EUROMED PROTECT-NET

Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement

Proceedings

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Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement

Proceedings

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Prof. Roberto Mugavero, President, European Centre for Disaster Medicine

Forum EUROMED PROTECT-NET

Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement

2 - 3 May 2024 San Marino

Statements

Audience

Public Palace, Hall of the Great and General Council

His Excellency Alessandro Rossi, His Excellency Milena Gasperoni

Audience with their Excellencies the Captains Regents for the EUR-OPA Forum on Major Risks and the inauguration of the Global Studies Centre (CGS) of the Parliamentary Assembly of the Mediterranean, in collaboration with CEMEC

We are particularly pleased to welcome to San Marino the Directors of the Specialized Centres of the EUR-OPA Major Hazards Agreement and to extend our warmest welcome to the President of CEMEC, Prof. Roberto Mugavero, as well as to the Secretary General of the Parliamentary Assembly of the Mediterranean, Ambassador Sergio Piazzi. They are jointly engaged in a series of impactful international initiatives.

We also extend our cordial greetings to the authorities and esteemed guests gathered here.

Today's presence is a source of great satisfaction and sincere pleasure for us, reflecting the multilateral significance of this occasion, in line with the established relationship between our state and the international organizations represented here today.

It is noteworthy how these institutions tend to connect with each other, increasingly reinforcing the pressing need for collaboration, particularly in emergency-related fields, such as the areas of specific interest and activity of our esteemed interlocutors. This interconnection highlights the contribution of each entity, echoing the shared commitment to managing risks, which is evident in the solid reality of CEMEC in San Marino, as well as in the Parliamentary Assembly of the Mediterranean and the Council of Europe. In 1987, the Council of Ministers established the EUR-OPA Major Hazards Agreement.

The importance of intervening to prevent major risks lies in the nature of these risks themselves, determined by the potential damage they could cause, both immediately to infrastructure, buildings, the environment, or worse, human lives, and in terms of long-term effects such as potential economic losses and social implications.

The actions of planning, monitoring, securing, and responding to risks from natural events like earthquakes or landslides, as well as extreme weather conditions such as floods, fires, or droughts, become crucial. It is also essential to recognize that technological progress, despite its undeniable advantages in everyday life, can also be a source of potential challenges.

In this context, the EUR-OPA Agreement operates with the commendable goal of promoting multidisciplinary cooperation among its current 22 member states through initiatives and projects aimed at raising public awareness by implementing information and training programs. These efforts are designed to lead to sustainable, innovative, and interconnected development in the affected regions.

Therefore, cooperation in environmental protection, the exchange of information and experiences in climate action, the development of climate policies, and raising awareness of ongoing changes are fundamental. The aim is to improve preparedness for these challenges and reduce their impacts. For your dedication to this complex effort, we wish to express our heartfelt gratitude and satisfaction.

We are confident that the Euro-Mediterranean Forum EUROMED PROTECT-NET—focused on disaster risk management, health preparedness, and advancing necessary collaboration, which is currently taking place in our Republic and hosted by CEMEC, and which we are pleased to have granted the High Patronage of the Regency—will continue, with the support of all the international

experts present here, the important work done so far. This includes outlining fundamental guidelines for managing risky situations that require careful protection of civilians and the surrounding environment, as well as developing coordinated strategies and information sharing among involved entities, including health and medical institutions.

We reaffirm our appreciation for the activities carried out in this field by CEMEC, the European Centre for Disaster Medicine, for its noble aim of establishing a training centre for Major Emergencies and Disaster Medicine for the Euro-Mediterranean area. This is based on its significant experience gained over 38 years of service under the auspices of the Council of Europe and the World Health Organization, training healthcare personnel, law enforcement, civil protection, volunteers, and rescuers for emergency and disaster management.

International organizations and national institutions increasingly stress the need to find collaborative responses to the ever more frequent and severe disasters occurring. We are pleased to witness the union of your experiences and specialized skills and the significant exchange of knowledge you are engaging in to respond effectively in times of crisis.

Your work is a significant contribution to promoting collective responsibility in the face of potential disasters and pursuing effective solutions to the urgent challenges facing our territories.

For this reason, we welcome with great satisfaction the inauguration of the second office of the Parliamentary Assembly of the Mediterranean in San Marino, which will house its Global Studies Centre. This new centre joins the International Studies Centre PAM, opened less than three years ago, which marked the beginning of our Republic's positive reception of the operational headquarters of this important international forum. We are confident that this additional

action hub will foster an increasingly aware and fruitful connection with neighboring states across multiple domains.

The Republic of San Marino has consistently upheld its multilateral commitment and intends to contribute to addressing the most challenging global issues. The opening of the second PAM Study Centre reaffirms our state's commitment to actively participating in the goals of international organizations, concretely supporting actions related to parliamentary diplomacy, political, economic, and social cooperation among member states, with a common aspiration for civil well-being and sustainable development. We are fully aware that ideological, religious, political, and cultural differences should be seen as a call for tolerance, solidarity, and cooperation.

Distinguished and esteemed guests,

In conclusion of this address, we renew our sincere appreciation for PAM's decision to strengthen its operational presence in San Marino and, thanks to the collaboration among all of you, for the opportunity to host such an important forum within our territory. Its value is particularly evident in the noble intent of civil protection, achieved through the synergistic action between CEMEC and the EUR-OPA Agreement.

Your work provides us with valuable insights into current issues addressed by your research and commits us to a future of security and well-being that must be increasingly ensured in the Mediterranean, European, and beyond.

Finally, we wish all present a productive working session in San Marino, within both projects we honor today and in any future activities and initiatives.

San Marino, May 2, 2024 / 1723 d.F.R.

Prof. Roberto Mugavero, President, European Centre for Disaster Medicine, CEMEC

Official Audience with Their Excellencies, the Captains Regent of the Republic of San Marino

Your Excellencies the Captains Regent,

Honorable Secretaries of State,

Dear and Esteemed Guests,

It is with immense satisfaction that we gather here today to present the event "EUROMED PROTECT-NET - Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement."

This initiative, scheduled for 2024 and 2025, is led by the European Centre for Disaster Medicine (CEMEC) and supported by the Council of Europe. It aims to enhance disaster risk governance, with a particular focus on health aspects, within the Euro-Mediterranean region. The planned activities aim to both promote capacity and knowledge and strengthen cooperation among key actors involved in major risk reduction. Additionally, the initiative includes the development of cohesive strategies and the sharing of information among the involved entities.

This action is also an integral part of CEMEC's efforts to establish a training centre for major emergencies and disaster medicine for the European and Mediterranean regions.

EUROMED PROTECT-NET, which begins today in San Marino with a two-day meeting, to which all the Specialized Centres of the EUR-OPA Agreement have been invited, represents a new chapter in CEMEC's activities. Established in 1987, in response to the interest of the Council of Europe and international organizations in preventing and

protecting against major natural and technological hazards, and in accordance with the “Helsinki Accords” of 1975, CEMEC’s founding members include France, Greece, Italy, Malta, Portugal, San Marino, Spain, Turkey, as well as the Council of Europe and the World Health Organization.

The statutory objectives are to develop technical and scientific initiatives and cooperation with European and non-European countries, the Council of Europe, WHO, the European Community, International Organizations, and both governmental and non-governmental organizations active in major risk sectors.

The Centre, utilizing necessary scientific support and in collaboration with universities, research centres, and health facilities, promotes and organizes research, analysis, education, and knowledge-sharing activities aimed at organizations and personnel engaged in prevention and rescue activities.

CEMEC also serves as a primary reference centre within the EUR-OPA Agreement of the Council of Europe, a cooperation platform for natural and technological events in Europe and the Mediterranean. The main goals of EUR-OPA are to promote and strengthen collaboration among member states in a multidisciplinary context to ensure better knowledge, prevention, preparedness, risk management, and post-crisis analysis in the event of severe disasters. Established by the Committee of Ministers of the Council of Europe in 1987, the Agreement now has 22 member states.

The Ministerial Meeting, held every four to five years, is the decision-making moment where each state is represented by its ministers responsible for emergency prevention and management. The Committee of Permanent Correspondents meets once a year, with each state represented by a Correspondent who serves as a permanent liaison between national authorities and the Agreement. The Permanent Correspondents and their experts are responsible for

preparing the Ministerial Meetings, gathering the necessary materials for drafting and publishing basic documents and resolutions, and exchanging and sharing information about relevant events in participating countries.

At the scientific and technical level, the role of the Euro-Mediterranean Specialized Centres is to develop projects, both nationally and regionally, aimed at improving awareness and resilience among populations regarding major risks. Once a year, the meeting of the Directors of the Centres facilitates the concrete contribution of various partners to common objectives through the implementation of European research, training, and information programs.

Important partners of the EUR-OPA Agreement include UNDRR, UNESCO, WHO, UNOCHA, and ICDO. They participate in the Agreement's work and are regularly invited to statutory and thematic meetings of interest. The International Federation of Red Cross and Red Crescent Societies also regularly contributes to the Agreement's activities.

Over the years, CEMEC has played a fundamental role in organizing and promoting international projects and activities related to documentation, study, education, dissemination of knowledge, and network creation, with a particular focus on public health, resilience, and the protection of people and the environment.

Currently, CEMEC's activities are based on four areas that form the foundation of the Centre's multidimensional approach: research and analysis; training; dissemination; and specialized scientific and technical assistance.

The year 2023 has been particularly dynamic for CEMEC. Six international cooperation agreements have been signed, including one related to the partnership with the Parliamentary Assembly of

the Mediterranean, which has its prestigious Study Centre in the Republic of San Marino and aims to enhance disaster preparedness and response capacities across the Euro-Mediterranean region. Three international research projects have been launched, along with a Traineeship program open not only to Europe but also to other continents. Eighteen different advanced courses and educational programs have been designed and delivered, in collaboration with the University of San Marino, the University of Rome "Tor Vergata," and the OSDIFE Research Institute, in the fields of Medical and Health Sciences, Emergency, and Disasters. Seven broad initiatives have been organized or participated in by CEMEC, targeting teachers, students, and parents from primary, middle, and secondary schools, as well as the general public. Two volumes have been published as a result of international research and cooperation projects. There have been eight bilateral meetings with international organizations and EU and non-EU countries throughout 2023. Fifteen international conferences and workshops have been held in Europe, the Middle East, and Asia, where CEMEC presented technical and scientific papers. Finally, five international exercises have been organized or attended by the Centre.

CEMEC has also created the "Centre for Disasters, Forensic and Biometric Sciences" and is among the founding institutions of the European Chapter of the World Association for Disaster and Emergency Medicine (WADEM).

The current natural, accidental, and deliberate crises and emergencies affecting the globe urgently highlight the inevitable need for a holistic and integrated approach to disaster prevention and management. In addition to responding to current emergencies, we must look to the future with a proactive and innovative vision.

To effectively address risk in a constantly evolving world, there must be increasing global and coordinated commitment. This effort

requires strengthening institutions and capacities at all levels, from local to international governance. It is also crucial to invest more in training and education to ensure that communities have the necessary skills to address emerging challenges.

Promoting collaboration and knowledge exchange between different regions and sectors is another key element. Sharing experiences and best practices can enhance our understanding of risks and vulnerabilities, enabling more effective and targeted responses.

The Forum that opens today represents an unprecedented opportunity to embark on this path toward more efficient and inclusive global risk management. Beyond being a moment of discussion and dialogue, our hope is that the event will act as a catalyst for concrete actions and long-term collaboration. Only by working together can we hope to create a safer and more resilient future for all.

In closing, I warmly thank Mr. Krzysztof Zyman, Executive Secretary of the EUR-OPA Major Hazards Agreement of the Council of Europe, the Directors and Delegates of the Specialized Centres, and the Permanent Representatives for their presence. I extend heartfelt thanks to the Excellencies of the Regency, the Secretaries of State, particularly the Secretary of Health, and the Sammarinese institutions for their constant support in the growth and development of CEMEC. Finally, a great acknowledgment to all those who have previously led and managed the Center and helped us become what we are today: a small seed from which greater security and well-being for the global community can flourish.

Mr. Krzysztof Zyman, Executive Secretary
European and Mediterranean Major Hazards Agreement
(EUR-OPA), Council of Europe

Forum Opening Ceremony

Dear Directors, dear Forum Participants,

It is an honour to open the "EUROMED PROTECT-NET - Euro-Mediterranean **Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement**" initiated and organised by the European Centre for Disaster Medicine (CEMEC), in collaboration with the University of San Marino's Centre for Security Studies (CUFS), the University of Rome "Tor Vergata" Department of Electronic Engineering (DIE), and the Italian Research Institute Observatory on Security and CBRNe Defense (OSDIFE).

For those of you who are less familiar with the EUR-OPA Major Hazards Agreement, I will recall some basic facts:

In 1987, the Council of Europe created an instrument to promote governmental co-operation in the field of Disaster Risk Reduction and dealing with emergencies "the European and Mediterranean Major Hazards Agreement (EUR-OPA)". Today, the Agreement unites 22 member States, among whom are two States that are not member States of the Council of Europe. San Marino was a founding member of EUR-OPA, even before it joined the Council of Europe in 1988.

Fighting against environmental degradation and climate change is one of the key priorities of the Strategic Framework for the Council of Europe.

At the 4th Summit of the Heads of State and Government of the Council of Europe held in mid-May 2023 in Reykjavik, member States adopted a Declaration "United Around Our Values" in which they

underlined the urgency of taking co-ordinated action to protect the environment by countering the triple planetary crisis of pollution, climate change, and loss of biodiversity. The Declaration, which provides guidance for future priorities of the Council of Europe affirms that human rights and the environment are intertwined and that a clean, healthy and sustainable environment is integral to the full enjoyment of human rights by present and future generations.

The "Reykjavik process" initiated at the Fourth Summit of Heads of State and Government aims to strengthen the work of the Council of Europe in the environmental protection field, with the aim of identifying the challenges raised by the triple planetary crisis of pollution, climate change and loss of biodiversity for human rights and contribute to the development of common responses thereto, while facilitating the participation of youth in these discussions.

The **Convention on the Conservation of European Wildlife and Natural Habitats** (the "Bern Convention"), a unique international instrument aimed at aligning national standards and practices in conserving wild flora and fauna and their natural habitats at pan-European level and beyond, provides the necessary tools to strengthen intergovernmental co-operation and creates an opportunity to civil society to engage with governments and bring to their attention concerns about threats to biodiversity and natural habitats and their detrimental consequences. It's my duty to point out that **San Marino remains the only Council of Europe Member State that has not ratified the Bern Convention**, thus depriving it of the right to be called a European-wide standard for Conservation of European Wildlife and Natural Habitats. It would be a fantastic development if this question was reconsidered by the authorities.

The **Council of Europe Landscape Convention** - the first international treaty devoted exclusively to all dimensions of the landscape – specifies that the landscape has an important public interest role in the cultural, ecological, environmental and social fields and is a key

element of individual and social well-being, and that landscape protection, management and planning entail rights and responsibilities for everyone. San Marino has been a party to that Convention since 2004.
The Council of Europe is committed to strengthen its work on the human rights aspects of the environment based on the political recognition of the right to a clean, healthy, and sustainable environment as a human right. Furthermore, the Council of Europe strives currently to conclude ongoing work on a convention superseding and replacing the European Convention on the Protection of Environment through Criminal Law.

On 26 April 2023, the Parliamentary Assembly of the Council of Europe debated a report on Political strategies to prevent, prepare for, and face the consequences of natural disasters.

Last month, on 18 April 2024, the Parliamentary Assembly debated **Mainstreaming the human right to a safe, clean, healthy, and sustainable environment with the Reykjavik process** and welcomed the setting up in January 2024 of an Inter-secretariat Task Force on the Environment, responsible for carrying out a stocktaking survey of existing and planned activities, and "proposing elements for the development of a first Council of Europe strategy on the environment". It stated that this future strategy must have a clear goal in terms of setting standards at European level and underlined the importance "to draw up a legal binding instrument recognising an autonomous right to a healthy environment within the Council of Europe", capitalising on existing Council of Europe standards.

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What I outlined above, pertains primarily to the intergovernmental cooperation within the Council of Europe, and the Major Hazards Agreement plays its part within this process.

In two weeks from now the Committee of Permanent Correspondents will discuss in its turn **"The right to living in a clean, healthy and sustainable environment for the current and future generations"** and decide on the further steps to be taken, with the view to elaborate the Agreement's guidelines and a recommendation.

But the Agreement stands on two pillars: one is intergovernmental, the other is scientific. EUR-OPA Major Hazards Agreement has been construed from the beginning as a platform for intergovernmental and scientific cooperation.

My presence here, as one of only a handful of representatives of those who work on the governance and policy side, points to a serious issue. This issue is the need **for** and often the inadequate practice **of** an interface between scientific communities and policy makers usually found in governmental or similar advisory bodies.

The situation varies in different parts of the world, but insufficient cooperation between scientists and policy makers is all too often a problem that significantly impacts the effectiveness of measures taken to prevent hazards turning into disasters, for efficient actions being taken to minimalize the scale of disasters when they happen and for building back better.

The reasons for such state of affairs are multiple:

- Governments may not have the reflex to consult scientists,
- they may not sufficiently understand the arguments that are being put forward,
- they may not have constituency support for taking necessary actions,

- or they may not dispose of adequate funding to implement scientific recommendations.

On the other hand, scientists:

- may be frustrated by bureaucratic way administrations operate,
- may not have access to the decision-makers,
- or ay simply concentrate on science and not on matters which seem less important.

All these factors are detrimental to effectively addressing the challenges of confronting hazards, preventing them from turning into disasters, and building societal resistance.

I strongly believe that it is our task ad this forum, to address this question and to propose solutions. Also, within the EUR-OPA Network of the Scientific Centres we should seek ways to maximise synergies and to strengthen partnership among centres.

The standards elaborated by the EUR-OPA Major Hazards Agreement, both at the governmental level and at the scientific level, are useful guidance tools at governments' disposal, allowing for the elaboration of more fine-tuned strategies and policies that offer better protection to the most vulnerable persons in our societies. Which is the aim we all share and work towards. I am looking forward to our discussions over the next two days!

Thank you for your attention!

Krzysztof Zyman

Prof. Roberto Mugavero, President, European Centre for Disaster Medicine, CEMEC

Forum Opening Ceremony

Ladies and gentlemen,

It is with great pleasure and honour that I welcome you all to the Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement, under the banner of EUROMED PROTECT-NET. As the hosting authority, the European Centre for Disaster Medicine (CEMEC) is privileged to lead this significant gathering, in collaboration with esteemed partners: the University of San Marino's Center for Security Studies (CUFS), the University of Rome "Tor Vergata" Department of Electronic Engineering (DIE), and the Italian Research Institute Observatory on Security and CBRNe Defense (OSDIFE).

Today, we are privileged to host distinguished guests, including Mr. Krzysztof Zyman, Executive Secretary of the EUR-OPA Major Hazards Agreement, Council of Europe, as well as EUR-OPA Centre's Directors, Delegates, and Permanent Correspondents. Your presence improves this forum with invaluable insights and expertise, crucial for advancing our collective efforts in disaster risk reduction.

This event stands as an example of collaboration and innovation, representing the spirit of partnership across borders. Our overarching objective, supported by the Council of Europe, is to forge robust cooperation within the EUR-OPA Major Hazards Agreement network. By fostering dialogue and synergy among key stakeholders, we aim to enhance disaster risk governance and fortify our resilience against emerging threats.

Over the next two days, we'll explore the complex dimensions of disaster risk reduction, with a special focus on integrating health and medical considerations into our strategic frameworks.

As we tackle our challenges together, it's crucial to share what we know, what works best and how break down barriers to benefit our communities.

Moreover, this Forum serves as a platform to spotlight the key role of EUR-OPA Major Hazards Agreement and the Specialized Centres. By showcasing their innovative approaches and impactful initiatives, we seek to amplify their contributions to national and regional risk reduction actions.

In closing, I extend my heartfelt gratitude to all of you for the great commitment to advancing disaster risk governance and health preparedness. Let us seize this opportunity to forge new partnerships, exchange insights, and chart a course towards a safer, more resilient future.

Thank you.

