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NATURAL DISASTER RISK PREPAREDNESS AND MITIGATION GUIDELINES OF
CULTURAL HERITAGE SITES OF ALBANIA (Part I)

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PART I

NATURAL DISASTER RISK PREPAREDNESS AND MITIGATION GUIDELINES OF CULTURAL HERITAGE SITES OF ALBANIA

1. PROJECT OVERVIEW: MOTIVATIONS, OBJECTIVES AND STRUCTURE

"This training changed my perception, I see things differently now, I am more conscious and aware of risks, I can spot them where once I could not".¹

As recalled in the recent Heritage and Resilience Publication prepared for the fourth session of the global platform for Disaster Risk Reduction (19/23 May 2013) in Geneva, Switzerland (R. Jigyasu, 2013), the recommendations of the WHC in 2007 on Reducing Risks from Disasters that encourage all states parties to develop disaster risk management plans for the World Heritage properties under their sovereign jurisdiction, have been largely disregarded.

Several indicators corroborate this assertion, such as the very low numbers of requests submitted in the frame of the WH International Assistance Programme that concern disaster risks and a WHC survey on the role of WHS

managers and managing authorities of sites, mainly placed in high-risk locations, to DRR. As reported, only one out of 10 investigated sites have formally complied with the above recommendations (Fig. 1; P. Antoniu, 2012). There is also evidence of the fact that poor or no risk reduction elements are particularly traceable in WHS management systems located in low-income countries.

This projection may also be applied to south eastern European countries, in particular to those of lower-middle income such as Albania,¹ which still ranks as one of the poorest countries in Europe, despite undisputed progress made after the collapse of its communist regime.

Taking the opportunity offered by the integrated project on Disaster Risk Preparedness in Cultural Sites of Albania under the ONE UN initiative, and foremost in consideration of the fact that Albania is vulnerable to several types of hazards including structural fires, wild land fires, earthquakes, floods, heavy storms, rock falls and landslides and in accordance with the government of Albania priorities, the implemented actions

State of Conservation reports 2012

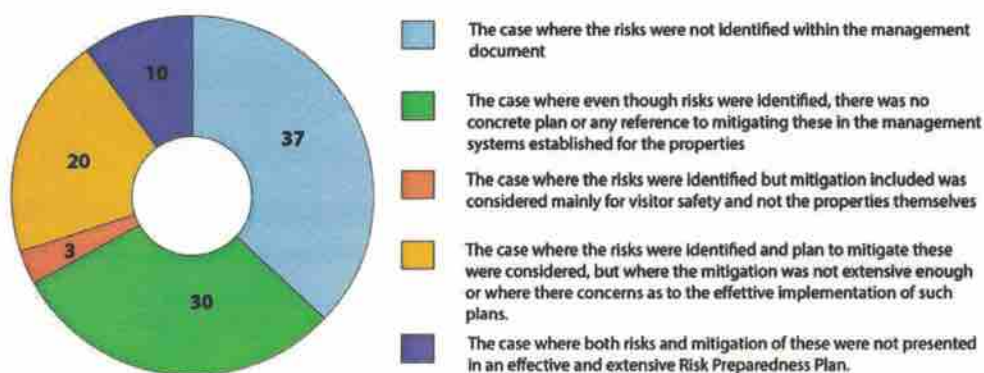


Fig. 1. Analysis of responses as per the State of Conservation Reports 2012. Based on the study by Pinelopi Antoniou for UNESCO World Heritage Centre 2012. The graphic should be considered as an indicative projection since not comprehensive of all WHS. The graphic should be considered as an indicative projection since not comprehensive of all WHS.

NOTE

¹ Statement of trainee at the end of UNESCO-ICCROM Training, Berat, November 2011.

were conceived to compound the scientific investigations conducted to assess the geohazard vulnerability of the major cultural sites of Albania with the need developing the governance capacity of the targeted sites in Disaster Risk Reduction.

In more details the UNESCO Venice Office and ICCROM pioneered a training workshop on Disaster Risk Preparedness and Management at the World Heritage site of Berat (19 to 24 November 2011; Fig. 2 a,b). This brought together heritage professionals from the aforementioned selected World Heritage properties of Albania and provided them with knowledge on current thinking, methods and tools available for the preparation of Disaster Risk Management plans on the basis of the newly issued World Heritage Resource Manual on "Managing Disaster Risks for World Heritage" (<http://whc.unesco.org/en/activities/630/>).

Using the manual and analyzing the specific context of the selected sites, a broader methodological framework was developed. This was done to lay the ground for the development of Disaster Risk Management plans in the selected cultural sites, acting as a model for other sites both in Albania and in the whole region.

This action was therefore designed, planned and conducted in close collaboration with ICCROM and the World Heritage Centre. Its objectives were meant to illustrate the core principles of Disaster Risk Management (DMR) for Heritage Sites and the applied methodology to identify, assess and mitigate disaster risk in Cultural Heritage sites. This was performed by:

- Training key stakeholders and site managers selected in collaboration with the government of Albania, to reduce risks in their cultural heritage properties;
- Teaching in a demonstrative way how to prepare a DRM plan for cultural heritage properties.

