



A new concept of Civil Protection Plan

Cultural HERitagE.
Risks and Securing activities

Interreg
Alpine Space
 **Cheers**
European Regional Development Fund

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Table of content

A NEW CONCEPT OF CIVIL PROTECTION PLAN	8
INVESTIGATED HAZARDS	9
SOURCES OF INFORMATION	9
AFFECTED AREAS	9
EXPECTED IMPACTS	10
CULTURAL HERITAGE IN THE AREA	11
SOURCES OF INFORMATION	11
CULTURAL HERITAGE DISTRIBUTION	11
EARLY WARNING SYSTEMS.....	13
OPERATING SYSTEMS.....	13
COMMUNICATION PROVIDED.....	13
ALERTS DISSEMINATION	13
ACTIVATION PROCEDURES	13
RISK SCENARIOS.....	14
REFERENCE RISK EVENTS.....	15
TIME SPAN FOR INTERVENTIONS	15
EXPOSED ITEMS	15
PRIORITIES OF INTERVENTION.....	16
SAFEGUARDING INTERVENTIONS.....	19
AVAILABLE RESOURCES	20
HUMAN RESOURCES.....	20
MEANS AND MATERIALS	20
STORAGE WAREHOUSES.....	20
MODEL OF INTERVENTION	21
RESCUE TEAMS.....	21
DEPLOYMENT OF INTERVENTIONS	21
COMMAND-AND-CONTROL CHAIN	21
OPERATING PROCEDURES.....	21

Scope:

Aim of this document is to generalize the experiences on pilot areas acquired by the CHEERS consortium in order to provide, in the form of an easy-to-read guideline, a synthesis of the main steps that local communities are invited to take when dealing with emergency planning for the safeguard of Cultural Heritage against natural hazards

Who this report is for

The contents of this document are mainly of interest for Civil Protection bodies, emergency planners and Cultural Heritage managers dealing with emergency planning for the safeguard of Cultural Heritage against natural hazards

Key words

Emergency planning, natural hazards, Cultural Heritage, geo-catalogues, early warning, risk scenarios, priorities, safeguarding, techniques, value, exposure, vulnerability, rescue teams, interventions, command-and-control, procedures

For public dissemination: Yes, it is intended to be published on project web site

Foreword

Emergency Plans are needed to ready Civil Protection structures for tackling and managing alert or emergency situations. They allow to prepare structured deployment of men and means for intervention, applying a logically organised approach, coordinated in time.

Cultural Heritage represent the ground of people identity in the Alps and strongly contribute to the economies of the local communities. Nevertheless, the work carried out by the CHEERS consortium also in the framework of Technical Workpackage «Emergency planning and salvaging activities» confirmed a widespread criticality: despite most of the existing regulation frameworks and Civil Protection schemes in the Alpine countries can be considered theoretically capable to set up efficient operational responses, the investigations carried out in the framework of CHEERS project highlighted that a significant amount of the Emergency Plans currently in place in the Alps, at different territorial levels, do not take into proper consideration the safeguard of Cultural Heritage.

Especially in front of predictable risk scenarios (e.g. floods, landslides, or forest fires), this appears particularly critical in cases when preventive interventions for the safeguard of Cultural Heritage must be implemented within limited time spans or stabilization actions need to be put in place immediately after the impacts occur.

The effective implementation of preventive or stabilization actions requires the creation of the cognitive base for sizing and organizing the employment of available resources (both human and means and materials) on the field.

That is planning, through:

- the characterization of damage scenarios, calculated using territorial exposure and vulnerability data and based on reference events more likely to occur within selected time intervals
- the elaboration of models of intervention which take into proper account the operational Civil Protection response schemes locally in force
- the definition of operating procedures for the safeguard of Cultural Heritage at risk

The experience acquired by the CHEERS consortium allowed to set up a step-by-step process which can be considered as a reference guidance, to be declined at the different territorial levels in accordance with the Civil Protection operational schemes locally in force, for integrating existing Emergency Plans with sections dedicated to the safeguard of Cultural Heritage.