Prof. Roberto Mugavero

EUROMED PROTECT-NET

Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement

Presentations

Evangelia Linda Pelli

Presentation of ECPFE - European Centre on Prevention

of Earthquakes – Greece

EUR-OPA MAJOR HAZARDS AGREEMENT

In a nutshell

EUR-OPA MAJOR HAZARDS AGREEMENT
ACCORD EUR-OPA RISQUES MAJEURS

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

- Set up in 1987 by the Committee of Ministers of the Council of Europe
- Partial Agreement designated "open", as membership may be requested by any state, whether or not it is a member of the Council of Europe
- Members: 22 member states , of which 20 are members of the Council of Europe and two are from the southern Mediterranean
- Decision- taking bodies:
  - Committee of Permanent Correspondents (and its Bureau), (Political Level)
  - Meeting of Directors of Specialised Centres (Scientific Level)
  - Ministerial Meetings, usually every four years, covering priority fields of action (Political Level)
  - Specialised Centers : numbering 21
- In our Country this Agreement was ratified by the Greek Law , 2031/92.

European Center on Prevention and Forecasting of Earthquakes ECPFE

- The European Center on Prevention and Forecasting of Earthquakes (ECPFE) operates within the Framework of EUR-OPA .It belongs to the Network of 21Specialized Centers of the Agreement and it is based in Athens , Greece .The Center has a close cooperation with Earthquake Planning and Protection Organization of Greece (OASP).

- The objectives of ECPFE are compatible with the thematic unions that OPA is interested , concentrating on earthquake planning and protection. ECPFE is also co-operating with other European Centers with relevant targets.

Web site: https://ecpfe.oasp.gr/

EUR-OPA
EUR-OPA MAJOR HAZARDS AGREEMENT
ACCORD EUR-OPA RISQUES MAJEURS

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

European Center on Prevention and Forecasting of Earthquakes - ECPFE

BODIES OF ECPFE

PRESIDENT: Prof. E.LEKKAS

DIRECTOR OF ECPFE: Dr L.Pelli

DEP. DIRECTOR OF ECPFE: M.Panoutsopoulou

AXIS OF POLICY

- EARTHQUAKE PROTECTION OF MONUMENTS & HISTORICAL CENTERS
- REDUCTION OF THE VULNERABILITY OF STRUCTURES
- EARTHQUAKE –DEVELOPMENT OF INFORMATIVE MATERIAL FOR INDIVIDUALS WITH DISABILITIES
- ACCESSIBILITY ASSESSMENT

CO OPERATION WITH OTHER CENTERS

- **EARTHQUAKE PROTECTION OF MONUMENTS & HISTORICAL CENTERS**
  (CUEBC –ECILS-ECRM-CERU)
- **REDUCTION OF THE VULNERABILITY OF STRUCTURES**
  (ECRP-ECBR)
- **EARTHQUAKE –DEVELOPMENT OF INFORMATIVE MATERIAL FOR INDIVIDUALS WITH DISABILITIES**
  (ECFF-ECBR- ECRM)
- **Other topics: "Assessing drought recurrence in EUR-OPA countries using non-linear approach", (A & B phases, 2014-2015) as a partner**
  (GHHD)
- **Participation in the project «BE-SAFE-NET», protect yourself from Hazards E.C. on Disaster Awareness, Cyprus, in the topic : «RISKS & MONUMENTS»**

EARTHQUAKE PROTECTION OF MONUMENTS & HISTORICAL CENTERS

EUR-OPA MAJOR HAZARDS AGREEMENT
ACCORD EUR-OPA RISQUES MAJEURS
COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

In this sector ECPFE has carried out the following :

Seminars :

1.Two-day meeting entitled "Aseismic Interventions to Monuments and Historic Settlements" in Athens on 16-17 February 2006.
2.Two-day meeting entitled "Strategies towards Seismic Protection of Monuments" in Athens on 26-27, February 2009.
3.Seminar concerning "Seismic Protection of Monuments", in Athens on 2-3 December 2013

Winter Schools :

1.Training course entitled "Seismic Risk Assessment in Specific Areas with Monumental Structures" by EPPO and ECPFE in Athens on 6-10 December 2010.
2.Training course entitled "The Protection of the Integrity of Monuments under Seismic Actions" in Thessaloniki on 3-5 November 2011.

Publications:

1.Geotechnical Issues and Issues of Soil – Monuments Interaction, NTUA, G.Bouckovalas, 2009
2.Draft Regulatory Document , NTUA, Th.Tassios ,2010, in Greek
3.Draft Framework Regulatory Document for Structural Interventions and Seismic Protection of Monuments, E.Vintzilaiou, N.Miltiadou, F.Karantoni, 2011, in English
4.State Of The Art Report For The Analysis Methods For Unreinforced Masonry Heritage Structures And Monuments , S. J. Pantazopoulou, 2013 in English

2021

BeSafeNet
EUR-OPA Major Hazards Agreement

Contribution in the platform "Be Safe Net - Protect yourself from hazards"and providing material concerning "RISKS & MONUMENTS"

European Centre on Disaster Awareness, Cyprus.

BeSafeNet Editorial Board Meeting in Athens, Greece, 04-05 October 2023

Report of BE-SAFE-NET ACTIVITIES and Future Planning

Structural Category	Category description	Subcategory
A	Structures with **vertical bearing elements and horizontal floors, roofs (flat or inclined) or vaults.** This category collects of small sized buildings or buildings of larger dimensions with relatively dense partitioning with internal load-bearing walls, satisfactorily connected to each other and to the perimeter walls. As long as the floors or roofs are adequately connected to the vertical load-bearing elements, the building presents box- behavior.	A.1 Structures of small dimensions (residential buildings, small-scale industrial units – olive mills, watermills, etc) A.2 Small or middle-sized churches. A.3 Single or multi-storey buildings of large dimensions with dense partitioning (public buildings: hospitals/schools, commercial buildings, buildings of mixed use etc). A.4 Two or multi-storey buildings of middle and large sized dimensions with dense partitioning and mixed vertical load-bearing elements
AB	Constructions consisting of wide spaces, with no or few internal load-bearing walls, connected to the perimeter walls, with or without intermediate floors and timber or steel roofs, that transfer loads only to the external walls.	AB1. Single or multi-storey buildings with wide spaces (basilica churches, industrial buildings, warehouses, Local markets, cinemas, theaters, etc) AB2. Medium or large-sized buildings, with non-load-bearing internal walls (public buildings, residences, etc.)
B	Structures characterized by wide spaces, with few or no internal walls, in which distinct structural macro-elements are often found, for which independent failure mechanisms are developing (domes, cut-door galleries, apses, wings, etc.)	Single or multi-storey structures with wide spaces and distinct macroelements: B.1Temples (churches,mosques/wi-th domes, proches etc B.2 Ottoman public buildings (Madrasa, hammams, etc) B.3 Public buildings dating back to the Venetian and Italian rule Period
C	Structures in which the vertical dimension prevails over the others. As these buildings are often characterized by significant slenderness, their seismic response may be assumed as a global flexural behavior	C.1Towers C.2.Bell towers C.3.Minarets C.4.Lighthouses Chimneys

Classification of the Greek Monuments according to their structural type (based on Lagomarsino's classification)

D	Structures with large length compared to their width and height, with arches and vaults characterized by in-plane failure	D.1 Apses (triumphal arches) D.2 Aqueducts D.3 Bridges
E	**Massive constructions** in which the wide thickness of walls, compared to other dimensions, doesn't allow the idealization as plane structural element. Local failure occurs as, for example, the detachment of external leaf. Geotechnical aspects play as well important role	E.1 Earth walls E.2 Walls of large thickness (free standing walls) E.3 Walls with abutments
F	**Single isolated constructions**, which do not delimit an interior space.	F.1 Free standing collumns F.2. Trilithes (Monolithic columns with architrave) F.3. Free standing walls, ofsufficient height, survivingparts of older standing buildings F.4. Colonnades
G	Historical centers, or other clusters of buildings made of ordinary historical and traditional buildings' aggregates. The seismic response must consider the interaction among adjacent buildings.	G.1. Buildings with common adjacent walls G.2. Statically independent buildings in contact (with or without double wall between them)
H	**Archaeological sites** consisting of ordinary masonry remains of **small height** which are mainly vulnerable to environmental threats other than earthquakes	
I	Underground structures, often constructed with the cut-and-cover procedure, or structures carved in soft bedrock or caves. In these particular structures the geotechnical aspect is of main importance	I.1. Cave structures I.2. Catacombs I.3. Tunnels I.4. Tombs in tumulus

Classification of the Greek Monuments according to their structural type (based on Lagomarsino's classification)

The proposed framework of OASP, for the three level Pre-Earthquake Assessment of Buildings

First Level Pre-earthquake Inspection

Rapid Visual Screening Procedure

The First Level of pre-earthquake assessment was implemented in 2001. It is performed to public buildings to identify those which present inefficient earthquake performance and might pose a risk of loss or injury, or severe interruption of community services in the event of a damaging earthquake.
The inspection of each building is carried out by the authority that is responsible for the operation and the safety of the building.
The inspection forms sent to E.P.P.O. are entered into a data base and are classified in three categories **A, B, C.** Lower scores correspond to an expected better seismic performance. The results determine the priority for the second degree inspection and are sent from E.P.P.O. to the Regions.

Second Level Pre-earthquake Inspection

E.P.P.O., in 2012, developed the Second Level pre-earthquake assessment for masonry buildings (S. Dritsos, C. Ignatakis, D. Panagiotopoulou, A. Spiliopoulos). The developed methodology was based on the procedure described in: "Measuring of the relative seismic risk of historic masonry buildings" by Th. Tassios and E. Vintzilaiou.
The assessment is directed at masonry buildings that have received a score from the first level pre-earthquake assessment that is below a certain threshold value.
The aim of the procedure is to re-evaluate the ranking of identified vulnerable buildings. This evaluation goes into more detail and requires access to all parts of the building, and basic calculations without performing an analysis of the structure.

Third Level Pre-earthquake Inspection

Detailed assessment of seismic performance

The Third Level pre-earthquake assessment is performed to buildings with local or general inefficient seismic performance. Detailed assessment studies and redesigns (strengthening) are required.
E.P.P.O. assigned to a scientific committee the development of a Code of Interventions for Masonry Buildings (KADET). The scope of the Code is the enactment of criteria for the assessment of the structural capacity of existing masonry buildings. The Code is going to be evaluated by several technical offices and external evaluators.

Pre earthquake assessment (Activities 2016- up today)

STRUCTURAL CATEGORY A
SUBCATEGORY A.4: TWO OR MULTI-STOREY BUILDINGS OF MIDDLE AND LARGE SIZED DIMENSIONS WITH DENSE PARTITIONING AND MIXED VERTICAL LOAD-BEARING ELEMENTS 2021

Ottoman period mansion, Ierocleous street, Rhodes

a

b

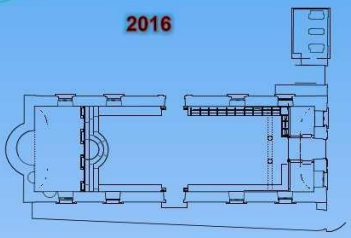
Overview of the building (a) before and (b)after the restoration project

Ground floor plan (survey)

Top floor plan (survey)

STRUCTURAL CATEGORY AB

2016



CHURCH OF THE VIRGIN'S DORMITION PANAGIA AGRILOU - KONTOGENNADA CEFALONIA

Design Project: K.Athanasiadou & collaborators

STRUCTURAL CATEGORY D
SUBCATEGORY D.3: BRIDGES 2019

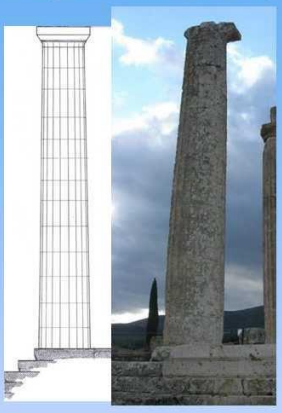
Arch bridge at Nerutsu Milos of Viotikos Kifissos

Overview of the bridge

Pathology of pedestals (base of piers)

STRUCTURAL CATEGORY F
SUBCATEGORY F.1.: FREE STANDING COLUMNS 2016

Free standing column of the Sanctuary of Zeus in Nemea



Overview and section drawing of the columns

Sources: Ministry of Culture and Sports, Pre-earthquake assessment of monuments (OASP-2016), Research group I.Psycharis, E.Delinikola, J.Dourakopoulos, A.Miltiadou, K Papantonopoulos, E.Toumpakari

STRUCTURAL CATEGORY F
SUBCATEGORY F.2: TRILITHES (MONOLITHIC COLUMNS WITH ARCHITRAVE)

2016

The temple of Aphaia, Aigina

Overview of the monument

Sources: Ministry of Culture and Sports, Pre-earthquake assessment of monuments (OASP-2016), Research group I.Psycharis, E.Delinikola, J.Dourakopoulos, A.Miltiadou, K Papantonopoulos, E.Toumpakari

STRUCTURAL CATEGORY F
SUBCATEGORY F.4: COLONADES

2019

Zeus temple, Nemea

Overview of the monument

Sources: Ministry of Culture and Sports, Pre-earthquake assessment of monuments (OASP-2019), Research group I.Psycharis, E.Delinikola, J.Dourakopoulos, A.Miltiadou,
K. Papantonopoulos, E.Toumpakari, M.E.Dasiou

2. EUROPEAN CENTER FOR VULNERABILITY OF INDUSTRIAL AND LIFELINES SYSTEM (ECILS)

2022

«Seismic Vulnerability Assessment of the Skopje Old Bazaar»
Coordination Center : ECILS
Partner: ECPFE

During our visit to North Macedonia we carried out the following:

- In 3 selected buildings of the Skopje Old Bazaar , we performed the Rapid Visual Inspection according to the First Degree Pre-Earthquake Assessment Procedure that is implemented in Greece using the related Form.

- The results were compared to those derived by the Relevant Methodology implemented in North Macedonia and regardless the different approach the 2 countries share a similar attitude.

2022

«Atlas of the Monuments of Greece classified according to their seismic behavior»

1st action of EPPO

«Atlas of the Monuments of Greece classified according to their seismic behavior»

1η ΔΡΑΣΗ του ΕΚΠΠΣ

2023

CORDINATION CENTER: ECPFE

PARTNER :ECILS

Technical visits to Bitola and Ohrid with purpose the recording of the monumental stock and a trial to classify them accordingly to the Greek classification methodology

"Second Pre- Earthquake Assessment of Masonry Buildings "

This proposed empirical Methodology, was carried out in the framework of the activities of E.C.P.F.E. 2014, it is the process of a second level pre-earthquake assessment , where the end result of such an assessment, is a "score" called the " relative seismic risk index I" of the building. The " relative seismic risk index I" follows from the expression :

$$I=V(H/R-1)$$

Where:

H: Building's seismic hazard (Hazard) "H"
R: Building's earthquake resistance index (Resistance) "R"
V: Building's importance index (Value) "V"

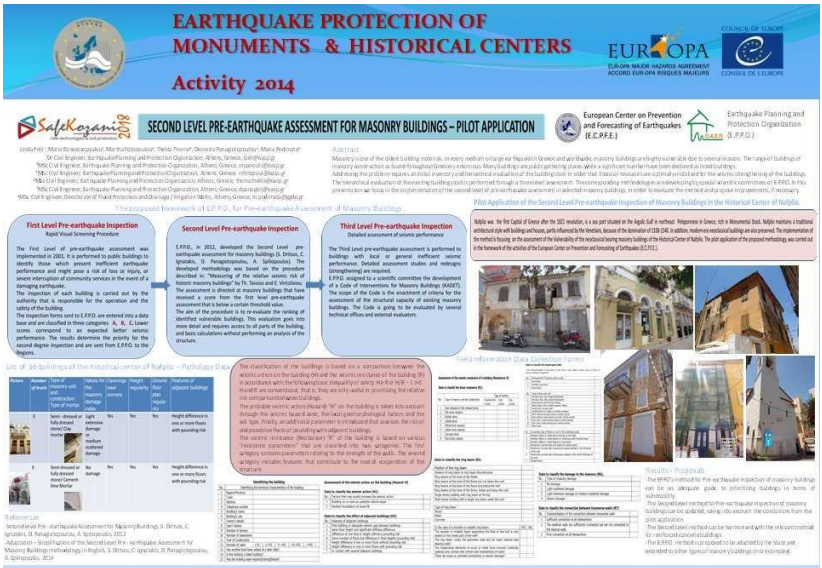
- The selected Historical Center for the implementation of the proposed Methodology was Nafplio.

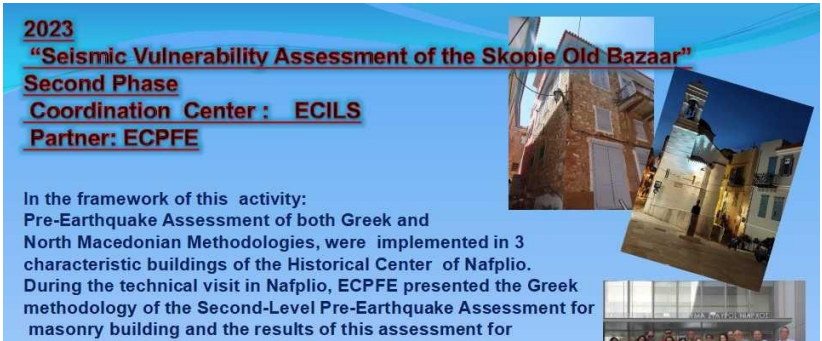
NAFPLIO

- Nafplio was the first Capital of Greece after the 1821 revolution, is a sea port situated on the Argolic Gulf in northeast Peloponnese in Greece , rich in Monumental Stock.
- Nafplio maintains a traditional architectural style with many traditional-style colorful buildings and houses, partly influenced by the Venetians, because of the domination of 1338-1540. In addition, modern-era neoclassical buildings are also preserved.
- The project is focusing on the assessment of the Vulnerability of the neoclassical bearing masonry buildings of the Historical Center of Nafplio, based on the proposed empirical Methodology.

PART OF THE DATA BASE

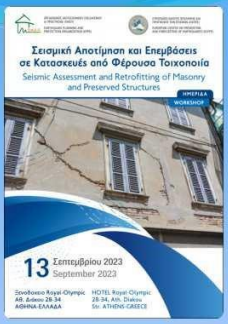
Picture	*Address*	*Number of levels*	Type of masonry unit and construction Type of mortar	Values for the masonry damage index	Openings near corners	Height regularity	Groun d floor plan regula-rity	Features of adjacent buildings
	Queen Olga 29	3	 Semi dressed or fully dressed stone/ Clay mortar	Light extensive damage or medium scattered damage	Yes	Yes	Yes	Height difference in one or more floors with pounding risk
	Queen Olga 24	3	 Semi dressed or fully dressed stone/ Cement-lime Mortar	No damage	Yes	Yes	Yes	Height difference in one or more floors with pounding risk


EARTHQUAKE PROTECTION OF
MONUMENTS & HISTORICAL CENTERS
Activity 2014
EUR-OPA
SECOND LEVEL PRE-EARTHQUAKE ASSESSMENT FOR MASONRY BUILDINGS – PILOT APPLICATION
European Center on Prevention and Forecasting of Earthquakes (E.C.P.F.E.)
Earthquake Planning and Protection Organization (E.P.P.O.)
Abstract
Pilot Application of the Second Level Pre-earthquake Inspection of Masonry Buildings in the Historical Center of Nafplio
First Level Pre-earthquake Inspection
Second Level Pre-earthquake Inspection
Third Level Pre-earthquake Inspection
Vulnerability Assessment of Historical City Centers – The Case of Nafplio


2023
"Seismic Vulnerability Assessment of the Skopje Old Bazaar"
Second Phase
Coordination Center : ECILS
Partner: ECPFE
In the framework of this activity:
Pre-Earthquake Assessment of both Greek and
North Macedonian Methodologies, were implemented in 3
characteristic buildings of the Historical Center of Nafplio.
During the technical visit in Nafplio, ECPFE presented the Greek
methodology of the Second-Level Pre-Earthquake Assessment for
masonry building and the results of this assessment for
the selected buildings. ECILS representatives
implemented their methodology in the same buildings.
This project targets at the comparison of the two
methodologies.
Also, ECILS and ECPFE representatives carried out a technical visit to
Stavros Niarchos Foundation. During the visit the engineers of the
Foundation presented, the seismic isolation system that was implemented
during the constructional phase of the building.

