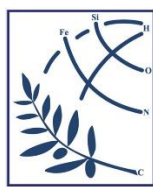


**INTERNATIONAL CONFERENCE ON PLANNING, CHALLENGES OF DISASTER
MANAGEMENT AND RESILIENCE (ICPCDMR)**

PROCEEDINGS OF THE ICPCDMR

Organized by:

**International Hellenic University
School of Science**



CHEMISTRY DEPARTMENT



HEPHAESTUS ADVANCED LABORATORY

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Editor Michail Chalaris

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**PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON PLANNING, CHALLENGES
OF DISASTER MANAGEMENT AND RESILIENCE (ICPCDMR)**

**PROGRAMME
&
BOOK OF ABSTRACTS**

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EDITOR

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**INSTITUTE OF MANAGEMENT OF MANMADE AND NATURAL DISASTERS -
PANHELLENIC NETWORK OF CIVIL PROTECTION AND CRISIS MANAGEMENT S.C.E.**

WELCOMING ADDRESS BY CHAIRPERSON OF THE CONFERENCE

On the behalf of Organizing Committee, I express a sincere welcome to all representatives attending the **International Conference on Planning, Challenges of Disaster Management and Resilience** which take part by distance using the zoom platform and YouTube and with physical presence in Athens, the capital of Greece, a place that combines the famous historical past with the modern, scientific – oriented present.

Today(11-Feb), 112 Day, the International Conference on Planning, Challenges of Disaster Management and Resilience, organized by the Department of Chemistry - Hephaestus Advanced research Laboratory- of International Hellenic University, has solemnly opened here.

Also, Happy Day to all First Responders and everyone response in Crisis Management.

Before I proceed, I would like to mention that today, 11th of February, has declared by the United Nations General Assembly as the International Day of Women and Girls in Science in 2015, in order to achieve full and equal access to and participation in science for women and girls, and further achieve gender equality and the empowerment of women and girls.

In our conference of 416 participants 38.5% are women, the 59,4% men and 2,1 others.

So, Returning to our main topic:

Developmental considerations contribute to all aspects of the disaster management cycle.

One of the main goals of disaster management, and one of its strongest links with development, is the promotion of sustainable livelihoods and their protection and recovery during disasters and emergencies.

Where this goal is achieved, people have a greater capacity to deal with disasters and their recovery is more rapid and long lasting.

In a development-oriented disaster management approach, the objectives are to reduce hazards, prevent disasters, and prepare for emergencies. Therefore, developmental considerations are strongly represented in the mitigation and preparedness phases of the disaster management cycle.

In appropriate development processes can lead to increased vulnerability to disasters and loss of preparedness for emergency situations.

This is a distinguished cross-century gathering of the world's information circles.

Experts and entrepreneurs from many countries have come together under the same hybrid room to exchange academic viewpoints, display technological achievements, and explore development trends, this will have an important influence on the development of the world's Disaster Management and Resilience technology.

The aim of the Conference is:

To answer one of the major issues of our time which is related with the climate crisis.

To stress the multiple dangers, to analyze today's data and to suggest solutions for the disaster risk reduction and management and to resilience.

To show off the importance of new technologies offering the chance of promotion to research, study and implementation of those technologies which conduce to the easing off or the solution to the problems regarding the disaster risk reduction and management.

To show the importance of cross-scientific methodology and collaboration in dealing with the problem of disaster risk reduction and management, which are objectively multi-dimensional, and to promote the communication among those who study, handle and deal with the problem of disaster risk reduction and management.

More specifically, it is aimed to attain the following objectives:

- 1) Collaborate, communicate, coordinate and capitalize on effective climate crisis adaptation and mitigation strategies such as land use planning, utilization of alternative and renewable energy, among others, in order to limit global warming to safer levels;
- 2) Embark on studies to improve the resilience of all ecosystems to avert adverse effects on food production, health, and economic security and
- 3) serve as venue in pursuing an enabling environment of change geared toward mitigating the worsening effects of climate crisis.

The Conference will cover a wide range of topics such as:

- 1) Disaster Preparedness
- 2) Disaster Response
- 3) Disaster Rehabilitation and Recovery
- 4) Disaster Prevention and Mitigation
- 5) Integration of risk and Resilience with Disaster management

The conference addresses chemists, engineers and other experts and professionals, from different countries who are occupied with the research and the development of activities, in a wide range, regarding issues of Climate Crisis, disaster Management and Resilience.

It also addresses the competent state, communal, social, and business carriers who are involved in these issues.

All accepted and presented papers in this conference will have the opportunities to be published in Proceedings and in a Book indexed by Sci-Scopus.

The conference has received 87 submitted papers, whereby 69 papers have been accepted by the committees for presentation and to be included in the proceedings.

These papers on various topics are divided into 7 sessions and 2 workshops in the conference.

To all members of the organizing committees, the scientific committee, the reviewers, and the collaboration partners, we would like to thank all of them for their tremendous efforts to organize this conference successfully

The organization of the international conference together with the small-scale exhibition, aspires, on the one hand, to bring together the scientific knowledge and applied technology and on the other to boost the dissemination of scientific information and the expansion of the possibility of free access of all citizens to knowledge.

Thus everyone, citizens, producers, scientists, planners, and researchers can become familiar with the themes of the conference in order to contribute towards the constant preservation of disaster risk reduction and management

The local Organizing Committee, the Scientific Committee, and the secretary desk (Institute of Management of Manmade and Natural Disasters -Panhellenic Network of Civil Protection and Crisis Management S.C.E.) are here to help you.

Even though all of you who are visiting Athens will be very busy working for productive days, I wish you an enjoyable staying in our city and I hope you will find some time to state some typical characteristics of the country, its nature, and history, its culture and heritage, its food and tradition.

For the participants by distance, I hope next time have the opportunity to visit the Greece due to their participation on the 2nd International Conference on Planning, Challenges of Disaster Management and Resilience...

We look forward to having a successful conference, and we hope that all the attendees enjoy and benefit from this conference.

Yours Sincerely

Michail Chalaris, MA, PhD
Conference chair of ICPCDMR
Assistant Professor, IHU
Research Director on Risk, Hazards, Crises, and Safety
Hephaestus Advanced research Laboratory
Rtd Major General (HFCs)

**SPEECH BY PROFESSOR (EM.) DR. (HEIDELBERG) ATHANASSIOS KAISSIS,
PRESIDENT OF THE GOVERNING BOARD OF THE INTERNATIONAL HELLENIC
UNIVERSITY, CORRESPONDING FELLOW OF THE INSTITUTE FOR FOREIGN LAW,
INTERNATIONAL LAW, COMPARATIVE LAW, CONFLICTS OF LAW AND
INTERNATIONAL BUSINESS LAW, UNIVERSITY OF HEIDELBERG,**

Dear all,

Allow me first to introduce the International Hellenic University.

The International Hellenic University, a pillar of excellence in education and research, focuses at the same time on internationalization, on the application of research results, on teaching and learning innovation, on the development of entrepreneurship and on linking the University with society.

The International Hellenic University offers 69 postgraduate programmes, 25 of them are offered in English.

The IHU also operates the University Centre of International Programmes of Studies (UCIPS) (www.ihu.gr/ucips/) which offers international students and professionals specialised programmes of study at postgraduate level, conducted entirely in English. UCIPS is an integral part of IHU and a Greek public university. Our permanent academic staff are reinforced by distinguished visiting professors, from Greece and abroad. Together they constitute the nucleus of the centre for excellence in teaching and research which forms our primary aspiration as a university.

The UCIPS comprises two (2) Schools offering twenty-four (24) postgraduate programmes in flexible modes [Full time (1 year) or part time (2 years) or Executive mode (weekends) or Distance learning mode].

Moreover, during this period in order to increase extroversion and connect the university with the business world more than 15 Memorandums of Understanding were signed between the International Hellenic University and various organisations, universities, financial establishments, chambers of commerce and other in Greece and abroad.

The strategic mission of the International Hellenic University has four main axes:

1. Digital Transformation, for the provision of high-level education.
2. Green Deal, as regards environmental protection and energy saving.
3. Extroversion (Cooperation with Universities in Europe, the USA and Asia).
4. Cooperation with industry and agriculture.

From 14/02/2020, when the new Governing Board of the International University of Greece took office, until today, more than one hundred meetings of the Governing Board of the International University of Greece were held, where various academic, financial and administrative issues were discussed and decided.

We would be delighted to welcome you to the International Hellenic University if you visit Thessaloniki in the near future. We could then show you more of the University, the old Thessaloniki city and our country, Greece.

This is an important event regarding disaster management and resilience, and I would like to congratulate the Department of Chemistry of the IHU and Assistant Professor M. Chalaris for organising this conference.

PROGRAMME

Friday, February 11th, 2022

12:00 - 18:00	DELEGATES ACCREDITATION
SESSION I	
Chair	Nancy Alonistioti, Aspasia Karamanou, Nikolaos Katopodis
14:00 - 14:15	STUSTAINABLE DEVELOPMENT CONCEPT - FIASCO OR THE ONLY HOPE TO SURVIVE O.Popovski, L. Shosholovski
14:15 - 14:30	CLIMATE CHANGE AND CHALLENGES THAT ARE BEING CREATED N. Taneski, S. Smileski, A. Iliev
14:30 - 14:45	BIBLIOGRAPHIC MONITORING OF RESEARCH PERFORMANCE OF GREEK RESEARCHERS IN DISASTER MANAGEMENT C. Stefanis, E. Giorgi, K. Kaletzis, A. Tselemonis, C. Tsigalou, E. Nena, C. Kontogiorgis, Y. Kourkoutas, C. Voidarou, E. Chatzaki, I. Dokas, T. Konstantinidis, E. Bezirtzoglou
14:45 - 15:00	UTILIZATION OF THE VIDEO FOR DISTANCE EDUCATION OF EDUCATORS,TEACHERS AND STUDENTS IN MATTERS OF CIVIL PROTECTION IN THE FRAMEWORK OF THE PROJECTS "MY NAME IS TEACHER" AND "PANTOPOULOS TEACHING PROJECT" F. Pantopoulos, I. Chalvantzi
15:00 - 15:15	SnR, SECURITY & RESILIENCE IN DISASTER MANAGEMENT Marta Burgos González
15:15 - 15:30	THE EMERGING ROLE OF TRANSLATION AND INTERPRETING IN CRISIS MANAGEMENT C. Vafeiadaki
15:30 - 15:45	COFFEE BREAK
SESSION II	
Chair	Nikolaos Katopodis, Dimitrios Emmanouloudis, Panagiotis Nastos
15:45 - 16:00	THE APPLICATION OF SEWER MINING TECHNOLOGY IN THE CITY OF ATHENS: CIRCULAR ECONOMY AND WATER N. Tsalas, G. Katsouras, D. Angeliki, A. Lyras, I. Dafnos, V. Polychniatou, S. Samios, E. Lytras and G. Sachinis
16:00 - 16:15	ADAPTATION TO CLIMATE CHANGE EFFECTS ON WATER RESOURCES: UNDERSTANDING INSTITUTIONAL BARRIERS IN NIGERIA O. Sola, H. Mensah, E. Albrecht and B. Ibrahim

16:15 - 16:30	WATER LACK AS A SOCIAL RISK AND THREAT TO SOCIAL DEVELOPMENT AND ENVIRONMENTAL DISORDER M. Dojchinovski, B. Andonovska, N. Kletnikov
16:30 - 16:45	PROTECTION OF WINES FROM HIGH CONCENTRATIONS OF HEAVY METALS F. Papageorgiou, M. Chalaris, A. Mitropoulos, G. Kyzas
16:45 - 17:00	THE CASE OF MICROPLASTICS POLLUTION IN KAVALA PORT, GREECE G. Savvopoulos, A.Thysiadou, A. Mitropoulos, G. Kyzas
17:00 - 17:15	THE IMPACT OF PUBLIC UNIVERSITY ACTIVITIES ON GLOBAL AGENDAS G. Santos, Jordan H. Souza, M. Carrara, R. Tortorelli
17:15 - 17:30	THE COMBUSTION HEAT OF FOREST FIRES IN RELATION TO THE DIFFICULTY OF SUPPRESSING THEM AT OPERATIONAL LEVEL N. Iliopoulos
17:30 - 17:45	CRISIS MANAGEMENT AND CLIMATE CHANGE G. Tsatsoulas
17:45 - 18:00	PROJECT OF NATIONAL HAIL PREVENTION SYSTEM IN GREECE S. Kolpidi
18:30 - 20:30	CONFERENCE OPENING CEREMONY
Chair	Athanasios Mitropoulos, George Kyzas, Michail Chalaris
	<p>INTRODUCTION AND WELCOME</p> <p>ATHANASIOS KAISIS, PRESIDENT OF INTERNATIONAL HELLENIC UNIVERSITY</p> <p>ANDREAS KATSANIOTIS, DEPUTY MINISTER OF FOREIGN AFFAIRS, IN CHARGE OF DIASPORA GREEKS</p> <p>APOSTOLOS TZITZIKOSTAS, PRESIDENT OF THE UNION OF REGIONS OF GREECE</p> <p>GEORGE PATOULIS, REGIONAL GOVERNOR OF ATTICA</p> <p>DIMITRIS PAPASTERGIOU, PRESIDENT OF THE CENTRAL ASSOCIATION OF MUNICIPALITIES OF GREECE - KEDE</p> <p>KOSTAS BAKOGIANNIS, MAYOR OF ATHENS</p> <p>SPYRIDON MAMALIS, PRESIDENT GEOTEE</p> <p>INVITED PLENARY LECTURE</p> <p>KONSTANTINOS ARAVOSIS, SECRETARY GENERAL OF FORESTS</p>
20:30	COCTAIL PARTY

Saturday, February 12th, 2022

SESSION III	
Chair	Ioannis Dokas, Orce Popovski, Gerasimos Karabelias
09:00 - 09:15	APPLICATION OF RESILIENCE FRAMEWORK TO COVID19 RE-FRAMING OUR WORK R. Biñas
09:15 - 09:30	RISK ANALYSIS OF A BIOLOGICAL DISASTER IN THE COVID-19 PANDEMIC Chih-Long Pan, Jet-Chau Wen
09:30 - 09:45	PUBLIC SITUATION AWARENESS DURING COVID19: HOW DOES THE PUBLIC UNDERSTAND AND ACT DURING A CONTINUOUS EMERGENCY? C. Rapaport, E. Shamash
09:45 - 10:00	PROCESSES OF SOCIO-ECONOMIC EXCLUSION IN COVID-19 INFECTION DURING LOCKDOWN. THE MADRID CASE STUDY Victor Pérez Segura
10:00 - 10:15	DISASTER RISK ASSESSMENT OF LAND SUBSIDENCE AREAS UNDER CLIMATE CHANGE: THE CASE OF CHOUSHUI ALLUVIAL FAN Rong-Yu Chen, Hong-Ru Lin, Jet-Chau Wen
10:15 - 10:30	DISASTER RISK ASSESSMENT OF LAND SUBSIDENCE AREAS UNDER CLIMATE CHANGE: THE C DOES TEMPORAL ENHANCEMENT IN ACCUMULATED STRAIN CONSEQUENT TO LUNAR ALIGNMENT IN WESTERN HEMISPHERE ACCOUNT FOR RECENT SERIES OF TREMORS AT NCR DELHI Umesh Prasad Verma. Shatrughan Singh, Madhurendra Nath Sinha, Alok Nath Sinha
10:30 - 11:00	COFFEE BREAK
SESSION IV	
Chair	Paraskevi Nomikou, Nichole Georgeou, Panteleimon Xofis
11:00 - 11:15	EARTHQUAKE EARLY WARNING EARTHQUAKE EARLY WARNING SYSTEMS: A REVIEW WITH APPLICATIONS IN GREECE C. Maniatakis, A. Zacharenaki, C. Moraitis, G. Stavroulakis
11:15 - 11:30	PROBABILISTIC SEISMIC RISK ANALYSIS OF URBAN ROAD NETWORKS IN MOUNTAINOUS AREAS D. Sotiriadis, N. Klimis ,B. Margaris, I. Koutsoupaki, E. Petala, I. Dokas
11:30 - 11:45	A METHODOLOGY FOR TEMPORARY SCAFFOLD DESIGN CONSISTENT WITH THE ASEISMIC DESIGN CODES C. Maniatakis, A. Zacharenaki, G. Stavroulakis
11:45 - 12:00	DAMAGE DETECTION IN FIBER REINFORCED CONCRETE SPECIMENS THROUGH THE APPLICATION OF A NOVEL STRUCTURAL HEALTH MONITORING SYSTEM M. Naoum,G. Sapidis, N. Papadopoulos, C. Constantin
11:45 - 12:00	GEOHAZARDS AND RISK FROM LANDSLIDES AND ROCKFALLS. RECENT EXAMPLES FROM GREECE C. Saroglou

