



RISK ASSESSMENT AND SUSTAINABLE PROTECTION OF
CULTURAL HERITAGE IN CHANGING ENVIRONMENT

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Disasters and catastrophes pose risks not only to the conservation of the cultural heritage assets with its cultural, historic and artistic values, but also to the safety of visitors, staff and local communities. Additionally, they cause undoubtedly negative consequences for the local economies due to the loss of tourism revenues, and for the livelihoods of local people who are dependent on it. Protecht2save contributes to the

improvement of capacities of the public and private sectors to mitigate the impacts of climate change and natural hazards on cultural heritage sites, structures and artefacts. The project focuses primarily on the development of feasible and tailored solutions for building resilience of cultural heritage to floods and events of heavy rain.

WHAT HAPPENED IN THE LAST FEW MONTHS?

SUMMER UNIVERSITY CULTURAL PROPERTY PROTECTION JOINS ENVIMAT IN 2019 - AUSTRIA

The annual Summer University Cultural Property Protection 2019 was held together with the International Summer School ENVIMAT 2019 at Danube University Krems from **8 - 13 July 2019 - *Climate Change and Cultural Landscapes***. The one-week programme was based on **state-of-the-art research and EU funded projects on climate change and risk assessment** for natural and cultural heritage. It aimed at scientists, architects, engineers, archaeologists, site curators, cultural heritage managers, conservators, restorers, policy and decision makers, military personnel, graduate students, and post-doctoral fellows alike. The faculty included **international experts** on climate change, UNESCO World Heritage matters, terrace landscapes, flood modelling, and emergency planning for cultural heritage.

Austrian Pilot Testing

On **July 12th 2019** the Austrian pilot testing took place. The Austrian pilot site is the medieval city of **Stein** which today forms an integral part of the municipality of Krems. The main threat posed to Stein is the **flood from the Danube**. Stein is well protected by a mobile flood barrier which is raised by the fire brigades when the need arises. During the pilot testing the flood barrier was not erected since the fire brigade is well honed in building up the barrier and cultural heritage institutions are not involved in that part of preparedness measures.



For the pilot testing the newly opened **State Gallery of Lower Austria** was chosen, which houses the most important pieces of art from Schiele and Kokoschka to modern



artists from Lower Austria. It stands in a zone that is likely to be threatened by severe Danube floods, should the mobile barrier either be damaged or not high enough during a future flood. Therefore the fire brigades tested a crash evacuation of the most important paintings on display. The preparedness measures were prepared by the participants of the joint summer schools, who also presented the system of route cards to the fire brigades and the museum staff. The local stakeholders were invited to observe the pilot testing exercise as part of the **3rd Local Focus Group Meeting** which continued on Saturday 13th with a final discussion of the pilot testing and the agreement on further steps to be undertaken.

INTERACT VALENCIA / WPT3 VIDEO GAME

On 19th and 20th September 2019 ProteCHt2save was present at the InterACT Event in Valencia, Spain which dealt with **“Cultural Heritage and Creative Industries: Challenges and Results in Interreg”**. During the event the video game, developed as interactive handbook on best practice for municipalities, emergency responders and members of ProteCHt2save’s Cultural Heritage Rescue Teams was presented. In **CHRT: Vltava Rising** the player will be in charge of a team of cultural heritage protection experts and has to coordinate the recovery of precious museum artefacts during a flood scenario in Prague. The cultural heritage experts and the artefacts represented in the training game represent every partner country of ProteCHt2save. The video game includes aspects of strategy, role-playing and puzzle games and is a first step towards on-line and off-site individual training possibilities in order to assure functional Cultural Heritage Rescue Teams in the partner countries. To learn more about the game design and development, and more about the design of serious games in general, go to www.VltavaRising.com.



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PILOT TESTING

The plans developed in WPT3 (*Elaboration/implementation of plans for cultural heritage protection in emergency situations*) have been tested at the pilot sites in order to evaluate strengths and weakness, and to proceed towards the final definition through an action learning process and feedback evaluation.

Seven pilot actions were conducted linked to climate change and variability, associated with hydrometeorological and climate extremes:

- i) Flood events in large basin (Czech Republic, Austria, Hungary);
- ii) Fire due to drought (Austria, Croatia);
- iii) Extreme events of heavy rain (Italy, Croatia, Slovenia, Poland).

First pilot actions target the testing of preparedness strategies for monumental complexes in historic city centres affected by flood (Troja CZ, Krems AT), fire due to drought (Krems AT) and heavy rain (Ferrara IT).