For each operational phase of such process, the document outlines the main points that, based on the groundwork of the CHEERS consortium, an emergency planner or disaster manager should take into consideration when planning the protection of Cultural Heritage against natural hazards

Stefano Oliveri

Executive Summary

The document synthesises the experiences on pilot areas acquired by the CHEERS consortium and, with the aim to make a replicable and transferable methodological approach available, elaborates on the main phases that Civil Protection bodies, emergency planners and Cultural Heritage managers are invited to deal with when planning safeguarding interventions on Cultural Heritage exposed to natural hazards.

In the document, each phase is described and associated with a set of guiding topics and related questions pertaining:

- investigated hazards:
- Cultural Heritage in the area
- early warning systems
- risk scenarios
- available resources
- model of interventions
- operating procedures

That is, the whole planning process is elaborated, with evaluations specifically referred to Cultural Heritage and its safeguarding



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In the framework of CHEERS project, through a participated process involving experts and operators from the fields of both Civil Protection and Cultural Heritage management, pilot areas were called to update the **local Emergency Plans**.

Such process allowed the production of **concept notes** and **sets of recommendations** specifically oriented and dedicated to the safeguard of Cultural Heritage against natural disasters, in the different areas.

The implemented activities covered a **broad set of hazards** and focused on Emergency Planning schemes at **different territorial scales**: from the single Municipality to the Community of Municipalities or the Province:



Based on the experiences carried out and the lessons learnt at local level this document provides, in the form of an **easy-to-read guideline**, a synthesis of the main steps that local communities are invited to take when dealing with emergency planning for the **safeguard of Cultural Heritage** against natural hazards.

With the product «*Critical overview of Emergency Planning schemes at Alpine level*», the CHEERS consortium produced a survey focusing on the **Emergency Planning tools** provided for by the **Civil Protection regulations** in force in the different Alpine countries.

The highly etherogenous picture arisen suggested not to recommend a rigid Plan structure, but rather to develop an **emergency planning concept** consisting in a **methodological approach**, to be applied and declined **at country level** on the basis of regulations locally in force.



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Investigated hazards

The **first step** that needs to be tackled in the development of the Plan consists in a clear **definition of the hazards** that are going to be the object of the emergency planning document.

On the same territorial area, different hazards evolve through unique **dynamics** and **agents of damage**, impact distinct **parts** of the territory, require different **approaches** in the safeguarding interventions, can occur with different periods of return, can be **predictable or not** and, when predictable, they are expected to develop with **typical processes** and **alert timings**.

Such features strongly influence the **intervention approaches** that Civil Protection is called to apply in order to manage the arising risk scenarios.

After the **hazards under investigation** have been clearly defined, the emergency planning process should provide both for a detailed **description** of their expected **areas of impact** and for a proper **evaluation** of the **points of strength** and **limits** of the data available for their characterization

Analysis of hazards

When drafting the Civil Protection Plan, the emergency planner should **characterize** the investigated hazards in the area by providing a detailed picture on the following elements



Sources of information

The sources of data available to investigate the hazards should be stated, with information on both the data provider and the state of update of the accessible dataset.

In case hazard maps are not directly available, but they rather need to be generated through the application of dedicated methodologies, the source of such methods should be cited, the analytic process described and the data usable for their application stated



Affected areas

Based on the available data, their state of update, assumed reliability and accuracy, the reference dataset for depicting hazards in the area should be defined.

Thereafter, an overall description of the expected hazard distribution on the territory needs to be produced, with first level information on the zones assumed to be affected, with different periods of return, by the different kinds of phenomena under investigation



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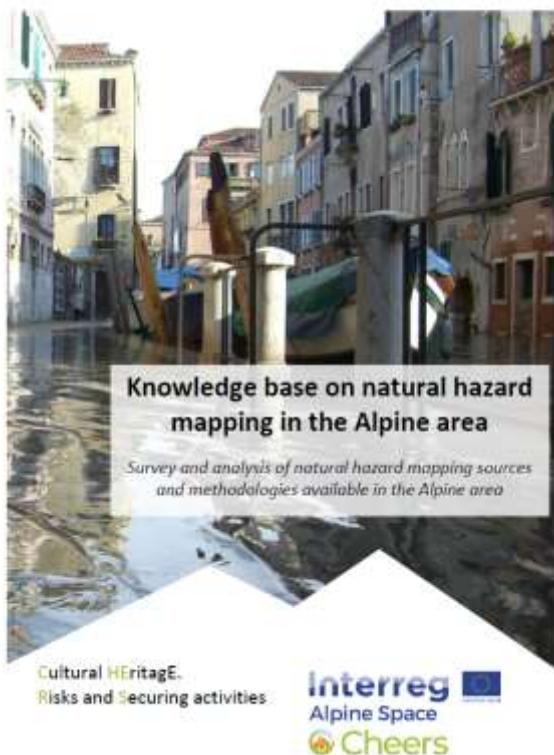
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Expected impacts