The Disaster Risk Reduction (DRR) training was conducted in a timely manner as it coincided with the development of the Disaster Risk Management (DRM) plans for three World

Heritage Site in Albania, in Berat, Butrint and Gjirokastra. Special focus was devoted to risk preparedness for earthquakes and fires², through the participation of highly qualified international experts on such fields of expertise.

Trainees relied on post-training coaching support from these experts and received personal certificates of attendance upon delivery of a site-based framework presentation highlighting relevant components for their future management plan (15th May 2012). The benefits of the seeds sown throughout the short and intensive training and coaching activities produced a lasting legacy that saw DRR principles and concepts integrated into the DRM plan for Berat. Projects in Butrint and Gjirokastra now have the capacity to also follow this example of good practices. As a general rule and stressed by prominent scholars and practitioners in the field, for institutional arrangements set in place for managing the commons or, as in our case, to mainstream DRR principles, there is a vast distinction between 'rules on paper' and 'rules in practice' (Ostrom, 1990). The real threshold between the success and failure of a system of governance (regimes) lies in their level of effectiveness. This depends on whether the regime is translated by the social constituents (main stakeholders) into everyday practices or whether the plan is merely fed into 'dead letter documents' and not utilized.

Moreover, whether formalised or not, the importance and effectiveness of management plans are dependent on their capacity to embody guiding DRR principles within the overall management system(s) in force. This step is fundamental to ensure the resilience of heritage sites against disasters and unforeseen events and also against potential risks to the site's authenticity, integrity and their outstanding universal value.

Taken as a whole, a DRR management plan should be considered as a continuous cycle of an ongoing process of revision and change with inputs from monitoring and evaluation mechanisms followed by subsequent

implementations of further action. This process is rather unique to the DRM cycle, which is characterized by constitutive and interconnected phases of identification and assessment of risk, prevention and mitigation, emergency preparedness and response, and recovery actions, whenever required.

Whilst the DRR cycle in its entirety was introduced and analyzed throughout the DRR training held in Berat, the scope and purpose of the current chapter is to report on the concrete outcomes of the workshop whereby the first phase of the DRM cycle, that is, the identification and assessment of risk phase was done. This first step of the DRM cycle is fundamental to the process, and will pave the way for further phases to be implemented.

To conclude, it is within our best interests and under our auspices that further activities that

mirror the success of the initial stages of capacity building and the integration of DRR principles into the management plans for Berat, will be realized and implemented for World Heritage Sites throughout Albania. The intention of such a process is to provide site managers and heritage administrators throughout countries in South East Europe with an effective methodological framework to make World Heritage Sites more resilient to risk at the global level.

The following is a brief overview of the three Cultural Heritage sites with World Heritage status, in Albania: Berat, Butrint and Gjirokastra, the various risks each faces, and risk prioritization recommendations to begin addressing these risks.



a



b



c



d

Fig. 2. Photo at Training Workshop on Disaster Risk Preparedness and Management at the World Heritage site of Berat (19 to 24 November 2011) (a,b); c) painting at the churches of St. Mary of Blachernae; d) churches of the Holy Trinity.

2. ALBANIAN WORLD HERITAGE SITES

The city of Berat

The city of Berat was inscribed with Gjirokastra in the World Heritage list under the appellation of Historic Centres of Berat and Gjirokastra in 2008. They were inscribed on the basis of criteria (iii) and (iv) as per Decisions 29 COM 8B.48 and 32 COM 8B.56.

Criterion (iii): Berat and Gjirokastra bear outstanding testimony to the diversity of urban societies in the Balkans, and to longstanding ways of life, which have today almost vanished. The town planning and housing of Gjirokastra are those of a citadel town built by notable landowners whose interests were directly linked to those of the central power. Berat bears the imprint of a more independent life-style, linked to its handicraft and merchant functions.

Criterion (iv): Together, the two towns of Gjirokastra and Berat bear outstanding testimony to various types of monument and vernacular urban housing during the Classical Ottoman period, in continuity with the various Medieval cultures which preceded it, and in a state of peaceful coexistence with a large Christian minority, particularly in Berat.

Located in central Albania, Berat bears witness to the peaceful coexistence of various religious and cultural communities through the centuries. It features a castle, locally known as the "Kala", most of which was built in the 13th century, although its origins date back to the 4th century B.C. The citadel area has many Byzantine churches, mainly from the 13th century, as well as several mosques built under the Ottoman period. The city is comprised of urban quarters dated to the 15th through 19th century.

The settlement is traditionally believed to have been founded by Cassander, King of Macedonia, in 314 B.C. and later ended up under the Roman protectorate.

Excavations around the medieval city walls of Berat have resulted in the identification of parts of the first wall circuit, including the remains of

a major gateway. These wall sections date to the 4th century B.C. (Braka, 1990).