12:00 - 12:30	THE RELATIONSHIPS BETWEEN TECTONICS AND VOLCANISM IN SANTORINI P. Nomikou, T. Druitt, S.Kutterolf, C. Hubscher, D.Papanikolaou
12:30 - 12:45	AN AGENT-BASED METHODOLOGY ON HOW WORLD CULTURAL AND NATURAL HERITAGE MONUMENTS CAN BE PROTECTED FROM RISKS K. Kravari, E. Samourkasidou
12:45 - 13:00	CREATING A TWO-DIMENSIONAL MODEL FOR PREDICTING POSSIBLE FLOOD PRONE AREAS BY USING HEC HMS AND HEC RAS SOFTWARE PACKAGES. THE CASE OF XIROPOTAMOS WATERSHED IN DRAMA, GREECE S. Lalikidou, A. Vasileiou, P. Angelidis, E. Efrimidou, C. Akratos, M. Spiliotis, F. Maris, I. Dokas
13:00 - 13:15	FIRE RISK ASSESSMENT IN WUI – WII IMPLEMENTING BAYESIAN NETWORKS TO INFER FIRE SPREAD PROBABILITIES J. Gómez, M. Castro, A. Cantizano
13:15 - 13:30	MULTI-SOURCE EO DATA FUSION FOR REGIONAL FOREST FUEL MAPPING AT REGIONAL SCALE G. Mallinis, I. Chrysafis, C. Damianidis, V. Giannakopoulos, I. Dokas
13:30 - 13:45	ANALYSIS OF TECHNOLOGICAL INTERVENTIONS TO LEVERAGE INVESTMENT IMPACT ON FOREST FIRE CONFRONTATION OPERATIONS. THE GREEK EXPERIENCE A. Kanavos, M. Chalaris, D. Anastasiadou, E. Housos, E. Adamides
13:45 - 14:00	MCI'S IN GREECE SINCE 1996. ARE WE READY TO FACE THEM? M. Drosos
14:00 - 14:15	PREDICTING THE OCCURRENCE OF COMBUSTION IN THE PRODUCTION OF POLYURETHANE FOAM DURING THE STORAGE PROCESS FOR TEMPERING T. Damyanova, Y. Dulev, G. Ilieva
14:15 - 14:30	THE ARFF MANAGEMENT MODEL OF FRAPORT GREECE A. Panagiotakis
14:30 - 15:30	WORKSHOP I HOW USEFUL IT IS TO GAIN KNOWLEDGE OF HUMANITARIAN NORMS? F. Luciano, R. Treno Fraternity – International Humanitarian Federation (FIHF) Fraternity – International Humanitarian Missions (FIHM)
15:30 - 16:30	LUNCH BREAK
SESSION V	
Chair	Lazaros Filippidis, Dionysios Kolaitis, Myrto Konstantinidis
16:30 - 16:45	PHILOSOPHY OF THE ROMANIAN EMERGENCY SITUATIONS MANAGEMENT SYSTEM A. Mocioi
16 :45 - 17:00	ADAPTIVE STRATEGY IN PREPARING FIRE BRIGADES TO DISASTERS IN POLAND P. Gromek
17:00 - 17:15	SYNERGY EFFECT OF ENTITIES ASSOCIATED IN THE NATIONAL FIREFIGHTING AND RESCUE SYSTEM OF REPUBLIC OF POLAND W. Szulc

17:15 - 17:30	CROSS-BORDER COOPERATION ON FIREFIGHTING ACTIVITIES AND PROFESSIONAL COMMUNICATION T. Damyanova
17:30 - 17:45	A VULNERABILITY ANALYSIS TOOL FOR FIRST RESPONDERS – DEVELOPMENT AND EVALUATION S. Scheuer, C. Geyer, Y. Prinzellner
17:45 - 18:00	CONCORDE: A state-of-the-art emergency & crisis management platform A.Liapis
18:00 - 18:15	TECHNOLOGICAL CHALLENGES FOR FIRST RESPONDERS IN CIVIL PROTECTION; THE RESPOND-A SOLUTION G. Boustras, Cl. Mikellidou, I. Senekkis
18:15 - 18:30	FIRST RESPONDER ADVANCED TECHNOLOGIES FOR SAFE AND EFFICIENT EMERGENCY RESPONSE A. Díaz, An. Cintora, Sol. Gómez, J. Ruiz, O. Carrillo, F. Carrillo, M. Rodríguez
18:30 - 18:45	100 CITIES – 100 YEARS – EVALUATION OF URBAN FIRE RISKS P. Wagner
18:45 - 19:00	COFFEE BREAK
SESSION VI	
Chair	Alin Mocioi, Manolis Koudoumas, Charilaos Maniatakis
19:00 - 19:15	IMPACT ON THE ENVIRONMENT FROM DISASTERS AT FACILITIES USING DANGEROUS SUBSTANCES G. Mouzakis
19:15 - 19:30	SEARCH FOR REDUCTION OF CHEMICAL DISASTERS BY ANALIZYNG THE MOST SERIOUS CHEMICAL INCIDENTS ACCORDING TO EMARS PLATFORM Cristina Horrillo García, Ana María Cintora Sanz, Cristina Gómez Usabiaga, Raquel Lafuente Sáenz, Eva Teresa Robledo Muñoz, Ricardo García Martínez.
19:30 - 19:45	STAKEHOLDER ANALYSIS FOR SAFE LNG HANDLING AT PORTS I. Koromila, O. Aneziris, Z. Nivolianitou
19:45 - 20:00	EMERGENCY RESPONSE ON A KICK F. Zachopoulos, N. Kokkinos
20:00 - 20:15	AN ADR VEHICLES RECOGNITION TOOL FOR THE PREVENTION OF EMERGENCY SITUATIONS IN TUNNELS M. Konstantinidou, G. Sisiyas, S. Kontogiannis
20:15 - 20:30	THE UTILITY OF ALOHA SIMULATION IN ACCORDANCE WITH THE YEARLY CLIMATE CHANGES IN GREECE. A FIELD REVIEW IN CONJUNCTION WITH THREE-CHEMICAL-AGENT SCENARIOS K. Alexopoulos, G.Koufioti, A. Kounios, M. Chalaris
20:30 - 20:45	WEATHER TYPES AND CARDIOVASCULAR/RESPIRATORY MORTALITY IN EASTERN MACEDONIA AND THRACE, GREECE: A SYNOPTIC CLIMATOLOGY APPROACH TO PROTECT PUBLIC HEALTH P. Begou, I. Petrou, K. Psistaki, I.M. Dokas, A.K. Paschalidou

20:45 - 21:00	TRAPPED ON THE SEASHORE, SEABORNE EVACUATION, AND IMPACT OF EXPOSURE TO PM2.5: LIVE DEMONSTRATION OF THE URBANEXODUS LARGE-SCALE EVACUATION MODEL L. Filippidis, P. Lawrence, D. Blackshields, J. Ewer
21:00 - 21:15	THE NECESSITY OF THE “DEBRIEFING” AFTER DISASTER INCIDENTS C. Papapanou
21:15 - 21:30	THE NEED FOR MINIMUM HUMANITARIAN STANDARDS F. Luciano, R. Treno

Sunday, February 13th, 2022

SESSION VII	
Chair	Ioannis Dermentzoglou, George Stavroulakis, Peter Wagner
10:00 - 10:15	RESILOC-HORIZON 2020: The Municipality of West Achaia M. Didachos
10:15 - 10:30	AUTONOMOUS BARS FOR SAFE PASSAGE OF IRISH PASSAGES P. Chatzidimitrakis, D. Chatzidimitrakis, Ms. C. Agorgianiti
10:30 - 10:45	INFORMATION NEEDS ON NATURAL AND TECHNOLOGICAL DISASTERS FROM THE VIEWPOINT OF PRIVATE COMPANIES LOCATED IN THE EAST MACEDONIA AND THRACE PREFECTURE A. Zeleskidis, K. Chouvardas, S. Charalampidou, I. Dokas
10:45 - 11:00	KNOWLEDGE OF VULNERABLE GROUPS FROM NORTH MACEDONIA, BULGARIA, AND SPAIN RELATED TO PROTECTION AND RESCUE - FUNDAMENT FOR BUILD STRONGER COMMUNITY RESILIENCE B. Andonovska, N. Kletnikov, M. Dojchinovski
11:00 - 11:15	EARLY WARNING SYSTEMS FOR CIVIL PROTECTION: EVIDENCE FROM THE EARLY USE OF EMERGENCY SERVICE 112 FOR EMERGENCY EVACUATION IN GREECE M. Dandoulaki, I. Kapris, A. Plessa
11:15 - 11:30	LOCAL GOVERNMENTS' ENGANGEMENT IN HERITAGE DISASTER MANAGEMENT; ANCIENT MESSENE'S CASE STUDY G. Marava
11:30 - 11:45	ROBOTIC SOLUTIONS IN THE FIELD OF RESCUE V. Pipitsoulis
11:45 - 12:00	FIREBREAKS, CASE XPYRO LTR M. Jurvélius
12:00 - 12:30	BREAK
SESSION VII	
Chair	Grigoris Varras, Miltiadis Statheropoulos, Christos Bouras
12:30 - 12:45	FLEXIBLE AND AVAILABLE COMMUNICATION NETWORKS FOR EFFECTIVE DISASTER MANAGEMENT V. Pipitsoulis

12:45 - 13:00	I-REACT PREPARATION & RESPONSE TO DISASTERS J. Alexander, C. Bielski, V. Pipitsoulis
13:00 - 13:15	LONG-DISTANCE MASS NOTIFICATION VOICE MESSAGING SYSTEMS V. Pipitsoulis
13:15 - 13:30	COMPARISON OF THE SUPPRESSION SYSTEMS FOR WILDLAND FIRES M. Chalaris, V. Gkerles, M. Skerbic
13:30 - 13:45	THE IMPACT OF CLIMATE CHANGE ON THE RISK OF HYDRO-METEOROLOGICAL DISASTERS I. Agiannidis, A. Vranna, P. Sarigianni
13:45 - 14:00	TRAINING AND KNOWLEDGE SHARING PLATFORM FOR FIRST RESPONDERS AND EDUCATIONAL TOOLS FOR STUDENTS' AND CITIZENS' AWARENESS AND PREPAREDNESS AGAINST NATURAL AND MANMADE DISASTERS AND RISKS K. Kravari, E. Samourkasidou, D. Emmanouloudis, M. Chalaris
14:00 - 15:30	WORKSHOP II (In Greek Language) in cooperation with the Panhellenic Association of General Secretaries in Municipal Authorities in Greece, 'Kleisthenes'
	TOWARDS A STRONG NATIONAL CRISIS MANAGEMENT AND RISK MANAGEMENT MECHANISM TO IMPROVE RESILIENCE AND AVOID ADVERSE EFFECTS FROM NATURAL AND MAN-MADE DISASTERS
	ΠΡΟΣ ΕΝΑ ΙΣΧΥΡΟ ΕΘΝΙΚΟ ΜΗΧΑΝΙΣΜΟ ΔΙΑΧΕΙΡΙΣΗΣ ΚΡΙΣΕΩΝ ΚΑΙ ΑΝΤΙΜΕΤΩΠΙΣΗΣ ΚΙΝΔΥΝΩΝ ΓΙΑ ΤΗΝ ΒΕΛΤΙΩΣΗ ΤΗΣ ΑΝΘΕΚΤΙΚΟΤΗΤΑΣ ΚΑΙ ΤΗΝ ΑΠΟΦΥΓΗ ΤΩΝ ΔΥΣΜΕΝΩΝ ΕΠΙΠΤΩΣΕΩΝ ΑΠΟ ΦΥΣΙΚΕΣ ΚΑΙ ΑΝΘΡΩΠΟΓΕΝΕΙΣ ΚΑΤΑΣΤΡΟΦΕΣ.
	Μιχαήλ Χάλαρης Επίκουρος Καθηγητής, Τμήμα Χημείας, Διεθνές Πανεπιστήμιο της Ελλάδος Διευθυντής Ερευνών σε θέματα Διακινδύνευσης, Κίνδυνων, Κρίσεων και Ασφάλειας «Ήφαιστος», Θεσμοθετημένο εργαστήριο υποδομών μεγάλης κλίμακας
	Θέμα: Μπορούμε να πετύχουμε ένα αποτελεσματικό σύστημα διαχείρισης εκτάκτων αναγκών της χώρας μας;
Δρ. Μιχάλης Χρηστάκης Πολιτικός & Διοικητικός Επιστήμονας, Δρ. Διεθνών Σχέσεων, Ειδίκευση στις Ευρωπαϊκές Πολιτικές & Χρηματοδοτήσεις, Γενικός Γραμματέας Δήμου Νέας Σμύρνης Πρόεδρος Πανελλήνιας Ένωσης Γενικών Γραμματέων Τοπικής Αυτοδιοίκησης "Κλεισθένης"	
Θέμα: 'Ανθεκτικότητα Δομών & Πολιτική Προστασία στην Τοπική Αυτοδιοίκηση'.	
Καλλιόπη (Κέλλυ) Σακκαλόγλου , Πληροφορικός, π. Στέλεχος Γενικής Γραμματείας Αθλητισμού, Αντιδήμαρχος Περιβάλλοντος & Υπεύθυνη Πολιτικής Προστασίας Δήμου Νέας Ιωνίας	
Θέμα: 'Παραδειγματικό Μοντέλο Εφαρμογής Σχεδιασμού Πολιτικής Προστασίας σε Αστικό Περιβάλλον: Η Περίπτωση του Δήμου Νέας Ιωνίας'.	

Ασημίνα Κυριακού, Οικονομολόγος, Ειδίκευση στην Διοίκηση Επιχειρήσεων, Απόφοιτη Εθνικής Σχολής Δημόσιας Διοίκησης & Αυτοδιοίκησης, Στέλεχος Αποκεντρωμένης Διοίκησης Θεσσαλίας - Στερεάς Ελλάδας, Γενική Γραμματέας Δήμου Μαντουδίου- Λίμνης - Αγίας Άννης

Θέμα: 'Πολιτική Διαχείριση Αποτελεσμάτων Εκτεταμένων Πυρκαγιών σε Συνεργασία με Δημόσια Διοίκηση και Ιδιωτικό Τομέα: Η Περίπτωση του Δήμου Μαντουδίου - Λίμνης - Αγίας Άννης'.