2023

" Seismic assessment and retrofitting of masonry and preserved structures"
Coordination Center: ECPFE
Partner : ECILS- European Centre on Vulnerability of Industrial and Lifelines Systems, North Macedonia



In the framework of this activity ECPFE and OASP organized a Workshop in Athens on "Seismic Assessment and Retrofitting of Masonry and Preserved Structures" where the new Greek Code for the Assessment and Structural Interventions of Masonry Structures (KADET) was presented. ECILS participated as a partner in the Workshop in Athens.

KADET:The main objective of the Code is the introduction and enforcement of criteria for the assessment of the bearing capacity of existing masonry structures. The code set rules for the re-design of these structures, following potential interventions (repairs or strengthening).

REDUCTION OF THE VULNERABILITY OF STRUCTURES

"Vulnerability Assessment of the Historical Center of Lefkas "

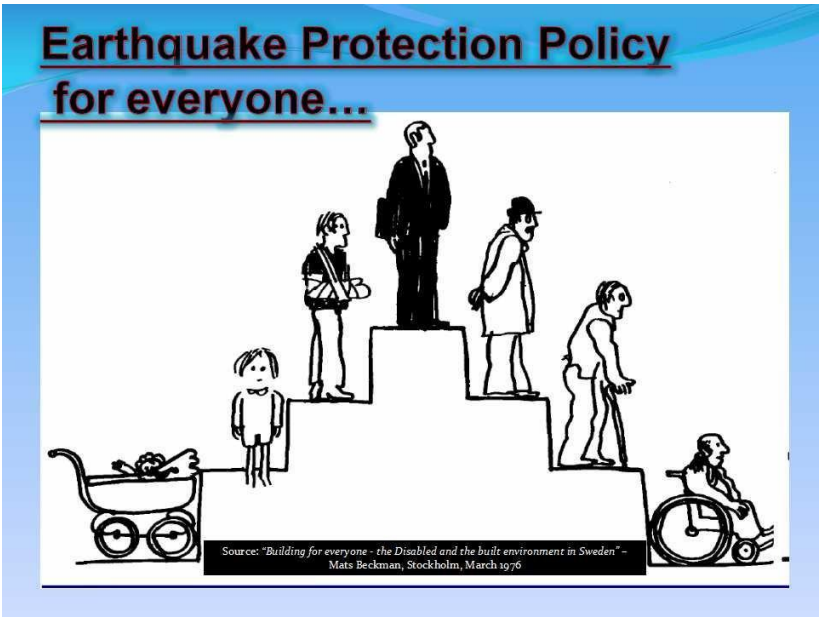
SEISMIC RISK = SEISMIC HAZARD* VULNERABLITY*VALUES AT RISK

Estimation of the Seismic Hazard of the town of Lefkas

Analysis of characteristic buildings of the Historical Center of Lefkas

Most of the buildings of the historical center of the town were built by local practices (double Bearing System) and have been designated as representative earthquake resistant constructions by the European Council Cultural Heritage Unit.

2019


Earthquake Protection Policy
for everyone...
Source: "Building for everyone - the Disabled and the built environment in Sweden" – Mats Beckman, Stockholm, March 1976


DEVELOPMENT OF INFORMATIVE MATERIAL FOR PEOPLE WITH DISABILITIES 2014-2015
1. LEAFLETS-POSTERS
Earthquakes often
All of us should
know what to do
strikes
Learning what to do in an earthquake
Evacuation Planning of Critical Infrastructures in case of an Earthquake or a Fire for People with Disabilities
December 2016
Be ready for an earthquake
Before an earthquake
I talk with my family and carers
An earthquake is happening
What should I do?
The earthquake stops
What should I do?

"Involving people with disabilities in disaster planning and preparedness, as an integral part of disaster preparedness and response", Coordinator Yerevan,(ECRM) Activity 2014

2.VIDEOS **2015**

"Development of a tablet application concerning Earthquake Protection Measures, for People with disabilities with the implementation of "Easy to Read" language (Coordinator: ECPFE, Athens)"

26 videos (13 in Greek & 13 in English)

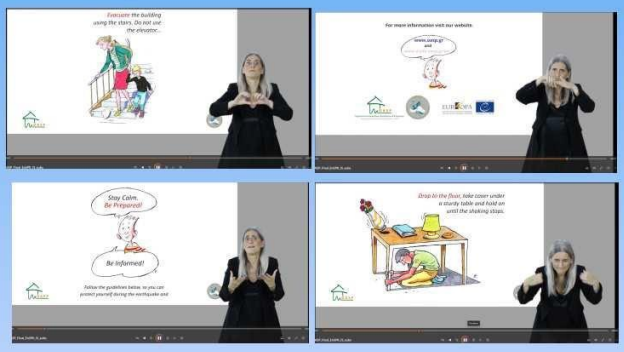
www.oasp.gr

https://ecpfe.oasp.gr

Video: Ducking under a table-link

https://www.youtube.com/channel/UCnUm-OamqjNTYMf5urnY5hA

2023 "Enhancing the resilience of buildings and persons with special vulnerabilities to earthquakes and pandemics in Romania, within the EUR-OPA goals for inclusive societies"
Coordinator Centre: ECBR
Partner: ECPFE



ECPFE, participated as a partner in this activity and produced a video with guidelines for self-protection during an earthquake and behave appropriately after an earthquake. Deaf or hard of hearing people have full access to the video content, through International Sign and subtitles.

2022 ACCESSIBILITY ASSESSMENT
"Inclusion of Vulnerable groups in Disaster Preparedness and response for coping with emerging risks:Evacuation exercise including people with disabilities"
Coordination Center: ECFF Partner : ECPFE

The Development of a Methodology for evaluation the accessibility of disabled people in historic buildings and the syntax of the relevant questionnaire

2023

Methodology for the Accessibility Assessment of Esamea Building

TAMAZ CHELIDZE

Problems of Landslide Hazard Assessment in Mountainous Countries

T. Chelidze, A. Amiranashvili, D. Svanadze, N. Varamashvili,
T. Tsamalashvili.
European Centre: Geodynamical Hazards of High Dams of European Open Partial Agreement on Major Hazards,
Micheil Nodia Institute of Geophysics of Tbilisi State University

1. Introduction

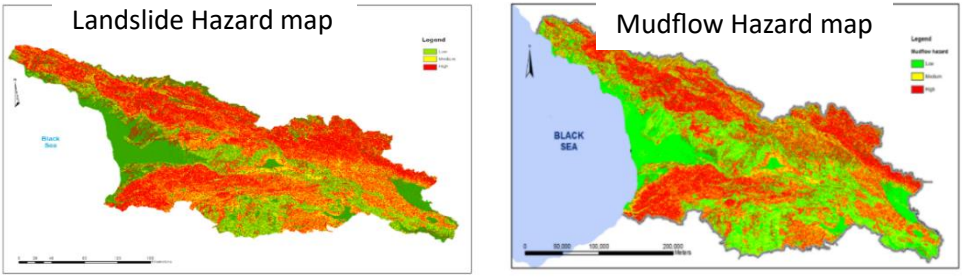
On August 3, a catastrophic Shovi mudflow occurred in Racha region of Georgia, killing dozens of people. The question arises - whether it is possible to avoid such catastrophic results using modern technologies. For this, it is necessary to review the current state of the problem of landslide/mudflow (mass-movement) prediction, that is, whether it is currently possible to predict the frequency, intensity and, most importantly, the time of occurrence of a mass-movement, with some accuracy.

Fig.1 a-The source of mudflow (brown area) on the glacier Buba, Caucasus, Georgia

Fig.1 b- The area at Shovi resort, located on the trace of mudflow.

2. Stationary Landslide and Mudflow Hazards maps of Georgia

In recent years, many scientists around the world have been working on this problem, including the Institute of Geophysics (TSU) and in parallel at the Georgian-European Center on Geodynamical Hazards of the Council of Europe (EUR-OPA Major Hazards Agreement). Let us consider the state of problem of stationary landslide/mudflow (LS/MF) prediction.



Hazards maps of Georgia.
Fig.2. Stationary Landslide and Mudflow Hazards maps of Georgia.

Today, in many countries, and among them by our group in Georgia, stationary, i.e., time-independent maps of landslide hazards are built according to the European standard (ELSUS1000 V1), where LS/MF hazard levels are based on the data of terrain, geology, forest cover and other data of the region, namely: low, medium and high-risk regions [1]. Such maps are useful in the planning of settlements and technological objects in construction work (Fig.2).

3. Landslide Hazards maps of Georgia taking into account stationary precipitation

The next step is to assess the role of intense rains on the initiation of LS. Here again it is possible to use the stationary approach, namely, to assess the long-term (100-year data) landslide hazard using an additional factor of long-term precipitation (Fig.3a).

Fig. 3a. The map of maximum 5-day precipitation (mm) for 100 years return period in Georgia**.**

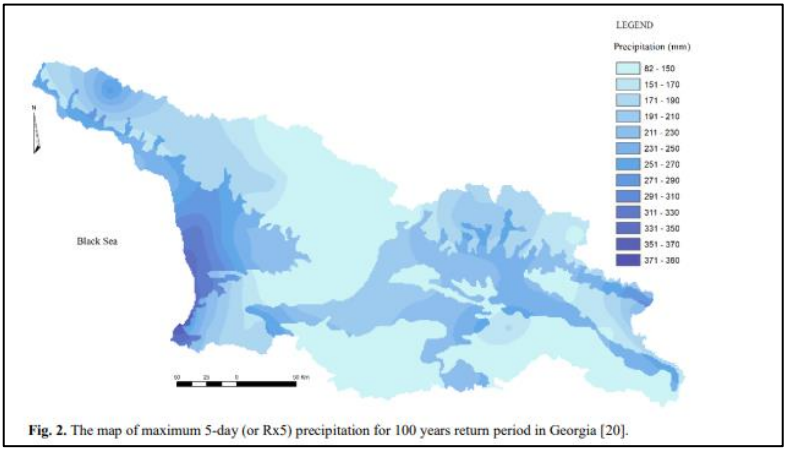


Fig. 2. The map of maximum 5-day (or Rx5) precipitation for 100 years return period in Georgia [20].

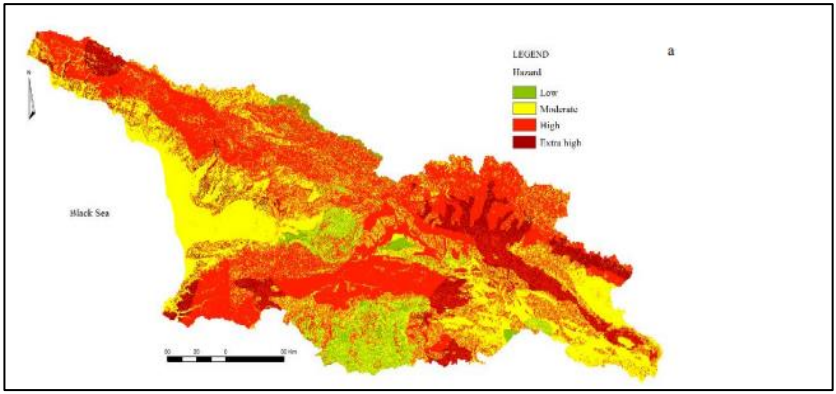


Fig.3b. Stationary Landslide Hazard map of Georgia including stationary rainfall data of Georgia for 100y recurrence interval using artificial intelligence method, "Fuzzy Logic System" (FLS)

Fig. 3b show the preliminary stationary (long–term) Landslide Hazard map of Georgia [2] including stationary rainfall data of Georgia for 100 y recurrence interval using artificial intelligence method, "Fuzzy Logic System" (FLS). The additional fourth gradation "Extra High" in Fig. 3b shows the areas, where the probability of LS is increased compared to the previous gradation "high" due to including stationary rainfall data into traditional stationary LS Hazard Map (Fig.2). Note: most green areas in previous maps became yellow compared to previous map - (Fig.2). That means that the map (Fig.3b) needs some corrections, as even the strong precipitation cannot invoke LS in the plain areas.

4. Cost-effective technology of mass-movement Early Warning Systems (EWS) (laboratory and field data)

2016-2017 we worked on the project "Cost-effective technology of mass-movement EWS ", supported by Europe Council Agreement on Major Catastrophes [3, 4]. As landslide processes develops rapidly,

the data on the intensity and duration of precipitation should be promptly measured and transmitted to the processing centre. We have created an economical Early Warning System for early notification of landslide danger, for which we have received a Georgian patent. This kind of system is local; special sensors provide us with the information of soil wetting by external precipitation and acoustic emission (AE) on the area of several tens of square meters. Given that the size of landslide/sources can be much larger, the complex of such early warning sensors can be used locally to protect certain responsible facilities. The sensitivity of system was high as it registers differential signal between the sensor, installed in the stable area and sensors placed in the potential landslide area. The system was tested in laboratory on the sand box with varying inclination (Fig. 4).

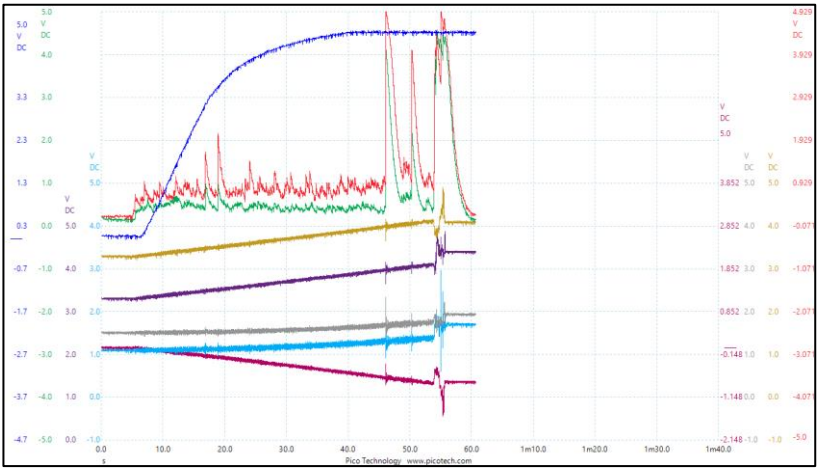


Fig. 4. Laboratory LS experiments on the sand mass placed in the box, which was inclined at varying angles (X-axis); the graphs show recordings of acoustic emission and tilts (Y-axis) at changing the sand box inclination; the sharp maxima of AE (red, green) at sliding of sand mass

Note sharp spikes of AE (red and green) at the increasing the slope of the box from zero to some critical value (around 46^0), when the sand mass locally begins sliding. The above system was used for monitoring the behaviour of Gldani LS in Tbilisi area (Fig.5.6).

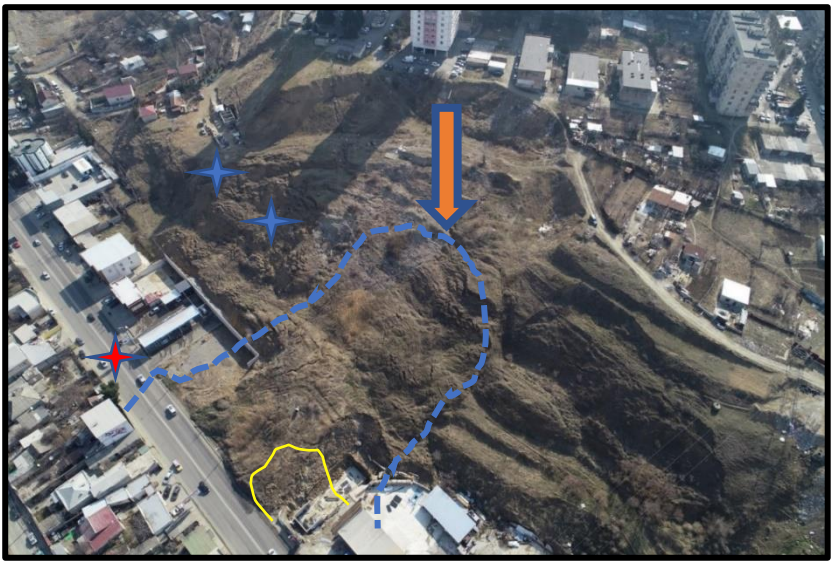


Fig.5. Drone photo of Gldani LS after activation event 5 January 2019; red arrow shows the crown of technogenically (by excavation, shown in yellow) activated landslide head – red arrow. Red star – stationary sensor, blue stars – sensors installed near the activated LS body.

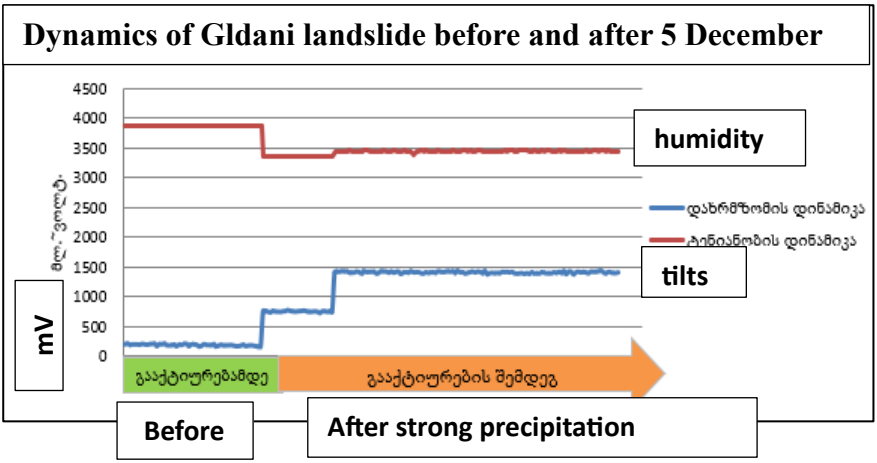


Fig. 6. The effect of 5 December 2019 precipitation at Gldani LS. The acceleration sensors do not show any anomaly. The ground tilt changed significantly by ~ 750 mV (i.e. by α~ 2.5˚). The humidity value W changed from 3873 to ~ 3360 mV (26 % <W< 30 %,)

5. Dynamic Landslide Hazards maps of Georgia

In recent years, research on the influence of one of the main factors of landslide activation - precipitation - has been intensively developed in order to construct, in addition to stationary, also time-dependent - so-called Dynamic Landslide Hazard (DLSH) maps, as a result of combining stationary hazard maps and spatial-temporal distribution of rainfall intensity. As landslide processes develop rapidly, the data on the intensity and duration of landslides should be promptly collected and transmitted to the processing centre [2]. The main problem in constructing DLSH maps is assessment of the critical level of precipitation intensity and duration, which can induce LS at a given location.

6. Space technology in operative prediction of mass-movements

In order to promptly assess the landslides hazard caused by precipitation for large areas, in 2020-2023 we worked on the Rustaveli Foundation project: "Dynamic system of landslides and mudflows hazard assessment for the territory of Georgia using satellite data of precipitation". Within the framework of the project, by combining terrestrial and satellite data, the critical level of precipitation that causes the activation of landslides in the regions of Georgia is estimated using space and terrestrial data.

What is the situation in this line in the world: last years, NASA (National Aeronautics and Space Administration) since 2017 has been intensively working on the problem of dynamic (i.e. time) prediction of landslides based on the intensity of precipitation - website https://gpm.nasa.gov/applications/landslides. The global Landslide Hazard Assessment for Situational Awareness (LHASA) model was developed in USA to provide situational awareness of landslide hazards for a wide range of users. The model combines NASA Global Precipitation Measurement Mission (GPM) near real-time precipitation data with a global landslide susceptibility map to generate estimates of where and when rainfall-triggered landslides are likely to occur around the world. Information on landslide reports is available on the Cooperative Open Online Landslide Repository (COOLR), which combines data from NASA's Global Landslide Catalog, other landslide inventories and contributions from citizen scientists via the Landslide Reporter Application. A perusal of these pages reveals that, temporal distribution of precipitation intensity is a complex scientific and technological problem, which is intensively developed, and it is possible that the problem can be solved in the near future (5).