The findings from the excavations within Berat date back to the 7th century B.C., which suggests that the city of Antipatrea was possibly established on an existing Illyrian settlement.

In 440 A.D., the city was renamed Pulcheropolis by Emperor Theodosius II (408-450 A.D.) after his sister. Later the city walls were rebuilt, most probably during the reign of the Emperor Justinian (527-565 A.D.).

In the 9th century *Pulcheropolis* fell to the Bulgars. The city was renamed Belgrade (from which the modern name of Berat derives) and was the seat of a bishopric. The Bulgars lost the city in the 11th century to the Byzantine Empire. Under the Despotate, the Muzaka family dominated Berat.

The city was refortified in the 13th century. The city walls were rebuilt, following the contours of the hill, to form a triangular fortress, enclosing 9.6 hectares. The city walls were protected by a system of towers. Within the city, a castle was constructed on the summit of the hill. It comprised an outer work, five towers and an inner work with a large cistern. Alterations and additions were made to the system of fortifications throughout the following century, and included an extension of the fortified area by the construction of two defensive walls (Fig. 2c) running from the south side of the city wall to the river. This extension enclosed a further six hectares. Several churches dating to the 13th and 14th centuries have survived within the city - the churches of St. George, St. Michael and the Holy Trinity being the best preserved (Fig. 2 d,e).

In 1417, Berat fell under Ottoman control. The fortifications were maintained with the addition of urban quarters at Gorica and Mangalem, outside the medieval fortifications. The city prospered under the Ottomans and much of the historic centre of modern Berat comprises Ottoman-period houses (fine 17th and 18th century stone-built dwellings) and, close to the river, timber-framed shops of the

old bazaar. In addition there is an important group of mosques including the late 15th century Sultan's Mosque (Xhamija e Mbretit), the 16th century Leaded Mosque (Xhamija e Plumbit) and the 19th century Mosque of the Bachelors (Xhamija e Beqareve). A group of 18th century buildings associated with the Tekke of the Helvetis also has survived. Many churches were also constructed in this period and decorated by Onufre, a 16th century Albanian painter, and his school of painters. A museum of Onufre's work can be found in Berat.

Threats to the World Heritage Property of Berat

Since the time of its inscription, the site has recorded a combination of human- and natural-induced threats, affecting the property:

Natural

- seismic threat
- fires
- floods
- landslides, rock falls

Human

- lack of specific monitoring indicators
- lack of a program of archaeological excavations
- lack of adequate fire suppression facilities and arrangements
- lack of a detailed tourism development plan

Gjirokastra

The World Heritage property Museum-City of Gjirokastra was inscribed on the World Heritage List in 2005, and in 2008 the property was extended to include the city of Berat and renamed as Historic Centres of Berat and Gjirokastra. They were inscribed on the basis of criteria(iii) and (iv) as per Decisions 29 COM 8B.48 and 32 COM 8B.56.

Criterion (iii): Berat and Gjirokastra bear outstanding testimony to the diversity of urban societies in the Balkans, and to longstanding ways of life, which have today almost vanished. The town planning and housing of Gjirokastra are those of a citadel town built by notable

landowners whose interests were directly linked to those of the central power. Berat bears the imprint of a more independent life-style, linked to its handicraft and merchant functions.

Criterion (iv): Together, the two towns of Gjirokastra and Berat bear outstanding testimony to various types of monument and vernacular urban housing during the Classical Ottoman period, in continuity with the various Medieval cultures which preceded it, and in a state of peaceful coexistence with a large Christian minority, particularly in Berat.

Over the last thousand years it was invaded by Ottoman Turks, Italians and Germans, and this mixture of prosperity and insecurity has led to the development of the architecture that it is still preserved today.

The town itself was built by big landowners and has a castle that has origins in the 13th century, named Citadel. This is one of the biggest castles in Balkan. With the decline of the Byzantine Empire, it became the residence of the very powerful Zenebeshi feudal clan.

The city has some typical dwellings called the Turkish kule, typical of the Balkan region. Gjirokastra contains many of them dating back to the 18th century, but even some more elaborate ones, from the 19th century.

The surrounding historical sites show the earliest evidence of the prehistoric period such as the Goranxi Gorge. Evidence of other important sites of Antigonea and Adrianopol are also testimonies of the importance of the region even during the Greek and Roman occupation.

The archaeology of Gjirokastra is relatively unknown. Due to the proximity of the Classical and Hellenistic settlement at Jermë (Antigoneia) and the Roman city of Hadrianopolis it has frequently been assumed that the medieval fortress represents the first occupation of the site. However, this has now been challenged by the results of excavations within the fortress that have led to the discovery of ceramics from four different phases of occupation before the Ottoman period: 5th-2nd centuries B.C., 5th-7th

centuries A.D., 9th-10th centuries and 12th-13th centuries A.D.