The **second series of pilot actions** tests evacuation plans in emergency phase, in museums and historic buildings facing flood (Kočevje SI; Pécs HU), fire due to drought (Kastela HR) and heavy rain (Kastela HR; Bielsko-Biała PL).

The experiences carried out in the second half of 2019 are presented below.

SLOVENIA - 20 August 2019

The Municipality of Kočevje together with the Regional Museum Kočevje conducted an **evacuation exercise in the event of heavy rain**. The exercise has improved the emergency preparedness for movable cultural heritage and at the same time raised the awareness on the importance of protecting the movable cultural heritage in case of natural disasters. Video: **HERE** (<https://www.youtube.com/watch?v=viEo9Sev-w>)

"TEMPEST 2019" IN POLAND - 30 September 2019

The aims of the **tactical and combat exercises "TEMPEST 2019"** were the following:

- checking the effectiveness of assumptions adopted in the Rescue Plan for the Bielsko District and the city of Bielsko-Biała, assessment of the degree of preparation of fire protection units and other services and entities cooperating during rescue and firefighting operations;
- assessment of the degree of preparation of fire protection units and other services and cooperating entities in the need to evacuate the movable cultural heritage;
- improving cooperation and exchange of information between practitioners in the field of liquidation of the effects of threats, the possibility of evacuating people and property, including movable cultural heritage;
- improving the cooperation of the national fire and rescue system with services, local authorities and entities responsible for safety.

Units participating in the exercises were:

- City Headquarters of the State Fire Service in Bielsko-Biała,
- Fire Rescue Unit 2, Outpost in Czechowice-Dziedzice,



- Volunteer Fire Brigade in Stara Wies, Dankowice, Hecznarowice, Wilamowice and Piszowice,
- City Police Headquarters in Bielsko-Biala,
- Parish Council.



On September 26 2019, the Department of Crisis Management of the Bielsko District organized a briefing before tactical and combat exercises "TEMPEST 2019" in Stara Wies with all actors involved in the exercise.

The main purpose of the briefing was to familiarize the rescuers with all the procedures being implemented during the protection and evacuation of cultural heritage, and also to familiarize all, with existing problems of the pilot site. Additionally, general assumptions for the "TEMPEST 2019" exercises were discussed. The briefing was attended by commanders of the fire brigades, Heads of local Volunteer Fire Brigades and representatives of the Parish Council.



HUNGARY - 16 October 2019

The Disaster Management Department of Baranya County together with the Faculty of Health Sciences (University of Pécs) and the Police Department of Baranya County organized a complex joint exercise that focussed on the rescuing of both human lives and objects of cultural heritage sites. The two venues included the Early Christian Necropolis of Pécs and the Zsolnay Museum. Video: [Cella Septichora](https://www.youtube.com/watch?v=3wVhZgm_UkA&t=50s) (https://www.youtube.com/watch?v=3wVhZgm_UkA&t=50s) and [Zsolnay Museum](https://www.youtube.com/watch?v=v56whBdZ334&t=58s) (<https://www.youtube.com/watch?v=v56whBdZ334&t=58s>).



CROATIA - 23 November 2019

The Municipality of Kaštela - in collaboration with the Museum - performed the evacuation exercise to quickly evacuate and secure objects from the building in the **event of sea flood and heavy rain**. Museum staff participated in the evacuation of the movable cultural heritage.

The demonstration exercise aims to achieve the best preparedness for nature's responses (in this case flooding the coast). Awareness is being raised about the protection of museum exhibits and the protection of cultural heritage.

In cooperation with the **Kaštel Gomilica firefighters**, the Municipality of Kaštela organized an exercise in **case of floods, heavy rains and fires**. In this case the focus was on defending the building as a cultural property. The demonstration exercise in the area of Kaštilac demonstrates a fire department in the protection of immovable cultural property: in case of floods and fires, it includes the evacuation and rescue of the population and facilities of Kaštilac. These demonstration exercises enhance the cooperation and exchange of information between fire systems with local authorities and other entities responsible for security.

**ITALY - 10 December 2019**

Within the Municipality of Ferrara case, the activities focus on the **prevention and management of risks on the cultural heritage**, due to violent rains, taking into consideration the "system of the squares of the Historic Center".

Among the actions planned for the year 2019, an exercise with flooding simulation of the central squares of the Historic Center has been scheduled for the day 10 December 2019 from 13 to 17.

