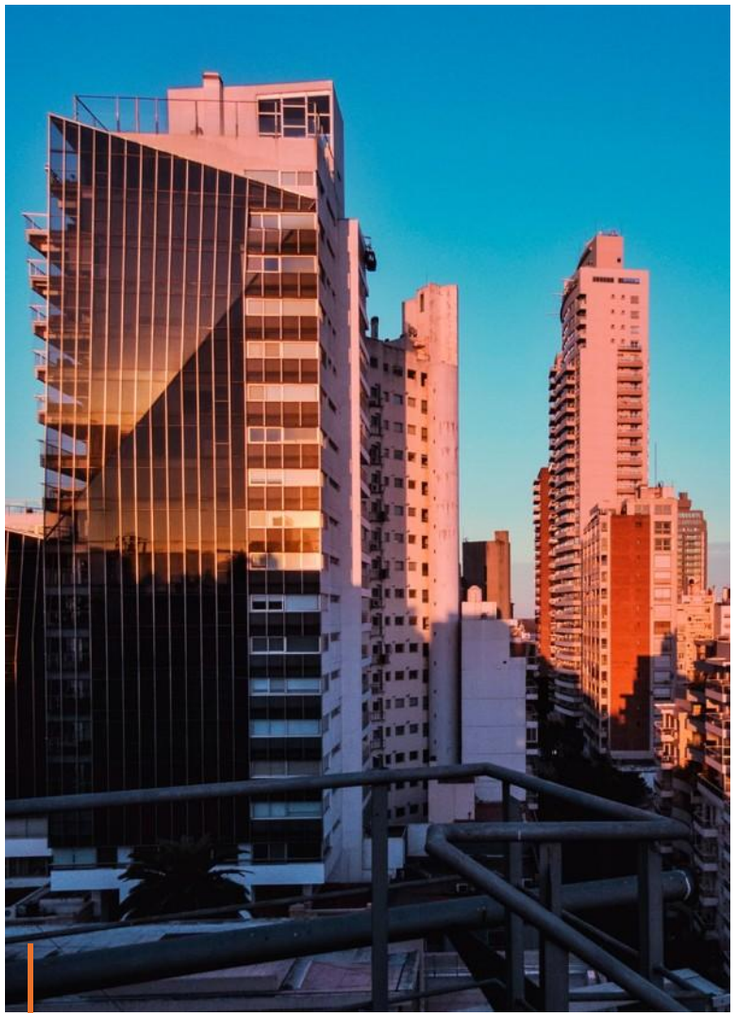
24. IUCN - Urban Protected Areas - Profiles and best practice guidelines https://www.iucn.org/content/urban-protected-areas-profiles-and-best-practice-guidelines

25. Berkes F (2008), Sacred ecology". 4th Ed. https://www.routledge.com/SacredEcology/Berkes/p/book/9781138071490

26. Parrotta J, Yeo-Chang Y, and Camacho LD (2016), Traditional knowledge for sustainable forest management and provision of ecosystem services. International Journal of Biodiversity Science, Ecosystem Services & Management, 12:1-2, 1-4, https://www.tandfonline.com/doi/full/10.1080/21513732.2016.1169580

27. Sangha KK, Preece L, and Villarreal- Rosas J (2018), An ecosystem services framework to evaluate Indigenous and local peoples' connections with nature. Ecosystem services, 31, 111-125. https://www.sciencedirect.com/science/article/abs/pii/S2212041617306782

28. Europe's endangered heritage - Recommendation 2038 (2014) Final version. Parliamentary Assembly, Council of Europe https://assembly.coe.int/nw/xml/XRef/Xref-XML2HTMLen.asp?fileid=20549&lang=en



Rosario - Argentina
Photo by Leandro Parenti on Unsplash

29. Mizutori, M. Reflections on the Sendai Framework for Disaster Risk Reduction: Five Years Since Its Adoption. Int J Disaster Risk Sci 11, 147–151 (2020). https://doi.org/10.1007/s13753-020-00261-2
https://link.springer.com/article/10.1007/s13753-020-00261-2

30. EU EACEA - Town Twinning
https://eacea.ec.europa.eu/home/programmes-and-actions/towntwinning-0_en

31. UNDRR. City-to-City Learning Exchange Programme - Disaster Risk Reduction and Resilience Building for Local Governments
https://www.preventionweb.net/events/view/54634?id=54634

32. ABA Committee on Disaster Response and Preparedness: Surviving a Disaster. A Lawyer's Guide to Disaster Planning
https://www.americanbar.org/content/dam/aba/events/disaster/surviving_a_disaster_a_lawyers_guide_to_disaster_planning.authcheckdam.pdf

