

When Risks Overlap

Floods, Fires, storms ,
armed conflict and
earthquakes increasingly
combine—creating
cascading impacts for
people, heritage and
infrastructure



A yellow firefighting aircraft is seen from below, flying horizontally across the upper portion of the frame. The background is dominated by a massive, billowing plume of dark grey and black smoke that rises from behind a dense line of green trees at the bottom of the image. The smoke fills most of the sky, creating a dramatic and somewhat ominous atmosphere. The text is overlaid on the left side of the image, with the words "1 degree rise" and "triple" highlighted in blue boxes.

With every 1 degree rise in temperature, the costs for disaster response will triple

Building heritage resilience

against overlapping and interconnected risks from disasters, conflict and climate change



01

Good-enough risk assessment

Timely, proportionate and actionable—then updated as conditions change.



02

Prevention, Preparedness and capacity to act

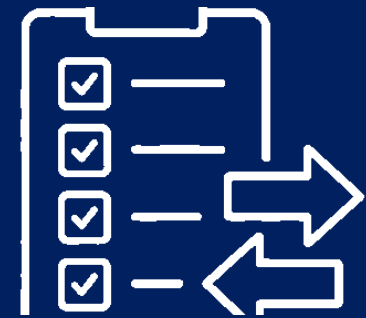
Clear roles, usable skills, resources and authority before an emergency.



03

Trained and trusted networks

Relationships practised in peacetime and ready to coordinate under pressure.



04

Standardized procedures

Shared methods for safety, assessment, documentation, prioritization and handover.

The first Principle for protecting heritage is a good enough risk assessment. It must match the time available and should lead to targeted action



IMMINENT THREAT • A WAR/ FAST APPROACHING WILD FIRE

What must we decide today?

- Is staff access safe?
- Protect in place—or evacuate?
- Which priority objects, route and destination



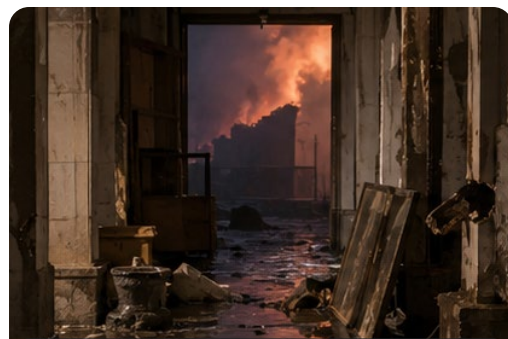
A RECURRING EVENT • A FLOOD EVERY 3–5 YEARS

What can we change before it returns?

- Map past flood routes and depths
- Raise or relocate exposed collections
- Improve drainage, barriers and readiness

risk is created by interacting causes

Risk assessment reveals where action can interrupt the chain.



1

HAZARD

What can happen—and from where?



2

EXPOSURE

Which collections are in its path—and where?



3

WEAKNESSES

Where can storage or protection fail?