7. New problems in prediction of mass-movements: the impact of climate change

After this review, let us return to the Racha (Shovi) mudflow event. As mentioned in the report of the Ministry of Nature Protection of Georgia, this event is even more complex. Its nature is much more difficult than the mechanism mentioned above – namely, the activation of landslides only by intense precipitation. The Shovi event is a completely different phenomenon; here, to all known landslide-causing factors, the mechanism of global climate warming is added. From Fig. 7 a, b, c and Fig. 8 it is evident that this Shovi LS was not related to regional anomalous precipitation (Fig. 7b). At the same time, it is shown, that the solar radiation and the temperature rise anomalously in the last decades beginning from the 1999 and especially – after 2008. The same effect after 2008 is visible in the graph of number and intensity of heatwaves at the station Shovi (Fig.8). These data in principle can be used for the long-term (several years) predictions of mass-movements activation in high mountains due to global warming.

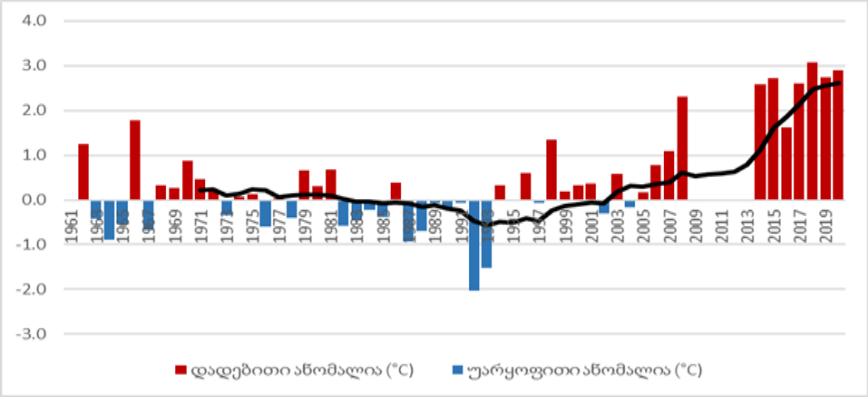


Fig. 7a. Temperature anomalies from 1961 to 2019 and mean 11-years values (black) compared to 1961-1990 period (red - positive and blue – negative anomalies)

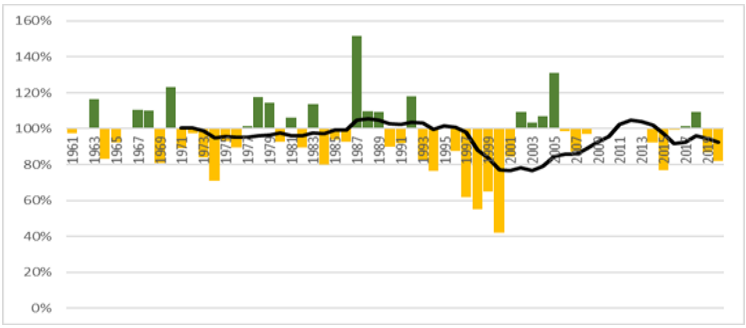


Fig. 7b. Yearly anomalies of precipitation 1961-2020 and mean 11 years values (black) compared to 1961-1990 period (green - positive and yellow – negative anomalies).

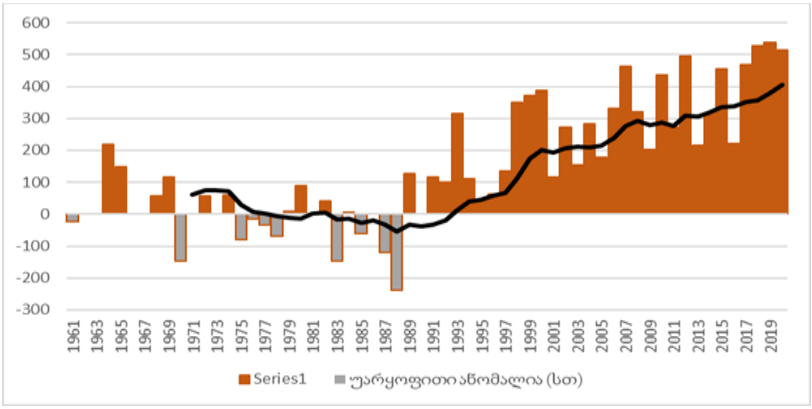


Fig. 7c. Solar radiation anomalies during 1961-2020 compared to compared to 1961-1990 period

Fig. 7 a, b, c. Anomalies in microclimate data in the area of Shovi mudflow 1961-2020. Figs. 1, 7-8 are obtained from the Georgian National Agency of Environment

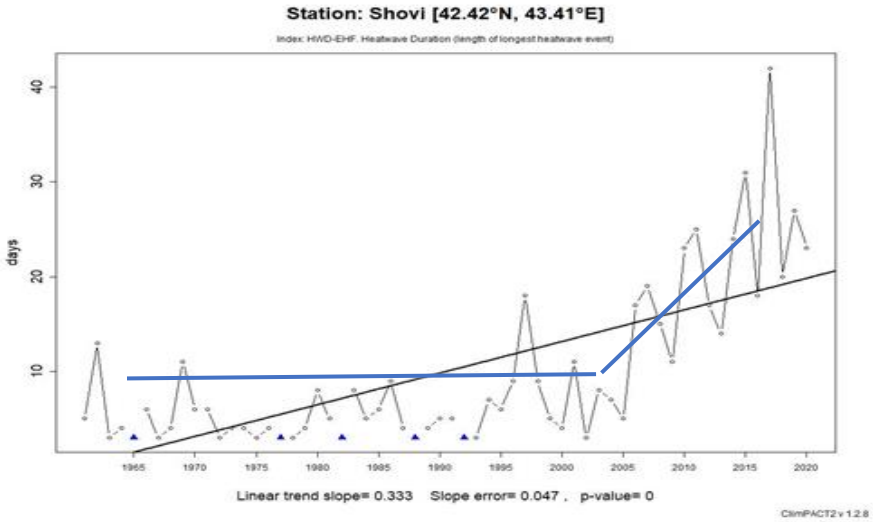


Fig 8. The graph heatwaves intensity at the station Shovi, 1961-2020: note anomaly after 2005: linear (black) and piecewise-linear (blue) approximations

The summer of 2023 was abnormally hot, which could cause melting of glaciers; as a result, the meltwater was added to groundwater. Calculating the impact of this additional ground saturation in the high mountain regions on the mass-movement activation is a new and rather difficult task compared to considering only precipitation impact. This is due to the influence of many hidden

Fig 8. The graph heatwaves intensity at the station Shovi,1961-2020: note anomaly after 2005: linear (black) and piecewise-linear (blue) approximations.

The summer of 2023 was abnormally hot, which could cause melting of glaciers; as a result, the meltwater was added to groundwater. Calculating the impact of this additional (underground) factors activating mass-movements: where and how much underground meltwater appeared, how it is distributed in the subsurface, how this

additional wetting affected soil stability, etc. Thus, in contrast to precipitation-induced mass-movements, the events, similar to Shovi, are even much more difficult to predict than the heavy rain-induced landslides described above, as the preparation process is very difficult to follow – the main part of mass-movement preparation process is hidden under surface. At the same time, such events though generated in unpopulated area in high mountains, can cause big damage and human losses, as the big activated mass moves fast down to the distant settlements below, like in Shovi case. Some new approach is needed for solving this problem – possibly, detail analysis of the satellite data on the water saturation of surface layers can be useful for prediction of above catastrophic events. These data are available from the NASA web-site Global Precipitation Measurement Mission - https://gpm.nasa.gov/.

Conclusions

The problem of landslide/mudflow stationary hazard assessment including long-term precipitation-induced effect seems to be more or less solvable, especially taking into account recent progress in application of modern methods of machine learning.

The real-time prediction of precipitation–induced dynamic mass-movements in middle-altitude regions is now actively studied in several countries – USA, Italy, Georgia and can be resolved in the near future using operative satellite data and modern methods of machine learning. Note, that precipitation-induced LS hazard is dramatically increasing last years due to the effect of climate change.

In contrast to precipitation-induced mass-movements in a middle-altitude regions, which seem to be predictable (in future) by special monitoring systems, the high-mountain events, similar to Shovi, are much more difficult to predict, as the main part of the process, connected with a new factor (climate-change-induced snow melting) is hidden under the surface.

Some new approach is needed for operative assessment of this kind of mass-movement hazard – possibly, the analysis of satellite data on

the water saturation of surface layers can be useful for prediction of above catastrophic events in high-mountains.

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Chelidze T, Varamashvili N. et al. 2018. Cost-effective telemetric monitoring and early warning systems for signaling landslide initiation. (in Georgian). Tbilisi, ISSN 1512-1135, UDC 550.3-624.131:543.

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Landscape Fires, Human Health and Security: Addressing Local and Transboundary Impacts by Cooperative Solutions

Johann Georg Goldammer

The Global Fire Monitoring Center (GFMC)

Europe's long history of fire use in land cultivation

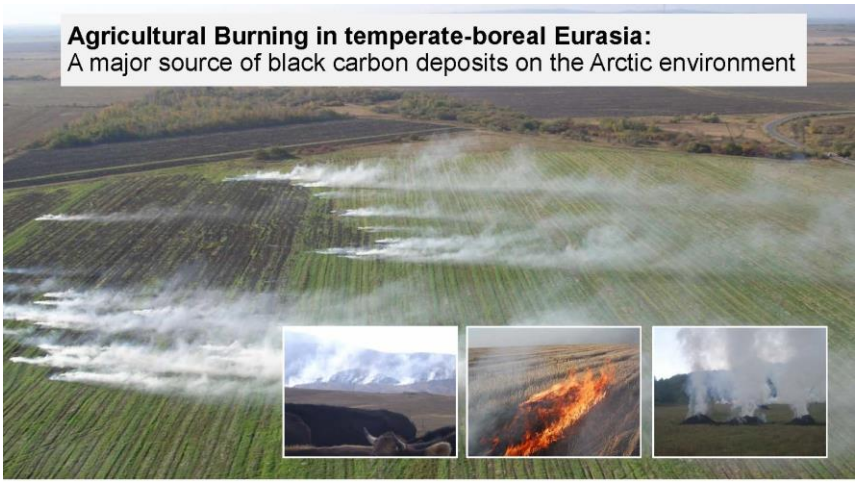
Cross-boundary Impacts and Management Solutions

- Regional impacts of landscape fires
- Between countries – fires crossing national borders
- Across jurisdictions – fires crossing administrative borders
- Between natural and cultural landscapes and protected areas
- Fires burning at the interface of settlements and peri-urban areas

Landscape Fires in the Pan-European Region

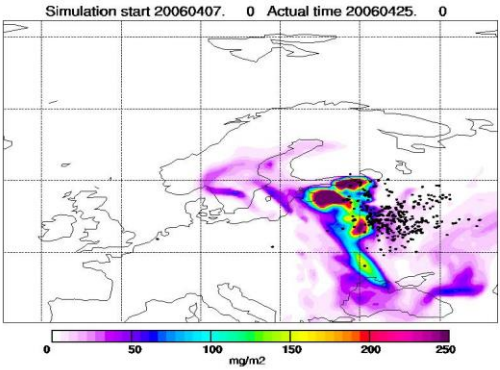
Examples of thematic work of multilateral intergovernmental organizations

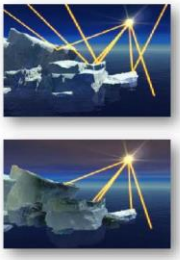
- Member States of the Council of Europe (46 Member States)
- European Participating States of the Organization for Security and Cooperation in Europe (OSCE) (total: 57 Participating States)
- UN Economic Commission for Europe (UNECE/FAO) (56 Member States)
- UN Office for Disaster Risk Reduction (UNDRR/UNISDR) Europe / Central Asia Region (covering 56 countries)
- FOREST EUROPE (46 Signatories) – FoRISK



Transport of Fire Emissions to the European Arctic

Black Carbon transport modelling – courtesy of Norwegian Meteorological Institute



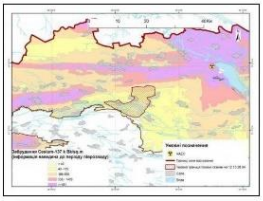


"Black Carbon" (soot) deposited on Arctic ice and snow – change of albedo and accelerated melting

Eastern Europe – Radioactive Contamination

Wildfires and redistribution of airborne Radioactivity

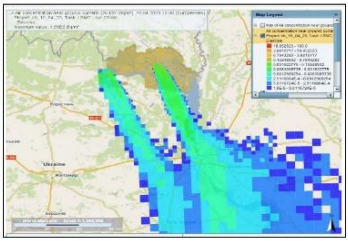
Example: Wildfires in 2015 and 2016



Radioactive smoke transport

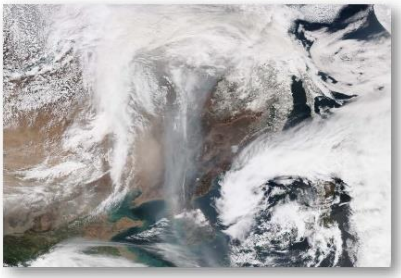
Ukraine-Belarus-Russia – 2016

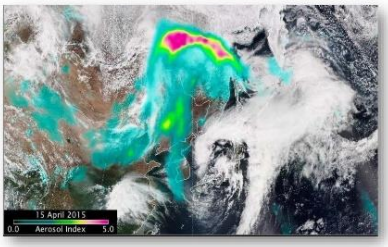
Eastern Europe – Radioactive Contamination
Wildfires and redistribution of airborne Radioactivity
Example: Wildfires in 2020-2022



2020-2022

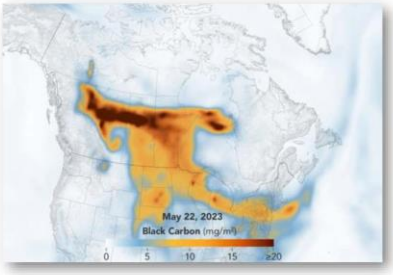
April 2015
Smoke export from Central Asia to the Korean Peninsula and across the Pacific Ocean





Source: NASA

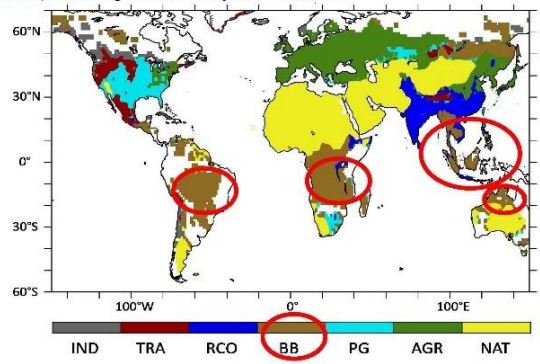
Canada 2023
Extreme severe large and lasting wildfires associated with cross-boundary smoke pollution



Source: NASA

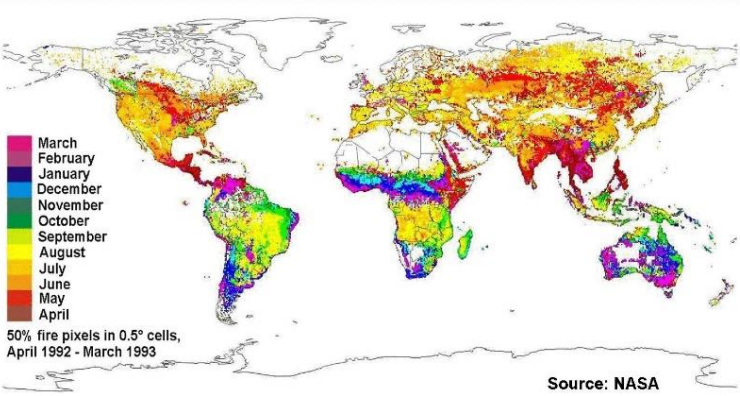
Landscape Fire Emissions and Premature Mortality

Global premature mortality due to landscape fire emissions (**BB = Biomass Burning, marked in brown**): Average deaths / year: 180,000



Source: Lelieveld et al. 2015

Calendar of Global Landscape Fires seen from Space: Fire Use and Wildfires
Communalities and Differences – Social, Cultural and Ecological



International Cooperation in Fire Management

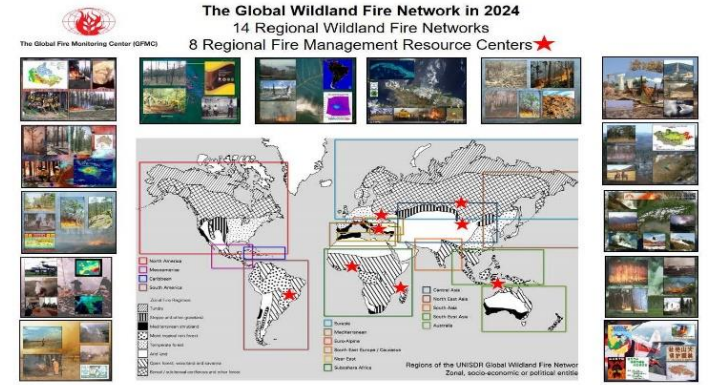
- 1998: Establishment of the Global Fire Monitoring Center (GFMC) with multi-years financial support by the German government (German Foreign Office) as Germany's contribution to the UN *International Decade for Natural Disaster Reduction* (IDNDR)
- 2001: Establishment of the Global Wildland Fire Network with 14 Regional Wildland Fire Networks
- 2007+: Pan-European cooperation through the Council of Europe, OSCE and UNISDR / UNDRR
- 2010+: Successive establishment of Regional Fire Monitoring Centers / Regional Fire Management Resource Centers in Europe, Asia, Africa and Latin Amerika – 8 Regional Centers

Mission of GFMC and GWFN

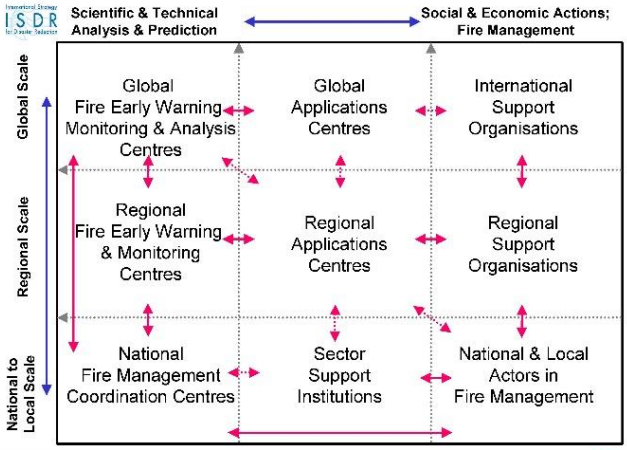
The GFMC is serving

- As an international platform to serve the Science-Policy-Practitioners Interface (SPPI)

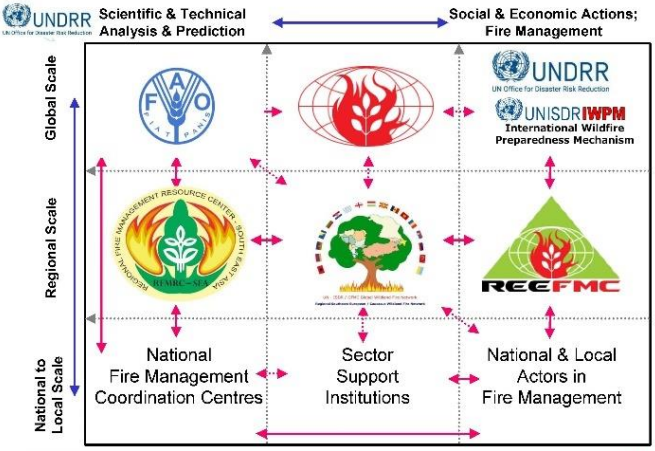
- 14 independent Regional Wildland Fire Networks and 8 Regional Centers of different / individual origins and mandates. Its mission is to:
  - Reduce the negative impacts of landscape fires on the environment and humanity
  - Advance the knowledge and application of the ecologically and environmentally benign role of natural fire in fire-dependent ecosystems, and sustainable application of fire in land-use systems.