Κωνσταντίνα (Νάντια) Δημητρίου, Πολιτικός Μηχανικός, Γενική Γραμματέας Δήμου Βέλου - Βόχας

Θέμα: 'Σχεδιασμός Πολιτικής Προστασίας για την Αντιμετώπιση Απωλειών Γης σε Συνεργασία με Δημόσιους Φορείς: Η Περίπτωση των Παραλιακών Περιοχών στο Βέλο - Βόχα'.

Δρ. Παναγιώτης Αγγελόπουλος, Οικονομολόγος, Διοίκηση Επιχειρήσεων, Πολιτικής Επιστήμης & Ιστορίας, Ειδίκευση στην Διαχείριση Ανθρώπινων Πόρων, Ειδίκευση στην Εθνική & Κοινοτική Διοίκηση, Υποψήφιος Δρ. στην Δημόσια Διοίκηση στο Πάντειο Πανεπιστήμιο, Πρόεδρος Ινστιτούτου Ανάπτυξης Δημόσιας Διοίκησης & Αυτοδιοίκησης – Καποδίστριας

Θέμα: 'Προληπτικός Σχεδιασμός για Πολιτική Προστασία στις Πόλεις: Παραδειγματικές Αναφορές από τον Σύνδεσμο Προστασίας & Ανάπτυξης του Υμηττού (ΣΠΑΥ)'.

Δρ. Ευγενία Χριστοπούλου, Φυσικός, Ειδίκευση στην Αστρονομία, Αστροφυσική & Θεωρητική Μηχανική, Δρ. στην Ψηφιακή Επεξεργασία Ηλιακών Εικόνων, Επιστημονικός Συνεργάτης Δήμου Αμφίκλειας - Ελάτειας, Γενική Γραμματέας Δήμου Διστόμου - Αράχοβας - Αντίκυρας

Θέμα: 'Περιβαλλοντική Διαχείριση & Πολιτική Προστασία στην Τοπική Αυτοδιοίκηση'.

Δρ. Μάρκος Μαργαρίτης, Χημικός Μηχανικός, Δρ. στις Τεχνολογίες Διαχείρισης Στερεών Αποβλήτων, Μεταδιδάκτωρ στις Τεχνολογίες Διαχείρισης Στερεών & Υγρών Αποβλήτων, Πρόεδρος & Διευθύνων Σύμβουλος Break Even Consulting IKE, Επίκουρος Καθηγητής, Σχολή Πολιτικών Μηχανικών, Πανεπιστήμιο Πελοποννήσου

Θέμα: 'Σχεδιασμός & Προγραμματισμός για την Διαχείριση Υποδομών & Δικτύων σε Περίπτωση Φυσικών Καταστροφών'.

Απόστολος Τζήκας, Διοίκησης Επιχειρήσεων, Αναπτυξιακός Σύμβουλος, Αντιπρόεδρος TEONOVA SA

Θέμα: 'Διαχείριση Τηλεπικοινωνιακών Δικτύων & Ψηφιακής Επικοινωνίας σε Περίπτωση Φυσικών Καταστροφών'.

Ιωάννης Νικλήτσας, Γενικός Διευθυντής International Forum Training & Consulting

Θέμα: 'Δια Βίου Μάθηση & Κατάρτιση με Πιστοποίηση για Στελέχη & Εθελοντές στον Τομέα της Πολιτικής Προστασίας'.

END OF CONFERENCE

EXHIBITORS

During the Conference, there was an Exhibition of Activities of the following Civil Protection Institutions and Voluntary Organizations:

1. INSTITUTE OF MANAGEMENT OF MANMADE AND NATURAL DISASTERS - PANHELLENIC NETWORK OF CIVIL PROTECTION AND CRISIS MANAGEMENT S.C.E.
2. HELLENIC RED CROSS
3. RESCUE TEAM DELTA
4. LIFE SOLUTION S.A.
5. PROTECT MYSELF AND THE PEOPLE - PROTEKTA OF ILION
6. RESCUE FORCE TEAM OF CIVIL PROTECTION (EPOPP)
7. SOCIAL PROJECT "I OFFER"

ATTEND THE CONFERENCE

Please find the below YouTube Links to join the Conference:

ICPCDMR - Day 1 Friday , Feb 11, 2022	https://youtu.be/RxYp_XWRjrM
ICPCDMR - Day 2 Saturday , Feb 12, 2022	https://youtu.be/ZkRvhEmEcAg
ICPCDMR - Day 3 Sunday , Feb 13, 2022	https://youtu.be/o1OKTPn7_5Y
Please join my YouTube from your computer, tablet, or smartphone	

SUSTAINABLE DEVELOPEMENT CONCEPT – FIASCO OR THE ONLY HOPE TO SURVIVE

Orce Popovski¹, Ljupco Shosholovski²

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Before the beginning of the industrial revolution, the climate changes were regarded solely as a natural phenomenon. From then onwards, anthropogenic activities present an enormous influence over the climate changes. Numerous studies which were conducted at the beginning of the '80s of the last century, indicate link between environment and security. Studies primarily are related to the research of the implications of environmental changes on security. Knowledge about the global impact of environmental changes, such as the reduction of the ozone layer, increased pollution of all environmental media, the disproportion in population growth and food production, demographic imbalance, the increased influx of immigrants in developed countries, all show their implications on security. As a result, the relevant authorities were motivated to make a re-evaluation of the security dimension, incorporating environmental concerns.

Sustainable Development is one of the most important environmental issues, since it was launched during the 1992nd Rio de Janeiro's World Summit. Together with the formulation of Agenda 21, the Declaration on environment and development, concern on forests, climate changes, bio-diversity, and desertification, a Commission on Sustainable Development was established as well.

CLIMATE CHANGE AND CHALLENGES THAT ARE BEING CREATED

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This study provides a common starting point for understanding and discussing disasters, disaster management and disaster preparedness as part of every society's mission, and discusses the potential scope of disaster preparedness measures.

The following text is appropriate for anyone who has general responsibilities for disaster management and programme implementation. Benefit from reading this study can have non-technical personnel interested in acquiring a better understanding of disaster preparedness and the strategies and measures that may be implemented as well. The most essential but difficult part in the management of disaster is identifying the risk and vulnerabilities of the local communities.

The biggest motivation for this study comes from the two important professional challenges confronting emergency managers in the coming years. There are the professionalization of emergency management, involvement in hazard mitigation, involvement in preimpact disaster recovery planning, expansion of the professional domain and regional collaboration.

One of the most important goals is involving youth in disaster preparedness and recovery efforts. Youth-serving agencies can help to not only increase youths' awareness of particular hazards, but can also enhance the chance that they openly discuss how to adequately protect their families and loved ones and understand how to seek help.

BIBLIOGRAPHIC MONITORING OF RESEARCH PERFORMANCE OF GREEK RESEARCHERS IN DISASTER MANAGEMENT

Christos Stefanis¹, Elpida Giorgi², Konstantinos Kaletzis³, Athanasios Tselemponis⁴, Christina Tsigalou⁵, Evangelia Nena⁶, Christos Kontogiorgis⁷, Yannis Kourkoutas⁸, Chrysa Voidarou⁹, Ekaterini Chatzaki¹⁰, Ioannis Dokas¹¹, Theodoros Konstantinidis¹², Eugenia Bezirtzoglou¹³

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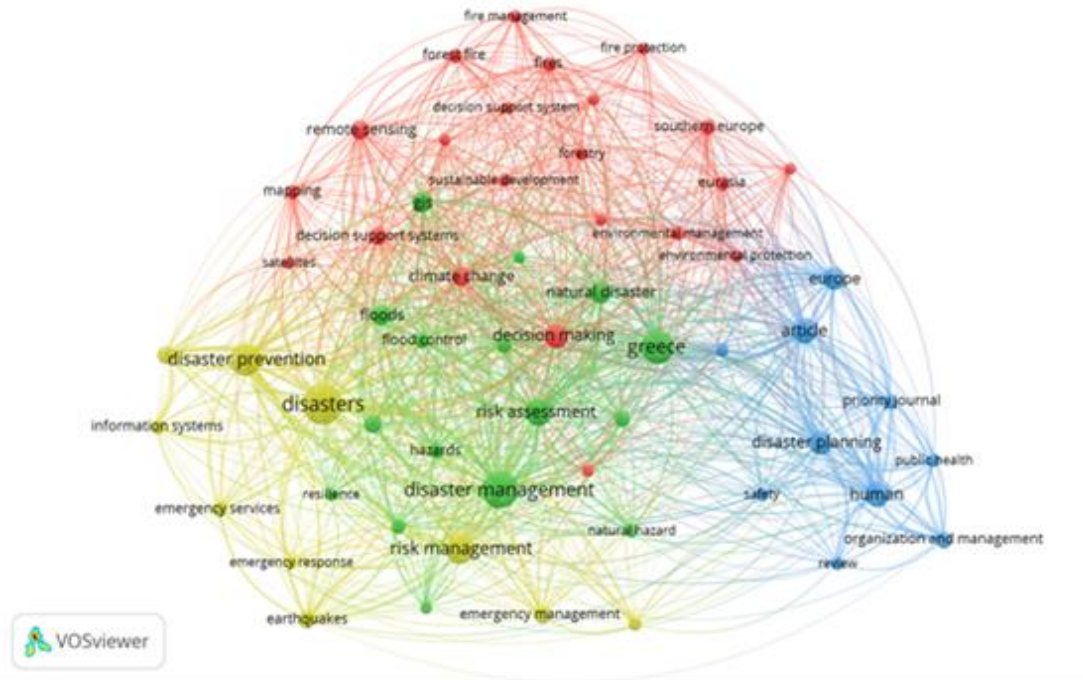
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This study's goal is to reveal the research performance of Greek scientists in disaster management. In recent years, bibliographic studies that highlighted the direction and orientation of various scientific domains have increased. Also, due to their interdisciplinarity, the expansion of scientific fields is only visible throughout bibliographic indicators and analyses. In the scientific field of disaster management, there do not seem to be such studies that present the activity of Greek researchers. Through VOSviewer software, Microsoft Excell and the analysis of bibliometric indicators such as temporal distribution of publications, research productivity of universities, and financial sources, it was possible to determine the research frontiers of disaster management and create a bibliographic map. After applying various combinations, the phrase "disaster management" was used in the Scopus database, with a time range from 1998 to 2021, language selection English and country: Greece.



Overall, 352 records were found, with the publicity of records escalating over the last decade. The primary funding source for disaster management research is the EU. NKUA and AUTH are the most productive institutes in this research field. Disaster management is a diverse scientific field with over 20 subject areas, such as environmental sciences, ICT, and engineering sciences. The bibliographic keyword map illustrated four clusters, with pattern analysis focusing on decision-making, risk assessment, disaster prevention, management, and the human factor. This particular bibliographic analysis demonstrated the research trends in the management of natural disasters of the Greek research community, the orientation and the future development of this scientific domain.

UTILIZATION OF THE VIDEO FOR DISTANCE EDUCATION OF EDUCATORS, TEACHERS AND STUDENTS IN MATTERS OF CIVIL PROTECTION IN THE FRAMEWORK OF THE PROJECTS "MY NAME IS TEACHER" AND "PANTOPOULOS TEACHING PROJECT"

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This work aims at the implementation of an educational project using video on Civil Protection issues. The training by specialists but also by educators trained in the teaching model, concerns educators, teachers and students. The motivation for the study was the realization that Greek society and education appear unprepared and without interesting prospects of change of the situation in the critical -based on the educational philosophy itself and the extreme climatic conditions and other circumstances- issues of Civil Protection. As citizens and educators we try to tackle the problem by exploiting the potential of new technologies in order to overcome objective obstacles, but also to introduce new methodologies. For this, we used sources such as: i) news, which shows the degree/manner of response and the extent of citizens' ignorance in times of danger, ii) relevant legislation, which often describes vague and/or conflicting training responsibilities on behalf of stakeholders, iii) Curriculum in the Greek school, iv) relevant literature regarding video technology in education, v) relevant philosophy for the use of video as a learning tool by the Teaching Model "PTP". The first results are very encouraging, as we found that the initial hypothesis for emphasis on know-how and didactics in creating the video without high technical requirements yields high quality learning outcomes. The novelty of the project is found in the combination of knowledge about Safety and Prevention as products of long education with the educational quality and know-how of video as a training tool.

SnR, SECURITY & RESILIENCE IN DISASTER MANAGEMENT

Marta Burgos González

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Abstract: Search and Rescue (SnR) project was launched on 1 July 2020, funded by the European Commission under the grant agreement 882897. It is dedicated to the development of technologies, being the ultimate goal to reduce search and rescue times for victims in disaster situations, as well as to promote a common holistic response framework.

Method: In the SnR research project, ESDP collaborates with companies and other public and private organisations from countries belonging to the European Union, forming a consortium that aims to develop technologies that improve: the detection of risks, the collection of data from the disaster area, the processing and optimisation of the use of these data.

This optimisation in the flow of information, the improvement of communications, the reception of information from emergency teams in real time, will help first responders to carry out their work in a more efficient and safer way. The creation of a common, uniform and agile platform and the development of tools capable of reflecting the situation in the disaster area will increase the quality of care so that response/search/rescue times can be reduced and lives will be saved. The communication platforms, the personal location and information gathering from different devices, together with the IT architecture capable of supporting all these elements will be responsible for the success of this project.

Conclusion: The development of an IT architecture for the collection and circulation of data, the fusion of different sources in order to create a common situation analysis and the optimisation of advanced sensors, systems and procedures to obtain the highest level of disaster response capability, will be the work to develop under SnR project.

THE EMERGING ROLE OF TRANSLATION AND INTERPRETING IN CRISIS MANAGEMENT

Chrysoula Vafeiadaki

Journalist, former UNHCR Senior Management Translator

The communicational dimension of crises and disaster management contains two often underestimated components: translation and interpreting. State authorities, international organizations, NGOs and other emergency planners and responders seem not to be fully aware of the fact that multilingual communication – written and oral – both in the field and in decision-making settings needs not to be exercised by ad hoc volunteers or non-professionals, especially when universities produce high level translators and interpreters. Peace communication requires precision in the transmission of messages, a wide range of knowledge beyond linguistic proficiency, learning of special techniques, neutrality, and attention to extralinguistic communication. The person who acts as an intermediary between the transmitter and the receiver of a message should comply with the rules of a code of professional conduct. In this case, the intermediary should also be trained on crisis management and response, as she/he influences preparedness, mitigation, and response, while the field is challenging and constantly changing by uncertain factors imposing an interdisciplinary approach. Such crises may be varying, e.g. political, social, economic, health, military, diplomatic, environmental, na-tech, cybersecurity, etc. and entirely depend on geography and time. Thus, taking into consideration examples from recent humanitarian (refugee/migrant, environmental, etc.) crises, we conclude that there is a need for a legal framework to define who acts as translator and interpreter when and where during crises and disaster management, standards of procedures and cooperation between State and academia.