The medieval fortress, which has been dated to the second half of the 13th century, encompasses an area of 2.5 hectares. The remains of five towers and three main entrances of the original fortress can still be seen, though the fortress was substantially rebuilt and extended southwest in 1811-1812 by Ali Pasha of Tepelenë. Ali Pasha was also responsible for the construction of an aqueduct feeding the fortress from a water source on Mt. Sopot, some 10 km from Gjirokastra. Complete sections of this aqueduct were still visible at the beginning of the 20th century but were destroyed in 1932. The fortress was used as a garrison in the 19th century. During the communist period, the castle also served as a prison for dissidents.

Threats to the World Heritage Property of Gjirokastra

The site has recorded a set of natural threats affecting the property:

Natural

- seismic threat
- wildland fires
- erosion, landslides, rock falls

Human

- lack of financial support for the monuments
- lack of a management plan
- uncontrolled urban development of Gjirokastra
- abandonment of the site by the inhabitants, which will contribute to the potential fire hazard and general degradation of the building over time
- misuse of monument by the owner with the risk of damaging the authenticity and the integrity of the building

Butrint

The property of Butrint was inscribed on the World Heritage List in 1992 as an example of outstanding universal value, meeting the cultural criterion C (iii), according to the Operational Guidelines (2005), since it bears “a

unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared.”

Butrint is located on a low hill at the end of the Ksamil peninsula, which separates the Ionian Sea from Lake Butrint (the two are connected by the Vivari Channel). To the south lies the flat expanse of the Vrina Plain, punctuated by low hills with villages. Butrint is the best-studied ancient city in Albania, as well as being a site of extraordinary beauty, and it is in many ways a microcosm of Albanian history. Butrint was an ancient Greek city that eventually became a Roman city in Epirus.

Currently it is an archaeological site in the Sarandë District in Albania. It is located on a hill overlooking the Vivari Channel and part of the Butrint National Park. Inhabited since prehistoric times, it entered into decline in Late Antiquity, before being abandoned during the Middle Ages.

In 2003, Butrint became a designated site under the RAMSAR Convention (1971) due to its lagoon, also known as the lake of Butrint, which is now recognised worldwide as a wetland of international importance.

Threats to the World Heritage Property of Butrint

Butrint, like the other sites, is exposed to varying hazards. The more significant risks related to life and cultural heritage include

Natural

- seismic threat
- wildland fires;
- floods and sea-level rise

Human

- looting
- illegal urban sprawling in to the World Heritage sites;
- widening and modernization of the road from Saranda to Butrint within the World Heritage property

The property has registered a series of monitoring/assessment missions carried out by UNESCO and its advisory bodies since 1997.

After the civil strife in the country, a report of looting of the site was issued by the Butrint Foundation. Following the first mission outcomes at its 21st session (December 1997), the World Committee decided to include Butrint in the list of the World Heritage sites in Danger.

Following the UNESCO-ICOMOS-ICCROM joint assessment mission on the site in 2005 and its recommendations in consideration of the recorded improvements achieved and upon condition to finalize the management and conservation plan of the property and to prevent any illegal development or inappropriate construction in the site, in accordance with an effective application of the legal provisions of the new law on cultural heritage, the World Heritage Committee decided to remove Butrint from the list of World Heritage in Danger.

3. RISK ANALYSIS OF NATURAL HAZARDS

Overview

The three World Heritage sites of Berat, Gjirokastra and Butrint are exposed to various natural hazards such as earthquakes, landslides, fires and flooding. The following Table 1 provides a list of those hazards to which the three World Heritage sites are exposed, due to their geographical location or materials, structure and condition of the buildings.

However, there are several factors that further increase the vulnerability of exposed populations and Cultural Heritage at these sites. These include limited awareness, public knowledge and training for disaster preparedness, inadequate infrastructure to address these hazards, as well as the necessary resources to maintain them, unsafe/uninhabited buildings and exploitation of natural resources.

The following are general recommendations to help reduce disaster risks noted above in these World Heritage sites:

- Identify, assess and monitor disaster risks for each of the sites periodically and prioritize risk mitigation actions.
- Reduce hazards and risks and those components underlying these where practical.
- Continue to develop appropriate systems and tools for strategic planning, codes/standards and policy making related in particular to disasters including earthquakes and fire/life safety, and protection of cultural heritage.
- Improve risk communication through early

warning systems (floods, adverse weather, fire, etc.).

- Establish and implement a plan for effective disaster response and recovery activities for structures, as well as people at various levels. These may include evacuation routes, signage, temporary salvage areas etc.
- Carry out regular emergency drills to practice and review standard operating procedures for emergency response by the site staff, in cooperation with local civic defence agencies.
- Provide resources for supporting emergency responders (training, equipment, enforcement, etc.) and the infrastructure necessary to carry out this work.
- Create public awareness programs for the community, especially those living in World Heritage properties, about disaster preparedness.
- Develop and implement training programs with the public to build a culture of resilience and safety.
- Develop training, licensing and enforcement programs for professionals, including designers, engineers and architects, as well as code enforcement authorities.
- Continue to strengthen management and technical capabilities of those involved with managing historic sites, including capabilities related to Disaster Risk Management.

With regards to more specific risk Reduction prioritization recommendations, additional specific recommendations are made below.