Regions of the UNDRR Global Wildland Fire Network and the Regional Hubs
North America – Mesoamerica and Caribbean – South America – Caribbean – Mediterranean / Near East – Eastern Europe – Southeast Europe / Caucasus – Subsahara Africa (Eastern Africa – Western Africa) – South Asia – Southeast Asia – Australasia – Northeast Asia – Central Asia – Eurasia – Euro-Alpine



Sharing of Information and Resources within the Global Wildland Fire Network – 2001



Sharing of Information and Resources within the Global Wildland Fire Network – 2024

Functions of "Regional Fire Monitoring Centers" (RFMC) / Regional Management Resource Centers" (RFMRC)

- **Advisory support to nations and regional organizations:**

  - Development and implementation of fire management policies

  - Support of participating countries of the region to develop informal or formal agreements / protocols for cross-boundary cooperation in fire management

Establishment of Regional Fire Monitoring / Fire Management Resource Centers (I)

- 2010: Establishment of the first Regional Fire Monitoring Center for Southeast Europe / Caucasus Region (Skopje, North Macedonia)
- 2013: Second Regional Fire Monitoring Center for Eastern Europe (Kyiv, Ukraine)
- 2015: Regional Fire Management Resource Center in Central Asia (Ulaanbaatar, Mongolia)
- 2017: Regional Fire Management Resource Center in South East Asia (Bogor, Indonesia)

Establishment of Regional Fire Monitoring / Fire Management Resource Centers (II)

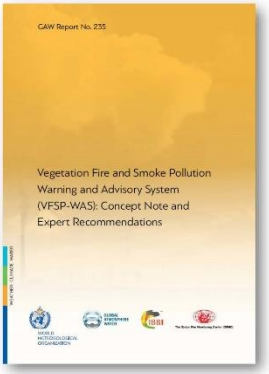
- 2017: Regional Central Eurasia Fire Monitoring Center and Russia (Krasnoyarsk, Russia)

- 2020: Fire Management Resource Center – South America Region (FMRC-SAR) (Gurupí, Brazil)

- 2020: Regional Eastern Africa Fire Management Resource Center (REAFMRC) (Antananarivo, Madagascar)

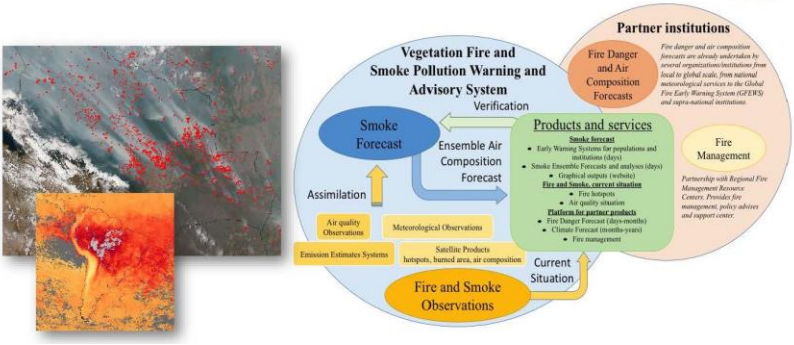
- 2021-2023: Regional Western Africa Fire Management Resource Center (RWAFMRC) (Kumasi, Ghana)

Interaction between two Regional Centers in South East Asia: Collaborative efforts between WMO, GFMC and RFMRC-SEA



WMO Global Atmospheric Watch Report No. 235
2018

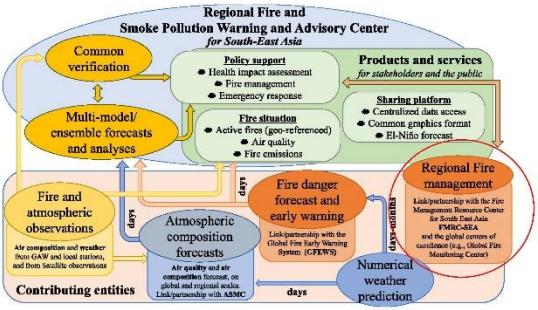
Vegetation Fire and Smoke Pollution Warning and Advisory System (VFSP-WAS)



Interaction between two Regional Centers in South East Asia: Collaborative efforts between WMO and GFMC

Overview of a potential Vegetation Fire and Smoke Pollution Warning and Advisory System

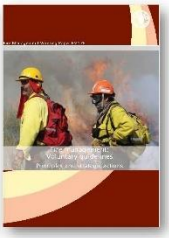
Interaction between two Regional Centers in South East Asia: Collaborative efforts between WMO and GFMC

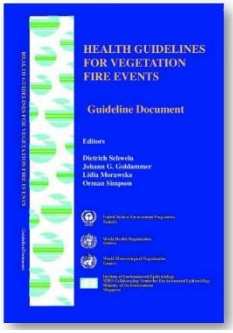


Cooperation between thematic Regional Centers:
Smoke Forecasting & Early Warning and Fre Management Resource Center

International Actors – The United Nations Family

Voluntary Guidelines for Fire Management:
Support for Policy and Strategy Development





ITTO 1998

WHO 1999

FAO 2005

International Actors – Regional Intergovernmental Organizations

Strengthening national governance and cross-boundary cooperation in fire management: Wildfire crisis preparedness and response

– Effectiveness – Efficiency – Safety –

EuroFire

27

The way ahead: International coordinated action
The UN Family & Associates (I)

- **The Global Fire Management Hub**
  - The One-Stop global entry point to data, information, resources advisory services, interoperability, harmonization ……..
- **Scientific Basis**
  - WMO and WHO: Early warning, monitoring and forecasting of landscape fires and smoke pollution – human health
- **Disaster Risk Reduction**
  - UNDRR / Sendai Framework: Bridging science to policies and practice

The way ahead: International coordinated action
The UN Family & Associates (II)

- **Wildfire Emergency Response**
  - UNEP/OCHA Joint Environment Unit (JEU) and partners
- **Technical – Example Aerial Firefighting**
  - International Search and Rescue Advisory Group (INSARAG) and International Fire Aviation Working Group (IFAWG)
- **Climate Change and Security**
  - Organization for Security and Cooperation Europe (OSCE): Confidence building through transboundary cooperation
- **Human Rights and Democracy**
  - Council of Europe / European and Mediterranean Major Hazards Agreement & Bern Convention

Paula Teves Costa & Manuel João Ribeiro
CERU - European Centre on Urban Risks
Activities developed under risk mitigation
San Marino, 3 May 2024

From 2012 to 2019 CERU developed several projects on tsunami and earthquake mitigation, in the aim of the European and Mediterranean Major Hazards Agreement (EUR-OPA). These projects were developed in collaboration with other EUR-OPA Specialised Centres (namely CEPRIS (Morocco) - Euro-Mediterranean Centre for Evaluation and Prevention of Seismic Risk, CUEBC (Italy) - European University for the Cultural Heritage and ICoD (Malta) - Euro-Mediterranean Centre on Insular Coastal Dynamics), as well as researchers from Lisbon University and technicians from Municipal Civil Protection Services of Lagos, Cascais, Lisbon and Setúbal.

The activities developed consisted of holding formative and informative sessions for risk mitigation devoted students, specific professionals and general public. Workshops and seminars were also held in collaboration with several municipalities. CERU performed and participated on itinerary exhibitions and produced a set of informative leaflets (in PT and EN) that were distributed to tourists and the local population.

Among the informative and formative sessions, we can enhance the participation on the Civil Protection Week of Cascais (since 2013) and on the open-air awareness activities carried out in Cascais and Setúbal (2015). CERU also encouraged the participation on the National Shake Out exercise, since 2013, and performed seminars devoted to secondary schools and to specific professionals (2013-2015).

Figure 1 – Awareness public sessions

In 2017, CERU promoted and participated on a workshop held in the Hydrographic Institute, devoted to lifeguards in order to alert for the need to be prepared to support bathers in case of tsunami occurrence. CERU elaborated and proposed a module, on tsunami hazard, to be included in the next programmatic content on the training course manual for beach lifeguards.

In 2018, the workshop held in Cascais on tsunami risk had presentations by researchers from Lisbon University, the Portuguese Institution in charge of the Tsunami Alert System (IPMA), the National Civil Protection Authority (ANPEPC), the Maritime Authority and the Cascais Municipal Civil Protection Department. There was also a special presentation invited by CERU, given by Domenico Mangione, from the Italian Civil Protection, about the experience of raising awareness abroad, exemplified with the case of Stromboli. The workshop was attended by about 100 participants: hotel and tourism agents, harbour and marine responsible, beaches concessionaires, lifeguards' associations and anonymous citizens.

Following the seismic and tsunami risks projects CERU developed another project that addresses different risks on coastal areas and in the beaches: Solar Exposure; Unstable cliffs and dunes; Tsunamis; Safe swimming area; Rip Currents; Drowning; Thunderstorms; Gelatinous organisms. Beach Swim Safety Flags, Alerts and other information (Beachrisks Project 2018-2019). CERU produced leaflets on these risks (in PT and EN) that were distributed in the beaches and coastal zones.

This is particularly important because Portugal is a very popular holiday destination, receiving thousands of tourists annually. It has a 943 km long coastal area and it includes the Azores and Madeira archipelagos in the Atlantic Ocean. In addition to foreigners, beaches and coastal areas also receive many national tourists who usually live in inland areas and who may not be aware of the risks present on beaches. This information is useful not only for the coastal areas of Portugal but also for all European coastal areas, particularly those in the Mediterranean countries. Ten coastal municipalities attended the final project's workshop, as well as the Drowning Prevention Association, the Algarve Tourism Region and the project partners (CEPRIS & ICoD).

Since 2015 CERU promoted, participated and held several traveling exhibitions not only on seismic and tsunami risks, but also on raising awareness and warning about other environmental risks (hydrological, meteorological, and forest fires). These exhibitions toured several locations within a municipality (Lagos, Setúbal) and, in the case of the exhibition on the Evocation 50th anniversary 28th February 1969 earthquake, toured several municipalities in Portugal (2019-2020).

The participation of CERU on the studies of evacuation routes in case of tsunami, as well as on the elaboration and implementation of the respective signalling, in Lagos and Cascais, should be enhanced. CERU

participated as an observer on the CASCADE European Civil Protection Exercise on beach evacuation in case of tsunami alert (Cascais, 2019), were the signalling and evacuation routes were tested. Afterwards, the Municipality of Cascais installed a set of sirens along its coast.

In 2021, under the coordination of CUEBC, CERU developed the project LOKSAND (Local Knowledge and Schools Against Natural Disasters). The main activity in the aim of this project was the implementation of a PYT devoted to the main risks identified in a selected pilot municipality (Odivelas, near Lisbon). In this platform, https://riscosurbanos.pt/, the population can find information on several risks affecting the area (floods, landslides, road and pedestrian circulation, and risks to heritage – vandalism, lack of maintenance) and can report risk situations. It is possible to locate the site, to describe the situation and to upload photos. After validation, the reports are sent to the responsible institutions.

The main advantages of this platform are: *(i)* It can be used as an app in a mobile; *(ii)* It can be automatic translated in 6 languages (English, French, Italian, Portuguese, Russian and Spanish). The webpage was presented in a secondary school and students were encouraged to use it. The Municipal Civil Protection Department also collaborated on the project/page dissemination. This webpage was performed for Odivelas County, but it can be adapted for other areas or municipalities.

During the last two years (2022-2023) CERU developed the Project POPIRIM (*Population involvement on risk management and mitigation - Testing in small communities*). The goal of this project was to test public participation in governance and disaster risk reduction in different communities that present susceptibilities to one or more risks in different countries. The project was implemented in Encosta da Luz (Portugal), a neighbourhood in the

municipality of Odivelas belonging to two parishes and in Amalfi (Italy), a commune in the province of Salerno, through the participation of CUEBC, partner of this project.

During the first year, CERU selected the area of study and identified the main risks affecting this area. Surveys of the population were then carried out in order to assess the perception of the risks already identified, and assess their main concerns. As a result of these surveys, it was found that 50% of the population consider the neighbourhood safe.

During the second year, CERU promoted meetings with the entities and political responsible and the population, in order to incentive the participation of the population in the discussion and implementation of disaster risk measures. Awareness sessions, informative sessions and training exercises on first aid and fire extinguishing were also performed, in collaboration with the Odivelas Municipal Civil Protection Department.

Figure 2 – Formative sessions and training exercises (first aid and fire extinguishing)

Information and results of all mentioned projects can be found in CERU's webpage, http://www.ceru-europa.pt/en/, under "Projects" (http://www.ceru-europa.pt/en/projectos.php). Final reports, short presentations and leaflets, as other deliverables, are available.

Appendix 1 - Projects developed with the support of the European and Mediterranean Major Hazards Agreement (EUR-OPA)

1. Projects devoted to seismic and tsunami risks mitigation

Vulresada (2012-2013) – Management of coastal areas in the face of seismic and tsunami risk: the socio-economic impact. Assessment of vulnerability, resilience and adaptation of Cascais and Lagos (Portugal), Tangier and M'dieq (Morocco) (CERU & CEPRIS)

Inspired (2014-2015) – INform and involve the population in the Prevention of seismic risk and tsunami, contributing to minimize damages and Increase REsilience of the cities of Cascais and Lagos, in Portugal, and Tangier and M'diq in Morroco (CERU & CEPRIS & CUEBC)

Baywatch (2016-2017) – Involving sales and tourism agents on earthquake and tsunami mitigation measures (CERU & CEPRIS)

2. Projects devoted to other risks mitigation

Beachrisks (2018-2019) – Beach and Coastal Resorts Risks (CERU & CEPRIS & ICoD)

POPIRIM (2022-2023) – Population involvement on risk management and mitigation - Testing in small communities (CERU & CUEBC).

LOKSAND (2021) – Local Knowledge and Schools Against Natural Disasters (CUEBC & CERU).

3. Other projects

TraRetro (2016) - Revisiting Traditional Building Techniques for Appropriate Maintenance and Earthquake Retrofitting of Vernacular Constructions (CUEBC & CERU & CEPRIS & ECPFE)

European Landslides (2016-2017) - European Landslide Hazard Maps: Fostering European Harmonization of Slope Movement Hazard Assessment at various spatial scales (CERG & CERU & GHHD & AFEM)

ABS-COVID (2020) - Anthropogenic Base factors of Spreading COVID (CERU & IGOT, University of Lisbon)

SOFIA KARMA

European Center for Forest Fires

HELLENIC REPUBLIC
Ministry for Climate Crisis and Civil Protection

Council of Europe
Conseil de l' Europe

Forum
"EUROMED PROTECT-NET - Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement"

"Inclusive Community Engagement in Disaster Preparedness and Response-Experiences and Lessons Learnt by ECFF", *by Sofia Karma Director, European Center for Forest Fires (ECFF), EUR-OPA/Council of Europe*

Introduction

The European Center for Forest Fires (ECFF) is one of the Specialized Centres of EUR-OPA with the role to improve the awareness and resilience to major risks within the population.

ECFF is accommodated and run at the headquarters of the General Secretariat for Civil Protection, Hellenic Ministry for Climate Crisis and Civil Protection (https://civilprotection.gov.gr/)

Overall Concept, Mission and Work done by ECFF on Wildfires and Smoke

Large scale wildfires have been associated with climate crisis in terms of prolonged heatwaves and droughts, causing significant health impacts, especially on the groups at high-risk (e.g., the elderly, pregnant women, children, persons with disabilities).

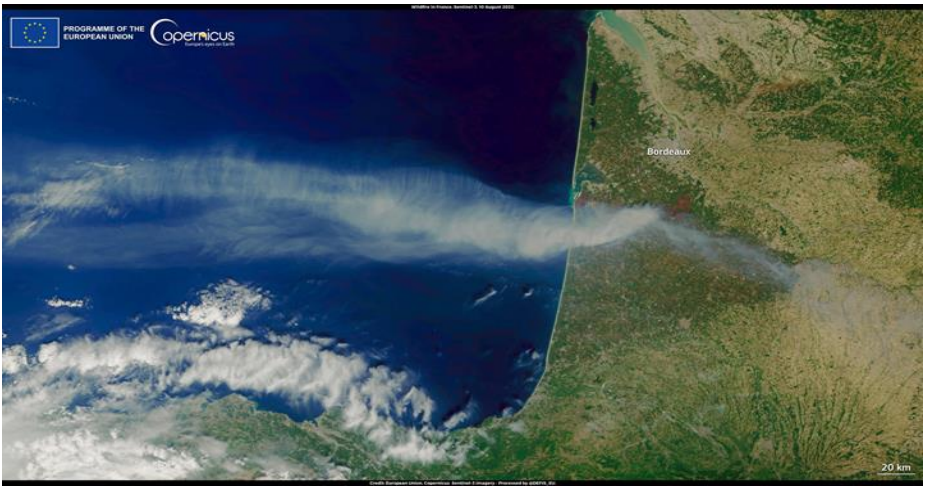
Monitoring the forest fire emissions and Early warning could provide with valuable data for supporting decision making and protection of the affected areas e.g. early evacuation.

Improve the population awareness upon disaster risks, focusing on risks from wildfires and the produced smoke-Enhance Disaster Preparedness

The overall mission and objectives of ECFF are to:

- Improve the population awareness upon disaster risks, focusing on risks from wildfires and the produced smoke-Enhance Disaster Preparedness
- Strengthen the coping and adaptive capacity of the exposed communities upon wildfire related risks with inclusive criteria - Inclusive Community Engagement for Disaster Resilience

  Another important issue to consider is the Cross-regional or Cross-border transfer of Wildfire Smoke and what are the Health Risks due to Exposure to Wildfire Smoke.



Copernicus' Sentinel 3 satellite image shows the smoke rising from the wildfire in southwestern France, near Bordeaux, on 10 August 2022. Credit: European Union

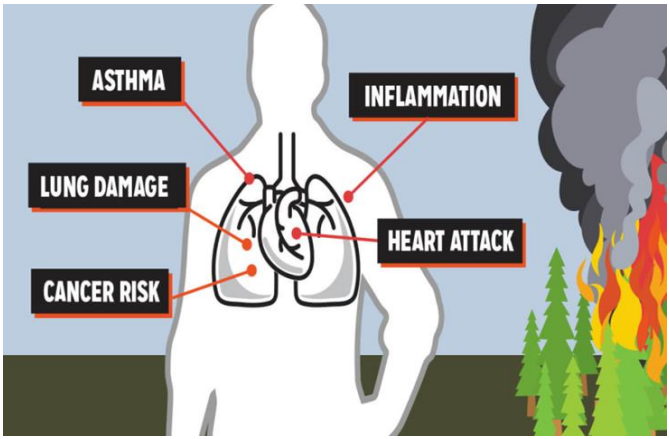
Wildfire smoke is a complex mixture of components such as:

- Fine and Ultrafine particles (PM2.5, PM1, PM0.1)
- Carbon monoxide (CO)
- Formaldehyde/Acrolein
- Benzene
- Polycyclic Aromatic Compounds (Benzo-pyrene)
- Dioxins or other highly toxic compounds

Exposure to wildfire smoke can cause multiple health effects on the exposed population

Smoke Synthesis & Toxicity is directly dependent on the Fuels Burned towards the Fire-front Path. Smoke exposure has been associated with increased risk of COVID-19 cases and deaths.

The adverse health effects due to Wildfire Smoke Exposure can be Acute, Short-term, or Long-term.



Acute, Short-term, or Long-term health effects due to wildfire smoke exposure

Forest Fire Net (FFNet) volumes published by ECFF dedicated to wildfire and smoke issues

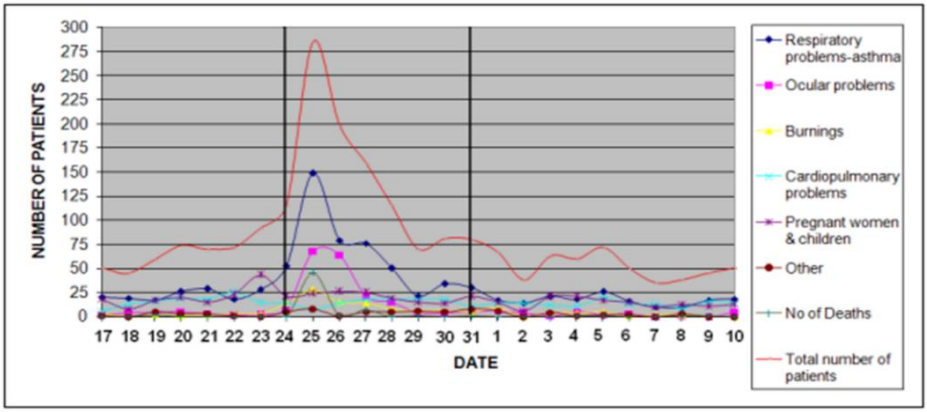
ECFF has published so far 7 Volumes of Forest Fire Net (FFNet) dedicated to wildfire and smoke issues, with experts' participation as guest editors, namely:

- FFNet 1 (2003): "Inauguration of ECFF"
- FFNet 2 (2004): "Lessons learned" from the large-scale forest fires in summer 2003 in Europe
- FFNet 3 (2005): "Short- & Long-term health impacts of forest fire smoke on fire-fighters and the exposed population"
- FFNet 4 (2006): "Air quality monitoring in the field and personal protective equipment in big forest fire incidents: a state-of- the art and beyond"
- FFNet 5 (2007): "Forest fires in Greece during summer 2007: The data file of a case study"
- FFNet 6 (2009): "Human rights in Disasters: Search and Rescue Operations in Disasters especially for vulnerable people"
- FFNet 7 (2010): "Recent Developments and Needs for Wildfire Fighting on the Ground: Tactics and Technologies"

In the following examples of ECFF's work on smoke exposure assessment are shown, using state-of-the art methods and cutting-edge technologies (field chemical analysis) as a tool for the early detection of hazardous environments and for monitoring the exposure to chemicals.