THE APPLICATION OF SEWER MINING TECHNOLOGY IN THE CITY OF ATHENS: CIRCULAR ECONOMY AND WATER

Nikolaos Tsalas, Georgios Katsouras, Derlere Angeliki, Antonios Lyras, Ioannis Dafnos, Vasiliki Polychniatou, Stylianos Samios, Efthymios Lytras and Georgios Sachinis

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This publication presents the sewer mining (SM) unit, that has been operating since 2021 in the Athens Plant Nursery, in the city of Athens, Greece, within the framework of the European research program NextGen. The Unit is the result of the cooperation of EYDAP with the Municipality of Athens, NTUA and Chemitec. EYDAP is also responsible for monitoring the quality of the recovered water, which covers a part of the irrigation needs of the plants maintained by the Municipality in its facilities, while additionally in the future it could be used for the enrichment of the underground aquifer. The need for greater security around water resources, due to risks such as increased water consumption, water scarcity and climate change, has led to the application of such units. It is estimated that by 2030 there will be a shortage of water, which will reach up to 40% of global demand, significantly increasing the pressure on water resources. Sewer Mining technology is based on Sewage Treatment Plants which consist of three parts: 1. The wastewater recovery from the sewerage network, 2. The treatment of these, using a membrane bioreactor (MBR) and a UV disinfection unit, 3. The excess sludge treated via a rapid composting solution. In this work we present the seven months continuous monitoring of the raw material of the Unit, that treated sewage to recover water. The analysis of the physicochemical and microbiological parameters, showed that there is compliance with the perimeters of the Greek legislation enabling the recovered water (average NH₄-N = 1.7 mg/lit, BOD₅ <10 for 80% of samples) to be suitable for unlimited irrigation, industrial /urban use and for enrichment of the underground aquifer. In this way, the principles of the circular economy are outlined, such as the saving of potable water and the conversion of waste into useful resources.

ADAPTATION TO CLIMATE CHANGE EFFECTS ON WATER RESOURCES: UNDERSTANDING INSTITUTIONAL BARRIERS IN NIGERIA

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Climate Change (CC) and variability are global issues that the world has been facing for a long time. Given the recent catastrophic events, such as flooding, erosion, and drought in Nigeria, many have questioned institutions' capacity in managing CC impacts in Nigeria. This study explores emerging institutional barriers of adaptation to CC effects on water resources in Nigeria. The study data were obtained from in-depth interviews with institutional heads from water resources management and emergency management and a review of secondary literature from databases such as Google Scholar, Scopus, and Web of Science. The results show that inadequate hydrological data management, low awareness on how to adapt among the public and decision-makers, financial constraints, no political will to pass important bills into law, and inadequate institutional and legal framework are the main institutional barriers of adaptation to climate change in Nigeria. The study concludes that it is essential to strengthen the institutional and legal system, information management mechanism, public awareness, and participatory water resources management. The implications for further research are presented in the study.

WATER LACK AS A SOCIAL RISK AND THREAT TO SOCIAL DEVELOPMENT AND ENVIRONMENTAL DISORDER

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Water problems and challenges are a warning that disasters can be caused by climate change but also because of human activities in relation to global warming.

The purpose of this paper is to point out the important aspects of creating opportunities for social risk and threat to social development because of water scarcity and asymmetrical development and management of water capacity. At the same time, the research will identify social problems, from which water can lead to disruption of national security.

The research problem is motivated by the right of existence and safe life, not only in its environment, and in its country, but also on a regional level.

The research will be done using analysis of documents, statistical data and descriptive approach, which will lead to empirical results for the etiological and phenomenological characteristics of water problems, as well as estimates, analyzes and studies, in order to project water challenges by 2040.

The research sample will show how water as a social risk and threat affects the situation of the Republic of North Macedonia within the international statistics regarding the use and use of water as a natural and necessary resource.

PROTECTION OF WINES FROM HIGH CONCENTRATIONS OF HEAVY METALS

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Pollution of the planet has gone beyond all bounds. One of these aspects is the burden on the environment with heavy metals. The main problem of heavy metals is the fact that they accumulate in the environment with negative consequences for it. In this work, we deal with the removal of copper and iron ions from wine. Wine is in our daily life and during its production chain his technological interest is located in the removal of excess copper and iron. Today, we do not use activated carbon to remove these two heavy metals, but alternative chemical methods. In the present work to remove these two metals, we study the use of activated carbon derived from potato peel (AC-Pot) in one case and the use of activated carbon derived from banana peel (AC-Ban) in the second case. According to the experimental data, the activated carbon derived from potato peels, when applied to white wines in a quantity of 1 kg/tn, has impressive results in reducing the content of iron and copper. But the same cannot be said of rosé and red wines. The redder the wine or the richer in phenolic compounds, the lower the activity of activated carbon derived from potato peels in reducing iron and copper. In order to have iron turbidity, the content of iron in the wine must be greater than 12 mg/L and of course there must be contact of the wine with oxygen. In the case of copper, turbidity is only found in white wines if we have a concentration greater than 0.5 mg/L and a reducing environment. In wines that are rich in tannins (phenolic components) due to their antioxidant action, we have natural protection against iron turbidity and so except in rare cases there is no need to remove iron from rosé and red wines. Based on these data, we consider that the activated carbon derived from potato peels is an ideal material for the removal of these two metals in white wine, which is essentially the wine that has a technological interest in their removal.

THE CASE OF MICROPLASTICS POLLUTION IN KAVALA PORT, GREECE

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Plastics have an essential role in everyday life, but despite that, they pose a potential health risk for both humans and the environment. Plastics in dimensions of less than 5 mm are named microplastics (MPs), which can be deliberately added to products (e.g., cosmetics) or can be formed when plastics of a larger size break down (e.g., from plastic litter in the seas). Microplastics originate from various polymer-based materials. Once released in the marine environment, high-density plastics (e.g., polyester) tend to settle and accumulate in the sediment, while low-density microplastics (e.g., polyethylene) float on the sea surface. Since MPs are not naturally removed from the marine environment, they can be ingested by aquatic biota. MPs can aid the delivery of persistent organic pollutants (POPs), which are added during manufacturing or adsorbed and concentrated from the surrounding seawater. As a result, MPs laden with high levels of POPs can be transferred via the food chain. This study confirms microplastics are present in abundance in the water and microplastics in sediment samples in the Port of Kavala (Eastern Macedonia and Thrace region). Microplastics were detected in all samples under investigation. Given the operational dredging that occurs within the Port of Kavala, and the subsequent dumping of sediment at an offshore disposal site, this finding is of concern and indicates that remediation of sediments before disposal might be required in future. Results indicated a widespread occurrence of microplastics in both environmental compartments, in agreement with previous studies, with varying concentrations according to locations within the port. Sites with higher particle concentrations were largely sites that have already been highlighted as macroplastic conduits. As preventing macroplastics is simpler than preventing meso- and microplastics, this is a good result and aids mitigation within ports.

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THE IMPACT OF PUBLIC UNIVERSITY ACTIVITIES ON GLOBAL AGENDAS

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Despite all the global agendas for Disaster Risk Reduction (DRR), integrated implementation is not coherent among local realities, mainly due to the need to train public agents on the subject.

In 2020, the United Nations Office for Disaster Risk Reduction (UNDRR) launched the “Making Cities Resilient MCR2030” Initiative to mobilize local managers in meeting international regulatory agendas and frameworks related to urban resilience and disaster risk reduction. (DRR).

In this context, the articulated activities between the Public University, the MCR2030 Initiative and local governments, demonstrate the aim of strengthening the capacity of local managers to develop strategies and plans to increase resilience, from the application of tools and methodologies aligned with the MCR2030 Initiative.

Finally, the objective is to present the results of the two editions of the online course “Making Resilient Cities - MCR2030”, implemented in the Portuguese-Brazilian language by a public university in partnership with the MCR2030 Initiative. The two editions had 147 Brazilian cities and 26 foreign cities and 86.5% of the course participants were public workers.

In this perspective, the quantitative and qualitative analyzes of the performance and knowledge of the course participants confirmed the relevance of the actions that make possible the democratization of information from major global agendas to the local level. In addition, the editions of the courses made it possible to publicize the MCR2030, boosting new enrollments from cities as well as mobilizing managers to develop actions based on the Tools aimed at the elaboration of the Local Resilience Plan.

THE COMBUSTION HEAT OF FOREST FIRES IN RELATION TO THE DIFFICULTY OF SUPPRESSING THEM AT OPERATIONAL LEVEL

Dr Iliopoulos Nikolaos
Greek Fire Service

An important goal of this study was how meteorological factors (wind and relative humidity) as well as the type and moisture content of the fuel, affect the combustion heat of a fire in a study area and consequently the fire hazard and the difficulty of extinguishing. Also, whether and how the description of spread of a forest fire at an operational level can be achieved, as well as the effect of forest firefighting forces, if the weather, topography and vegetation factors are known. The study area is the region of Attica, in Greece and especially the region of eastern Attica. The FARSITE (Fire Area Simulator) fire simulator was used. Specifically, it was confirmed that the intensity of the wind significantly affects the difficulty of extinguishing as it directly affects the speed of the fire. In the study area, for wind speeds of 70 Km/h (8 Bf), the possible fires, will develop into mega-fires in the first 30 minutes of their onset and the use of air means is imperative. With the intervention of a firebreak instead, the fires that will break out, in the first 30 minutes will be of medium difficulty and the use of machinery and vehicles is imperative. In summary, the above conclusions can be the first step towards systematization in immediate decision making and a valuable information tool at the operational level.

CRISIS MANAGEMENT AND CLIMATE CHANGE

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Climate change is contributing to the increase in frequent and severe extreme weather events, such as storms, droughts, heat waves and forest fires. There are very strong differences in these phenomena, while some parts of the world are affected more than others. The basic principle of tackling climate change is to manage risk (or risk) through the implementation of preparedness and response measures. It includes prevention, mitigation to an acceptable level or adaptation to climate change, preparedness for economic crises and pressures, and social development. Training and capacity building at all levels increase awareness, knowledge and skills that contribute to sustainability, intelligence and resilience. Dealing with security and protection aims to respect the right to privacy and public protection, as well as to prevent and manage risk in the city. If climate change cannot be reversed, we can at least mitigate its effects and adapt to its consequences.

PROJECT OF NATIONAL HAIL PREVENTION SYSTEM IN GREECE

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Hail is a big problem for Greece, causing a lot of financial damages and a politically and socially important problem – growing every year due to global climate change. Hailstorms and other related weather effects, bring substantial damage to the Greek land, property, crops and livestock, which has a serious effect on the livelihoods of Greek farmers and citizens leading to significant compensation payouts by the Greek state.

HPaaS is a qualifying project of the Green Greece initiative, and with an up to 95% efficiency of protection against hail, in practical terms – there will be no hail and represents the only available and viable solution. For the HPaaS service there is a single annual price per hectare covered that includes everything, encompassing consumables like the cost of fuel and of the anti-hail rockets, with no hidden or additional costs. The minimum area that can be contracted to be covered is a million hectares, and the discount pricing is as follows for larger areas:

up to 1.5 million hectares	up to 10 million hectares
35 € / ha + VAT if applicable	18 € / ha + VAT if applicable
up to 2 million hectares	up to 25 million hectares
33 € / ha + VAT if applicable	17.5 € / ha + VAT if applicable
up to 3.5 million hectares	up to 50 million hectares
29 € / ha + VAT if applicable	17 € / ha + VAT if applicable
up to 5 million hectares	above 50 million hectares
24 € / ha + VAT if applicable	16.5 € / ha + VAT if applicable

Assuming entire land of Greece is 13.1957 million hectares, and according to the country fact sheet of OECD on Greek land use, 39% of land is land used in agriculture, the equivalent of 5.146323 million of hectares is land that requires the HPaaS service. This results in the total annual price of coverage for Greece at 92.633814 million €. The Hellenic Agricultural Insurance Organization paid damages over 250 million € in 2020 for various items including primarily due to hail and hail related damages, and is on track to pay more in 2021 (estimated up to 40% more), while hail is estimated to cause in Greece annual damages in excess of several hundred million if you include the effects of 1) lower quality produce, 2) damage to flora and fauna, 3) damage to farm infrastructure including damage to electricity and telecommunication lines, 4) damage and costs to restore perennial plantings, and many other various damages, for instance like damage to roofs, cars and people.

Therefore, for the Greek state, the HPaaS service represent good value for money. Furthermore, there is no need by the Greek state to pay the entire cost of the HPaaS service upfront, with exception to the standard (one-time) 30% upfront annual payment on contract signing, and can pay the rest in monthly payments, allowing the state to stop paying if the service delivery is unsatisfactory, representing a low-risk financial model and allowing for accountability of the service provider – Grosvenor PC. There is also

no capital expenditure by the Greek state, all such costs including insurance, maintenance and repair burden exclusively the service provider.

In comparison to the reagent spraying aircraft model trialed in Greece, it is important to note the substantial economic savings in fuel and many other costs by removing the need to fly these expensive and mostly ineffective aircraft, not mention the health benefits. The benefit of using solely drones in HPaaS, an enhancement to the ground rocket launch model, allows to dispense with the high costs of securing locations and ammunitions on the ground and in transport (it is one thing to have 5 locations, and another to have 200).

The objective problem of hail, and its perception as a grave problem is so widespread in Greece, that it is prudent to state that presenting and implementing a no-risk technology like HPaaS to effectively completely solve this issue, can yield substantial political capital up to being responsible for winning elections. HPaaS is simple, there is no complicated infrastructure, it's simply buying a solution, a solution that has a defined start date, with no building and complicated delivery timelines required. It is also a very healthy solution – no waste or unnecessary dispersion of chemicals, and a very safe solution since drones have no crew.

APPLICATION OF RESILIENCE FRAMEWORK TO COVID-19: RE-FRAMING OUR WORK

Rustico “Rusty” Biñas

Freelance Consultant on Disaster Risk Reduction and Resilience Building

“We are all in this together but with differential disaster risk.”

Many would say that resilience is just a convenient buzz word used by development and humanitarian workers. But resilience is a framework and a tool determining the degree of risk. It describes measures to increase capacities and reduce hazard impact on people and element at risk to avert disaster.

“Disaster Risk Analysis” is a systematic process of consolidating the findings on a hazard, vulnerability, and capacity assessments to determine the risk levels for various elements at risk which are person, livelihood, infrastructures, ecosystem services, etc. The analysis contributes to the community’s awareness of potential COVID-19 risks for each element at risk and enables the community to define community action to reduce disaster risk. The “Resilience Framework” helps in understanding the interrelatedness of the capacities and guides the risk assessment. It is an essential precursor to decision-making in COVID-19 risk reduction, as well as the formulation of development policies, strategies, plans (development and contingency), programs, and projects.

Resilience is hazard-specific!

Resilience is people and element at risk specific!

Resilience is space-specific!

Resilience is time-specific!

Resilience requires specific attention which can be realized by the application of the “Resilience Framework”!

RISK ANALYSIS OF A BIOLOGICAL DISASTER IN THE COVID-19 PANDEMIC

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The purpose of this research is to find a reliable risk analysis for the biological disaster in the COVID-19 pandemic. The World Health Organization (WHO) announced that the SARS-CoV-2 infection was recognized as a pandemic in March 2020. This information initiated all the public health and emergency medical service strategies to contain transmission of the COVID-19 pandemic globally. Based on the WHO COVID-19 dashboard on 25 January 2022, 352,796,704 reported confirmed cases, including 5,600,434 deaths. As of 24 January 2022, a total of 9,620,105,525 vaccine doses have been administered. The COVID-19 vaccines had been extensively inoculated, yet some countries have not seen the full effects of the vaccine on the epidemic. Therefore, the biological disaster risk analysis of the COVID-19 pandemic should be emphasized to construct a comprehensive pandemic prevention system.