The first level framework on areas potentially affected by the hazards should be further integrated with information useful to predict the severity of the expected events and to derive first estimations on their possible impacts, in case the available dataset make this knowledge at hand (e.g. head of water, flood speed, landslide or avalanche volume, etc.)

Strengths and limits of the available data

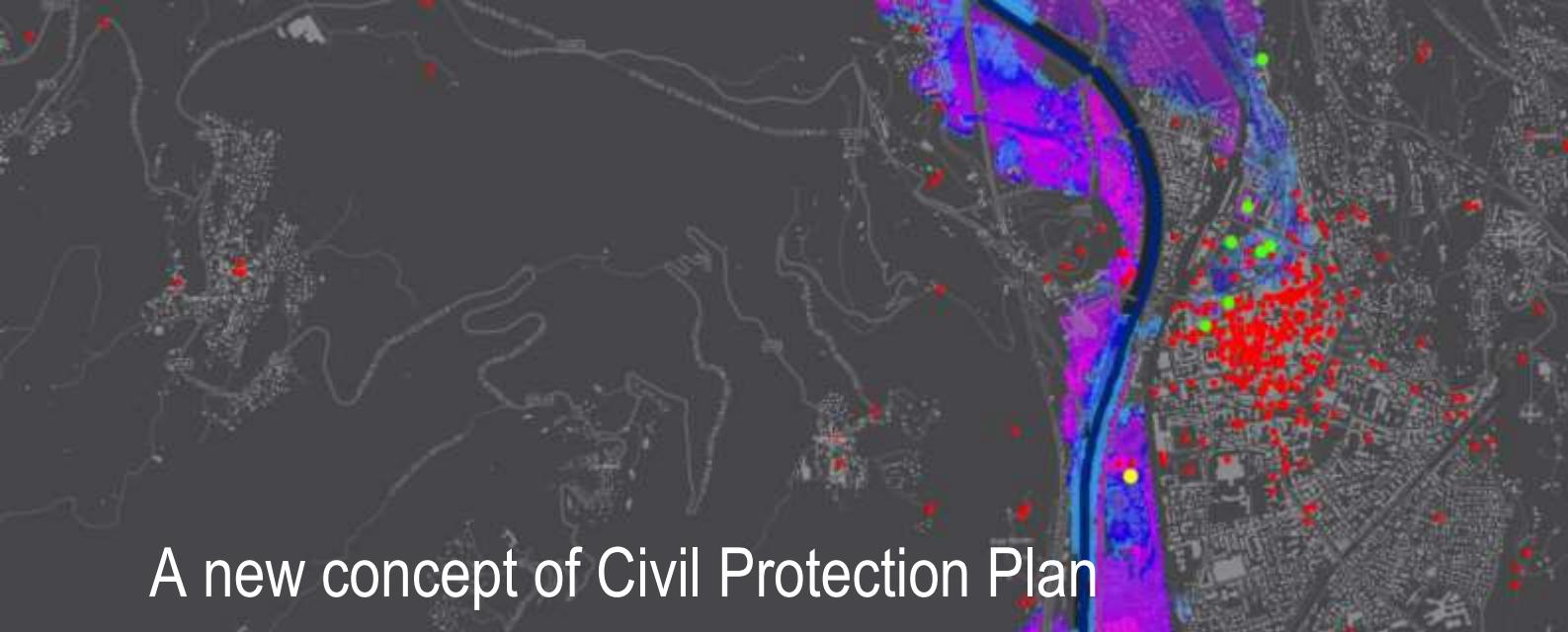


An effective use of hazard maps and data for the safeguard of Cultural Heritage against natural hazards implies that the emergency planner needs to be aware of the characteristic features of this action area.