Forest Fire Field experiments and chemical analysis conducted by ECFF/NTUA researchers

Another example of ECFF's work on smoke exposure and health impacts is FFNet 5 (Forest fires in Greece during summer 2007: The data file of a case study). In the following, the number of admissions and number of deaths recorded at nearby medical centers in Peloponnese, Greece is shown.



Profile of the number of admissions and number of deaths according to 19 medical centers and hospitals of Peloponnese in between the 17th of August to the 10th of September 2007

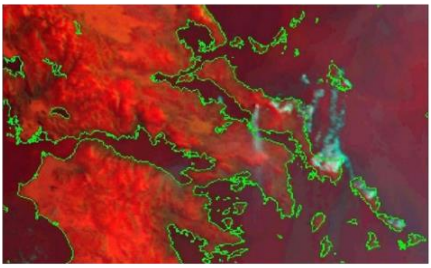
It is obvious that after the 25th of August, when the fire event occurred there is an exponential increase of the number of deaths and admission to hospitals suffering by different symptoms due to wildfire smoke exposure, e.g. respiratory problems, burnings, ocular problems etc. Also, admissions of pregnant women and children that are considered vulnerable were recorded.

ECFF has also conducted the following "Case study: Fine and Ultrafine particles from forest fires: Recommendations/Guidelines for the protection of vulnerable groups of population especially in the wildland urban interface (WUI) areas".

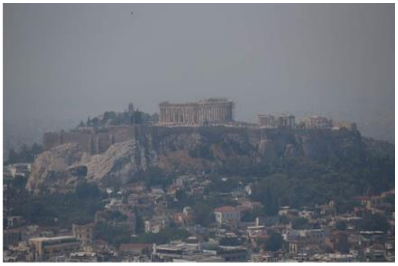
The case study focused on the wildfires in Central Evia, Greece in Summer 2019.

Destruction of 2.356 hectares in Evia fires confirmed (August 2019)

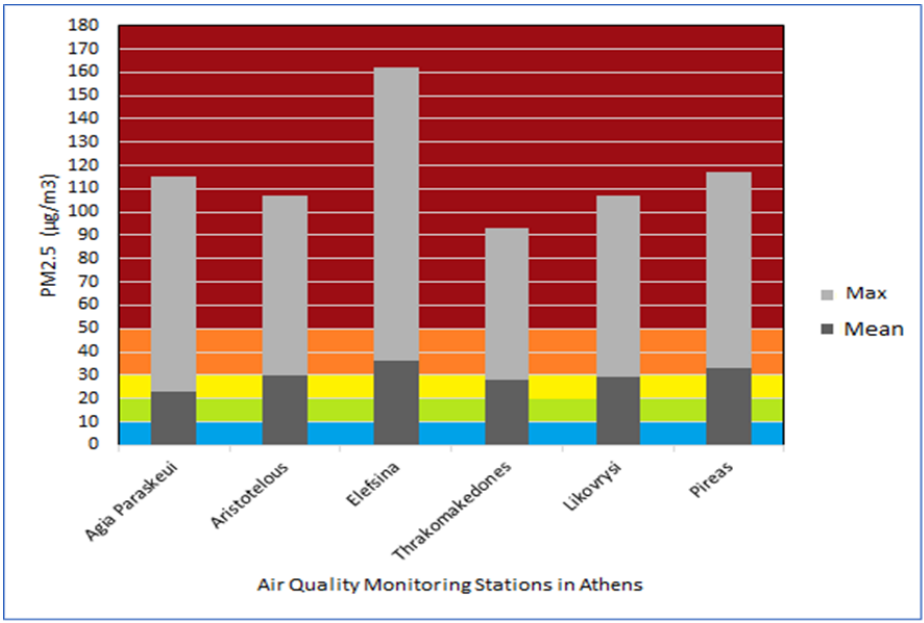
One of the main problems recorded in this event was the **cross-regional smoke dispersion and effect on Athens due to Central Evia Fires**, as shown in the maps below.



Evia fires on the 13th of August 2019 released the smoke plume in cyan colour (Satellite Image-Hellenic National Meteorological Service)



Smoke effect on the Greek Capital of Athens on the 13th of August 2019, due to Evia Fires



Air quality	Good	Sufficient	Moderate	Unhealthy	Very Unhealthy
24-h Values of PM2.5 (μgm^{-3})	0-10	10-20	20-25	25-20	>50

Mean and Maximum value of particles concentration (PM 2.5) recorded on the 13th of August 2019 (24h monitoring), by 6 different Air Quality Monitoring Stations located in Athens

It is obvious that there was a significant impact on the air quality of Athens recorded by nearby monitoring stations. For that reason, emergency measures were reported on the 13th of August by the Civil Protection in accordance with the announcement of the Ministry of Health for the protection of population from toxic smoke inhalation, focusing on the more sensitive groups such as:

- People with respiratory problems
- People with Cardiovascular problems
- The Elderly
- Children
- Infants
- Pregnant women
- Smokers

Priorities based on the Sendai Framework for Disaster Risk Reduction 2015-2030 and Relevant Work by ECFF

ECFF is aligned with the priorities of Sendai Framework since 2015 and specifically:

- "Understanding disaster Risk": Promote awareness raising among vulnerable groups, such as persons with disabilities.
- "Enhancing disaster Preparedness": Inclusion of people with disabilities in Disaster Management Cycle (preparedness & response phases) to reduce their vulnerability.

"Major Hazards and People with Disabilities- A toolkit for Good Practice, EUR-OPA, CoE"

EUR-OPA has prepared in 2015 “A toolkit for Good Practice Guidance” gathering examples of good practice for civil protection professionals, decision-makers, and people with disabilities from the member states.

In that perspective, it is important to **tackle the vulnerability issue in disasters.**

“The UNDRR global survey in 2013 explains why so many people living with disabilities die in disasters". *Available at: https://www.unisdr.org/archive/35032*

A follow up survey was conducted at the beginning of 2023 by UNDRR revealing that not much progress has been made the last 10 years towards disaster preparedness and response of persons with disabilities.

Global Survey Report on Persons with Disabilities and Disasters, UNDRR (https://www.preventionweb.net/news/2023-survey-persons-disabilities-and-disasters)

It is important to investigate which factors burden the evacuation process for persons with disabilities in Emergencies.

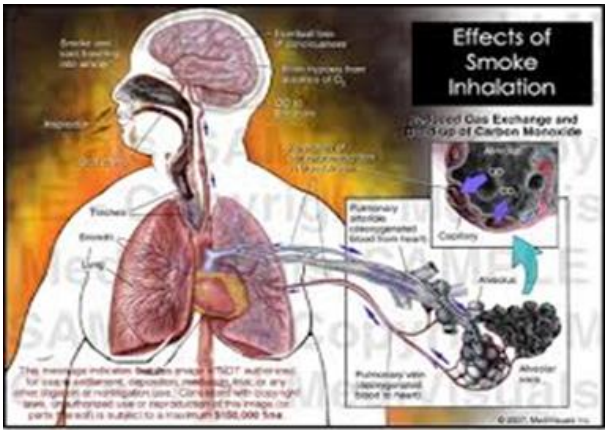
Possible restrictions/limitations during evacuation can be:

- Difficulty in moving
- Orientation difficulties
- Limited perception of risk
- Failure to recognize warning messages
- Lack of emergency response coordination/Emergency Plan

Though, all the above limitations should be considered as interaction with the physical environment and the inherent vulnerability drivers.

Persons with disabilities are at higher risk in case of a fire due to difficulties in evacuating alone and because of the smoke inhalation.

Persons with disabilities are at higher risk in case of a fire due to difficulties in evacuating alone and because of the smoke inhalation. This is because the fire evacuation process requires increased physical endeavor for the wheelchair users, especially in the harsh environment of dense smoke and high temperatures; human respiratory rate may be increased from a typical resting rate of 15 breaths per minute up to 40 – 50 breaths per minute and this leads to increased amount of smoke inhaled. As a result, the carbon monoxide can cause serious problems, even death in significant quantities, especially when exposure to open air (oxygen) for recovery from smoke inhalation is delayed; increased particles inhalation may result to significant symptoms, even suffocation.



Smoke inhalation can be a threat also for the caregivers of persons with disabilities

The Accessibility of the Built Environment can significantly reduce vulnerability of persons with disabilities in emergencies in terms of:

- ✓ Accessibility of escape routes/adequate widths
- ✓ Unobstructed Access to safe places in buildings or outdoor areas
- ✓ Accessible Signs (signs with BRAILLE system, placed at an appropriate height)

The Universal Design of the Built Environment can reduce vulnerability of Persons with Disabilities

Aiming at strengthening the Disaster Resilience with inclusive criteria it is important to remember the following equation of Disaster Risk:

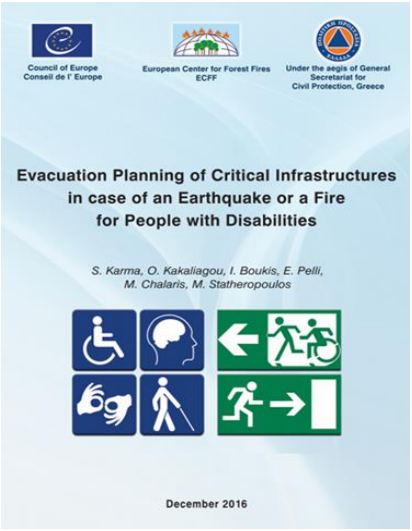
Disaster Risk = Hazard x **Exposure** x **Vulnerability**

So, if we cannot do much about emerging hazards there are certain measures that can be taken to reduce exposure and vulnerability, namely:

- ✓ Reduce the level of Exposure for all
- ✓ Minimize the Different Types of Vulnerability Before-During-After a Disaster
- ✓ Strengthen Inclusive Community engagement in Disaster Risk Reduction (Disability Inclusive Disaster Risk Reduction-DIDRR)

ECFF's activities are aligned with the above priorities and in the following example of the work done in the framework of EUR-OPA funded projects will be presented.

- **2016-2017: "Basic Principles of Building Aseismic Code, Evacuation planning of critical infrastructures in case of an Earthquake or a Fire", in cooperation with the European Centre on Prevention and Forecasting of Earthquakes (ECPFE, ECFF)**



"Evacuation Planning of Critical Infrastructures in case of an Earthquake or a fire for People with Disabilities (2016)" *https://www.preventionweb.net/publication/evacuation-planning-critical-infrastructures-case-earthquake-or-fire-people*

In this book, egress signs designed for persons with disabilities in building evacuation were presented; the "Accessible Exit Sign Project" (http://accessibleexitsigns.com/)

The “Accessible Exit Sign Project” (http://accessibleexitsigns.com/)

Exit sign showing an accessible exit (ISO 21542:2021)

Accessible means of Egress Icon: “Running man” and “wheelchair user” ***are moving quickly together towards the exit***

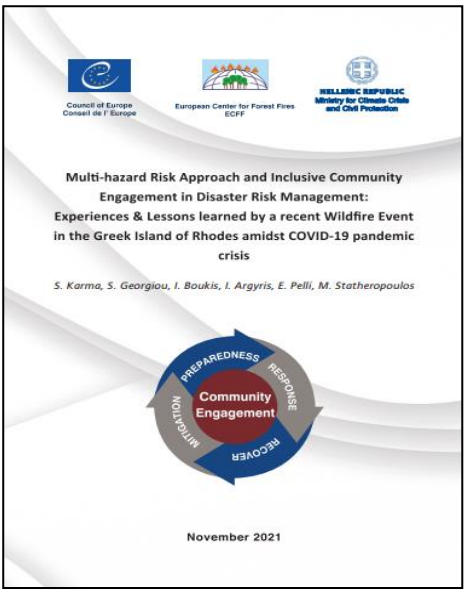
Evacuation Signs for Persons with Disabilities proposed by the “Accessible Exit Sign Project”; “Running man” and “wheelchair user”

are moving quickly together towards the exit compared with accessible exit sign (ISO 21542:2021)

Example of using the new egress signs together with the existing ones in the same Fire Escape Plan based on ISO 23601:2020 (ECFF)

In the book prepared by ECFF there is an example of using the new egress signs together with the existing ones in the same Fire Escape Plan based on ISO 23601:2020

- **2022-2023: Inclusion of Vulnerable groups in Disaster Preparedness and Response for coping with emerging risks: Evacuation exercise including persons with disabilities (ECFF, ECPFE)**



"*Multi-hazard Risk Approach and Inclusive Community Engagement in Disaster Risk Management: Experiences & Lessons learned by a recent Wildfire Event in the Greek Island of Rhodes amidst COVID-19 pandemic crisis (2021)*"

https://www.preventionweb.net/publication/multi-hazard-risk-approach-and-inclusive-community-engagement-disaster-risk-management

- **2022-2023: Inclusion of Vulnerable groups in Disaster Preparedness and Response for coping with emerging risks: Evacuation exercise including persons with disabilities (ECFF, ECPFE)**

"Leave No One Behind: Active Involvement of Persons with Disabilities in Disaster Preparedness and Response towards Strengthening Inclusive Disaster Resilience" https://www.linkedin.com/posts/sofia-karma-b399185b_leave-no-one-behind-inclusive-disaster-activity-7178842082675941376-zoVC/

This book includes **the "Evacuation exercise with Participation of Persons with Disabilities", an innovative initiative at European Level.**

Hellenic Ministry for Climate Crisis & Civil Protection/ General Secretariat for Civil Protection	Council of Europe/ European Center for Forest Fires	National Confederation of Disabled People Greece/ Institute of the National Association of People with Disabilities& Chronic Diseases

- Date: 26th of October 2023, in Athens, Greece
- Place: Premises of the National Confederation of Persons with Disabilities (ESAmeA)

- Contributors:
  - European Center for Forest Fires (ECFF), Council of Europe (EUR-OPA)
  - Hellenic Ministry for Climate Crisis and Civil Protection, General Secretariat for Civil Protection (GSCP)
  - National Confederation of Persons with Disabilities Greece (ESAmeA) / Institute of National Confederation of Persons with Disabilities & Chronic Diseases Greece (IN-ESAmeA)
  - European Centre on Prevention and Forecasting of Earthquakes (ECPFE)
  - Hellenic Fire Service
  - National Centre of Emergency Care

Among the Objectives of the Evacuation Exercise were to:

- ✓ Highlight the importance of participation of persons with disabilities through their representative organizations, both in the initial design and in the implementation phases of evacuation exercises
- ✓ Underline the necessity of preparing Building Evacuation plans with inclusive criteria.
- ✓ Enhance awareness and training of the involved parties including the vulnerable groups and possibly their caregivers or their personal assistants.
- ✓ Practice the interoperability of means and actors and identification of possible gaps.
- ✓ Provide with suggestions on how to prepare similar exercises including people with disabilities, based on the lessons learnt.

Table-Top Evacuation Exercise with participation of persons with disabilities at ESAmeA building, 26/10/2023, Athens, Greece

Role playing of persons with disabilities during the exercise at ESAmeA building, 26/10/2023, Athens, Greece

Guiding techniques for persons with visual disability were presented at ESAmeA building, 26/10/23, Athens, Greece

The INNOVATION of the exercise was the early engagement of the representatives from the disability community in ALL phases of the exercise (Design-Planning-Implementation-Active Involvement).

- 2023: POPIRiM. Population involvement on risk management and mitigation - Testing in small communities (CERU, CUEBC, ECFF)

ECFF prepared accessible informative material for inclusive public awareness in cooperation with the General Secretariat for Civil Protection, Hellenic Ministry for Civil Protection.

112 European Emergency Number and Protection against Wildfires-Accessible Informative Material (ECFF/GSCP, GR)

- **2024-2025: Resilience4ALL: Public Awareness raising upon Disaster Risks via Accessible Digital tools and drafting of Good Practices for Training of the first responders focusing on persons with disabilities (ECFF, ECPFE)**

Activities 2024

- **Raising awareness upon** emerging risks for all the groups of population, especially for those who dwell nearby disaster-prone areas, using digital tools, e.g. **accessible videos.**
- **Training of the first responders on how to manage persons with disabilities** during the search and rescue operations.

The above activities will be implemented with the contribution of ESAmeA/IN-ESAmeA.

ECFF's Dissemination Activities

2017: Conference entitled: "Evacuation of Buildings in Case of Emergency for People with Disabilities"

Date: 31/10/2017
Place: Multimedia Auditorium, Library, NTUA
Organizers: Joint effort among NTUA, GSCP, ECFF/EUR-OPA

Representatives from the Disability Community

- Center for Education & Rehabilitation for the Blind (CERB)
- Panhellenic Association of the Blind
- School of Primary Special Education for children with cerebral palsy, at the premises of Cerebral Palsy Greece
- ELEPAP (Rehabilitation for The Disabled)
- Greek National Confederation of Disabled People

2018: Participation at " Help for All" Conference, organized by the Italian National Fire Department, National Fire Academy, 5 April 2018, Rome
(http://www.vigilfuoco.it/aspx/notizia.aspx?codnews=47754)

2019: Participation to Workshop on inclusion of vulnerable groups and disaster risk reduction, 18-19 September 2019, Baku,Azerbaijan

Title of Presentation: Coping with Disaster Risks focusing on Vulnerable People: CHALLENGES FOR INCLUSIVE FIRE SAFETY

2019: Participation to the Joint meeting of the Groups of Experts on Protected Areas and Ecological Networks and on Biodiversity and Climate Change, 3-4 October, Trondheim, Norway

Title of Presentation: "State-of-the art technologies as Early Warning Systems for mitigating Climate Change Related Risks:The case of Forest Fires and the generated Smoke"

2022: Workshop 8-11-2022, Ministry for Climate Crisis and Civil Protection "Leave No One Behind: Inclusivity in Disaster Preparedness and Response"

8-11-2022, Ministry for Climate Crisis and Civil Protection, Athens, Greece

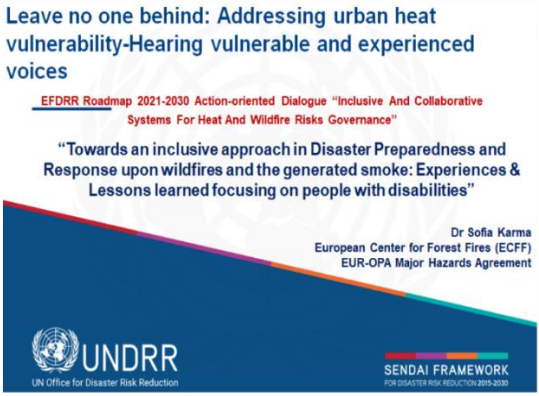
- **Welcome greeting by Mr Krzysztof Zyman**

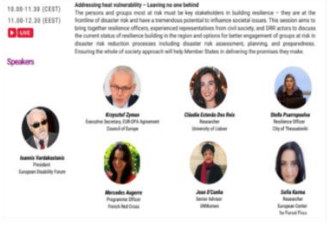
Representatives from:

- **Disability Community**
- **Academics**
- **Researchers**
- **Civil Protection**
- **Operational People**
- **Policy makers**

8-11-2022, Ministry for Climate Crisis and Civil Protection, Athens, Greece

2022: EFDRR Roadmap 2021-2030 Action-oriented Dialogue "Inclusive And Collaborative Systems For Heat And Wildfire Risks Governance", 21 October, Domotel Kastri Hotel, Athens, Greece





The persons and groups most at risk must be key stakeholders in building resilience – they are at the frontline of disaster risk and have a tremendous potential to influence societal issues. This session aimed to bring together resilience officers, experienced representatives from civil society, and DRR actors to discuss the current status of resilience building in the region and options for better engagement of groups at risk in disaster risk reduction processes including disaster risk assessment, planning, and preparedness. Ensuring the whole of society approach will help Member States in delivering the promises they make

2023: Participation of the ECFF EUR-OPA Center at the **8th International Wildland Fire Conference in Porto, Portugal, on 16-19 May**

"Inclusive Community Engagement in Disaster Preparedness and Response focusing on Wildfires and the generated Smoke: Best Practices and Lessons Learned", presented by S.Karma

2024: Publications of ECFF with UNDRR

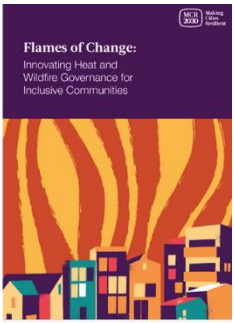
1. Adaptation of cities to climate-related extreme events, Available at: https://w3.unece.org/sdg2024/story-9.html

The Making Cities Resilient 2030 initiative has effectively encapsulated diverse initiatives undertaken by local governments to tackle urban heat and wildfire issues. By facilitating knowledge exchange, MCR2030 fosters a shared understanding of these challenges and empowers local actors and policymakers to collaborate.