4

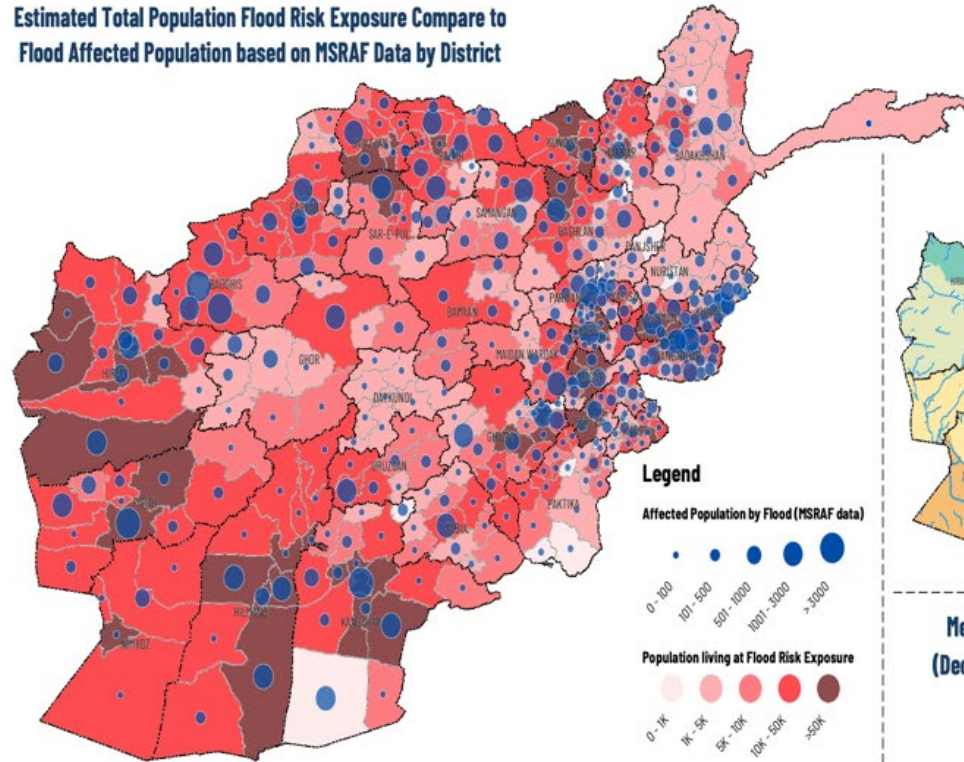
CAPACITY

What can we mobilize to change the outcome?

EXPOSURE IS SPATIAL

If a museum is beside government buildings during unrest, anticipate crowd movement, approach routes, vulnerable façades—and the collections lying behind them.

Estimated Total Population Flood Risk Exposure Compare to Flood Affected Population based on MSRAF Data by District



Description: This map indicates the estimated total population living in flood risk exposure areas by districts based on potential flood depth at a 100-year inundation event sourced by NATO C3 flood model, and bubbles show the number of individuals affected by floods during the period of (2012-2023) based on MSRAF data.

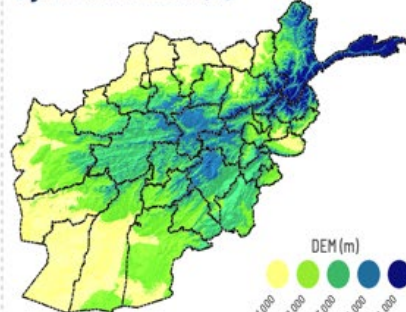
Note: The figures don't mean annually this much of the population will be affected by floods, for additional information see the documentation of the AFG-FHM. The second map shows the mean historical accumulated precipitation for the Spring season (March, April, May/June) by districts between (2000-2023), data sourced from Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) - Daily Precipitation dataset with 4800 m (1/20-de) computation resolution (scale). The third map shows mean historical accumulated snow cover for the winter season (December, January, February, March) by districts between (2015-2024) in percentage that indicates the number of days an area has experienced. For example, 70-100% (purple color) would be equivalent to 85-121 days in single season and light blue color shows fewer snow cover days respectively. The dataset is provided by NASA NSIDC DAAC at 500 meters resolution. This information has been proceed through Google Earth Engine (GEE) platform. The fourth map shows DEM (Digital Elevation Model) in meter.

Disclaimer: This map is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of iMMAP and do not necessarily reflect the views of USAID or the United States Government. The data is the responsibility of the data providers; it does not give an endorsement or acceptance by iMMAP, who is only responsible for its visualization.

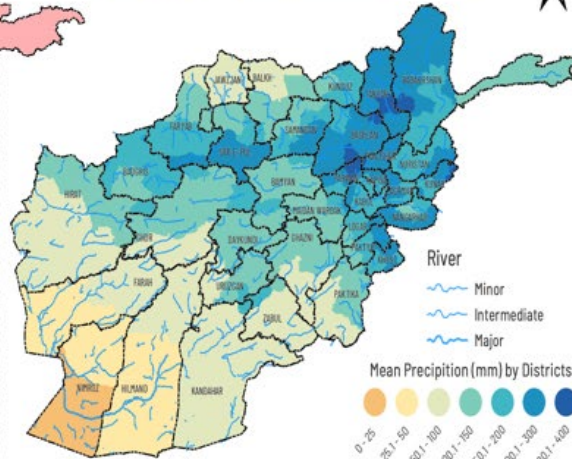
Datum/projection: WGS84/Geographic. **Data Sources:** ABCDO, AFG-FHM, CHIRPS, NSIDC.