The exercise has been **coordinated by the Provincial Command of the Ferrara Fire Brigade in collaboration with the Associated Civil Protection Service Terre Estensi**; the aim of the exercise has been to reproduce the actions that could be put into action following heavy rains events, circumscribing the **simulation inside the Piazza Trento Trieste and Piazza del Municipio** located in the historic city centre of the UNESCO site. The Local Police, the Fire Brigade, the Civil Protection volunteers, the Municipal



Operational Center and the technicians of the Municipality of Ferrara have been actively involved.



CZECH REPUBLIC - 16 December 2019



The evacuation exercise - organized by the ProteCHt2save partners Municipality of Troja and ITAM - took place on 16 December 2019. The main aim of this event was to **test and evaluate the preparedness strategy for Troja Municipality** and in particular the **effectiveness of the evacuation plan for the Trojan Horse Gallery** together with the **implementation of flood protection measures**

for immovable artwork. The specific objective of this exercise included, among others, the individuation of responsibilities for decision making according to the relevant skills of the stakeholders, the employment of the *CULTURAL HERITAGE RESILIENCE - Manual for owners* as well as the determination of priorities and adequate response actions.

The event featured the **participation** of the municipal police (Prague 7), the fire brigade volunteers, the flood Committee, the Crisis Unit of Prague 7, the local sport club TJ Sokol Troja, the gallery owners as well as staff from Troja Municipality and ITAM. The exercise represented a great opportunity to train the evacuation of movable heritage and to learn hands-on the advantages and limitations of different preventive protection measures against flooding, while - at the same time - fostering knowledge transfer and strengthening communication among stakeholders.



LOCAL FOCUS GROUP MEETINGS

ITALY - 2nd LFG (MUF & CNR-ISAC), 18 September 2019



Topic: THE ANALYSIS OF CULTURAL HERITAGE VULNERABILITY

The Local Focus Group meeting was organised by the **Municipality of Ferrara** and the Institute of Atmospheric Sciences and Climate (**CNR-ISAC**), within the most important Italian trade fair event related to the sector of cultural heritage and restoration, “*Restoration Museum and*

Cultural Business International Trade Show XXVI Edition”, hosted at the Ferrara Fair. The full programme is available [HERE](https://www.interreg-central.eu/Content.Node/AGENDA-18-09-2019-en.pdf) (<https://www.interreg-central.eu/Content.Node/AGENDA-18-09-2019-en.pdf>).

HUNGARY - 2nd LFG (GBC), 26 September 2019



The meeting was coordinated by the **Disaster Management Department of Baranya County**, and was attended by the local stakeholders, like the representatives of the county police, museums, the university library, the archives of Pécs, the mayor's office and the Faculty of Health Sciences.

The participants discussed and finalized the details of the Joint Exercise focussing on rescuing objects of cultural heritage sites.

POLAND - 2nd LFG (BBD), 30 September 2019



A meeting of the Local Focus Group in Stara Wies was held on the subject “***Protection of cultural heritage in crisis situation***”. The conference was organized by the Crisis Management Department of the Bielsko District and was **combined with tactical and combat exercises “TEMPEST 2019” (T4)** at the pilot site, the historic Church of the Exaltation of the Holy Cross in Stara Wies.

Marian Trela, the mayor of Wilamowice and the head of the Crisis Management Department, **Marek Raczka**, greeted the numerous guests. At the beginning of the conference the general assumptions of the



"ProteCHt2save" project were presented, then Fr. Grzegorz Then, the priest of the Roman Catholic Parish of the Exaltation of the Holy Cross in Stara Wies, introduced the most important information and history of the church and its buildings, and also talked about the existing threats related to changing weather conditions.

On the subject of *"Protection of monuments in the light of applicable law in Poland"* lectures were conducted by Mariusz Godek, representative of the Provincial Office for the Protection of Monuments in Katowice, Delegation in Bielsko-Biala. The next speakers were Roman Dudek, head of the Civil Protection and Logistics Department of the Security and Crisis Management Department of the Silesian Voivodship Office in Katowice, who talked about problems related to *"Plans for the protection of monuments in the event of armed conflict and crisis in Poland"*, a Senior Brigadier in reserve M.Sc. Grzegorz Fisher, expert in the field of fire safety provided information on *"Fire-fighting aspects of the protection of cultural heritage"*.