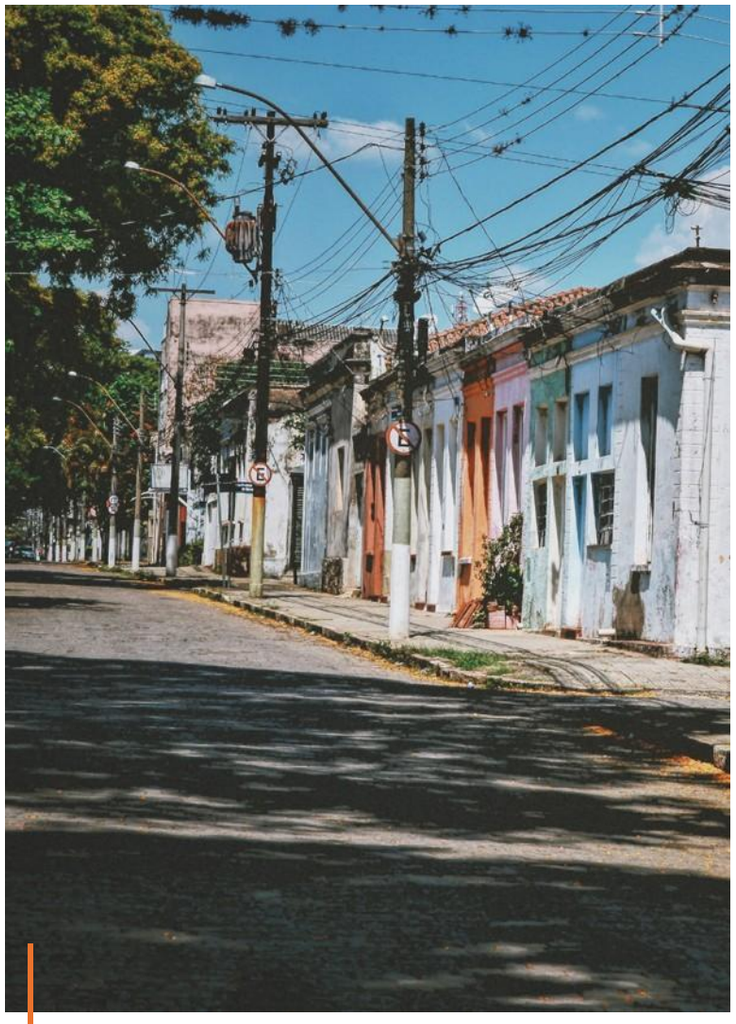
33. UNESCO.Operational Directives for the Implementation of the Convention for the Safeguarding of the Intangible Cultural Heritage
https://ich.unesco.org/doc/src/ICH-Operational_Directives-6.GAPDF-EN.pdf

34. UNDRR Reports - Indigenous knowledge for disaster risk reduction: good practices and lessons learned from experiences in the Asia-Pacific region
https://www.undrr.org/publication/indigenous-knowledge-disasterrisk-reduction-good-practices-and-lessons-learned

35. ResCult - Increasing Resilience of Cultural heritage: a supporting decision tool for the safeguarding of cultural assets.
https://www.rescult-project.eu/

36. UNESCO. Emblems for the Protection of Cultural Heritage in Times of Armed Conflicts
http://www.unesco.org/new/en/culture/themes/armed-conflict-andheritage/convention-and-protocols/1954-hague-convention/blueshield-emblem/

37. GFDRR. Post-Disaster Needs Assessments Guidelines Volume B
https://www.gfdrr.org/en/publication/post-disaster-needsassessments-guidelines-volume-b-2



Campinas - São Paulo, Brazil
Photo by Feliphe Schiarolli on Unsplash

38. IFRC. Services for the disaster-affected: Relief
https://www.ifrc.org/en/what-we-do/disastermanagement/responding/services-for-the-disaster-affected/relief/

39. ICOMOS. Matrix for the Compilation of Case Studies
https://www.icomos.org/en/focus/reconstruction/41704-icomosglobal-case-study-project-on-reconstruction

40. Chang RHH, Alex Greer, Haley Murphy, Hao-Che (Tristan) Wu & Steven Melton (2019) Maintaining the status quo: understanding local use of resilience strategies to address earthquake risk in Oklahoma, Local Government Studies, 45:3, 433-452
https://www.tandfonline.com/doi/full/10.1080/03003930.2018.1552145

41. Labadi, S., Giliberto, F., Rosetti, I., Shetabi, L., Yildirim, E. (2021). Heritage and the Sustainable Development Goals: Policy Guidance for Heritage and Development Actors. Paris: ICOMOS.
https://www.icomos.org/images/DOCUMENTS/Secretariat/2021/SDG/ICOMOS_SDGs_Policy_Guidance_2021.pdf

42. UNISDR. Build Back Better in recovery, rehabilitation and reconstruction. 2017 | Consultative version
https://www.unisdr.org/files/53213_bbb.pdf

43. Holtorf C. (2020) Special issue on "Authenticity and Reconstruction". International Journal of Cultural Property, 27(2), 161-290.
https://www.icomos.org/en/focus/reconstruction/80268-outcomesicomos-university-forum-published-in-the-ijcp

44. UNDRR.Terminology
https://www.undrr.org/terminology

Disaster Resilience Scorecard for Cities

CULTURAL HERITAGE ADDENDUM

UNDRR
UN Office for Disaster Risk Reduction

MCR 2030 Making Cities Resilient