Date Created: March 28, 2024. **Feedback:** rep-afghanistan@immap.org

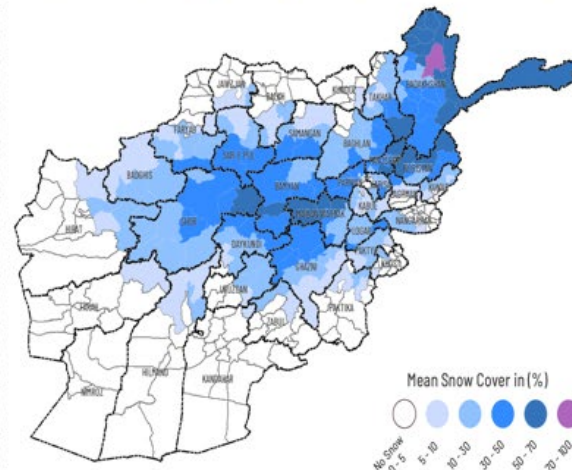
Digital Elevation Model (m)



Mean Historical Precipitation for Spring Season (March, April, May/June) between (2000-2023)



Mean Historical Snow Cover Percentage for Winter season (December, January, February, March) between (2015 - 2024)



GOOD-ENOUGH RISK ASSESSMENT

Geolocate risk before it reaches the museum

Use open-source hazard data to place your museum—and the collections within it—in relation to the threat.

ASK

- 1 What is exposed?
- 2 From which direction?
- 3 Where can protection fail?

Open data helps establish exposure. Field assessment tests what the map cannot show.



Risk is territorial. Assessment must be shared.

Work with disaster authorities, civil defense and fire services to build a common picture of risk.





**Principle 02: Prevention,
Preparedness and Capacity to Act**



**AFTER THE
EARTHQUAKE**

**SIMPLE ROPE
RESTRAINTS**



Once the risk is understood, simple preventive actions—such as installing rope restraints—can prevent losses worth millions

Zagreb earthquake · Croatia · 2021

PRINCIPLE 02

Prevention, Preparedness and capacity to act

Preparedness becomes real capacity through coordinated, joint action.

Reduce risks and share resources with emergency management actors—before an emergency.





INTERCONNECTED RISKS

**Reducing one risk
must not create
another.**

FOR EXAMPLE

Heavy crates moved to a basement may be safer from missile or drone attack—yet more exposed to flooding.





PRINCIPLE 03 Trained and trusted networks



ICOM-ALIPH online training of
Aiders to rescue objects in
archaeological Sites

01 TRAIN

Build skills, relationships
and trust.



02 SALVAGE

Sort, handle and stabilise
archaeological fragments.



03 DOCUMENT + EVACUATE

Record each object and move
it to safer storage.

Documentation and evacuation

A trained—and trusted—network was ready to act.

After the 2021 takeover, cultural first aiders and community members responded to a looted archaeological collection in Bamiyan.

DOCUMENTED • SALVAGED • STABILISED • EVACUATED TO SAFER STORAGE

PRINCIPLE 03

Trained and trusted networks

Training multiplied into local action.

In Dhamar, local cultural first aiders led a post-training field project to safeguard vulnerable recordings of traditional music and songs banned by group with the opposing ideology

DHAMAR, YEMEN

Locally led post-training field action



PRINCIPLE 04 | STANDARDISED PROCEDURES OR SOPs

Evacuate only when the whole chain is secured.



KATHMANDU, NEPAL · 2015

Too large to move intact, the Golden Throne was broken into pieces—without prior documentation or a secure storage plan.

SOPs must secure all four conditions

- 01 — Document before dismantling
- 02 — A safe route
- 03 — A trained, equipped team
- 04 — A secure destination

Otherwise, evacuation can transfer risk—rather than reduce it.