The field experiences acquired by the CHEERS consortium highlighted that maps and data commonly employed in emergency planning processes are proving only partially successful when used in designing Cultural Heritage risk scenarios.

As an example, data pertaining the expected head of water in floodable areas can be mentioned: in spite being strategic in the evaluation of the effective exposure of artworks, they are often missing in widely used flood hazard maps.

To provide emergency planners with useful information on the points of strength and limits of the available hazard maps and data, the CHEERS product «*Knowledge base on natural hazard mapping in the Alpine area*» integrates the survey on existing sources of information with assessments intended to describe their applicability in the framework of Cultural Heritage safeguard



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Cultural Heritage in the area

In the framework of CHEERS process, Cultural Heritage represent the **target to protect**. Therefore, after the analytical phase oriented to estimate how the hazards under investigation are expected to hit a certain area, the **second step** of the CHEERS methodological approach consists in building a clear picture of the **distribution** on the territory of the assets to safeguard.

Being capable to accurately map the presence of Cultural Heritage on an area is of crucial relevance in order to comprehend the **spatial relationship** between the potential sources of hazard and the objects they might affect. A deep understanding of such relationship allows emergency planners to give a first level **answer to key questions** such as: «*will an event hit Cultural Heritage in the study area? What parts of the heritage might be in danger?» or «does a certain Cultural Heritage lay within a potential hazard zone?*».

In the next phases of the CHEERS process, we will figure out that simply **overlaid** the geographic distribution of hazards and Cultural Heritage does not allow to estimate the **effective exposure** of the heritage to be safeguarded. Nevertheless, a detailed map of cultural resources represents the basis for the further development of **risk scenarios**.

The Civil Protection Plan should therefore contain a **section** dedicated to an inventory of Cultural Heritage and develop on the following **elements**



Sources of information

The available sources of information to build an inventory of Cultural Heritage in the area under investigation must be defined and accurately stated.

The experience carried out by the CHEERS consortium showed that, in order to produce a comprehensive picture of the heritage in a given territory, the need might arise to acquire and integrate several datasets.

As they might be redundant, cover different areas of competence and provide differentiated sets of descriptive information, the Plan should outline a summary of the available data



Cultural Heritage distribution

After the reference data sources have been identified, maps depicting the spatial distribution of Cultural Heritage should be generated and commented.

In producing such maps, attention must be paid to the geographic accuracy of the source datasets. As CHEERS activities highlighted, indeed, some of the existing geo-catalogues pinpoint Cultural Heritage with high levels of precision whilst, in other cases, dedicated geo-referencing interventions must be provided for.

In the latter case, it is good practice to declare the scale used to geo-reference the data

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Strengths and limits of the available data



Similar considerations as those reported in the dissertation on hazards apply to the use of geo-spatial catalogues of Cultural Heritage. Planning safeguarding interventions on Cultural Heritage entails the capability to evaluate its actual exposure to hazards.

To this aim, besides the need to accurately define the location of heritage on the territory, emergency planners have to rely on specific sets of information. If, for instance, we refer to mobile artworks: in order to estimate their level of exposure to a certain hazard or plan safeguarding prevention or stabilization interventions, knowledge is needed, for example, on their location inside the containers (*is the item in the basement or on the ground floor?*), height from the ground (*in case of flood, is the clearance higher than the expected head of water?*), size, weight and type of fixing to the walls (*can the item be easily handled?*).

The survey activities carried out in CHEERS showed that existing Cultural Heritage catalogues, in most cases realized for inventory purposes, seldom achieve this level of detail. In the emergency planning process, disaster managers are therefore called to integrate available catalogues with dedicated analysis aimed at the integration of the existing knowledge base.

Besides making an overall picture of the main inventories currently available, the CHEERS product «*Knowledge base on geo-spatial catalogues in the Alpine area*» critically evaluates their range of applicability for emergency purposes and provides hints on how to integrate the available data



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Early warning systems

After the **characterization** of the **hazard distribution** on the territory and the **first identification** of **Cultural Heritage** located in **areas potentially at danger**, the Civil Protection Plan envisaged by the CHEERS consortium provides for a section dedicated to **early warning systems**.

From the emergency planning perspective, natural hazards can be assigned to two main **categories**, clearly distinguishing between **predictable** and **unpredictable events**. All events for which **precursors** can be identified belong to the first category. Among the others they include, with different levels of predictability, natural phenomena such as floods, landslides, forest fires or avalanches.