Table 1

Hazard	Berat	Gjirokastra	Butrint
Fire (structure)	✓	✓	✓
Wildland Fire	✓	✓	✓
Geohazard (earthquake)	✓	✓	✓
Geohazard (landslide)	✓	✓	
Geohazard (rock fall)	✓	✓	
Flooding	✓		✓

FIRE

Challenges

One of the hazards with a higher probability of occurrence is fire. A fire in one of the historic residential structures in Berat for instance, that gutted the house was witnessed a few months back. However with the efforts of the local fire brigade, they were fortunately able to limit the fire to this structure before it could spread. There are many challenges related to fire, including the close proximity of structures to each other particularly in Berat and Gjirokastra which could lead to fire spreading to multiple buildings, primarily those of wood/combustible construction. Other hazard include limited smoke detection within buildings, including residential buildings and no automatic notification to emergency responders for prompt response, no automatic suppression systems, very narrow streets impacting fire vehicle access, limited/no fire-fighting water infrastructure, old/poor electrical installations and poor conditions of electrical equipment that could result in ignition sources, as well as abandoned houses that are not maintained and could represent fire hazards. There are also limited fire protection measures incorporated into the religious structures and museums that should be reviewed and assessed as to their overall effectiveness and reliability. A tailored fire strategy, should be developed as appropriate to protect these. There also currently appears to be limited awareness and training of local residents with regards to fires and protecting lives as well as the historic buildings.

Risk Reduction Recommendations

- Create a Fire Prevention Awareness campaign for local residents to raise awareness regarding fire, ignition sources, early detection and alarm, the benefit of smoke detectors in all homes, the challenges of fires at these sites, and what to do in case of a fire or other emergency. This should target not only adults

but there also should be educational programs in schools to educate children.

- Develop and implement Fire/Life Safety Strategies for various structures, including religious structures and museums.
- Automatically monitor alarms from buildings in addition to banks so as to initiate early warning and notification to the fire brigade to get them to the site and begin suppression activities as soon as possible.
- Revise local codes as necessary to address fire-related challenges and make these retro-active.
- Develop, implement and enforce guidelines for protecting structures from fire during renovation work.
- See also the Emergency Responder and Infrastructure Section for additional recommendations regarding fire.

WILDLAND FIRES

Challenges

Given the close wild land/urban interface for each of these sites, there is the potential for wild land fires to adversely impact the structures and the residents, including the archaeological sites in Butrint and the Berat Castle. These fires can have an immediate impact on loss of life/injury, as well as loss of structures and cultural heritage, and can adversely impact non-combustible structural components of the various buildings including the Castle and archaeological sites. These fires also destroy vegetation. This in turn can lead to other hazards including potential landslides if this vegetation is lost. The local fire brigade trains for these events, but additional resources are recommended for assisting them in undertaking their activities as noted below.

Risk Reduction Recommendations

- Develop and implement appropriate policies and regulations regarding limiting the potential for ignition of fields, grasslands and

wildfires. This includes checking ignition sources, identifying burning seasons, procedures and permits for burning, interfacing with emergency responders for controlled burns, building construction materials, developing a program to work with shepherds to limit/control their burning and developing and implementing early detection, warning and notification systems, etc.

- Review international perspectives and codes on wildfires. Develop and implement a plan for wild land management and fuel control to help control vegetation and limit the impact should a fire start, in terms of the extent of the fire, as well as limiting its impact on structures.
- Conduct a very thorough review of the wild land fire situation in Butrint. This includes ignition sources (smoking, electrical equipment, lighting, etc.) and control of combustible materials including vegetation. Additionally, the proposed fire hydrant system in Butrint needs to be very carefully reviewed and revised. This should include reviewing water supplies, piping materials, installation, hydraulic calculations and location of equipment including pumping stations and water supplies in a safe and protected area, etc. In addition, the design, layout and intended use needs to also be discussed with the local emergency responders to obtain their recommendations and input on the proposed system and how they may use it during an incident.
- Provide the necessary resources, equipment and infrastructure for the emergency responders to appropriately manage these fires. This should include vehicles and other related firefighting equipment and personnel, as well as personal protective equipment to protect the emergency responders as they undertake their activities.
- Develop, implement and enforce a public awareness campaign to help limit the potential for wild land fires. (i.e. information and regulations regarding campfires, rubbish

disposal and removal, including that close to the Castle, no smoking, etc.).

FLOODS

Challenges

Berat lies on the banks of the Osum River, and Butrint is at sea level and thus prone to floods. Some of the challenges, including a lack of water-collecting areas, lack of dyke systems and drainage channels and limited pumping stations, contribute to flooding.

Risk Reduction Recommendations

- Undertake further studies to identify additional reasons behind flooding.
- Review the state of existing flood-control measures and upgrade as needed.
- Develop and implement flood prevention/mitigation measures to control flooding (e.g., improving drainage systems, channelling of water, dams, pumping stations, reducing erosion through reforestation, etc.).
- Develop an early detection and warning program, including a system to notify residents of potential flooding, as well as plans to relocate these people.
- Develop an awareness and training program for residents.