An interesting and inspiring element of the conference was the presentation of the activities of the International Committee of the Blue Shield by Krzysztof Kociolek, head of the Blue Shield Contact Point in Krakow, a retired officer of the State Fire Service, an independent expert in the field of fire safety and fire protection of historic buildings.

POLAND - 3rd LFG (BBD), 14 October 2019



A meeting of Local Focus Group took place in Tresna on 14 October 2019. The target group included representatives of local authorities, the Heads of Towns and Municipalities and Cities of the Bielsko-Biala District. The board of the Bielsko-Biala District also participated in the meeting. The event was chaired by District Head Andrzej Plonka, coordinator of the ProteCHt2save project of the Bielsko-Biala District. The purpose of the meeting was to raise the

awareness of representatives of local authorities in the field of monument protection, discuss problems, bad and good practices in this respect as support for the creation of Monument Protection Plans.

First, important details and information about the project and project objectives were presented, to help regional and local authorities in the preparation of activities and plans for the evacuation of cultural goods in crisis situations.

The next topic on the agenda was presenting the pilot site in Poland by the Head of the Crisis Management Department Marek Raczka. The pilot project covered the historic church, "Of the Exaltation of the Holy Cross" in Stara Wies, located in Wilamowice Commune, where The "Tempest 2019" took place on 30/09/2019, and a film documenting the above event was projected at the same facility. After watching the video, all important aspects of the exercise were discussed.

The rest of the meeting focused on plans for the Protection of Monuments, developed at the commune, on district and voivodship level, based on existing legal provisions in the context of protection of historic monuments.



The Head of District **Andrzej Plonka** made a summary of the meeting and thanked the gathered municipal authorities and all who participated in the exercise.

CROATIA - LFG (Kaštela), 17 and 21 October 2019



Kaštela City organized the **2nd LFG** on two locations. In cooperation with University Zagreb Faculty of Architecture, the meeting on **17 October** was held with university associates in order to disseminate project outputs and to raise awareness of risks of climate change and its impact on cultural heritage. It is of the most importance to incorporate outputs of the project in further risk development documents and in design process.

The meeting on **21 October** was held in facilities of **Kaštela City** with representatives of **local government** and head of departments of Spatial planning, Communal infrastructure and Finance participating in the implementation of project output in local policies and development documents.



SLOVENIA - 2ND LFG (Kočevje), 24 October 2019



At the meeting ways to improve the management of movable cultural heritage in case of natural disasters were presented. The participants discussed ways in which **Kočevje Regional Museum** and the **Kočevje Library** can improve their preparedness level with additional risk assessment and action plan for natural disasters. The **decision support tool** was also presented to the local stakeholders.

CZECH REPUBLIK - 2ND LFG (Prague/Troja), 11 December 2019



The **2nd LFG** event organised by **ITAM** and **Municipality Prague-Troja** was held on **11th December, 2019** in the **Troja Municipal House**. Apart from updating the local stakeholders on the project progress, there were two important points on the agenda: **organisation of the pilot exercise TROJAN HORSE 2019** (scheduled for **16th December, 2019** in Prague-Troja), and the **presentation of the**

Manual for Owners [and managers of cultural heritage].



Amongst those present were representatives of police, Sokol volunteers, National Technical Museum employees, officials from Crisis Management Departments from Prague-Troja and Prague 7 and others. To better understand what a pilot exercise entails, they watched short videos from other partner's pilot exercises. A detailed discussion about the pilot exercise logistics ensued. Every minute was precisely scheduled to ensure the smooth running of the **TROJAN HORSE 2019** exercise and to make it as real-life as possible.

In the second part, Riccardo Cacciotti (ITAM) presented the pen-ultimate version of **Manual for Owners**. It was the last chance to offer feedback on the Manual prior to finishing works. ITAM gained some valuable and practical comments and hopefully will present the final version after the New Year.

OUTPUT: MANUAL OF GOOD AND BAD PRACTICES FOR DISASTER RESILIENCE OF CULTURAL HERITAGE RISK ASSESSMENT

The manual is developed within the framework of the activity *Cultural heritage vulnerability in emergency situations*, which concentrates on the critical analysis of local vulnerability and measures in emergency situations for cultural heritage. **Its main aim is to provide a critical overview of the foremost examples of good and bad practices, learned from experience, in managing risk for cultural heritage located in Central Europe** (considering mainly flood, heavy rain and fire due to drought).