In order to make evacuation safe and legal:

An emergency protocol between the ministry and heritage sites and institutions must be place in advance

Templates for permissions must be ready before hand

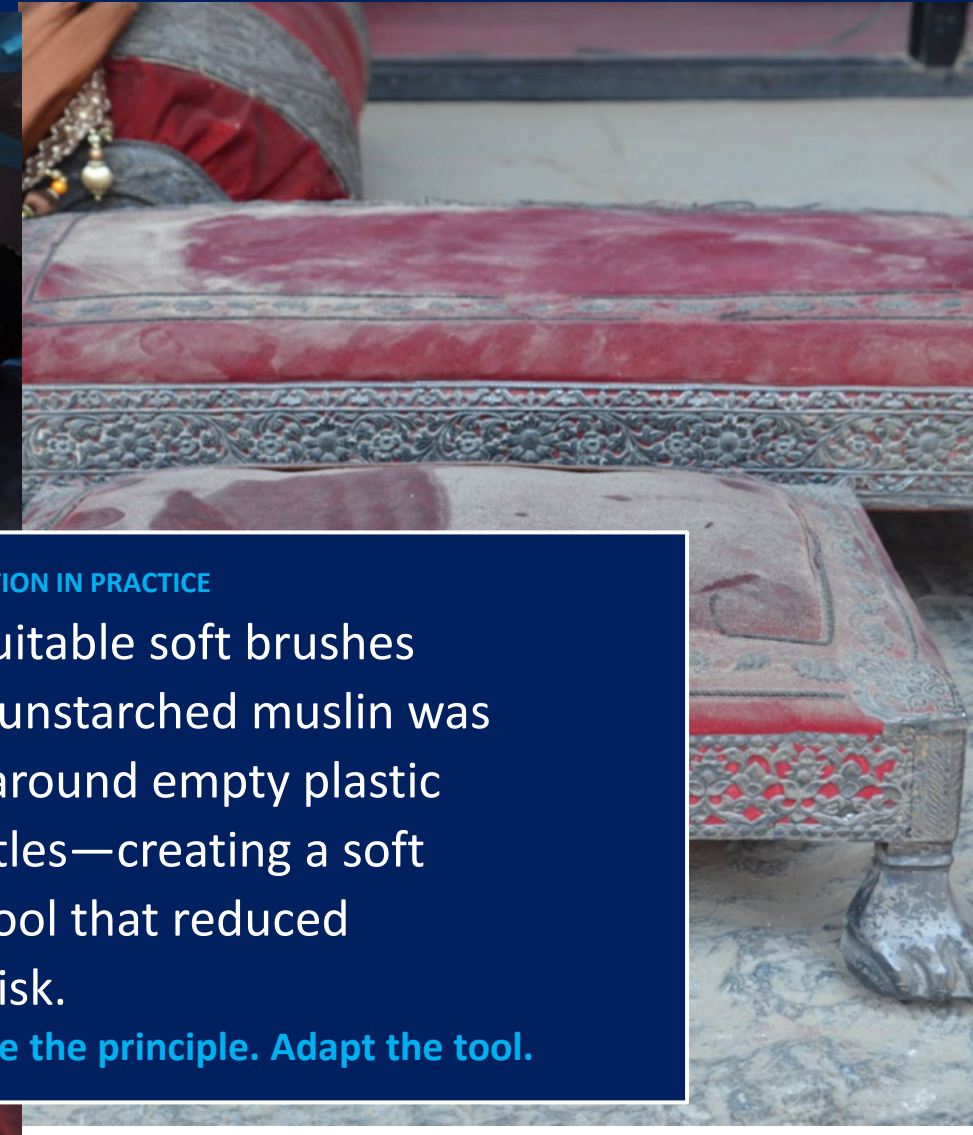
A safe and secure temporary storage must be identified and equipped to store priority items for an indeterminate period.

PRINCIPLE 04

Standardised procedures

CONSERVATION PRINCIPLES

- MINIMAL INTERVENTION



MINIMAL INTERVENTION IN PRACTICE

With no suitable soft brushes available, unstarched muslin was wrapped around empty plastic water bottles—creating a soft cleaning tool that reduced abrasion risk.