As the quantitative definition of "Disaster Risk" is equal to the product of "Hazard," "Vulnerability," and "Exposure." In order to evaluate the COVID-19 pandemic risk, mortality can signify the meaning of "Hazard" due to the vital damage of human life by the pandemic. "Vulnerability" is related to infection rate, basic reproduction number (R_0), percentage of people older than 65 years, occupation rate of hospital beds, non-inoculation index. The population density will represent the significance of "Exposure." All the parameters will be treated with the Z-score conversions to standardize the COVID-19 pandemic risk.

When such analyses detect the risks of the COVID-19 pandemic, the government can take some appropriate actions to reduce the SARS-CoV-2 infected population.

PROCESSES OF SOCIO-ECONOMIC EXCLUSION IN COVID-19 INFECTION DURING LOCKDOWN. THE MADRID CASE STUDY

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The objective of the research is to determine whether generalized lockdown, as a strategy to contain the contagion, has brought homogeneous health benefits among the entire population or whether, on the contrary, the measure has had a differential effect depending on the socioeconomic status of the territory. For this purpose, the relationship between certain sociodemographic indicators and the evolution of the outbreak has been studied by applying latent growth models. This is an ecological study whose units of analysis are the total number of basic health zones that make up the city of Madrid (N = 134). The results of the growth models have shown that both education and age are significant predictors of contagion. With regard to education, it was found that the lower the educational level of the neighborhood, the higher the incidence of COVID-19 cases in the area. With respect to age, the older the area, the higher the incidence. Furthermore, it has also been noticed that both variables sustain a significant interaction with the time variable, which means that the association becomes stronger as the period of lockdown progresses. The results of the research show that generalized lockdown has reported differential effects depending on the socioeconomic status of the territory. These findings are key evidence for the rethinking of the strategic repertoire against pandemic outbreaks, towards new, more precise measures that obtain more efficient and equitable results.

DISASTER RISK ASSESSMENT OF LAND SUBSIDENCE AREAS UNDER CLIMATE CHANGE: THE CASE OF CHOUSHUI ALLUVIAL FAN

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For a long time since the industrial revolution, humans have burned enormous amounts of fossil fuels, causing an increase in the concentration of greenhouse gases in the atmosphere, leading to global warming after a long period of accumulation. In addition, changes in atmospheric gas concentrations cause changes in rainfall patterns. As a result, climate change increases the frequency of extreme climate events, such as heavy rains, droughts, and forest fires. In recent years, many abnormal climate events have occurred in Taiwan, including the massive flooding caused by typhoon Fanapi (6-hour cumulative rainfall over 600 mm) in 2010 and the most extensive drought in Taiwan in 2021, both of which caused enormous damage. Many studies have been conducted to assess the risk of abnormal rainfall and drought events, but few studies have been conducted on land subsidence. Therefore, in this study, the land subsidence area of the Choushui alluvial fan was used as the study area, the hazard and vulnerability factors that may affect the area were collected and analyzed. The risk assessment method was established by combining the hazard and vulnerability factors in a risk matrix approach to investigate the disaster risk of the study area when the stratigraphic subsidence area was exposed to an abnormal rainfall event. The above findings can help government agencies to develop area-specific disaster prevention strategies and contingency, enhancing disaster response capabilities in the future.

DOES TEMPORAL ENHANCEMENT IN ACCUMULATED STRAIN CONSEQUENT TO LUNAR ALIGNMENT IN WESTERN HEMISPHERE ACCOUNT FOR RECENT SERIES OF TREMORS AT NCR DELHI

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In one month of June 13-14'2020 series of tremors were observed at NCR Delhi with apprehension of major shock. Doubt of facts is eliminated on the basis of temporal rise in gravitational potential energy and its estimated distribution of energy equivalent to subsequent tremors. Enhancement in accumulated strain turns stress generation Indo Australian –Cino Tibetan destructive plate boundary and subsequently release in energy by intermittent drop in form of tremors is observed. The seismic events are accounted as lunar alignment with Sun and earth in western hemisphere seven days prior events. Mechanism and theory behind is exhibited by Mathematical modeling and support of Rock mechanics. Newtonian Gravitational law plus Stokes Viscosity concept permitting mantle -Crust interface preparing simultaneous scenario of middle size Shocks at Japan and Taiwan 5.6M and 6.1 M respectively on 13-14 June as per expectation.

EARTHQUAKE EARLY WARNING SYSTEMS: A REVIEW WITH APPLICATIONS IN GREECE

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Catastrophic earthquakes have always been a major threat affecting the world's population and economy with the most disastrous consequences in urban areas. In order to tackle this fact, scientists from the mid 19th century showed interest in finding ways to inform about a forecoming earthquake event but only after 1960 did it find application with the evolution of technology. As a result of this effort came the development of the Earthquake Early Warning System (EEWS) as a new method for seismic risk mitigation. This system has evolved to detect earthquake parameters such as hypocenter, magnitude and time while disseminating alarm signals to the sites affected by the earthquake for societies to take the necessary actions. Its function is based to the fact that information travels faster than seismic waves and that s-waves travel faster than p-waves in an earthquake signal. Nowadays, EEWS are operational in several countries among which Mexico and Japan while action has been taken to be used in more countries. EEWS are becoming a significant tool for the reduction of seismic risk, despite its current restrictions, preventing loss of human lives and resources reducing the economic loss. In this paper EEWS are discussed and their application in Greece is presented to give an insight to state-of-the-art. Basic methodology, cost of operation and reliability limitations are examined while a possible improvement of their efficiency with the use of artificial intelligence and neural networks is discussed.

PROBABILISTIC SEISMIC RISK ANALYSIS OF URBAN ROAD NETWORKS IN MOUNTAINOUS AREAS

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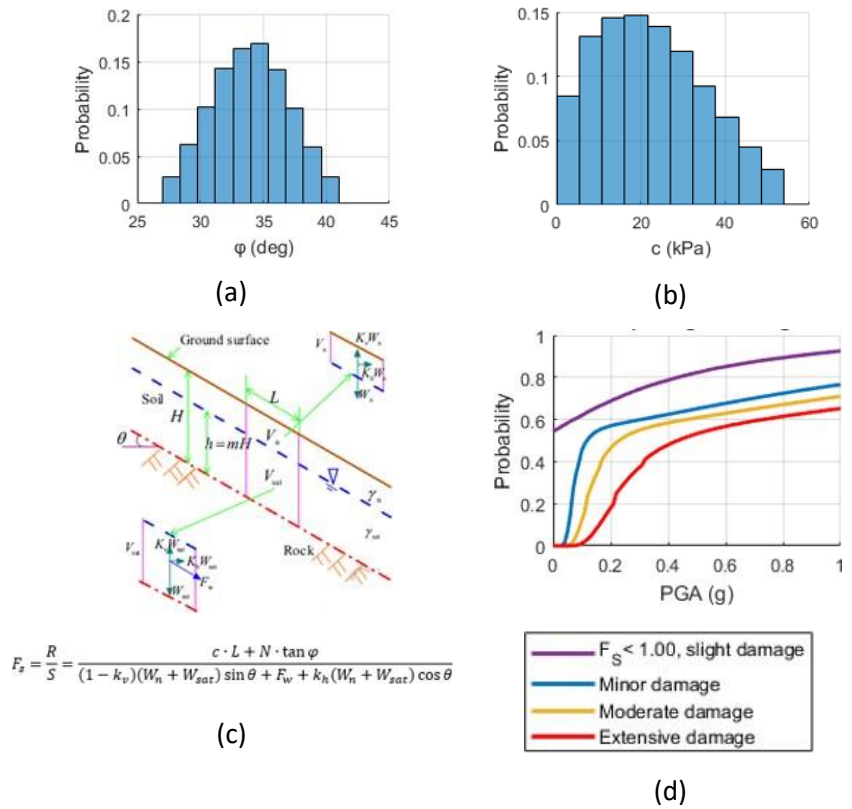
The natural ground relief in mountainous areas is usually modified, by creating cuts and embankments in order to facilitate the construction of roads.

Risk is defined as the convolution between exposure, hazard and vulnerability of assets. The purpose of this study is the assessment of seismic risk of road networks in mountainous areas in Northern Greece. Vulnerability is defined in terms of fragility curves, which express the probability that a structure will reach a damage state with respect to the intensity of the considered hazard. Risk assessment is performed along a vertical road axis connecting the city of Komotini and the Hellenic-Bulgarian borders (Fig. 1). Fragility curves are developed for cuts, using material properties probabilistically defined for relevant geologic formations, incorporating the infinite slope sliding model (Fig. 2, 3). The sliding safety factor (F_s) and permanent ground deformations (PGD) are considered as damage indices and specific thresholds are assigned to express multiple damage states (Table 1). The verification of the proposed fragility curves is made against local slope instability analyses for static loading conditions (Table 2). Stabilization measures, implemented on specific cuts after the initial construction, further verify the fragility curves (Fig. 4).

Combining the probabilistic seismic hazard, fragility and exposure input, probabilistic seismic damage distributions for 10, 50 and 100 years are derived (Fig. 5). Results indicate the low probability of significant traffic disturbance due to earthquake for a 10-year period. For longer time periods significant traffic disturbance is likely to occur.



Figure 1: Vertical Road axis under study. The relevant geologic formation codes are depicted whereas the white dots indicate the cut slopes for which seismic risk has been undertaken.



$$F_s = \frac{R}{S} = \frac{c \cdot L + N \cdot \tan \phi}{(1 - k_v)(W_n + W_{sat}) \sin \theta + F_w + k_h(W_n + W_{sat}) \cos \theta}$$

Figure 2: Derivation of fragility curves for cut slopes. a) Definition of geologic formation material properties, b) implementation of infinite slope sliding model for Monte Carlo simulations, d) Example of fragility curves for various damage states

Table 1: Definition of damage states due to ground shaking.

Damage state	Min PGD (cm)	Max PGD (cm)	Mean PGD (cm)	Road serviceability
Slight	-	-	-	Defined for $F_s \leq 1.0$, open road
Minor	2.0	8.0	5.0	Open, reduced speed limits or partially closed roads
Moderate	8.0	22.0	15.0	Closed or partially closed road
Extensive	22.0	58.0	40.0	Closed road

Table 2: Verification of proposed fragility curves through site-specific slope stability analyses

Cut slope	Geologic Formation	Slope angle (°)	$F_{S_{local}}$	$P(FS < 1)$	$P(FS < 1.25)$
O5	Ab, mr2	45	0.992	0.6	
O14-O15	Ab, mr2	45	0.97	0.7	
O16	Ab, mr2	56	1.122	0.87	0.93
O21A	Ab, mr2	63	0.83	0.87	
O21B	Ab, mr2	63	1.22	0.87	0.93

Book of Abstracts

O32	lp.gn	63	1.01	0.58	0.71

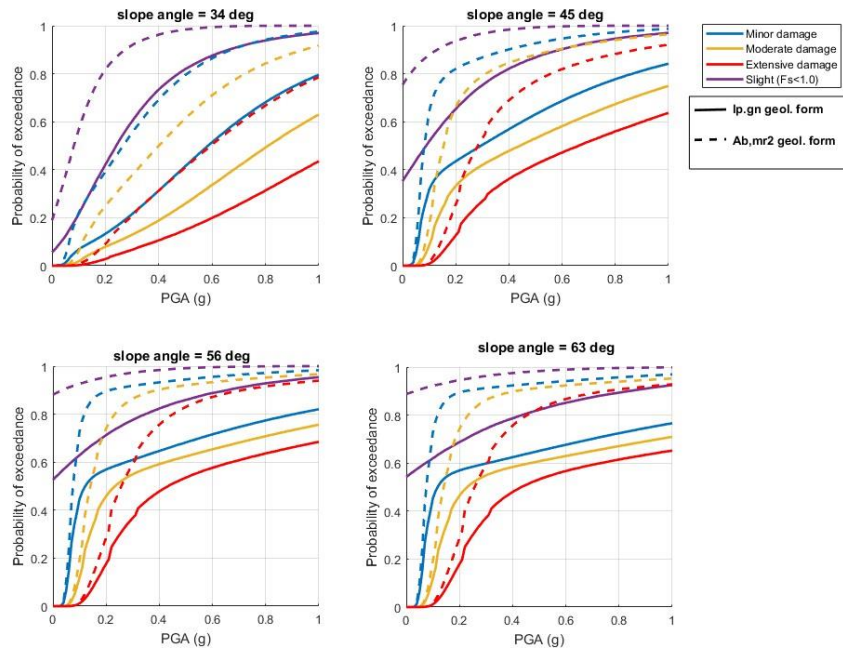


Figure 3: Fragility curves developed for various damage states and relevant geologic formations (solid line: lp.gn, dashed line: Ab,mr2).

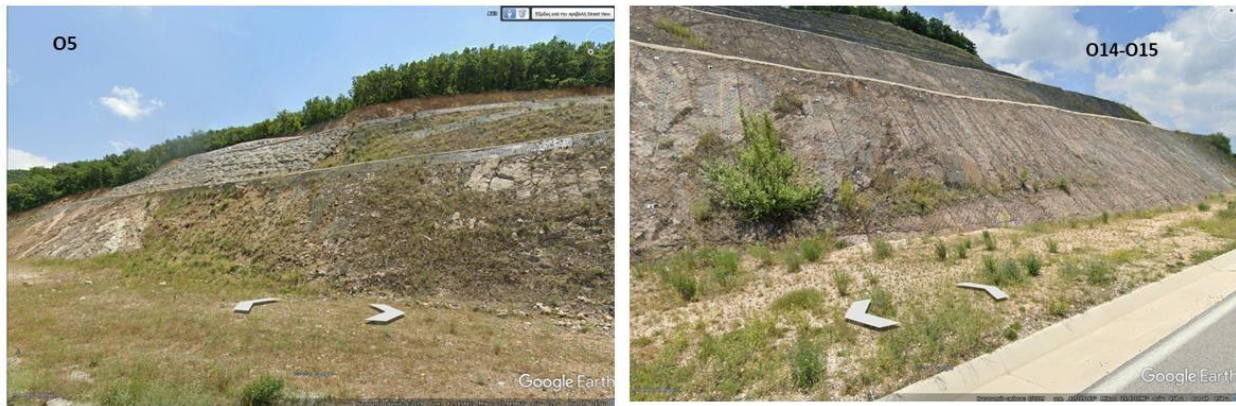
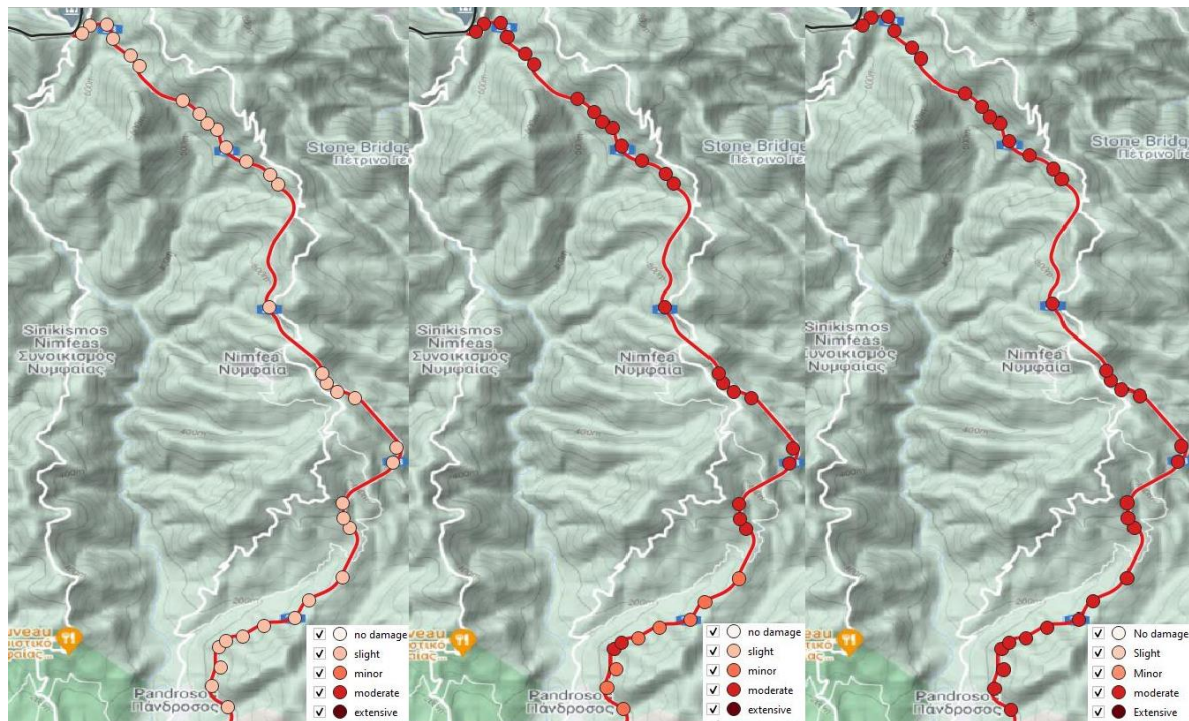


Figure 4: Examples of stabilizations measures taken for some the cut-slopes considered, after the initial construction, verifying the calculation of F_s from local analyses ($F_s < 1$), as well as, the proposed fragility curves under static loading conditions



(a)

(b)

(c)

Figure 5: Probabilistic seismic damage distribution for cut slopes for investigation time of a) 10, b) 50 and c) 100 years

A METHODOLOGY FOR TEMPORARY SCAFFOLD DESIGN CONSISTENT WITH THE ASEISMIC DESIGN CODES

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Usually during the first hours after a major earthquake event, temporary scaffolding arrangements are placed to buildings that are heavily damaged in order: (i) to allow rescue teams to work safely; (ii) to avoid partial or total collapse of the structure until permanent retrofit measures are applied.