Whilst in case of unpredictable hazards the Civil Protection deploys its activities immediately **after the events outbreak** with the aim to **manage the emergency**, in front of **predictable scenarios** Civil Protection can **progressively activate** its response and implement **prevention activities** of growing intensity as alert levels increase.

In order to ready Civil Protection structures for **tackling** and **managing** alert situations, emergency planning must provide for a **complete integration** of **early warning systems** in the overall risk management process.

To this aim, the Civil Protection Plan should elaborate on the following **elements**



Operating systems

With respect to the hazards under investigation, the early warning systems locally operating must be identified and the alert phases they provide for described



Communication provided

The Plan should then portray the documents produced, their time of release, the distribution procedures and the subjects in charge for their acknowledgment



Alerts dissemination

The CHEERS experience suggests to increase the involvement of Cultural Heritage officials and managers in the process of alerts dissemination. At the time being, indeed, they are rarely addressees of early warning communications. To this aim, a dedicated strategy should be briefly elaborated in the Plan



Activation procedures

Based on the alert systems and the Civil Protection schemes locally in force, the Plan then states how the early warning communications intervene in initiating progressive operational phases aimed at the activation of coordination centres for Cultural Heritage protection and deployment of men and means for intervention



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Risk scenarios

The steps of definition of areas expected to be hit by the **hazards**, first level identification of the **Cultural Heritage** laying inside them and description of how early warning communications intervene in activating Civil Protection **operational interventions** are propedeutical to the development of the **core contents** of the Plan: namely, the elaboration of the reference **risk scenarios**.

Risk scenarios can be interpreted as «*descriptions of plausible events that may occur in the future*»¹, tools capable to support **disaster response** and allowing to plan the **actions** to be taken **before**, **during**, or immediately **after** an events outbreak.

Planning a structured deployment of men and means for interventions, with the application of a logically organised approach coordinated in time, entails the emergency planner to develop an **analytical process** involving **several steps**.

One of those steps, on which the CHEERS consortium was highly committed, deeply **characterizes** the field of safeguarding Cultural Heritage: that is, the definition of **priorities for intervention**.

To frame this concept, it is worth starting from a few basic **assumptions**:

- in alert or emergency circumstances, Civil Protection response is first of all oriented to save human lives
- interventions needed to safeguard Cultural Heritage are often time-consuming and can require complex operations, involving a broad number of professionals with different backgrounds and equipped with dedicated means and materials
- before the outbreak of an event, time spans available to intervene can be very short
- *at the time being, in none of the Alpine countries the specialized corps for the safeguard of Cultural Heritage have been structured enough to guarantee interventions on extended areas within limited time spans*

Given such constraints, the **need for planning** clearly emerges and, in the framework of the process aimed at defining disaster risk reduction interventions, emergency planners are called to **answer the question**: «*what to save first, if the need be?*». A statement which implies the awareness that something could be lost.

To this aim, based on the CHEERS consortium experience and outcomes, Civil Protection Plans should elaborate on the following **topics**

¹ Cambridge Centre for Risk Studies, in collaboration with Lighthill Risk Network, 2020. *Scenario Best Practices: Developing Scenarios for Disaster Risk Reduction*. Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School

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Reference risk events

The events taken into consideration for planning the safeguarding interventions must be defined. For each of them, detailed information should be provided on both the affected areas and the expected severity of the events



Time span for interventions

Based on the operativity of early warning systems in force and the expected dynamic of the events under investigation, an estimation should be provided on the time spans available to carry out the safeguarding interventions



Exposed items

Whilst the section dedicated to the «*Cultural Heritage in the area*» provides for a first level identification of the assets located in the areas potentially at danger, in the definition of risk scenarios the exposure of Cultural Heritage must be investigated deeper. Namely, the emergency planner should be capable to come to the identification of the single heritage pieces which are expected to be hit by the reference events.