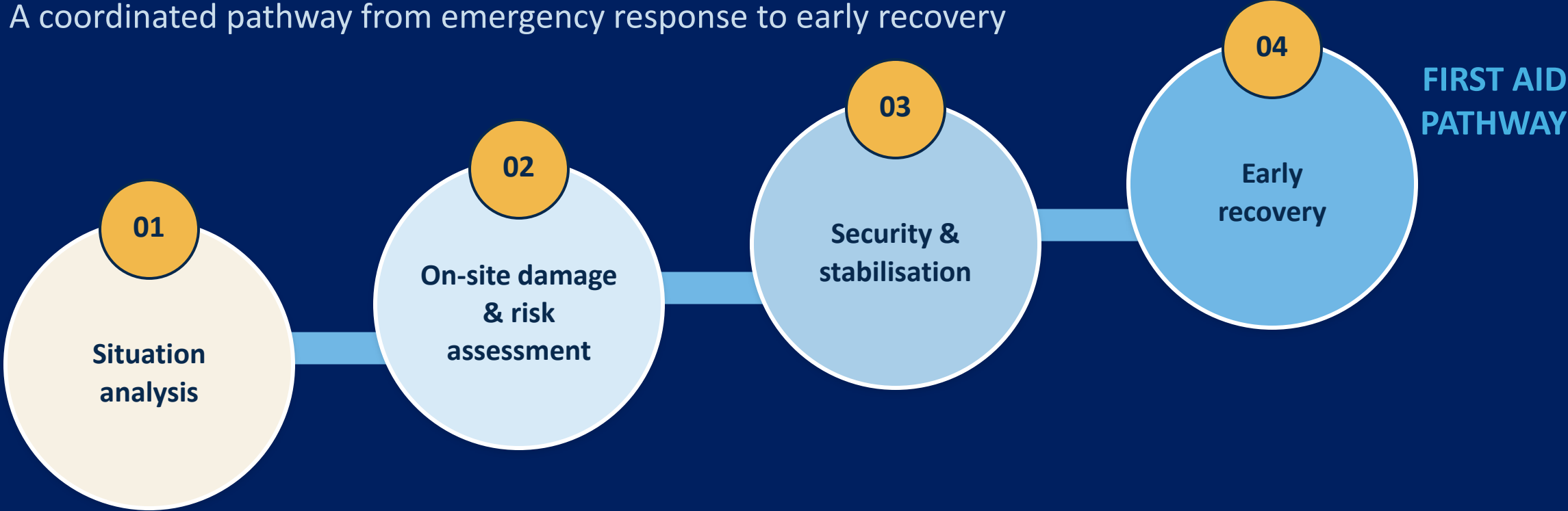
Standardise the principle. Adapt the tool.



PRINCIPLE 04

Standardised procedures guide every stage of cultural heritage first aid

A coordinated pathway from emergency response to early recovery



ACROSS EVERY STEP

DOCUMENTATION

RISK MANAGEMENT

COMMUNICATION & COORDINATION

Systematic situation analysis with National Corporation of Antiquities and Museums led to the identification of 77 at risk sites in Sudan at the onset of the conflict later updated to more than 100