Common methods of shoring and temporary retaining structures include the placement and interconnection of timber and steel scaffolds and cross sections that are properly wedged to the main bearing structure; however, these measures are rapidly implemented within a limited timeframe, following a rather empirical procedure based on previous experience. Also, there is a lack of a more rational assessment of their effectiveness, especially regarding their lateral load bearing capacity.

Recent seismic sequences have shown that significant damages and even collapses can be caused by aftershocks in buildings that were inappropriately supported after the first damaging earthquake event. This extensive damage may have been avoided if a suitable temporary shoring scheme had been applied. In this paper a methodology for a concise design of temporary scaffolds is presented for seismic prone areas. The major concept of the design is to provide the scaffold the structural integrity to reliably undertake the seismic loads of a possible aftershock. The importance of contact mechanics is addressed to model the connection between the shoring elements and the main bearing structure. The methodology might be useful also for a more rational implementation of scaffolding at archaeological sites where propping often remain for a significant period of time.

DAMAGE DETECTION IN FIBER REINFORCED CONCRETE SPECIMENS THROUGH THE APPLICATION OF A NOVEL STRUCTURAL HEALTH MONITORING SYSTEM

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Nowadays, due to the deterioration in existing structures, there is an extended need for precocious damage detection in reinforced concrete structures. Real-time applications of Structural Health Monitoring (SHM) via piezoelectric sensors are up to this task.

The present study presents Synthetic Fiber Reinforced Concrete (SFRC) prismatic specimens subjected to four-point bending with dimensions 150×150×450(mm). Prisms are subjected to repeatable loading (loading, unloading, reloading, etc.) using three different load levels which correspond to 25%, 40% and 70% of maximum flexural strength. Then, specimens reload until their consumption of load-carrying capacity and fracture from pure bending in the mid-span.

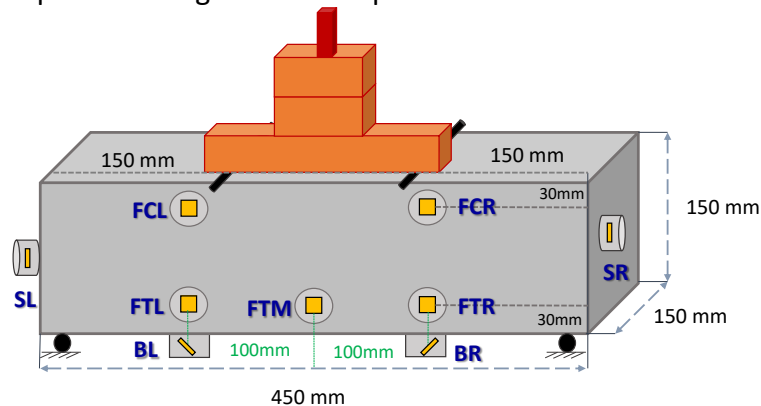


Figure. Specimen and test setup

The real-time evaluation of the structural integrity of the examined structural member was carried out via the Electromechanical Impedance (EMI) method on an array of Piezoelectric lead Zirconate Titanate (PZT) transducers that have been epoxy bonded to the surface of the SFRC specimens in locations shown in Figure. The purpose of the EMI method is to correlate the frequency response changes of the attached PZT transducers with the crack propagation and the formation of damage.

Test results of this study indicate strong potential in precocious identification of damage in SFRS specimens. Simultaneously, a crucial observation for the prompt damage diagnosis prior catastrophic failure is the strategic positioning of PZT transducers in the specimen surface in order to secure their structural resilience.

RECENT DEVELOPMENTS IN RISK MITIGATION OF GEOHAZARDS USING NEW TECHNOLOGIES, EXAMPLES FROM GREECE

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The lecture will present how new technologies can be effectively used for the reconnaissance, assessment and mitigation of geohazards, mainly related to slope instabilities. A resilience management framework, consisting of 4 stages (monitor – predict – respond – recover) will be discussed. The use of new technologies, in combination with traditional field reconnaissance provides a very effective method for identifying the actual risk areas affecting infrastructure works. It also further enables the assessment of slope stability conditions considering different triggering scenarios (rainfall, earthquake etc). UAV-enabled mapping has been recently used in case studies in Greece for the early impact assessment and study of slope instabilities. The cases that will be presented are mainly landslides and rockfalls impacting highways, sea canals and touristic coastal areas.

THE RELATIONSHIPS BETWEEN TECTONICS AND VOLCANISM IN SANTORINI

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The relationships between tectonics and volcanism are fundamental questions in modern Earth Sciences. How do volcanoes react to external forcings, how sensitive are these interactions, and what are the feedbacks? The Christianna-Santorini-Kolumbo (CSK) volcanotectonic line in the Southern Aegean Sea (Greece) is an excellent natural laboratory for the study of these questions, lying as it does in a 100-km-long, 45-km-wide rift zone that cuts across the Hellenic Volcanic arc. The line hosts volcanic centres including the extinct Christianna Volcano, Santorini caldera with its intracaldera Kameni Volcano, Kolumbo seamount, and 25 other submarine cones of the Kolumbo chain. It is one of the most important volcanic fields in Europe, having produced more than 100 explosive eruptions in the last 400,000 years, the mass flows from which have poured into the surrounding submarine basins. During the IODP Expeditions 398: Hellenic Arc Volcanic Field, drilling the fills of these basins will enable access to a complete record of the sedimentary, environment, tectonic and volcanic evolution of the CSK line since the Pliocene, enabling high-resolution reconstruction of the evolution of the rift and its volcanoes.

AN AGENT-BASED METHODOLOGY ON HOW WORLD CULTURAL AND NATURAL HERITAGE MONUMENTS CAN BE PROTECTED FROM RISKS

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Natural and man-made disasters lead to hundreds of casualties and significant catastrophic consequences, affecting world Cultural and Natural heritage sites. Many of these Monuments are at risk due to even moderate Natural or man-made hazards, given the structural vulnerability created over the course of their hundreds or even millennia of existence. Unfortunately, in recent decades the number of disastrous natural phenomena has increased, such as floods, fires, earthquakes and others, causing both social and economic problems and adverse effects on heritage. Therefore, local, national and regional networks, as well as national bodies and academic institutions in order to optimally protect heritage in emergencies merge their efforts. To this end, novel approaches that could assist on protecting them is undoubtedly imperative. The current work presents part of INBO, a methodology that brings together artificial intelligence, risk assessment techniques and even stakeholders. More specifically, the article clarifies the added value of the approach focusing on the intelligent agent technology that acts a virtual alter ego of our world without the limitations of the human factor. The aim of INBO methodology is to improve the way in which first responders and monument managers, even visitors, react to and handle risky or emergency situations. INBO enables the right prognosis along with smart decisions that will help prevent potential damage to the heritage without human losses. Hence, the proposed smart awareness and management solution, based on accurate information and the right knowledge, will be able to automatically make or propose the right actions and decisions.

CREATING A TWO-DIMENSIONAL MODEL FOR PREDICTING POSSIBLE FLOOD PRONE AREAS BY USING HEC HMS AND HEC RAS SOFTWARE PACKAGES. THE CASE OF XIROPOTAMOS WATERSHED IN DRAMA, GREECE

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Floods are considered one of the natural disasters and due to the proven climate change, they are considered as one of the most important threats. They affect the largest number of people compared to other natural disaster, jeopardizing human lives, properties and infrastructures. For that reason, there should be plans for their management and treatment. The key for the development of the plans and the goal of the paper is the creation of maps of possible flood prone areas in the study area which is Xiropotamos - Drama, by using a two-dimensional hydraulic model ensuring optimal results. The followed procedure is hydrological and hydraulic simulations by using HEC HMS and HEC RAS software packages. Moreover, the Object Based Image Analysis method of remote sensing with the usage of Trimble eCognition software was used to determine land uses. The analysis of the hydrographs shows that the maximum flow for a return period of 50 years is 386.3 m³ / sec while for 100 years is 499 m³ / sec. From the hydraulic simulation for the return period of 50 years, the water height is 4.66m while for the return period of 100 years, it is 5.87m. The results of the paper are preliminary elements of the research program KEDIAK (Risk and Resilience Assessment Center), and relate to the development of risk models and quantification of flood risk, for the Region of Eastern Macedonia - Thrace.

FIRE RISK ASSESSMENT IN WUI – WII IMPLEMENTING BAYESIAN NETWORKS TO INFER FIRE SPREAD PROBABILITIES

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The current state of development achieved in our society parallels our impact on the environment. Even though natural disasters have shaped human history, anthropogenic processes also catalyze large-scale disasters, being climate change a paradigmatic example: droughts and high temperatures trigger wildfires beyond what is acceptable to be environmentally sustainable. Unprecedented levels of industrialization and urbanization in history foster wildfire menace. Wildfire-Urban Interfaces (WUI) and Wildfire-Industrial Interfaces (WII) are relevant domains of wildfire impact, demanding efforts in all the aspects of the disaster management cycle to build resilience.

In this scenario, fire modelling tools help assessing risks in those interfaces. Fire spread is a complex physical phenomenon. To that aim, WUI-WII fire spread models need to be physically sound and scalable to geographically extended areas, which demands alternative computational approaches to comprise every possible fire exposure risk.

Dynamic Bayesian Networks (DBN) are a promising tool to infer fire spread probabilities, which depend on the landscape, wind, fuel constituents and weather variables. Our work explores novel efficient ways of interpreting fire spread as marginalizing node probabilities from network topologies representing geographical scenarios. DBN General-purpose commercial libraries are available, but they are not designed explicitly for modelling spatio-temporal physical problems. This limits their applicability to dynamical parameter updating or their impossibility to infer the main underlying physical parameters. To that aim, we propose a framework that will ultimately help to develop new open-source codes that may contribute to the field in future research.

MULTI-SOURCE EO DATA FUSION FOR REGIONAL FOREST FUEL MAPPING AT REGIONAL SCALE

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Accurate and up-to-date forest fuel maps are a prerequisite for efficient forest fire management, being a critical component of wildfire risk assessment and mitigation efforts. Earth Observation (EO) data has proven to be a useful information source during fuel mapping projects. However, the integration and use of multisource EO data remains a challenging task. Optical satellite imagery has been widely used for fuel type mapping while several studies have found that Synthetic Aperture Radar (SAR) imagery enhance vegetation type classification when used in combination with optical multispectral data. Additionally, other studies have related topographic variables such as elevation, slope and aspect, to vegetation distribution phenology and forest mapping.

In the present study, we assessed the synergistic use of Sentinel-1 and Sentinel-2 along with topographic variables to discriminate site specific forest fuel types within Prefecture of East Macedonia and Thrace, in Northern Greece, using a machine learning classification algorithm. The fuel mapping efforts are implemented within the framework of the Risk and Resilience Assessment Center for the Infrastructure of Eastern Macedonia and Thrace Prefecture.

Random Forest models were developed based on a) ten spectral indices (SP), b) the integration of spectral indices and topographic variables (SPT) and c) the synergistic use of spectral indices, topographic variables, and backscattering information (SPTS). The SPTS model yielded the highest overall accuracy (OA) of 91.57%, followed by SPT (OA = 89.52%) and SP (OA = 77.32%).

ANALYSIS OF TECHNOLOGICAL INTERVENTIONS TO LEVERAGE INVESTMENT IMPACT ON FOREST FIRE CONFRONTATION OPERATIONS. THE GREEK EXPERIENCE

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Authorities and societies seek to address the major environmental issue of protecting the forests against wildfires through improved stakeholders' readiness and effectiveness. The main objective of this article is to inform the local authorities that the impact of technological systems introduction in disaster management is depended on the adopted organizational context and the implemented strategy. The research question of this study is to explore the role of 17 technological systems that were established in specific areas around Greece, after the mega-fires of 2007 and how reacted to the effectiveness of local communities against forest fires. The research was conducted by a mixed methodology. The material was obtained from operational officers in crisis management authorities and oversight bodies by open interviews, focus groups, participatory observations, and public databases. The outcome confirms that the adoption of an effective policy of technological systems in the context of forest protection against fires is in fact valuable but also an unexploited approach. Findings indicated that the highest benefits cannot be drawn if forest fire protection technological systems are not designed centrally, and are not distributed for concurrent use by different collaborating bodies with diverse responsibilities and jurisdiction levels. It is argued that such systems should provide a unified effective administration of incidents and support the efficient coordination of resources, provided that key users actually operate properly those systems. Inefficiencies in the utilization and underperformance of technological systems often come about the lack of proper integration in terms of organizational or operational aspects.

MCI'S IN GREECE SINCE 1996. ARE WE READY TO FACE THEM?

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In a generally hostile field worldwide, full of mass casualty incidents (MCI's), Greece could not be an exception. This is an effort to collect the deadliest MCI's in Greece since 1996 in order to identify and understand the differences between them by kind but basically to conclude on those guidelines that must be followed no matter what. Because of its geographical position and oddity Greece has been vulnerable on many and different kinds of MCI's. In combination with its strategical place and social particularities and among the internal social and economical issues Greece has been the European country that received the majority of refugees during the last decade, mainly by sea, with unfortunately many MCI's happening on these poor and unsafe efforts with thousands drunk people including children. Using internet's information's about the majority of Greek MCI's the purpose is to understand the local level of crisis' readiness and preparedness through the relative carriers and hopefully to increase the national obligation to cooperate, confront and succeed beyond those challenges.