As highlighted above, in most cases existing Cultural Heritage geo-catalogues do not contain the whole set of information necessary for accurate exposure evaluations. Filling such gaps and acquiring the missing data can imply the need to carry out specific surveys, with dedicated inspections and direct involvement of the managers of Cultural Heritage sites. Based on the field experience of the CHEERS consortium, in order to achieve a comprehensive picture of the items exposed to a certain event (regardless, so far, of their vulnerability to the different deterioration agents), the planner should:

- detect the structures assumed to be hit by the event
- identify the relevant elements of those structures and the artworks that such containers host (making sure to check the state of update of the Cultural Heritage catalogues possibly available)
- characterize both structural elements and hosted mobile objects with information of relevance to evaluate their exposure: *have risk prevention and mitigation measures been implemented? What are the spatial relationships between the identified items and the expected deterioration agents (e.g. location in the container, height from the ground)?*
- on the basis of data and information acquired, define the set of items exposed



Informational grid	
Monumental archivolt portals (white limestone) with balcony	X
Element of the structure	X
Dimensions:	4 m x 6 m (B x H)
Weight:	not relevant
Localization:	on three facades: northern, eastern and western
Height from the ground:	from the ground, up to 6 m
Exposure:	YES

Safeguarding interventions: implementation of a short-term active protection system, consisting of temporary carpentry in scaffolding pipes (or wood) stopped up with a waterproof sheet and sandbag (10 per each portal). Wooden boards to protect the windowpanes. Waterproofing with cyclododecane layer

Human resources: 4 volunteers per each portal + 1 qualified restorer

Time interval: 2-5 hours after initial impact



Informational grid	
Detached mural fresco depicting a Madonna with a child (1320)	X
Element of the structure	-
Dimensions:	85 cm x 59 cm (H x L)
Weight:	further investigation needed
Localization:	presbytery
Height from the ground:	1 - 2,5 m
Exposure:	YES

Safeguarding interventions: application of a waterproofing layer (cyclododecane spray) & moving of the first floor of the rectory

Human resources: 1 qualified restorer + 2 volunteers

Time interval: 10 min for the application of hydrocarbon spray + 1 hour for transference measures



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WP.T.4 | Deliverable D.T4.2.2

Priorities of intervention

After identifying the Cultural Heritage exposed to a certain event, the Civil Protection Plan goes through the definition of **priorities of intervention**, that is «*what to save first, if the need be?*». Answering this question implies the need to consider and integrate **two main concepts**:

- a primary driver steering the priority in safeguarding interventions is the **relevance value**: the higher the estimated relevance value of an asset, the greater should be the priority for making it safe
- a second notion to examine is the **vulnerability** of assets, in relation to the deterioration agents possibly brought by a certain hazard

To deal with these topics, CHEERS project produced a **set of integrated tools**. Given Cultural Heritage assumed to be exposed to a certain scenario, their application can support the emergency planners in building a theoretical (so far, not taking into consideration the availability of time and resources) **ranking** of assets on which **prior safeguarding interventions** should be implemented and assist them in getting to the root of the **issue**:

*An asset of high value but low vulnerability/
or
an asset of low value and high vulnerability
.... what has priority?*

In applying such tools, the emergency planners will not work autonomously. Rather, they should act as «*facilitators*» and build up **working groups** involving all **relevant stakeholders** and **experts** in charge of managing the Cultural Heritage and asked to provide **estimations** both on their value and vulnerability.



To this aim, stakeholders must be introduced to the **conceptual framework** needed for the evaluations. Activities will then develop through **two steps**, which results need to be **illustrated** in the Civil Protection Plan, namely:

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Value of Cultural Heritage

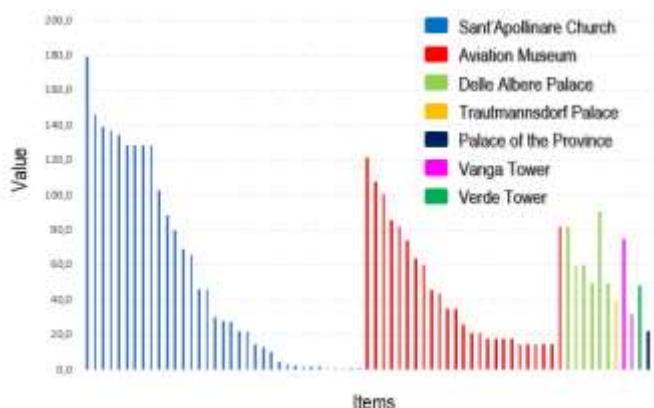


CHEERS consortium has developed a **dedicated tool**, described in the project product «*Conceptual document on evAluation Tool for Alpine Cultural Heritage (ATTACH) design*». The tool application provides for the following analytical steps:

- estimation, by means of an **Analytical Hierarchy Process (AHP)**, of **weights** (range: from 0 to 1) defining the relative importance of seven individual **types of values**, namely:
 - evidential
 - historic
 - aesthetic/artistic
 - communal
 - economic
 - use/fruition
 - scientific/educational
- assignment of a **score** (range: from 0 “null” to 243 “exceptional”) to each exposed item, pinpointing its **relevance** with regard to each type of value
- integration of weights and score by means of a **weighted sum process**

As a final result, for each item the ATTACH tool estimates an **Index**, proxy of each **item value**, with **theoretical range** between **0** and **243**. The higher the Index, the more valuable the asset is estimated to be.

As anticipated above, value estimations **do not provide**, as they are, a sufficient information framework to define the priority of safeguarding interventions on Cultural Heritage. To this aim, the CHEERS approach envisages their integration with evaluations pertaining the **items vulnerability** to the expected deterioration agents





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Vulnerability of Cultural Heritage



The application of the ATTACH tool brings to the estimation, for each item exposed to a certain scenario, of a **value** that depends only on the **relevance** of the item and which, in comparative terms, expresses the **relative importance** of each asset over all others.

Introducing the concept of **vulnerability** allows the planners to consider that different hazard scenarios (e.g. flood or forest fire) and deterioration agents (e.g. for flood: flow speed, wetting, humidity, impacts with floating objects, water pollution) are likely to cause, on the same item, different **levels of impact**, which might even turn out to be irreversible. Given a certain hazard, indeed, a high value item might not be vulnerable to its deterioration agents, whilst an item of lower relevance might be expected to suffer significant injuries.

Such evaluations suggested the CHEERS consortium to provide, in the process aimed at defining the priorities of intervention, for a **further analytical step**, quantitatively integrating the relevance values of items with synthesis indicators depicting their vulnerability.

Two approaches (and dedicated tools) have been generated by the CHEERS consortium and can be independently used by emergency planners:



3.2.1 FRAGILITY

The tool is based on the idea that certain alterations act on the value categories (the types of value adopted in ATTACH), possibly causing an overall loss of value, which is function of both the constituent material, the agents of damage and the expected alterations

The application of both tools allows a **full integration** of the relevance value and vulnerability concepts, with the generation of **correction factors** that, multiplied by the values estimations derived from ATTACH, bring to the generation of a final **list of priorities** for interventions



THREAT (cultural Heritage Risk Evaluation)

Based on expert based evaluations and adopting an item and event specific (agents of damage) approach, the tool estimates vulnerability by integrating likelihood values related to exposure and probability of damages, taking into consideration the possibility of permanent losses of value



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Safeguarding interventions

Besides estimating values and vulnerabilities of the items exposed to a certain event, planning a risk scenario for the safeguard of Cultural Heritage calls for a **further phase**. In strict cooperation with experts in the field of Cultural Heritage, the emergency planner should elaborate **item-specific evaluations** on the following topics



Interventions



Human resources



Means and materials

Firstly, interventions (prevention, protection, and stabilization after a potential events outbreak) to safeguard the exposed items must be defined and time needed for their implementation evaluated. Later, estimations should be provided on the operators (number and skills required, in accordance to the regulations in force) needed to manage the safeguarding interventions within the forewarning time. A “toolkit”, defining the set of means and materials needed to implement the interventions, should be then provided with evaluations on the logistical aspects for the activation of required resources.



Based on in-depth analysis carried out by the CHEERS consortium, comprehensive surveys integrating the available knowledges on threats and potential damages that Cultural Heritage can suffer when exposed to natural hazards and depicting reference techniques for their safeguarding are still missing.