EARTHQUAKES

Challenges

Albania has a long history of earthquakes. In June 1905, a devastating earthquake hit northern Albania. Subsequently it has been rocked by several earthquakes. The World Heritage Sites of Berat and Gjirokastra are highly vulnerable to earthquakes because of their location near fault lines and rocky terrain, which can trigger landslides and rock falls due to earthquake.

The primary geohazard affecting the city of

Berat is represented by the instability of the rock escarpments overlooking the historic city center. The risk related to this criticality is high in static conditions and could be even higher if a seismic event should occur.

The most critical zones in terms of possible site amplifications in Gjirokastra include: 1) buried narrow valleys located at the mouth of mountain streams (zone 4), carrying high volumes of coarse clastic materials to the Drino River Valley; and 2) narrow ridges bonding the buried valleys, where topographic effects highlighted by micro-tremors measurements could induce site amplification. A rigid fractured layer of conglomerates generally occupies the top of the narrow ridges (e.g., where the Castle is located) and is highly susceptible to rock falls and toppling of isolated blocks.

The territory of Butrint is heterogeneous in terms of susceptibility to seismic amplification, due to extreme geological variability. The most critical zone in terms of possible site amplifications is the coastal plain. High susceptibility to geological instability, both for differential settlements and rock falls, is related to the presence of the fault scarp bounding the Acropolis.

In addition to the above, the historic buildings appear to have limited design to be earthquake resistant and as well have suffered vagaries of time and poor maintenance. They are likely too weak to bear the lateral forces of an earthquake (CNR-IGAG 2012)³.

Risk Reduction Recommendations

- Adequate retrofitting measures should be undertaken for historic structures so that they are safer against earthquakes. These measures should try, to retain heritage values to the maximum possible extent while ensuring optimum safety levels.
- Guidelines for earthquake safety should be adopted and implemented for any new additions or alterations to historic structures.
- Masons and craftsmen should be provided with adequate training in earthquake-safe

construction practices especially for historic structures.

- In Berat, it is recommended to carry out a detailed study of structural and geo-mechanical settings of the limestone cropping out along the escarpments, if this work has not already been undertaken.
- For Gjirokastra, neither direct observation of subsoil nor Vs information are generally available for the site. No geotechnical parameters are available for a proper evaluation of the dynamic behavior of soils and rocks. An additional investigative survey and the passage to a level 3 of seismic microzonation is suggested.
- The seismic microzonation of level 1 of Butrint is affected by a high level of uncertainty because of the lack of information about lithology, thickness and shear wave velocity of the lithotypes. Lithostratigraphic and geometric uncertainty could be pulled down by means of one deep borehole located close to the Vivari channel, associated with Electrical Resistivity Tomographies (ERTs) oriented perpendicular to the fault scarp. Shear wave velocity could be detected by means of MASW measurements.

LANDSLIDE/ROCK FALL

Challenges

Given their location at the base of various hills and mountains, including Berat in the vicinity of the Tomorr Mountains, and Gjirokastra within the Gjerë mountains, both are susceptible to landslides and rock falls. Several of the comments regarding the various geological conditions noted above with respect to earthquakes are applicable here as well. In addition, there is one very large rock below the fort that needs assessment in the very near future in Gjirokastra. Part of the challenges including poor drainage systems, limited vegetation in areas to help hold the earth, and unstable rocks on the hillside/mountainside. No

protection of the people or buildings in close proximity against the landslides or falling rocks contribute to the potential risk.

Risk Reduction Recommendations

- Undertake studies to identify further hazards of landslides and rock falls and locations where this may occur, and exposures should they occur.
- Develop and implement appropriate prevention and mitigation measures to limit the probability of landslides and rock falls. (vegetation management, drainage, stabilize rocks, protection against falling rocks, etc.)
- Develop an awareness and training program for residents and staff responsible for maintenance and monitoring.
- Develop and implement an early warning system to alert residents at times they may be more prone to rockslides and landslides (e.g. heavy rainfalls, etc.).

Key Vulnerability factors

A few underlying factors need to be highlighted that are increasing the vulnerability of the three World Heritage properties to the above-mentioned hazards.

Abandonment of buildings

Due to various socio-economic reasons, historic buildings are being abandoned gradually. This is quite significant in Gjirokastra and is also occurring in Berat to a certain extent. Over time, there is deterioration of these properties. They are also used by the homeless who take up residence and build fires there. As they are not being maintained, the interiors are exposed to weather a condition, which creates deterioration of the structure and electrical systems. These items are adversely impacting the cultural heritage components of these structures, and also pose a fire hazard to them, as well as those structures and the people in the near vicinity given, the close proximity of the houses.

Therefore, it is important to develop and

implement a program to address these challenges, including either ways to appropriately rehabilitate these structures, or assessing them to review potential fire hazards, shutting down power, etc.