More specifically, the document pursues the following **objectives**:

- To outline past and recent examples of extreme events in Central Europe, highlighting the key aspects and shortcomings of risk management approaches and measures.
- To identify the foremost examples of good practices in managing risks for cultural heritage.
- To determine the target aspect of risk (hazard, susceptibility/exposure or resilience) at which the good practice measures aim together with their feasibility of implementation, impact on CH protection and limitations.

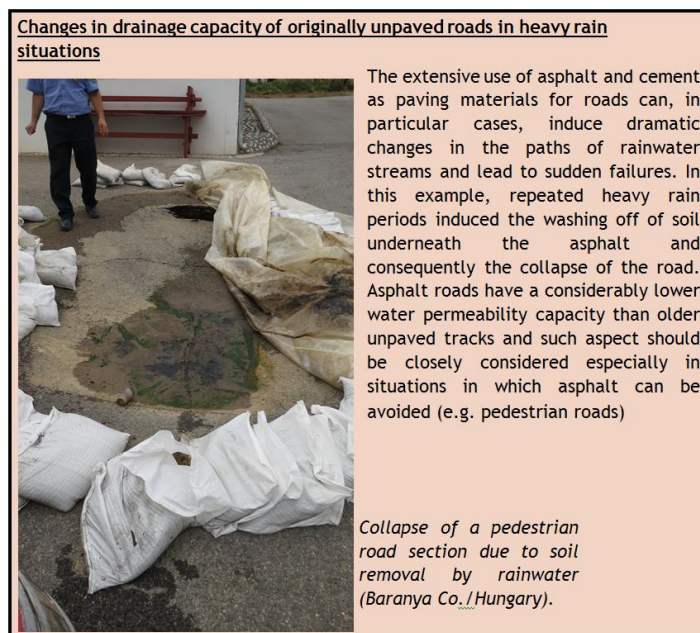
The manual (available on the ProteCHt2SAVE project website) features the use of 'cards' of **good and bad risk management practices** (respectively in green and red colour) in order to instruct and guide the readers toward the selection of appropriate resilience building strategies. It is composed of the following sections: section 2 presents the **key aspects and shortcomings of flood risk management measures** experienced during past and recent events; also "**good**" **flood risk organisational and operational/technical practices** are discussed. Section 3 deals with heavy rain, outlining examples of "**bad and good**" **practices in the management of cultural heritage assets with respect to strong rain and wind** including the possible limitations, if any, in terms of feasibility of implementation and impact on CH protection. Similarly, section 4 presents **past and recent fire due to drought events with future projections** in Central



Europe; organisational and operational/technical measures to be taken in case of fire risk in cultural heritage assets are discussed.

The manual should be read in conjunction with the following documents:

- D.T2.1.1 which has the scope of highlighting the main problems, barrier and challenges existing at Central European level in the resilience and risk management of cultural heritage facing natural disasters.
- D.T2.1.3 which aims at the definition of a decision support tool for the harmonization of data related to cultural heritage vulnerability and for a conscious definition of procedures, agreements and cooperation in an overall transnational approach.
- D.T2.2.2, which investigates resilience controllable criticalities of cultural heritage suitable for innovative mitigation, providing technical details of specific solutions.



Examples of green and red cards in the manual



FUTURE EVENTS

- DUK will support the fire brigades in Krems / Austria during a big fire fighting exercise in spring 2020 with the expertise created in ProteCHt2save and the newly created Cultural Heritage Rescue Team.
- 7th ProteCHt2save project partner meeting and SC meeting, Kastela 7-8 April 2020
- 8th Project partner meeting and SC meeting, Ferrara 27 and 29 May 2020
- International Final Conference of ProteCHt2save Project - CULTURAL HERITAGE: CHALLENGES CLIMATE CHANGE, Ferrara 28th May 2020



ProteCHt2save key facts

Project duration: 01.07.2017 - 30.06.2020

Project budget: 2,150,549 €

ERDF funding: 1,787,110 €

Website: <http://www.interreg-central.eu/Content.Node/ProteCHt2save.html>

LEAD PARTNER

National Research Council of Italy
- Institute of Atmospheric Sciences
and Climate



PROJECT PARTNERS

Institute of Theoretical and Applied
Mechanics of the
Czech Academy of Sciences



University for Continuing Education
Krems Danube University Krems



Bielsko-Biala District



Regional Development Agency
Bielsko-Biala



Municipal of Ferrara



Municipal District Praha – Troja



Government of Baranya County



City of Kaštela



Municipal of Kocevje