In order to be prepared, in relationship with the Civil Protection, all carriers and their personnel must frequently get educated, test their abilities due to trials and further to participate in cooperative trials. Through these procedures the suitable authorities should check the status of the basic fundamentals that must be present such as: communication, evaluation, progression's level, progression's ways.

PREDICTING THE OCCURRENCE OF COMBUSTION IN THE PRODUCTION OF POLYURETHANE FOAM DURING THE STORAGE PROCESS FOR TEMPERING

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Objective: This report analyzes the thermodynamic relationships of "freshly produced" polyurethane foam and its secondary ingredients. The reason for which was a fire in a warehouse for subsequent tempering of a finished commercial product. Combustion and / or thermal decomposition products of polyurethanes are among the most toxic substances directly threatening the life of the population.

Research problem: Modeling the thermodynamics of combustion of a commercial product is extremely difficult due to the large number of isomeric molecular forms that are difficult to distinguish from classical science.

Methodology: An adapted model of methodological scheme is applied, describing the fine specifics of the relationship between theoretical (statistical) and applied thermodynamics. The object of the study are: polyols, isocyanates, crosslinking agents, fillers, lubricants, catalysts, free water and carbon dioxide.

Results: The general functional dependence (presented in graphical form) between the main thermodynamic variables describing the process of self-ignition in the specific case is constructed.

Conclusion: Incomplete technological inhibition of the catalyst is the leading cause of self-ignition of polyurethane foam during the storage process for tempering. **Applicability of the results:** The modern control of the technological processes is easily synchronized with the fire-fighting installations. Thermal chambers could be set to a more sensitive mode at certain hours of chanting. If necessary, automatic systems would work by correcting factors of the storage environment, such as humidity, temperature, ventilation, etc. These actions would lead to overconfidence in fires and disasters, especially in urban environments.

THE ARFF MANAGEMENT MODEL OF FRAPORT GREECE

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Aircraft accidents or incidents are relatively rare but when they do occur, they have a major impact on lives and corporate economic figures.

Although the largest number of fatal accidents occur during the flight and approach, most incidents occur during landing at the airport, demonstrating the important role of airport's firefighting services in preventing human casualties.

In 2017, Fraport Greece undertook the modernization and management of 14 Greek regional airports in which in 2019, more than 30,000,000 passengers traveled.

The management model of fire and rescue services in relation to other stakeholders in the field such as the state fire service will be presented, and what has been done within these five years to strengthen fire and rescue response as well as compliance with international and national regulatory framework.

HOW USEFUL IT IS TO GAIN KNOWLEDGE OF HUMANITARIAN NORMS?

Frei Luciano (Francesco Gullo)

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Emergencies mobilize sectors of society that need an initial guide and orientation based on international standards to meet the exceptionality foreseen in these contexts, providing local agencies, governments, and civil society with tools for intervention. The training helps focus on priorities both at the protection level and at the level of assistance from basic items through to healthcare and housing. If States, regions, and cities know the protocols and have a contextualized approach to the exceptional scenario, it will be easier to prevent overloads on local systems and infrastructures and will make the intervention more effective and with greater synergy between actors. One of the biggest challenges in emergencies is coordination and optimization, due to several factors, and the knowledge of Sphere standards can help to focus on priorities, create emergency schedules and thus provide a more efficient and balanced humanitarian response.

PHILOSOPHY OF THE ROMANIAN EMERGENCY SITUATIONS MANAGEMENT SYSTEM

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Every day, through the media, the population is informed by news about the occurrence in the country or abroad of unwanted events with negative, natural or anthropogenic consequences, such as: fires, forest and vegetation fires, floods, earthquakes, tsunamis, storms, tornadoes, heat waves that result in a large number of victims in urban areas, zoonoses, road accidents, railway accidents, technological accidents that result in the release of harmful substances into the atmosphere, explosions, etc. It is also reported that they are serious, major, catastrophic, extreme or very large. At the same time, it is frequently communicated the establishment of the state of alert, of the emergency situation, of the zero-degree alarm, of the state of emergency, of the state of crisis, or of another exceptional measure. The series of expressions used in connection with such events may continue.

Thus, the “*emergency situation*” can be defined as the totality of fortuitous and exceptional circumstances which determine, at a given moment, the problematic conditions of the existence of a human being, a community or an activity and which require immediate resolution.

There are a number of arguments that have required and still require the rethinking of the structural conception of the management of those situations which subsume exceptional and, at the same time, undesirable events, which have a non-military character and which, by *magnitude* and *intensity*, threaten the life and health of the population, important material and cultural values, and in the event of their occurrence, urgent measures and actions needed, the allocation of additional resources and the unitary management of the forces and means involved are necessary for the restoration of normality.

The major effects of the disasters on the civilian population, as well as the alignment with the standards of the European Union and NATO, required that an integrated Emergency Management System be created in Romania, able to ensure a prompt response and avoid as much as possible the loss of human lives, namely the *National Emergency Situations Management System (SNMSU / NESMS-eng.)*.

ADAPTIVE STRATEGY IN PREPARING FIRE BRIGADES TO DISASTERS IN POLAND

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The purpose of the study was to investigate factors shaping preparation processes in fire brigades operation to disasters in Poland in the light of adaptive strategy. The research problem took a form of a question: How should be shaped the adaptive strategy in preparing fire brigades to disasters in Poland? The methodological layer based on review and systemic comparison of information related to disasters in Poland as well as formal documentation reflecting operational mechanisms for the fire brigades which operated when the disasters had occurred. The essential conclusion is that adaptive strategy in strengthening preparation of fire brigades to disasters should base not on the disaster data but on the disaster risk. As the data concerns past events, the risk concept allows to consider past, current and future issues determining fire brigades efficiency in terms of disasters. The research gives reason why Sendai Framework of Disaster Risk Reduction should be implemented in operational realm to emergency services. It allows to formulate also practical guidelines how to do this in systemic way. The guidelines should respect crucial disaster risk determinants: hazard, vulnerability, exposure, coping capacity and resilience (of emergency entities).

SYNERGY EFFECT OF ENTITIES ASSOCIATED IN THE NATIONAL FIREFIGHTING AND RESCUE SYSTEM OF REPUBLIC OF POLAND

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The objective of the presentation is to describe the results of research on the synergy impact of entities associated in the National Firefighting and Rescue System of Republic of Poland.

Last decades brought about numerous dynamic changes in security strategic environment. The key issue is to understand the significance of relations between fire safety and state safety. The institution of the state allows to achieve a high-quality level of rescue and civil protection. At the same time, effectiveness of rescue system is expressed by the integration and synergy of efforts of individual services and entities responsible for rescue.

The lecture refers to the functioning of the State Fire Service, Military Fire Protection Service, volunteer fire brigades and other entities in the National Firefighting and Rescue System of Republic of Poland.

It is crucial for the system to be able to respond effectively in times of peace, crisis and war. Therefore, one of the most important challenges for fire protection is the permanent, effective and rational connection of its potential elements in one system. The further development of operational capabilities, the integration of specialized rescue procedures and the development of the abilities to deal with CBRN threats are of vital importance.

The complexity of the issues undertaken, as well as the subject and area of the research, determined the use of methods in the research process, such as:

comparison, analogy, generalization, analysis, synthesis.

CROSS-BORDER COOPERATION ON FIREFIGHTING ACTIVITIES AND PROFESSIONAL COMMUNICATION

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Objective: This report examines the need to acquire basic knowledge and skills in the Balkan languages in order to support professional communication between fire services in the Balkans.

Research problem: The exchange of information, the coordination of activities and the co-operation between the fire services in the Balkans require written and oral communication on professional matters, which is usually done in English. Today the English language is undoubtedly considered as the modern lingua franca. English is the main language of science, education and interpersonal communication in many countries around the world. Modern lingua franca is the main means of communication in multinational groups abroad, it is also the main language of vocational training and professional communication. However, according to the Belgian philosopher of law, François Ost, Europe thinks in different languages, its language is translation and would be politically and culturally crippled if it obeyed the hegemony of English as the only means of communication.

Methodology: theoretical analysis of the available literature on the topic we have chosen.

Results: The exhibition presents a variety of possibilities for encouraging the learning of Balkan languages, in order for professional communication in the Balkans to maintain its Balkan tone.

Conclusions and application of the results: The Balkan languages can be used to improve professional communication and to be used in the context of existing regional and cross-border cooperation.

A VULNERABILITY ANALYSIS TOOL FOR FIRST RESPONDERS – DEVELOPMENT AND EVALUATION

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Vulnerability strongly influences the magnitude of negative consequences of natural and manmade disasters for people and communities. Manmade disasters (e.g., CBRNe incidents, terrorist attacks) can lead to a large number of victims and often require evacuation. Here, our vulnerability analysis comes into play, as a tool to identify the potential number of affected buildings and people. Such estimations are highly relevant for first responders to assess the required resources from a technical and medical perspective. We have developed and evaluated a vulnerability analysis tool for calculating the number of affected buildings and the number of affected people, categorized by their potential injuries as well as the medical resources needed for their on-site treatment. It also offers the functionality to estimate the number of vulnerable people that may need special care (e.g., people who are not mobile). The tool can be used beforehand, for a fast calculation at the beginning or during the operation. The main findings of the mixed-methods evaluation study highlighted the tools' potential for the practice of first responders, due to its simplicity. Its functional and trustworthy calculations were emphasized. Suggested enhancements included adding categories (e.g., buildings equally used for private and business) as well as the combined use with other tools (e.g. tools for localizing of POIs, online GIS systems) for a faster and more valid estimation of the affected area and identification of buildings.

CONCORDE: A STATE-OF-THE-ART EMERGENCY & CRISIS MANAGEMENT PLATFORM

Dr. Angelos Liapis

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Apart from earthquakes that usually result to catastrophic structural collapses, with many people entrapped or killed (e.g. Indonesia 2018, Japan 2011, Haiti 2010, Italy 2009, Greece 1999), there are also other causes that may result into a building's collapse, such as an accidental explosion or a terrorist attack (e.g. 9/11) in public areas or critical infrastructures (airports etc.). Moreover, natural disasters like earthquakes may trigger technological disasters, such as industrial chemical release or even fires; this dynamic or "domino effect", as it is called may pose tremendous risks to the countries and communities and hence it is a great challenge to cope with by the first responders and relevant organizations of civil protection.

CONCORDE features a highly interoperable, modular open architecture platform for first responders' capitalising on expertise and technological infrastructure to improve preparedness and interoperability amongst first responders and medical services at a local, regional or cross-border level.

TECHNOLOGICAL CHALLENGES FOR FIRST RESPONDERS IN CIVIL PROTECTION; THE RESPOND-A SOLUTION

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Summer 2021 was marked by a number of prolific fires in the EU (Greece, Cyprus, France) as well as outside the EU (USA, Turkey, Israel). This series of dramatic events has stretched national civil protection systems and first responders in particular. Despite the introduction of National, Regional and International frameworks (e.g. rescEU), a number of challenges has arisen, not only related to climate change.

RESPOND-A (funded by the European Commission by Horizon 2020, Contract Number 883371) introduces a unique five-tier project architectural structure for best associating modern telecommunications technology with novel practices for First Responders of saving lives, while safeguarding themselves, more effectively and efficiently. The introduced architecture includes Perception, Network, Processing, Comprehension, and User Interface layers, which can be flexibly elaborated to support multiple levels and types of customization, so as, the intended technologies and practices can adapt to any European Environment Agency (EEA)-type disaster scenario.

During the preparation of RESPOND-A proposal, some of our First Responder Partners expressed the need for an information management system that could boost existing emergency response tools, while some others envisioned a complete end-to-end network management system that would offer high Situational Awareness, Early Warning and Risk Mitigation capabilities. The intuition behind these needs and visions sits on the long-term experience of these Responders, as well, their smoldering worry that the evolving threat of climate change and the consequences of industrial accidents will become more frequent and severe.

Three large-scale pilot studies are planned in order to illustrate the capabilities of the RESPOND-A system. The first pilot study will focus on the deployment and operation of all available technologies for continuous communications, enhanced Situational Awareness and improved health and safety conditions for First Responders, according to a big fire scenario in a Wild land Urban Interface zone (WUI). An important issue will be examined during the second pilot study. One vital communication path is severely affected during and after a crisis. This is the flow of information from citizens to First Responders, therefore information from the affected areas and communities in need are not reaching the First Responders' Call Centers. Because of this absence of crowd sourcing information, the First Responders have limited information about the aftereffects of the crisis. Because people are on streets, Responders should use helicopters to perform rapid area surveys and assess the situation themselves. Furthermore, there is need for common operations between First Responders from various disciplines (e.g. para-medics, Fire Fighters, police officers, etc.). The final pilot study focuses on port security. Port

Authorities have a Self-Protection Plan (SPP). This SPP has the general objective of safeguarding human lives by minimizing damage to the port's infrastructure, to the surrounding areas and to the environment. It also plans the necessary intervention actions in emergency situations. It establishes the adequate coordination of all public and private services that intervene during any incident or accident that affects ships, companies and facilities located in the port, as well as to any natural or legal person that performs any activity in port's service area.

Results and work in progress will be presented in detail and challenges in relation to civil protection will be discussed.

FIRST RESPONDER ADVANCED TECHNOLOGIES FOR SAFE AND EFFICIENT EMERGENCY RESPONSE

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FASTER Project is a H2020 research, which started in May 2019. Urban Search teams with force corps validate in the field the use of technologies to support early responders in the response to victims, within different disasters areas.

For this purpose, it has been developed 2 pilot exercises in collapsed buildings, simulating two earthquakes environment.

METHOD: The objective has been to test and adapt the FASTER tools in a first intervening during the search for and extraction of the victims. The focus is put in collecting information from the disasters, evaluating the acceptability, ease of use, applicability, effectiveness, and effectiveness of FASTER technology. The exercises took place National School of Civil Protection and Villaviciosa using drones, autonomous vehicles, canine wearables, Portable command centre, weather station, social media analysis and real patients.

RESULTS: Drones provided information about the critical area by sectorising the aerial view. The use of 3D camera and thermal imaging system successfully allowed to assess the location and improved the initial assessment. 3D Images and video from unmanned ground vehicles indeed the detection of victims earlier, minimising time and travel. The real-time messaging and geolocation kept the team in real communication.

CONCLUSIONS : 1. Time saving favours the early removal of the victim by increasing its possibility of survival.

2. Staying in communication and knowing what is happening at all times improves the coordination of professionals in the rescue of the victims and confirms the proper follow-up of the victims.

100 CITIES – 100 YEARS – EVALUATION OF URBAN FIRE RISKS

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Over the centuries, cities became economic, scientific, administrative and cultural centers of the countries. This process accelerated especially in the 20th century. Life in the cities has become very pleasant for their inhabitants. Notwithstanding these manifold benefits of city life, the administrations of urban centers are increasingly confronted with problems: The streets of the cities are suffering from the ever increasing mass of vehicles. Noise and air pollution are the result. Housing is scarce in the centers. They cities grow in height and on the outskirts. The supply of drinking water is a problem in many places. Waste management is a major organizational and technical challenge for the city administration. One of the most important issues within the increasingly complex infrastructure of large cities is the safety and security factor. It is no coincidence that the municipalities have set up special services that deal with these problems: police, fire brigade, emergency services, disaster services for the gas, electricity, gas supply and communication networks (telephone, Internet). Purpose of the book is to take a closer look at the subject of fire safety. In the last century, cities have experienced a variety of revelations with the introduction of new building materials, new types of buildings, and new ways of using the buildings. Many advances in fire prevention have been made. Nevertheless, the fire danger in the cities is not banished.