Case of Athens, Greece, for an inclusive community engagement

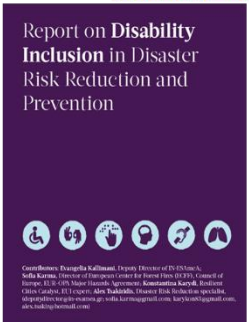
A table-top evacuation exercise that took place in October 2023 has integrated disabled individuals into disaster preparedness strategies in Athens, Greece. The simulation showcased earthquake-induced fire incidents, emphasizing inclusive evacuation planning and the participation of disability representatives. Encouraging academic, operational, and disabled community networking, the exercise highlighted the importance of early involvement of persons with disabilities in the scenario preparation. Participants agreed on the necessity of regular exercises involving local stakeholders to bolster community resilience against multi-hazard risks amid challenges like wildfires and the Covid-19 pandemic's co-existence, or other hazards. The exercise took place under the framework of the activities' roadmap of the European Centre for Forest Fires, which belongs to the Network of the Specialised Centres of the Council of Europe EUR-OPA Major Hazards Agreement, having as a main goal to improve the awareness and resilience to major risks within the population.

2023-2024: Publications of ECFF with UNDRR



2. "Flames of Change Report: Innovating Heat and Wildfire Governance for Inclusive Communities" MCR2030, UNDRR

Available at: https://www.undrr.org/news/new-mcr2030-knowledge-products-innovating-heat-and-wildfire-risk-governance



3. Special Report on Disability Inclusion in Disaster Risk Reduction and Prevention, MCR2030, UNDRR

Available at: https://www.undrr.org/publication/flames-change-special-report-disability-inclusion-disaster-risk-reduction-and

Catalogue of Ideas and Lessons Learnt

- ✓ We need to emphasize on the Universal Design in DRR otherwise the solutions and final outputs may not be compatible with PWD real needs.
- ✓ The one-solution fits all model cannot be applied in the case of persons with disabilities; every type of impairment should be treated separately (hidden disabilities)
- ✓ Personal Emergency Evacuation Plans (PEEPs) are needed that should be activated and tested regularly with the participation of all the involved parties (especially for the communities nearby disaster prone areas, e.g. the Wildland Urban Interface (WUI)).
- ✓ The training of the rescuers on how to manage persons with different kinds of disability is vital in terms of reducing the time needed for the search and rescue operations.

- ✓ The role of the caregivers or the personal assistants of the persons with disabilities, including also the assistance dogs under specific circumstances, can be a key element for facilitating the rescuers' job.
- ✓ Accessible emergency messages and universal early warning systems, as well as accessible buildings and refuge areas are crucial to secure disaster resilience for all.

Advantages of simulation exercises engaging persons with disabilities participation:

- ✓ They increase the awareness of the local population and of the participants regarding the need for disaster preparedness.
- ✓ They help familiarize participants with the procedures required in the event of emergency.
- ✓ They help organizations work together under unfamiliar conditions and under pressure.
- ✓ They may reveal limitations, gaps in terms of resources or preparation for a real emergency.
- ✓ They can provide answers to questions about rescue methods for people with disabilities and how to help them in emergency situations.
- ✓ They are aligned with the DESIGN FOR ALL concept, and they reinforce engagement of marginalized groups at the early stages of planning and preparedness.
- ✓ They strengthen inclusive disaster resilience.

DUSANA HALUZOVA & DOMINIKA REYNOLDS
STU – SCenT (Specialized Centre for Technological Hazards)

I. SLOVAK UNIVERSITY OF TECHNOLOGY (STU)

STU in Numbers:

- 168 664 graduates
- 10 976 students
- 7 faculties (schools)
- 1 institute
- 740 research projects
- 400 study programs
- 250 contractual research projects
- 116 framework agreements with foreign universities
- 90 international projects
- 1 280 teaching and research staff

STU offers:

- unity of education and scientific research, engineering and arts
- theoretical & practical learning methods (link to Mining academy in Banská Štiavnica)
- direct cooperation with industry & strong international links

STU - FACULTIES AND UNIVERSITY CENTRES

- Faculty of Civil Engineering
- Faculty of Mechanical Engineering
- Faculty of Electrical Engineering and Information Technology
- Faculty of Chemical and Food Technology
- Faculty of Architecture and Design
- Faculty of Material Sciences and Technology
- Faculty of Informatics and Information Technologies

+ Institute of Management (in the process of becoming a faculty)

Other facilities:

- Lifelong Learning Institute
- STU Research Centre
- Multimedia centre, Computing Centre, Publishing House, Student Houses, Academic Sports Centre

RESEARCH HUB AT STU

„University research park STU “: Project financed by EU structural Funds (Operational Program of
Research and Development) in the value of 80 mil. €.
Major research and innovation hub disposing of the most modern infrastructure for scientific research in Slovakia. Being an integral part of the Uni, USP provides a strong foundation for science and research + enables the integration of a large number of the STU labs and partners in the European Research Area.

Consists of:

- ✓ University research park in Bratislava: focused on information and communication technologies, electrical engineering, automation and control systems, nanoelectronics and photonics.

- ✓ University research park in Trnava: focused on material engineering, ion and plasma technology, automation and computerization of industrial processes.

INTERNATIONAL ASPECT

MOBILITIES:
Erasmus
CEEPUS, IAESTE, BEST
National Scholarship program

AWARDS:
Erasmus+ charter 2021 - 2027

Erasmus + charter 2014 - 2020
ECTS Label
DS Label

MEMBERSHIPS:
European University Association)
European Society for Engineering Education
EIT (European Institute of Innovation and Technology)
CESAER (Conference of European Schools for Advanced Engineering Education and Research)
Others (21 institutional memberships > 500 individual)

II. COOPERATION WITH THE STATE

Area of Education + Science & Research –contracts / agreements / memoranda:

- Ministry of Interior
- Ministry of Agriculture
- Ministry of Economy (w/ Faculty of Electrical Engineering and Information Technology)
- Ministry of Defence

STU & Ministry of Interior: AGREEMENT ON COOPERATION IN THE AREA OF SECURITY RESEARCH & CIVIL SECURITY
based on / following:

- following successful previous cooperation (environmental burdens)
- previously realized training programmes
- expressed need for integration of (security) research and development into national policies –newly emerging / modern threats
- declared international duties

Agreement signed December 2022 – in force January 2023.

Legal base for:

- purposefully oriented security research;
- end-pointe designed training & education / public awareness;
- connection of theory with practice - state administration with the academic environment;
- application of modern knowledge of science and research into the Ministry's activities (for starters: orientation at first responders needs);
- joint international cooperation in the area of security research & civil security

1st practical step: SPECIALIZED CENTRE FOR TECHNOLOGICAL HAZARDS

III. SPECIALIZED CENTRE FOR TECHNOLOGICAL HAZARDS (SCenT)

WHO ARE WE?

Specialized workplace, recently in the process of practical establishment on the grounds of STU in terms of defining and choosing necessary personnel, process the official inauguration within the Uni etc. Centre has been officially approved by the Academic Senate of the University in 2023, included within the Statute as an organizational unit under CEVES STU– Centre for scientific and S&T cooperation of the STU as a new organizational unit in the first months of 2024, followed by the establishment of the director of the Centre.

Technical supervisor: prof. Ján Híveš, PhD. (vice-rector, responsible for science and research)

Director: Ing. Dušana Halúzová, PhD.

GROUNDS FOR OPERATING:

- Recognition by the State – legal basis created by the Agreement on cooperation in the area of security research & civil security signed between the Ministry of Interior and STU;

- Close partnership w/ State institutions (research focused on defined topics);
- Steady grounds for scientific expertise guaranteed by the University

WHERE DO WE SEE OURSELVES:

- orientation on technological threats (CBRN-e hazards for starters, with the potential of expansion to other areas - e.g. forest fires, study of new approaches in risk analysis and management methodology – new methods based on recent science & research knowledge...):
- purpose oriented security research on the most recent (+ad hoc requested) issues related to technological hazards – project centre;
- expert-level consultations in the preparation of strategic materials at the state level;
- education among the population;
- update and improvement of the preparedness of intervention capacities (first responders) for more effective management of crisis events, and especially management of new threats, using the latest knowledge of science and research: training for first responders: follow-up on CBRN-e training center project (CBRN academy) that has never been brought to life (for the purpose of training of first responders in the matters of dangerous substances);

PLANS FOF THE NEAR FUTURE:

- once up and running, the intention of internalization of the Centre and beginning of international cooperation;
- working within the EUR-OPA Specialized Centres Network (joint projects, exchange of experts, lessons etc.);
- working in the Region: connection to the regional web/s of similar centres or with similar interests;
- recently opening up for new partnerships.

VERONIKA SENDOVA

R E P O R T on the **ECILS** presentation titled

Roles, Activities, and State of the Art of Risk Reduction in North Macedonia

ECILS/IZIIS contribution in Seismic Risk Reduction-

EUROMED PROTECT-NET - Euro-Mediterranean Forum for Disaster Risk Governance, Health Preparedness, and Networking Advancement, 2-3 May 2024, San Marino

On behalf of the European Centre for vulnerability of industrial and lifeline systems, ECILS, North Macedonia, I am expressing the gratitude to the European Centre for Disaster Medicine, CEMEC, San Marino for inviting and organizing the two-day forum EUROMEDPROTECT-Net in San Marino, as well as for the given opportunity to introduce the participant with the contribution of ECILS, as well of the Institute of Earthquake Engineering and Engineering Seismology, IZIIS, to the seismic risk reduction in North Macedonia.

North Macedonia National Platform for Disaster Risk Reduction

The foundations of the National Platform for Disaster Risk Reduction (NP for DRR) in North Macedonia can be traced in the national conceptual and strategic documents, most especially the 2005 Law on Crisis Management, by which the Crisis Management System was established. In December 2007, the process of establishing the National Platform began with the initial networking of stakeholders dealing with prevention and management of accidents and disasters. This networking established cooperation among all stakeholders in the country dealing with crisis management. Until 2009, a number of cooperation memorandums were signed with all ministries, governmental agencies, municipalities, public enterprises and services, NGOs, academic institutions, universities, research centres and laboratories, as well as with the business community and religious communities. As a result, the National Laboratory Network

and the National Network of Experts were launched as part of the National Platform.

In April 2009 the Government officially declared the National Platform for Disaster Risk Reduction, and after several interventions and updates, the actual NP for DRR was adopted in September 2019, representing document that sets and develops the systems and standards for preventing and reducing the consequences of disasters, using scientific and professional capacities, further harmonized with the obligations arising from numerous UN resolutions, international frameworks, EU directives related to civil protection, NATO standards.

The National Platform is organized on 4 interconnected and interdependent levels. On the *Political*, decision-making level the Government is actively engaged through the Steering Committee which is the managing body of the National Platform. On the *Local and Municipal* level, Local and Regional councils are formed to assess local risks and threats, while the ***administrative*** level consists of the Council of State Secretaries, headed by the Secretary General of the Government.

The *Expert* level, composed of the academic institutions, the public and private universities and research centres and observatories, is the scientific - technical and expert backbone of the NP for DRR. It is worthwhile to mention the impressive National Laboratory Network which brought under one umbrella 174 laboratories nationwide.

The Crisis Management Centre and the Rescue and Protection Directorate are the main operational bodies. Within the Crisis Management Centre, the State Operation Centre functions on a central (national) level 24 hours a day, 7 days in the week through the Single Communication and Information Centre. Naturally, the staff of the oldest Ss Cyril and Methodius University, UKIM, Skopje, is involved on the expert level, while IZIIS, under which umbrella ECILS is functioning too, is a permanent member of the Crisis Management Centre and is a national focal point which in the earthquake event is responsible for: site inspection, damage assessment and classification, structural

rehabilitation, reporting and assisting (to Government) in decisions related to policy for disaster reduction.

About IZIIS and ECILS

The history of **IZIIS** (www.iziis.edu.mk) began with the occurring of the strongest earthquake in the history of the capital Skopje. In the early hours of 26 July 1963, the city of Skopje, current capital of North Macedonia, was struck by a major earthquake, causing substantial humanitarian and economic losses. 1,070 human lives were lost; 3,300 were injured; more than 9,000 buildings were demolished; and more than 10,200 buildings suffered varying levels of damage. In this disaster, Skopje lost 82.4% of its administrative value, (fig. 1). In October of the same year, the United Nations General Assembly responded positively to the Yugoslav Government's request and appeal for "technical assistance in meeting the destroyed city's long-term needs". An International Consultative Board, appointed jointly by the United Nations and the Government of Yugoslavia was set up in the beginning of 1964. Based on the recommendations of this Board, the government 's decisions and the authorities of the city of Skopje the Institute of Earthquake Engineering and Engineering Seismology, (abbreviated "IZIIS") was established on 27 May 1965 as part of the Ss. Cyril and Methodius University, UKIM, in Skopje. During its initial stages, the Institute was supported by UNDP and UNESCO.

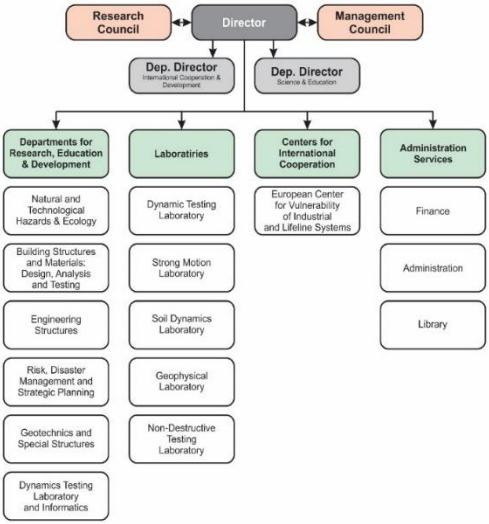


Figure 1. 1963 Skopje earthquake (upper left), IZIIS facilities (lower left), IZIIS organogram (right)

The initial mandate of the Institute was to assist and supervise the post-earthquake reconstruction and development of the destructed city of Skopje. In the first 15 years of post-earthquake reconstruction and intensified architectural activity, IZIIS participates as a designer, or consultant in the phase of rehabilitation and strengthening of damaged cultural and historical buildings in the old city, as well as in the design of the most important buildings, but also in the design of representative buildings in the several suburban residential areas.

Another initial mandate was to provide continuous research in the field of earthquake engineering and engineering seismology for understanding of our seismic environment, develop and adopt seismic design code and related standards, assure permanent acquisition of seismological and other relevant data and their implementation in the process of design and town planning, as well

as develop, through regular master degree studies, a national capability and capacity for improvement of the city planning, urban design and construction by transferring up-to-date methods, procedures and know-how in the field. Since 1981, IZIIS occupies several administrative-research buildings and a laboratory on the outskirts of Skopje at the foot of mount Vodno.

The European Centre for vulnerability of industrial and lifeline systems, **ECILS** was established in March 1997 as non-profit organization within IZIIS, by resolution of Council of IZIIS, supported by Ministry of Foreign Affairs, Ministry of Education and Science and the Government of the Republic of Macedonia, (http://www.iziis.ukim.edu.mk/en/ecils-en/). In May 1997 it joined EUR-OPA Major Hazard Agreement. Its mandate complies with scientific and development policy of IZIIS, but also with the strategic goals of the EUR-OPA Major Hazard Agreement. Since its establishment to date, ECILS has realized activities and projects in the domain of urban risk and vulnerability, natural and man-made hazards, raising of preparedness and response capacities as well as numerous consulting and professional missions and activities.

Starting from the fact that all around Europe the range of old masonry buildings, even public ones, is enormous, from one hand, and that they are highly vulnerable to earthquakes from the other hand, their relevant assessment and retrofitting is a common European engineering and risk mitigation challenge. In line with this, the projects realized in the last few years in cooperation with European Centre on prevention and forecasting of earthquake, ECPFE, Greece, aimed to mutual familiarization, comparison and implementation of the seismic vulnerability assessment and retrofitting of masonry preserved buildings, developed in both countries, (fig. 2). Within these activities highly successful workshops were organized in Athens (2023) and Skopje (2024) in order to present the new Greek Code for

the Assessment and Structural Interventions of Masonry Structures (KADET) to professional public in both countries.

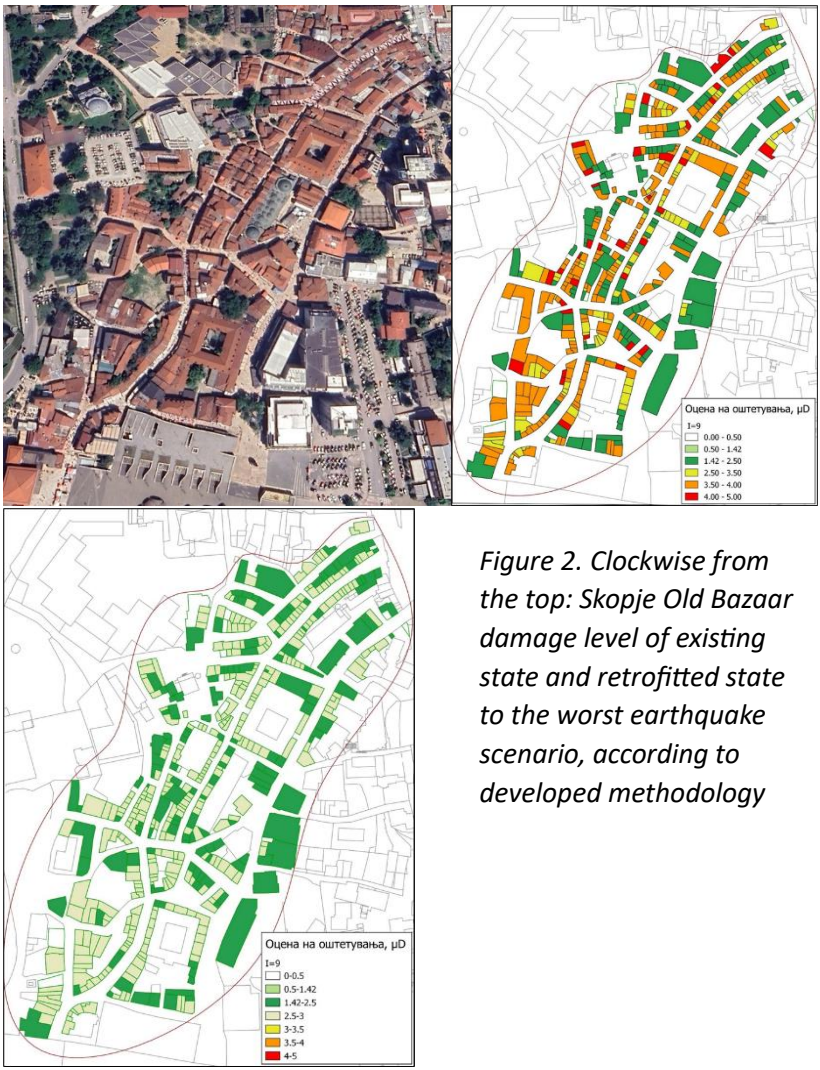


Figure 2. Clockwise from the top: Skopje Old Bazaar damage level of existing state and retrofitted state to the worst earthquake scenario, according to developed methodology

IZIIS', (and ECILS' as well) main pillars are *research*, *education*, *development* and *application* of acquired knowledge in everyday practice. The research and development, as well as the consulting activities of the IZIIS are organized in 6 specialized research departments and 5 laboratories used for development of experimental methods and techniques for investigations of behaviour of structures subjected to static and dynamic loads. We are especially proud on the two-component programmed seismic shaking table for dynamic testing of structures, where experimental testing is carried out on physical models of real structures of any kind to explore its existing state, (fig. 3 left) to investigate the efficiency and applicability of different seismic retrofitting techniques, as well as dynamic behaviour of retrofitted structures.