Emergency Responders and Infrastructure

The emergency responders should be commended for what they do with the limited resources available and the challenges they face. This includes the limited infrastructure for fire fighting e.g., no-limited fire hydrants, intermittent water supplies, delayed notification due to limited detection/alarm systems, narrow streets and alleys and the close proximity of the buildings making it difficult to get fire vehicles close to a fire scene. Recommendations to address some of these challenges include those noted below:

- Provide automatic notification to emergency responders regarding fire and other hazards.
- Make them aware of the heritage values of the site so that they take measures to minimize impact.
- Provide appropriate infrastructure for emergency responders to undertake their work and to limit the impact of fires on the historic cities (fire hydrant system, reliable water supply/storage, etc.).
- Further support the good work of local emergency responders and provide them with more resources including equipment (vehicles, personal protective gear, etc.) and continued training to help them undertake the important work they do in protecting the cities and their people.
- Continue to engage and review with the emergency responders their particular additional needs to help protect each of these World Heritage sites and effectively respond to the varying disasters that each is exposed to.

Lack of Maintenance and Degradation of Structures

There are several areas where a lack of maintenance is adversely impacting the Cultural

Heritage at these sites either directly or indirectly. These and others should be addressed and a program put in place to ensure they will be properly taken care of in the future. The following Risk Reduction recommendations are proposed:

- Clean up rubbish, particularly surrounding the Castle in Berat. This is a fire hazard and also contributes to additional people adding their rubbish to the piles.
- Part of the Castle wall has collapsed. The cause of this should be identified and repairs made, as well as additional assessments to see if this may occur in other areas.
- Infrastructure should be properly maintained. This includes the fire hydrants and water supplies to these, electrical systems and infrastructure in the cities, etc.

4. GUIDELINES FOR RISK REDUCTION OF WORLD HERITAGE PROPERTIES

Disaster management principles need to be developed and made an integral part of the site management plans (Table 2). The impact of disasters at World Heritage properties may be very significant as it could:

- Adversely affect their “Outstanding Universal Value” which justified their inscription on the World Heritage List;
- Result in loss of lives and assets for the local people, disrupt their communities and threaten the security of visitors;
- Negatively affect the local economy and tourism.

Through this project, UNESCO Venice Office, ICCROM and the experts participating in the training were able to build a shared understanding with trainees and with the representatives of the relevant governmental agencies in charge of cultural heritage in Albania upon the importance of the following:

- More coordination between a given World Heritage property management systems and the disaster management institutional framework of the nation and region in which the property is located;
- Prioritization of the risk and their solutions should be a well-governed process to be shared by all relevant stakeholders on site, without delegating pre-cooked solutions to the hands of “external technicians”;
- Multidisciplinary scientific approach is needed in different fields of risk for a thorough risk assessment which should encompass multiple settings at a given site. For instance, archeologists should be able to integrate with geologists and seismic engineers to better understand the magnitude of geo hazards at stake. Moreover, site managers should also be able to understand scientific-based evidence when they have to consider Disaster Risk Management before disasters occur in order to prevent and/or

mitigate them;

- Risk management plans are not stand-alone plans. They need to be integrated into the management plans of the site(s);
- Disaster Risk Management should be able to both prevent or reduce the impact of disaster on the values of World Heritage site properties, and to human lives and livelihoods;
- Disaster Risk Management should be able to secure resilience to the core value upon which the property was inscribed on the WH List. This should be the driving element to risk plans development;
- Significant considerations should be placed on the longer-term vulnerability factors (lack of maintenance, deterioration etc.) which may turn a small hazard into a larger scale disaster;
- Management planning is valuable not just for World Heritage sites but for any heritage sites. Therefore, World Heritage sites can play a catalyst role for enhancing risk resilience of other sites regardless of their designation status.

Table 2. Objectives and Priority Actions recommended.