In order to fill such gaps and provide planners and operators with useful information in planning interventions, the CHEERS deliverable «*Portfolio and application guidelines of cultural heritage protection reference techniques*» makes available:

- a screening (by type of material and deterioration agent) of possible alterations to cultural assets exposed to natural hazards, with details on:
 - type of damage (direct vs. indirect)
 - likelihood of damage and likelihood of permanent loss of value (these information are intended for the use of data in the application of the THREAT tool)
- related to the same materials and deterioration agents, a reference scheme of prevention and stabilization techniques



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WP.T.4 | Deliverable D.T4.2.2

Available resources

In the process of elaboration of the risk scenarios and, specifically, in the part dedicated to safeguarding activities, an estimation has been provided of the overall amount of **human resources**, **means** and **materials** which should be activated in order to manage the interventions on Cultural Heritage **within the forewarning time**.

As anticipated above, in alert or emergency circumstances, Civil Protection response is **firstly oriented** to ensure the **safety of people**, and this is the **primary field of action** on which operators are called to intervene. Moreover, safeguarding interventions on Cultural Heritage can be time-consuming, complex, and preventive or stabilization actions often need to be carried out within short time spans, thus needing a **great deployment of forces**.

Whilst the section on safeguarding interventions outlines the **overall amount** of resources whose activation might allow to protect or secure the **entire** Cultural Heritage exposed to a certain scenario, making emergency planning effective requires to define the resources which, in case of need, the Civil Protection could **actually count on**.

The overall amount of resources **in fact available** might, indeed, turn out to be **smaller** than the theoretical need, thus reinforcing the requirement to work on the concept of **priorities for interventions**: «*given the constraints due the available resources, what should I save first and what might be lost, if the need be?*».

Therefore, the Plan should build a **realistic estimation** of resources on which Civil Protection might count in case of emergency and elaborate on



Human resources

The number of operators expected to be operational should be evaluated and declared, structured by the different categories provided for by the legislation locally in force (e.g. officials of the Superintendences, restorers, fire brigades, specialized volunteers)



Means and materials

An inventory must be made of both means and materials in fact available at the operating structures responsible for safeguarding interventions. Deficiencies and needs should be highlighted, to foster an upgrading process of the available equipment

Storage warehouses

Prevention activities might consist in **handling operations**, aimed at securing mobile items in safe **storage warehouses**. Structures which can also be used to host Cultural Heritage in need of **stabilization** or **restoration interventions**, after the events outbreak. The Plan must identify the **storage warehouses** locally accessible and, in case they are not available in the area, emergency planning might foster their activation by the competent authorities



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WP.T.4 | Deliverable D.T4.2.2

Model of Intervention

Once the following topics have been developed:

- identification of **reference risk scenarios** (hazard areas, exposed Cultural Heritage, early warning systems, forewarning time)
- definition of **safeguarding interventions**
- estimation of **human resources, time and means and materials** needed for their implementation
- evaluation of **priorities of intervention**
- assessment of actually **available resources**

... the Civil Protection Plan comes to its **final section**, which elaborates on how the knowledge framework acquired can concur in the definition of a **conceptual simulation of how the interventions might unfold**.

To this aim, the following **main topics** should be examined



Rescue teams

Safeguarding interventions should be entrusted to rescue teams, whose composition depends on both the activities to be implemented (*what kind of skills are needed?*) and on the regulatory requirements in force (*in the operational theatre, what positions are provided for by the law?*).

Based on the resources actually available, the number of teams which might be activated should be defined



Deployment of interventions

Given the actionable resources, the time spans available and the estimated duration of the salvaging activities on Cultural Heritage exposed to a certain scenario, the Plan should develop an operational outline of the safeguarding interventions, defining the assignments of each rescue team with the aim to secure, within the forewarning time and based on the priorities of interventions and boundary conditions, as much of the Cultural Heritage as possible



Command-and-control chain

The command-and-control chain, ensuring the activation of the intervention coordination centres, must then be outlined, stating how the centres operate in growing phases of alert or emergency and defining the flow of communication provided for when the need arises to activate rescue teams



Operating procedures

Final step of the emergency planning process, operating procedures must be elaborated. With the aim to declare, in alert or emergency conditions, the roles, tasks and responsibilities of all the actors asked to activate, coordinate and implement the interventions aimed at the safeguard of Cultural Heritage



Project Partners

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Lombardy Foundation for the Environment (Lead Partner)
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Touring Club of Italy

FRANCE

National research institute of science and technology for environment and agriculture
French Geological Survey
Valabre Consortium

SLOVENIA

Slovenian Forestry Institute
Idrija Mercury Heritage Management Centre

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