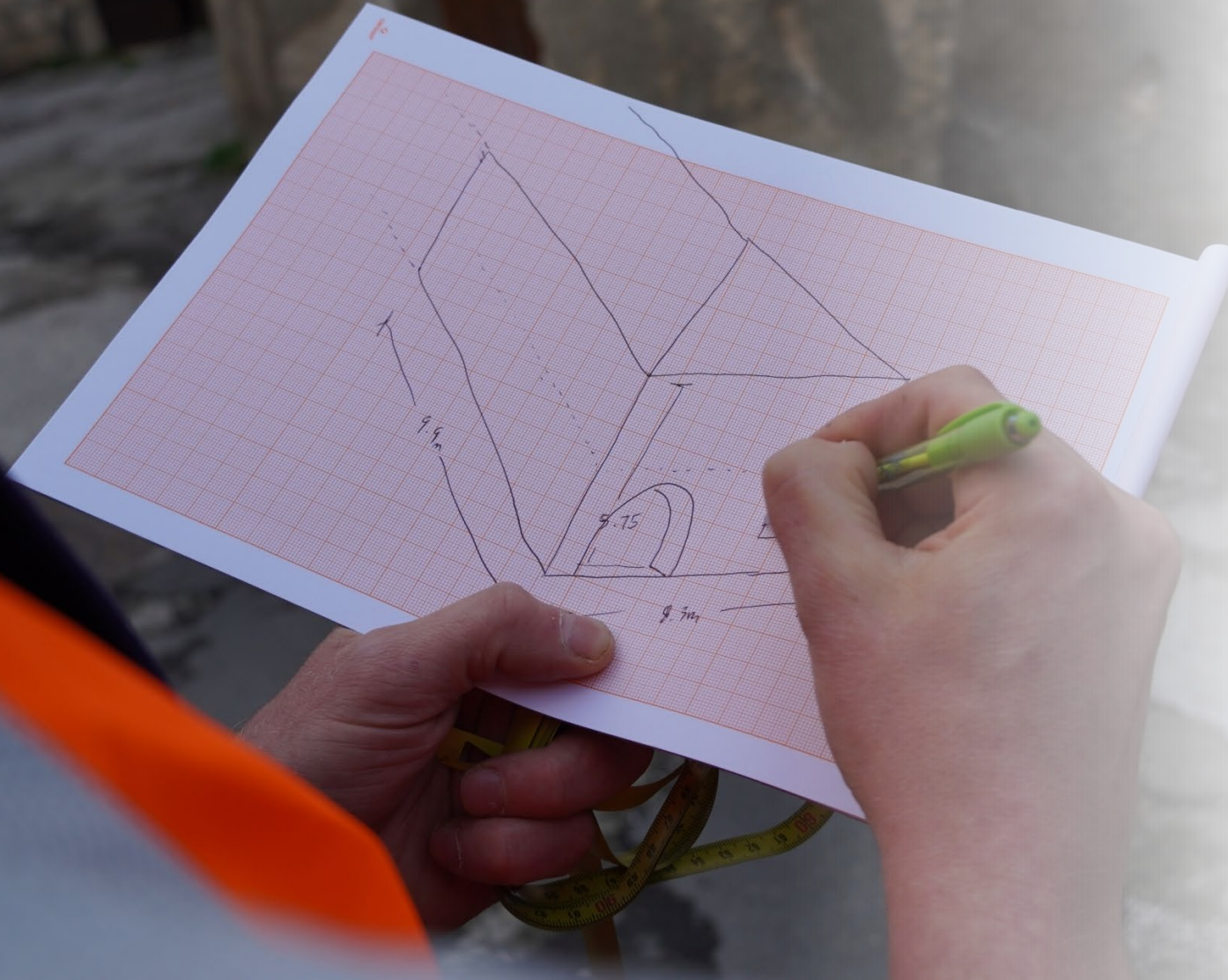
NO	MUSEUM	ACTIVE CONFLICT	FLOOD	FIRE	BOMBING	LOOTING	TERMITES,	Staff Capacity from RM	Community Capacity	Accessibilty	Risk Level	Publicity	Priority	High Priority Actions	
NORTHERN SECTOR															
1	KERMA MUSEUM	n	N	Y	N	Y	Y	Capacity Medium	High	Good	Low Risk		Low Priority	Very valuable collections can be considered a priority for criminal organizations	
2	JEBEL BARKEL MUSEUM	N	N	Y	N	Y	Y	Capacity High	High	High	Low Risk		Low Priority	The Museum has been looted twice,	
3	MARAWE LAND MUSEUM	N	Y	N	YY		Y	0	LOW	High	High		High		
CENTERAL SECTOR															
4	SENNAR MUSEUM	n		Y	Y	N	Y	Y	Capacity Low	Low	Good	High Risk		High Priority	The museum is built on soil that is exposed to subsidence and the building is deteriorated and suffers from many cracks the collections are very vulnerable and should be secured
5	WAD MEDANI MUSEUM	n	N	Y	N	Y	Y	Capacity Low-fair	Low	Good	Medium Low Risk		Medium Low Priority		
6	NATIONAL MUSEUM	y	Y	Y	Y	Y	Y	Capacity Low	High-Medium	0	High Risk	Y	High priority	Identify & train Guards. Insitu Protection (move collections to higher ground, cover with isolation material). Floor Plans location and inventory. Photographs for each room. Define conditions and SOP for Evacuation. On-site form for Risk Assessment.	
7	Sudan ETHNOGRAPHICAL MUSEUM	y	Y	Y	Y	Y	Y	Capacity Low	High-Medium	0	High Risk		High Priority	Get in Touch with the Community. Identify and train Volunteers. Define the priority list for the collections and its location. Prepare materials for moving objects. Move collection to higher ground. Cut electricity if shorts circuiting is a risk. Close the Sources of Water Windows and doors are secured. Identify safer places for priority objects inside the museum/ Storage. Make an SOP for reporting looting	
8	KHALIFA HOUSE	y	N	Y	Y	Y	Y	Capacity Low	High	0	High Risk		High Priority	Because it is next to the radio station and national tv and it is on the front line of the conflict and in terms of building materials is vulnerable.	
9	Sudan Natural History Museum	y	N	Y	Y	Y	Y	L	M-H	0	HIGH		High Priority		
10	THE MILITARY MUSEUM	y	N	Y	Y	Y	Y	L	H		HIGH		High Priority		
WESTREN SECTOR															
11	SHEIKAN MUSEUM	y	N	Y	Y	Y	Y	Capacity fair	High	possible for inside the city	Medium to high Risk		Medium Priority	the location is surrounded by radio station Gov buildings and a stadium, So the location is very exposed to high risk	
12	DARFUR MUSEUM	y	Y	Y	Y	Y	Y	Capacity fair	Low	0	High Risk		Medium Priority	The Location is in the middle of the conflict and beside a military unit	
13	SULTAN ALI DINAR MUSEUM	y	N	Y	Y	Y	Y	Capacity Medium	Low	0	Medium Risk		Medium Priority		
14	The temporary storage of the collection of SULTAN Nahr el-din PALACE MUSEUM (GENEENA Museum)	y	N	Y	Y	Y	Y	Capacity Low	Low	0	High Risk		Medium High Priority	2 years ago the museum was looted and attacked and a couple of objects were broken, and the museum was abandoned, the collection moved to a secret place near the museum	
EASTERN SECTOR															
15	PORT SUDAN MUSEUM	n	N	Y	N	Y	Y	Capacity Low-fair	Low	Good	Medium Low Risk		Medium Low Priority		
RIVER NILE SECTOR															