OBJECTIVES	PRIORITY ACTIONS
<i>1. Strengthen support within relevant global, regional, national and local institutions to reduce risks at World Heritage properties</i> Global actors for disaster reduction should give more consideration to cultural and natural heritage among the issues to be considered when defining their strategic goals and planning their development cooperation activities. At the same time, general disaster reduction strategies at regional, country and local levels must take into account and integrate concern for world cultural and natural heritage in their policies and implementation mechanisms	<i>Action 1.1</i> Promote cultural and natural heritage, and its potential positive role for disaster reduction as part of sustainable development, within relevant international development institutions, conventions and global forums and with other potential financial partners, as a means of raising support for the protection of World Heritage from disasters
	<i>Action 1.2</i> Strengthen policies and funding provisions for disaster reduction within the World Heritage system, for instance by including disaster and risk management strategies in the preparation of Tentative Lists, nominations, monitoring, periodic reporting and International Assistance processes
<i>2. Use knowledge, innovation and education to build a culture of disaster prevention at WH properties</i> The building of a culture of prevention, at all levels, is one of the key elements for a successful disaster reduction strategy. Experience shows that reacting <i>a posteriori</i>, especially as far as heritage is concerned, is an increasingly ineffective way of responding to the needs of people affected by disasters. Training, education and research, on relevant traditional knowledge as well, are the most effective ways of developing a culture of preparedness. This particular area of actions fits entirely within the broader mandate of UNESCO as the UN intellectual arm, in particular for establishing global knowledge networks	<i>Action 2.1</i> Develop updated teaching/learning and awareness-raising resource materials (guidelines, training kits, case studies and technical studies, glossaries) on disaster reduction for World Heritage, and disseminate them widely among site managers, local government officials and the public at large
	<i>Action 2.2</i> Strengthen the capacity of World Heritage property managers and community members through field-based training programmes, to develop and implement risk management plans at their sites and contribute to regional and national disaster reduction strategies and processes
<i>3. Identify, assess and monitor disaster risks at WH properties</i> The first step to reducing disasters and mitigating their impact is the identification of possible risk factors, including risks from global agents such as climate change. The vulnerabilities from disasters to World Heritage properties must be therefore identified, assessed in their level of priority and closely monitored so as to inform the appropriate risk management strategies	<i>Action 3.1</i> Support risk identification and assessment activities at World Heritage properties, including consideration of climate change impact on heritage, consideration of underlying risk factors, all necessary expertise and the involvement of relevant stakeholders as appropriate
	<i>Action 3.2</i> Develop a World Heritage Risk Map at the global level or at regional levels to assist states' parties and the committee to develop better responses

Key Words: Capacity Building, Disaster Risk Management (DRM) in Cultural Heritage sites, geohazard assessment, Disaster Preparedness and Mitigation, Fire, Wildland Fire.

Table 2. Continued...

OBJECTIVES	PRIORITY ACTIONS
4. Reduce underlying risk factors at WH properties When a disaster occurs, there are a number of underlying factors that can significantly aggravate its impact. These include land/water and other natural resources management, industrial and urban development, and socio-economic practices. Removing the root causes of vulnerability often implies the identification and reduction of underlying risk factors associated with human activities	Action 4.1 Give priority within international assistance to helping states's parties in implementing emergency measures to mitigate significant risks from disasters that are likely to affect the Outstanding Universal Value, including the authenticity and/or integrity of World Heritage properties
	Action 4.2 Develop social training programmes for communities living within or around World Heritage properties, including consideration of heritage as a resource to mitigate physical and psychological damage of vulnerable populations, particularly children, during and in the aftermath of disasters
5. Strengthen disaster preparedness at World Heritage properties for effective response at all levels The worst consequences of natural or human - made disasters can often be avoided or mitigated if all those concerned are prepared to act according to well-conceived risk reduction plans, and the necessary human and financial resources, and equipment are available	Action 5.1 Ensure that risk management components with identified priorities are integrated within management plans for World Heritage properties, as a matter of urgency. For World Heritage cultural properties, the scope of these plans should address ways of protecting the key assets that contribute towards the Outstanding Universal Value and should also include the protection of any significant original archival records that contribute to their heritage value, whether or not they are located within the boundaries of the World Heritage property. For natural properties, such plans should be oriented to protecting the key values for which the properties were inscribed as well as their integrity
	Action 5.2 Ensure that all those concerned with the implementation of disaster reduction plans at World Heritage properties, including community members and volunteers, are aware of their respective roles and are well and systematically trained in the application of their tasks

NOTES

¹ According to the World Bank (2012) ranking. Website: <http://data.worldbank.org/country/albania>

² Tragically, a few weeks following the training a fire swept through Berat and engulfed unoccupied historical residential houses and apartments in the heart of the town's historical centre. This happening, was in fact, a hypothetical case scenario developed by our trainees (see Annexes) and this unforeseen event again demonstrated the immense exposure that heritage sites are subject to everyday. Both natural and man-made events have the power to destroy or severely undermine heritage sites to the extent that their unique value is irremediably lost.

³ Assessment Analysis of Seismologic Risk and geohazard vulnerability of first level in major Cultural Heritage Sites of Albania.

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REFERENCES

- Ostrom E. (1990) - *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, Cambridge University Press.
- United Nation Office for Disaster Risk Reduction UNISDR (2013) - *Synthesis Report Consultations on a Post-2015 Framework on Disaster Risk Reduction (HFA2)*. April 2013, 28 pp.
- Milutinovic Z., Galperin A. and Spirollari M. (2003) - *DISASTER RISK ASSESSMENT IN ALBANIA* - Executive Summary Report. United Nation Development Programme, Disaster Management and Emergency Preparedness Project, Tirana, Albania, 107 p.
- Antoniou P. (2012) - 'Concern for Disaster Risk Reduction in the management of World Heritage Properties: A research through the archives of the World Heritage Centre', UNESCO.

WEBSITES

[http://www.preventionweb.net/english/profession
al/publications/v.php?id=25129](http://www.preventionweb.net/english/professional/publications/v.php?id=25129)
Historic Centers of Berat and Gjirokastra:
<http://whc.unesco.org/en/list/569>
Butrint, Albania: <http://whc.unesco.org/en/list/570/>

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