Figure 3. Selection of shaking table testing (left) and educational activities (right)

Since its foundation to date, IZIIS has continuously been educating staff from the country and abroad in the fields of earthquake engineering and engineering seismology. First master studies were organized and realized in IZIIS in 1965, the first of its kind in Europe. The first PhD studies at the Institute began in the 1977, and both the master and doctoral studies are accredited and realized in Macedonian and

English language. IZIIS has continuously been holding training courses, seminars and other trainings adapted to different target groups, including children in kindergarten, (fig. 3 right). The most remarkable one was the CADAC course, (http://www.iziis.ukim.edu.mk/en/about-studies/cadac-en/) by which IZIIS contribute to worldwide dissemination in earthquake engineering through education and training of young academics and professionals from developing countries in seismic prone areas. During 26 years of its existence, 520 participants from 74 developing countries were trained and became part of the world network of missionaries contributing to increase of the seismic stability and development of their countries. Today, most of them are eminent members of academic society, respected professionals and national authorities.

The professional capacity and organizational structure of IZIIS enable the realization of one of the biggest projects in the civil engineering sector in North Macedonia. Namely, in accordance with the national strategy for seismic risk reduction, IZIIS is legally obligated to control the processes of design and construction of all structures. The process, which is web GIS based platform involves professional control of technical documentation (design project) for getting the construction permit, but also field inspections during building construction for obtaining usage license. Since 2013, IZIIS issued more than 27000 positive opinions. Continuous reduction of remarks in opinions speaks also of a certain education of the designers through this process.

IZIIS played a major role in the post-earthquake missions in ex-Yugoslavia, working on damage evaluation, strength assessment and strengthening of buildings after occurrence of major earthquakes in ex-Yugoslavia, but also in post-earthquake missions in other countries, dominantly organized as donation of our government to the affected regions.

Within the frames of the activities IZIIS, and ECILS as well, developed extensive national and international cooperation, its partner-organizations in the country are: the different ministries, local self-management authorities, fund for innovation and technology development, NGOs etc, but it also realizes scientific projects in cooperation with foreign governmental and non-governmental organizations (EU, USA, NATO, JICA, PHARE, FP7, H2020, COST etc.). The projects realized in the last several years (fig. 4) aimed to improve the disaster and emergency management through building a harmonized and efficient system for risk assessment of basic services (health care facilities, school buildings, transport infrastructure) in the targeted cross-border region and beyond. The expected results are enhanced cross-border cooperation and coordination in disaster risk management based on developed models and tools and raising public awareness and preparedness for disasters.

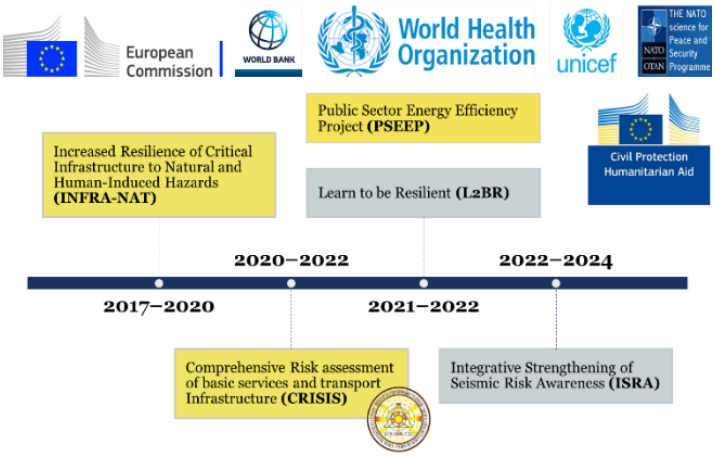


Figure 4. IZIIS/ECILS international cooperation

Figure 5. IZIIS' Campaign We Build Resilience

Finaly, last year Skopje marks 60 years since the catastrophic 1963 earthquake. To commemorate this anniversary, IZIIS organizes a campaign *We build resilience* by series of activities to increase preparedness for earthquake protection under the motto *IZIIS for Skopje*, (fig. 5). The activities relate to the organizing of educational interactive workshops in selected kindergartens, elementary and high schools, then a rapid assessment of the safety and earthquake protection of selected buildings, open days at IZIIS' premises, as well as the organization of the final scientific event.

As since its establishment, in the future IZIIS, and ECILS as well, will continuously put significant efforts in the disaster risk reduction. The primary goal of the activities has been and will be protection of population and property, reduction of physical and economic damage and protection of socio-economic systems of North Macedonia against effects of earthquakes, but also against other natural disaster agents. All the activities are in the domain of mitigation, preparedness and readiness, providing consistent

legislation, highly professional and human resources and other professional capability and capacity for sustainable development.

Concluding remark

In conclusion, on behalf of ECILS I would like to warmly thank CEMEC colleagues for their hospitality and for the opportunity given to us all to get acquainted with San Marino. As a dialog begun during the Forum, I do hope that as EUR-OPA Centres we will be able to continue this contact and to organize ourselves so that to achieve more joint initiatives and successful projects soon.

ACTIVITIES

carried out by

Centro Universitario Europeo per i Beni Culturali

in the frame of

EUR-OPA Major Hazards

By Ferruccio Ferrigni, Monica Valiante

Since the launch of the EUR-OPA Major Hazards Programme, the activity carried out by the CUEBC had been to promote knowledge and methods capable of mitigating the impact of natural disasters on cultural heritage. The LAReHBA (Local Appropriate Retrofitting of Historical Built-up Areas) Project, carried out in the two-year period 2016-2017, concluded this cycle, with the publication of the "*Guidelines for the appropriate retrofitting of historical built-up areas*".

It was also observed that very often local communities are aware of dangerous situations but that such awareness does not find a way to reach the local decision-makers who would be responsible for removing it. It emerges only "after" the disastrous events, when they become "news".

A new cycle of projects has therefore been launched which aimed on the one hand at disseminating the most effective methodologies for transferring knowledge on risk situations present in local communities to decision makers, and on the other at building the channels for disseminating this knowledge, giving their media coverage. Therefore, encouraging decision makers to intervene.

The title, objectives and products created from 2016 to 2023 are summarized in the following pages.

2016-2017

LAReHBA: Local Appropriate Retrofitting of Historical Built-up Areas"

Promoted by CUEBC Ravello, in collaboration with CERU Lisbon, CRSTRA Biskra and ECPFE Athens

General objectives

The general objectives of the project are:

a) To define a scientific framework to identify and validate the existing earthquake resistant characteristics of historical Built-up Areas

b) To define guidelines for the appropriate seismic retrofit of vernacular buildings taking into account their original earthquake resistant features

c) To define guidelines for transferring to population criteria for the adequate maintenance of those constructions and techniques in order to ensure their adequate seismic behaviour

Specific objectives for 2017

a) Compare the data collected in Italy, Greece and Portugal

b) Identify similarities and differences between the data collected in the four countries

c) Develop guidelines for the adequate maintenance and retrofit of vernacular buildings taking into account the characteristics of the local communities and the materials available locally for the retrofit

d) Develop guidelines for the most effective involvement of population in adopting technical suggestions for maintenance and adequate retrofitting

2016 Outputs

a) Census of the strengthening techniques present in the historical built-up area of some Italian seismic regions.

b) Analysis of the similarities and differences in the building techniques with reference to the locally available resources.

c) Draft tutorials to recognize local retrofitting techniques.

d) Internal workshop (Italy, Portugal and Greece) to compare the research material and to discuss the draft tutorial.

2017 Outputs

In the second year of the project the following activities have been carried out:

e) Conclusion and organisation of the census of the strengthening techniques.
f) Test to check the tutorial effectiveness, starting from the 2016 workshop results.
g) Production of the guidelines for the appropriate retrofitting of historical built-up areas.
h) Presentation of the tutorial and the guidelines during the open Workshop held in Ravello on the 6th of October 2017.

2018-2019

IKMEFIND: INDIGENOUS KNOWLEDGE AND MEDIAS TO FIGHT NATURAL DISASTERS

Promoted by CUEBC Ravello, in collaboration with CRSTRA Biskra

General objectives

After the occurrence of a natural disaster the media point out very often that the local population know very well the risks and the risk areas, but, that in spite of this, no precautions have been taken.
Before the occurrence of a disaster, media are not at all interested in "Indigenous Knowledge", which becomes "news" only after a disaster. As a consequence, if there is no media coverage, decision-makers do not give priority to the maintenance of the territory.

In this way we are caught in a vicious circle which turns an extraordinary heavy rain into a disaster.

By the way the popular sense of a danger does not always have scientific foundations. In order to make this valuable Indigenous knowledge a real and effective tool for disaster prevention it is necessary to sift it through the analysis of experts.

But experts' advice has to be paid for and media get no profit by giving spaces to the critical dissemination of Indigenous Knowledges. However, such dissemination can represent a public utility service.

An action aiming at the definition of the procedures to support media to offer periodic publishing spaces for the dissemination of Indigenous Knowledges on the local risks (for instance web pages on

"Protect your own territory") can urge decision makers to give priority to the maintenance of the territory and, consequently, to prevent natural disasters, or at least to reduce their impact.

Such an action meets EUR-OPA priorities of the Medium-Term Plan and falls under the current policies of major world organisations ("Cultural Heritage and Indigenous Knowledge for Building Resilience », UN Global Platform, Cancun 2017; Mobilizing local and indigenous knowledge for climate change observations and solutions, UNESCO Experts Conference, Georgetown, September 2017).

Outputs
Guidelines for the creation of PYT Pages
The "Amalfi Coast PYT Page" on the internet site www.unescoamalficoast.it
Research on "The reports of catastrophes in the media. The case of the Amalfi Coast" by Maria Carla Sorrentino

2020-2021
Local Knowledge and Schools Against Natural Disasters (LoKSAND)
Promoted by CUEBC Ravello, in collaboration with CERU Lisbon, CRSTRA Biskra and ECRM Erevan

General objectives
The LoKSAND project constitutes the continuation of IKMeFIND, carried out in the two-year period 2018-2019 within and with the support of EUR-OPA.
IKMeFIND aimed to improve knowledge of local risks by involving the media in their reporting; LoKSAND aims at the same goal through the involvement of secondary schools.
In 2020 the PYT (Protect your territory) Page for the Amalfi Coast was implemented with specific reference to extra-urban risks, in 2021, thanks to the involvement of the CERU Centre, the use of a PYT Page was integrated with reference to urban risks, strengthened and its effectiveness was tested, also through the involvement of schools and local media.

Outputs

1. Awareness campaign in schools (meetings)
2. Communication campaign online (6 articles in local press) (25 May-30 September)
    a. Sapere diffuso e partecipazione attiva a tutela del tuo territorio (*Widespread knowledge and active participation to protect your territory*)
    b. Dissesto idrogeologico: pericoli "minori", preludio ai disastri (*Hydrogeological instability: minor dangers, prelude do disasters)*
    c. Costa d'Amalfi: la manutenzione dei piccoli corsi d'acqua come aiuto alla prevenzione del rischio idraulico | (*Amalfi Coast: the maintenance of small watercourses as an aid to the prevention of hydraulic risk)*
    d. Frane in Costiera Amalfitana: non inevitabili | *Landslides on the Amalfi Coast: not inevitable*
    e. Fuoco e acqua: rischi correlati | (*Fire and water: related risks*)
    f. Conservare i terrazzamenti per prevenire il rischio idrogeologico (*Preserving the terraces to prevent hydrogeological risk*)
3. Leaflet printing of communication campaign and distribution in the schools (October)
4. PYT Page: management and implementation of the English version

2022-2023

SADUR Schools Against Domestic and Urban Disasters

Promoted by CUEBC Ravello, in collaboration with CERU – Lisbon and CEMEC San Marino

General objectives

The experience carried out by the CUEBC within the framework of EUR-OPA - the IKMeFiND and LoKSAND projects - have proven the effectiveness of the involvement of schools as a tool for

disseminating natural risk prevention programs to the local community (launch of the PYT Pages in Italy and Portugal, the "Protect Your Territory" website; requests by other schools to renew the project). The experience of recent times led us to think that there was also the field of domestic and urban risks in which the involvement of schools can help to reduce them. Just 3 examples: In December 2021, in Naples, the collapse of a corniche killed a boy; in December 2021, in Sicily and Rome, two explosions (produced by a gas leak) destroyed three buildings and caused 12 deaths; in January 2022, in New York, a fire (caused by an electric oven) produced 17 deaths. In fact, these accidents, even though can be qualified as "minor", have a territorial spread and a recurrence which produce a strong impact on the local communities and urban systems. It was therefore proposed to carry out the "SADUR - Schools Against Domestic and Urban Risks" project in 2022-2023. The project aimed to draft a Manual for the Detection of Hidden Domestic Risks (DHDR Manual) and a Manual for the production of the District Risk Map (DRM Manual), as well as the document on the HDRs detected and the DRM carried out by involved schools on the pilot areas invested by the project.

Outputs

1. Analysis of domestic accidents in the Amalfi Coast
2. Definition of the guidelines to be used for drafting the Manual for Assessment of Hidden Home Dangers and the District Risk Map
3. Definition of criteria for the choice of pilot areas where to carry out the AHHD Manual and the DRM
4. Drafting of the following articles:
    a. Domestic accidents on the Amalfi Coast
    b. Domestic accidents in the Prevention Plans
    c. Children and the elderly: the subjects most at risk for domestic accidents
    d. Domestic accidents: the most frequent causes and prevention

The articles were published in "Quotidiano della Costiera" on-line newspaper

5. PDF Brochure (Italian and English version) including the 4 thematic articles, in English and Italian,

2022-2023

POPIRIM Population involvement on risk management and mitigation. Testing in small communities

Promoted by CERU - Lisbon, in collaboration with CUEBC Ravello

General objectives

The project aimed to test the public participation in governance and DRR in different communities exhibiting susceptibilities to one or more risks, in different countries. In Portugal it was applied to a peripheral area of the city of Lisbon, located in the municipality of Odivelas, which presents characteristics of strong susceptibility to landslides, floods and earthquakes. It was intended to characterize the social content of the area, in its demographic, socio-economic, urban and cultural components, so that, in association with the dangers present in the region, to identify the main social vulnerabilities and perceptions that are constructed about these types of risk on the part of the resident population. Through this survey and diagnosis, the purpose was to build a formative and informative program providing citizens with the conditions and tools needed to act in the field of disaster risk reduction, in order to adequate their behaviour and to promote the public policies of local resilience.

Outputs

THE PARTICIPATIVE DIMENSION IN REDUCING URBAN RISKS Guidelines, including "*The self-assessment questions"*

The Future of Disaster Medicine: Emerging Challenges and Strategic Approaches

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Introduction

The landscape of disaster medicine is rapidly evolving, driven by the increasing frequency and severity of natural, accidental, and deliberate emergencies both within Europe and globally. These challenges underscore the necessity for a comprehensive, multidisciplinary, and balanced approach to disaster prevention, management, and response. The European Centre for Disaster Medicine (CEMEC) is at the forefront of addressing these challenges, focusing on critical areas that will shape the future of disaster medicine.

Key Areas of Concern

Climate Change: Climate change is intensifying natural disasters such as hurricanes, wildfires, and floods, requiring disaster medicine to adapt to more frequent and severe events. This necessitates the improvement of preparedness and response protocols to minimize health impacts, ensuring that medical services are resilient against the escalating threats posed by climate change.

Migrations: The rise in forced migrations due to conflicts, environmental disasters, and socioeconomic factors presents unique challenges for healthcare systems. Disaster medicine must be flexible and capable of providing assistance in diverse settings, addressing the health needs of displaced populations with agility and cultural sensitivity.

Conflicts: Armed conflicts create complex humanitarian crises, often overwhelming healthcare resources. Disaster medicine professionals must be prepared to operate in conflict zones, delivering essential

medical services while navigating security challenges and ensuring the safety of both patients and medical personnel.

CBRNe Risks: The threat of Chemical, Biological, Radiological, Nuclear, and explosive (CBRNe) incidents is a growing concern. Disaster medicine must be equipped to respond to these specialized emergencies, involving effective triage, decontamination, and treatment of casualties in highly dangerous environments.

Agro-Crime, Agro-Terrorism, and Food Supply Chain Protection: The increasing threats of agro-crime and agro-terrorism require innovative strategies to safeguard food supply chains. Disaster medicine must be prepared to address intentional acts targeting agriculture and food production, which necessitates specialized training and resources to protect public health from these emerging threats.

Vulnerable Populations: Special attention must be given to vulnerable populations, including the elderly, children, people with disabilities, and those in low-resource settings. Disaster medical plans need to be tailored to meet their unique needs, ensuring that no group is left without adequate care during emergencies.

Ethical and Legal Considerations: Disaster medicine involves navigating complex ethical dilemmas and legal issues, such as resource allocation and medical liability. A just and effective response to disasters requires clear guidelines and frameworks that address these challenges, balancing the demands of immediate crisis management with the principles of equity and justice.

Global Health Security: In an increasingly interconnected world, global health security is a critical concern. Preparedness for pandemics, infectious disease outbreaks, and international cooperation in disaster response are essential components of future disaster medicine, requiring coordinated efforts across borders.

Infrastructure Resilience: Ensuring the resilience of critical infrastructure, such as hospitals and emergency response systems, is crucial for maintaining functionality during disasters. Infrastructure must be designed and fortified to withstand the impact of various hazards, ensuring continuous service delivery in times of crisis.

Additional Considerations

Technological Advances The rapid evolution of technology offers new tools for disaster medicine, from telemedicine and artificial intelligence to data analytics. These advancements can enhance disaster preparedness, early warning systems, and healthcare delivery during emergencies, allowing for more efficient and effective responses.

Disaster Forensics: The integration of disaster medicine with forensic science is vital for understanding and responding to catastrophic events. This collaboration facilitates efficient healthcare delivery, victim identification, and post-disaster investigations, contributing to societal improvement and resilience.

Psychological and Mental Health: Disasters have profound psychological impacts on affected individuals. Incorporating mental health support and counseling into disaster medicine is essential to address trauma, stress, and other psychological consequences, promoting recovery and well-being.

Community Engagement: Active engagement with local communities is a cornerstone of effective disaster medicine. Public education and community-based preparedness initiatives are crucial for fostering a coordinated and informed response to emergencies.

Public Health Intelligence: Public health intelligence plays a pivotal role in disaster medicine, providing data-driven insights and preparedness strategies. This intelligence is key to developing effective emergency response plans and ensuring the delivery of healthcare during crises.

Strategic Focus

In response to these emerging challenges, the European Centre for Disaster Medicine is aligning its focus within two key strategic lines: the "All Hazards Approach" and the "One Health Approach."

All Hazards Approach

This approach encompasses a wide array of potential hazards, extending beyond healthcare to include risks from sectors like chemicals or radiological incidents, which can significantly impact public health. It advocates for a comprehensive scope in disaster preparedness and response, ensuring that all potential threats are addressed.

One Health Approach

The One Health Approach is an integrated and unifying strategy that seeks to balance and optimize the well-being of people, animals, and the environment. This holistic perspective recognizes the interconnections between these elements, emphasizing the importance of harmonious coexistence to safeguard overall health and welfare.

Conclusion

The future of disaster medicine is marked by increasing complexity and new challenges. By adopting a comprehensive, multidisciplinary approach and focusing on critical areas such as climate change, global health security, and technological advancements, the European Centre for Disaster Medicine is prepared to lead the way in disaster prevention and management. Through strategic initiatives like the All Hazards Approach and One Health Approach, disaster medicine will continue to evolve, ensuring the resilience and safety of communities worldwide.

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