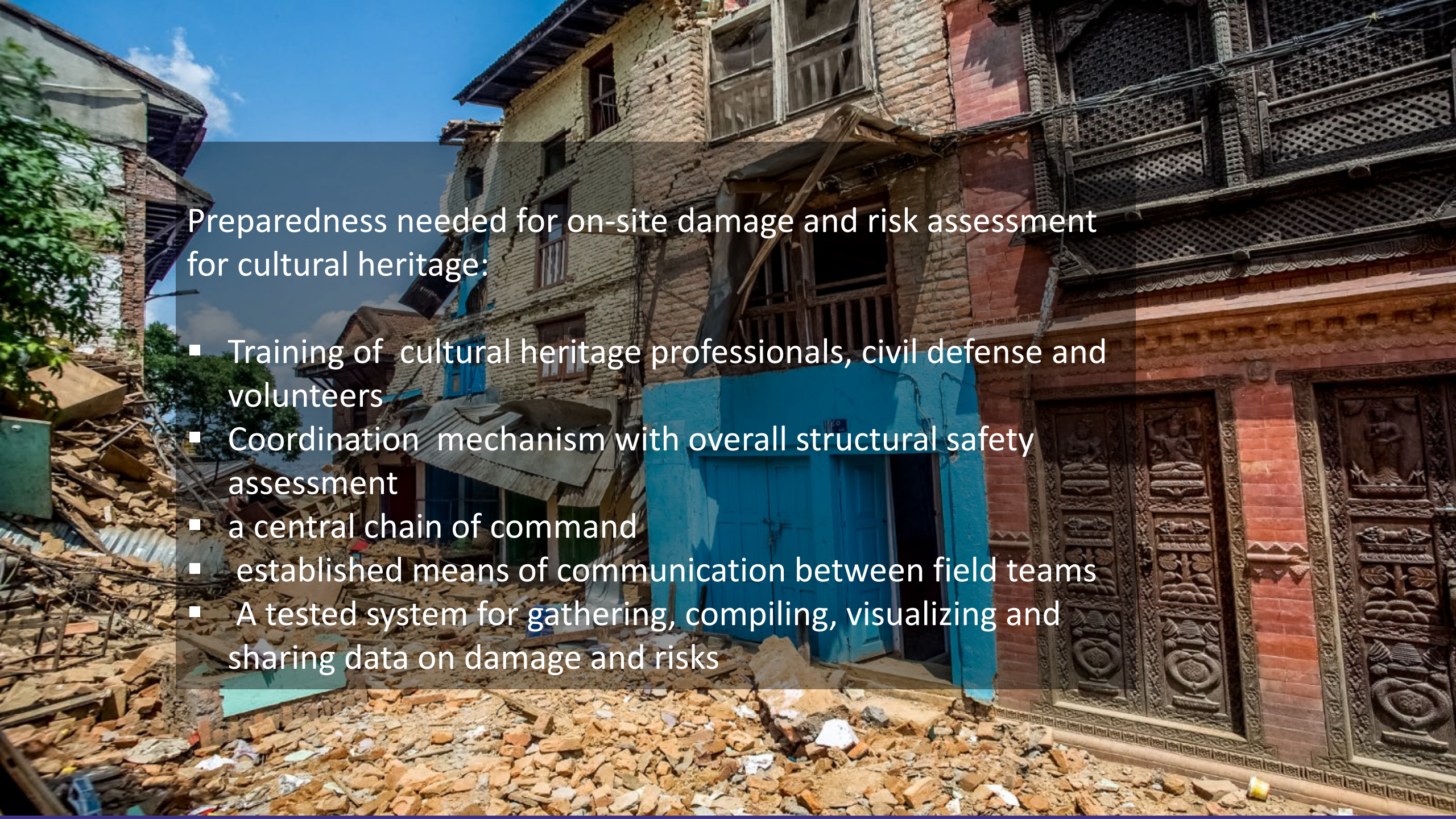
Step 2: Post-event, on-site damage and risk assessment

Gathering of actionable data to promote recovery

Three key elements of an effective assessment:

- Collection-data gathering
- Compilation- data collation and analysis
- Visualization – overview and geo-location of data, priorities and resources for on-site action.





Preparedness needed for on-site damage and risk assessment for cultural heritage:

- Training of cultural heritage professionals, civil defense and volunteers
- Coordination mechanism with overall structural safety assessment
- a central chain of command
- established means of communication between field teams
- A tested system for gathering, compiling, visualizing and sharing data on damage and risks

Step 3: Security and Stabilization



Salvage, Evacuation and Stabilization and Temporary Storage

Actions that stabilise the affected heritage and prevent further damage and loss through risk reduction

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

Systematic Salvage of Wall painting fragments



Step 4: Early Recovery – objects in an open temporary storage in National Museum of Nepal-one year after the earthquake



Guidance and tools I helped create

For heritage first aid, emergency evacuation, recovery and peacebuilding

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LANGUAGES



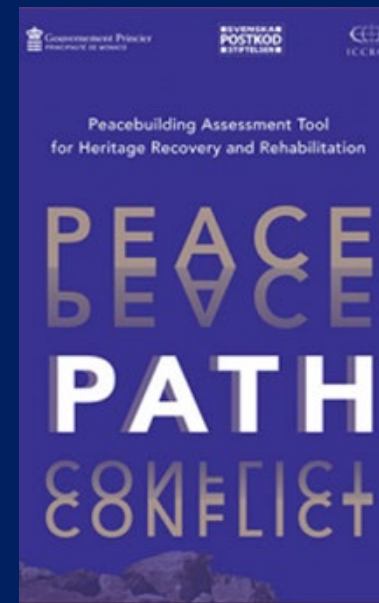
FIRST AID HANDBOOK



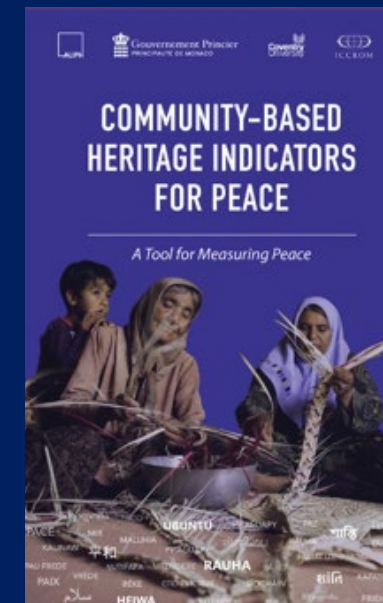
FIRST AID TOOLKIT



EMERGENCY EVACUATION



PATH



HERITAGE INDICATORS FOR PEACE

Field-tested guidance • practical decision tools • adaptable across different emergency contexts