The presentation uses some striking examples to illustrate how urban fire risks have changed in the past. The aim of the study is to use concrete and data-based developments in 100 cities on all continents of the world to show what urbanization and industrialization mean from the point of view of fire safety, and what possible solution scenarios there are for the future.

IMPACT ON THE ENVIRONMENT FROM DISASTERS AT FACILITIES USING DANGEROUS SUBSTANCES

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In the case of a disaster occurring in a facility where hazardous substances are used, we estimate the severity of the accident and the extent of the consequences. Depending on the type of the existing hazardous substance, the thermal radiation, the shock wave (overpressure) due to the explosion and the extent of the toxic or flammable cloud are estimated.

In addition to the risk to human health, the expected environmental impact associated with the hazardous substances used in the activity, are estimated by assessing the effects on the environment from disasters. This is how the sequence is examined:

1. Point of leakage / emission
2. Possible pathway / escape route
3. Final receptor

From the examination of the above sequence:

1. We can identify weak points of the establishment (risk identification) where a Top Event accident scenario may happen and dangerous substances may release to the environment;
2. We can assess the potential escape route / pathway and the final receptor, which may be the atmosphere, soil, groundwater or surface water;
3. We can define the measures for preparedness and response or mitigation of significant adverse effects on the environment, as well as the proposed response to such emergencies.

From the analysis mentioned, the corrective actions that need to be done and projects that need to be implemented in order to reduce the probability of a catastrophe on the one hand and on the other hand to reduce as much as possible the escape of the dangerous substance.

SEARCH FOR REDUCTION OF CHEMICAL DISASTERS BY ANALIZYNG THE MOST SERIOUS CHEMICAL INCIDENTS ACCORDING TO EMARS PLATFORM

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At the moment, the data collected to assess the risk situation of chemical accidents worldwide are very limited. There are some data sources that could be used to estimate the frequency and severity of more types of these events, but they are far from providing a complete picture covering all chemical accidents, limiting the objective picture of the risk of chemical accidents worldwide. The purpose of the project is identify the industries that most frequently cause serious chemical incidents with direct casualties (injuries or deaths) and make risk maps in each city based on the results to predict possible chemical incidents. Methods: This study will present a descriptive analysis of the EMars database, collecting mandatory information on serious chemical incidents according to the SEVESO directive. The analysis will make it possible to assess the facilities with the highest number of fatalities and direct injuries. Conclusions: The data obtained in this study will give us objective results on the type of industries and substances that generate the highest number of injuries and fatalities at international level. Waste storage, treatment and disposal is one of the sectors with the highest number of fatalities and injuries, so this type of facility should be given importance in risk mapping.

STAKEHOLDER ANALYSIS FOR SAFE LNG HANDLING AT PORTS

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This paper presents the initial results from a project entitled "TRiTON", funded by the Greek Ministry of Education, which addresses safety issues of Liquefied Natural Gas (LNG) at ports. Within this framework, a stakeholder analysis is performed for investigating the safety management operation during storage, transport, and supply of LNG at port areas. The national (Greek), the European and the international regulatory framework for LNG safety have been analysed, so as to identify relevant stakeholders and establish relationships between them. Relationships have been weighted by a group of experts to highlight the importance of some critical interactions in safety management. The social network analysis approach has been employed for creating three stakeholder networks for the most widely used methods for LNG storage and bunkering, namely: a) fixed-tank storage and tank to ship bunkering, (b) truck to ship bunkering, and (c) ship to ship bunkering. Statistics and metrics of the networks have been calculated, with the help of an open-source software called Gephi, such as density, centralities (degree, closeness and betweenness), clustering coefficient and modularity. Finally, the most important stakeholders for handling LNG safety at ports have been identified.

EMERGENCY RESPONSE ON A KICK

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An unscheduled entry of reservoir or formation fluids into the wellbore, while drilling for oil or gas, is called a “kick”. If the kick passes unnoticed or if it is not mitigated properly, a blowout might occur. Such an event can lead to large-scale technological disasters and can cause significant environmental, social, economic, business consequences and in some cases even fatalities. Detecting a kick can be difficult during its initial migration and the signs of its existence usually become noticeable after some time. The current research incorporates a novel methodology of investigating, accurately detecting or even early predicting the kick occurrence in order to safely mitigate it in time. The methodology includes computational fluid dynamics, mathematical models of cubic equations of states and semi-empirical equations, as well as advanced modelling and simulation software to model the fluid flow and the thermodynamic state of the kick. State of the art equipment, such as the Tier-2 GRID supercomputing center and the DS-5000 scientific drilling simulator are utilized to perform, test, verify, and validate the mathematical and simulation models. Finally, the examining phenomena are replicated by an actual mockup drilling system in lab-scale aiding in debug and improvement of the simulation results. The preliminary results established the foundation for an accurate analysis and study of the kick behavior in both static and dynamic conditions. The proposed methodology is a holistic approach starting from the early stage of research and analysis to efficiently forecasting of the current phenomenon.

AN ADR VEHICLES RECOGNITION TOOL FOR THE PREVENTION OF EMERGENCY SITUATIONS IN TUNNELS

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Undoubtedly, fire accident events are the greatest threat to road tunnel systems. Destructive experiences such as the Mont Blanc fire in France or the fire in Yanhou China are only indicative of the severity of such incidents. Past tunnel fire accidents have shown that apart from the thermal radiation effects, the toxic effects of the trapped fire smoke inside the tunnel in combination with the increased deploying temperatures result in a high number of fatalities amongst the tunnel trapped users. Safety management with respect to dangerous goods transportation primarily aims at reducing the frequency of fire accidents. The importance of the information that the tunnel operators are receiving in case of a fire accident is crucial; operators should be informed as soon as possible about the specific characteristics of the particular fire incident in order to take the appropriate actions. One of the fundamental information about the accident and the fire progression is the substance that is involved in it. This paper describes the development of an automated tool to identify and recognize ADR vehicles before they enter tunnels. This tool is as a software component interfaced to a Resources Management System developed in parallel and validated by a road operator. The overall goal of this ADR detection tool is to efficiently record, statistically visualize and therefore manage the motorway passage of vehicles carrying dangerous goods from tunnels. In this way by tracking the vehicles before they enter a tunnel the substances can be controlled over time, thus minimizing the risk of a potential accident.

THE UTILITY OF ALOHA SIMULATION IN ACCORDANCE WITH THE YEARLY CLIMATE CHANGES IN GREECE. A FIELD REVIEW IN CONJUNCTION WITH THREE-CHEMICAL-AGENT SCENARIOS

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Introduction: There is always the potential of an incident during the road transport of dangerous chemical agents, which leads to the possibility of leakage and/or evaporation of the delivered chemical agent into the atmosphere and the surrounding region. The implications of such an incident, both for the environment and for local communities, are difficult to ascertain in order to not only alert local communities in a timely manner, but also to develop measures to cope with these effects. The objective of this article is to provide a quick overview of the emission of three chemical agents (chlorine, ammonia, and liquefied petroleum gas) following a highway collision, as well as the impact on the surrounding region.

Methodology: Six scenarios were simulated, two scenarios per chemical agent. Each simulation was performed with the climatic conditions that are common during the winter period, and the climatic conditions that are common during the summer period in Greece and the results of each simulation were exported through the ALOHA (Areal location of Hazardous Atmosphere) software.

Results: The findings of the simulations supported the literature by demonstrating that the dispersion and extent to which the chemical agents take varied between the summer and winter months of the year. The climatic circumstances of each place also represent an essential impact in the result and dispersion of chemical agents.

Conclusions: Such simulation-scenarios enable industries that manage these chemical agents to establish cautious business strategies with the goal of safeguarding both industry, local residents and the environment.

WEATHER TYPES AND CARDIOVASCULAR/RESPIRATORY MORTALITY IN EASTERN MACEDONIA AND THRACE, GREECE: A SYNOPTIC CLIMATOLOGY APPROACH TO PROTECT PUBLIC HEALTH

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The association between extreme weather and adverse health outcomes is well-established by numerous epidemiological studies worldwide. For instance, respiratory and cardiovascular illnesses are known to exacerbate during heat waves and cold spells. The aim of this study was to identify weather types over Eastern Macedonia and Thrace associated with cardiovascular and respiratory mortality, in order to predict and prevent weather-related impacts on human health. For this purpose, we employed daily datasets of 500hPa and 1,000hPa geopotential height, 2m temperature, specific humidity, 2m zonal and meridional wind and total cloud cover from the NCEP/NCAR Reanalysis, gridded at 2.5°×2.5° and covering a 40-year time-period (1980-2020). We applied Principal Component Analysis as a dimensionality reduction tool and then k-means Cluster Analysis, in order to group dates with homogeneous meteorological patterns. Six discrete weather types (WT) were identified and their correlation with mortality was studied by using the PI sign-test. The analysis revealed that three WT are associated with increased mortality in the region: (a) the Anticyclonic A3 conditions over the Balkans and/or Greece, (b) the W₂ depression type of weather which brings cold weather and rain all over Greece and (c) the NW₁ depression type which is situated on the west of Eastern Macedonia and brings cold weather and strong winds. The results of this study could be used by the stakeholders when applying weather-health-watch-warning systems, in order to respond accurately and protect public health by means of issuing warnings for potentially harmful weather, as well as allocating resources and developing preparedness.

We acknowledge support of this work by the project “Risk and Resilience Assessment Center –Prefecture of East Macedonia and Thrace -Greece.” (MIS 5047293) which is implemented under the Action “Reinforcement of the Research and Innovation Infrastructure”, funded by the Operational Programme “Competitiveness, Entrepreneurship and Innovation” (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund).

TRAPPED ON THE SEASHORE, SEABORNE EVACUATION, AND IMPACT OF EXPOSURE TO PM_{2.5}: LIVE DEMONSTRATION OF THE URBANEXODUS LARGE-SCALE EVACUATION MODEL

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Wildfires can trigger large-scale pedestrian, vehicle and seaborne evacuations, and cause injuries and fatalities. Evacuation models are employed to better understand the involved processes and their interactions.

During the final exercise of the European Commission's H2020 IN-PREP project, urbanEXODUS was used within a training platform, by incident managers, to aid their response to a simulated disaster. The scenario involved a traffic accident escalating to a wildfire, causing the local community to evacuate. The model combined pedestrian and vehicle evacuation, and through a flow model, a simplistic representation of boat evacuation. The effects of wildfire on escape routes and possible fatalities were evaluated using fire perimeter data. The development of a novel fractional dose model allowed the software to determine agents' acute exposure to PM_{2.5}, in relation to the WHO daily mean Air Quality Guidelines (AQG).

The simulation results comprise key evacuation performance parameters including evacuation times, fatalities, and escape route usage. Results indicate that 6% of the population was unable to leave the area and are treated as fatalities. The road network and boats were used by 69% and 31% of the evacuees respectively. PM_{2.5} exposure was zero for 84% of the evacuees, and below the AQG, for 1%, while 15% received, on average, a dosage of 7.6 times the AQG (range 1.0 – 28.3, SD = 5.8), which may cause respiratory and cardiovascular disorders.

The model offers detailed evacuation information that is practically impossible to obtain otherwise, allowing crisis managers to take risk-informed decisions when planning for a crisis.

THE NECESSITY OF THE “DEBRIEFING” AFTER DISASTER INCIDENTS

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Throughout the 21st century, humanity has already recorded enormous technological progress, developing the necessary techniques not only for the effective response to a mass casualty event, but also for the complete restoration. In the context of the effective management of a critical event and especially during the recovery phase, the necessity of the application of the "Debriefing" method is examined thoroughly in this paper. This paper could also be characterized as a hybrid product of methodology as it consists of two main parts. The first part is based on the literature review in order to examine the process of the "Debriefing" technique, citing historical data of the evolution of the technique over the years. The method itself was then analyzed in depth indicating its stages as also whether its conduction is influenced by the interculturality. In the second part of this paper, statistics were presented for the "Debriefing" process that emerged after a survey through a structured questionnaire given to specific groups of professionals that usually involve in a major incident management. The objective was to give an overview of the Greek approach regarding the "Debriefing" method. The processing, developed through the SPSS software, of the collection of all data led to the conclusion that although the “Debriefing” is globally considered as a necessary method for the comprehensive management of a critical event, nevertheless in Greece it is not been conducted as a standard procedure at a regular basis. Additionally, it cannot be regarded the lack of a mental health professional during the procedure.

THE NEED FOR MINIMUM HUMANITARIAN STANDARDS

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Climate change, the unbalanced relationship with natural resources, conflicts between nations, and forced displacement within and between countries create emergencies that need to be addressed based on minimum international humanitarian standards, and this is what the Sphere Handbook is about. The Sphere Handbook content covers the humanitarian charter to the emergency response sectors considered essential for the first response in this type of exceptional context, thus creating a condition of minimum stability and protection that allows a reorganization of the infrastructure of the affected locations and gradually working towards solutions.

RESILOC-HORIZON 2020: THE MUNICIPALITY OF WEST ACHAIA

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RESILOC is to identify new strategies for improving on the processes of preparedness of local communities against any kind of hazards, either planned or unplanned. The project aims at bringing together the validity and experience of local communities and the strategies and commitment of national and supra-national actors to achieve a tangible impact on the way resilience is understood and increased in local communities. Therefore a holistic framework of **studies**, **methods** and **software instruments** will be developed, that combines the physical with the less tangible aspects associated with human behavior that applies at the community scale.

STUDY: Collection and analysis of literature and stories from the many approaches to resilience adopted across Europe and all over the World. Definition of a classification for the functions that are critical to resilience of communities, extending the realm currently adopted for measuring resilience in cities (...) including human aspects, such as risk perception and awareness. Definition of terms, indexes and correlations between indexes

METHODS AND STRATEGIES: Assessment of the resilience indexes of a community, together with simulations on the “what-if” certain measures are taken. Identification of new and better approaches to (e.g.) communicate with citizens, reduce the vulnerability of infrastructures, launch awareness campaigns on risks and adopt technological solutions to improve the understanding and the monitoring of critical infrastructures. Local Resilience Teams

SOFTWARE INSTRUMENTS: the **RESILOC inventory**, a comprehensive, live, structure for collecting, classifying and using information on cities and local communities, implemented as a Software as a Service (SaaS). It will be a live tool for stakeholders willing to study and improve on resilience;

the **RESILOC Cloud-based platform** for assessing and calculating the resilience indexes of any participating city or community, for developing localised strategies and verify their impacts on the resilience of the community. The Cloud platform, a combination of SaaS and PaaS, includes the RESILOC inventory as its main repository

The objectives: Increase the understanding of resilience in societies and local communities. Innovate on the strategies for improving resilience. Innovate on tools and solutions for improving on resilience in communities. Communicate, demonstrate and assess the validity of approaches, solutions and tools in field trials. Have an impact and define concrete steps towards a more resilient society.

AUTONOMOUS BARS FOR SAFE PASSAGE OF IRISH PASSAGES

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Purpose: To prevent accidents on Irish crossings due to the unsafe passage of drivers/ pedestrians.

Problem: In Greece from 1980 to 2018, 156 people lost their lives in 56 floods, 72% of which were swept away by a torrent of water and / or debris: that is, the accidents took place at Irish Crossings. Due to a variety of reasons the rate of growth is increasing rapidly with 3 people getting killed over the last 6 months in Greece. The main causes are climate change, lack of information and especially the lack of a mechanism to prevent access to unsafe roads.

Method: A research team was created at ISOCOM consisting of Mr. Panagiotis Chatzidimitrakis¹, Ms. **Danai Chatzidimitrakis**² and Ms. Christina Agorgianiti³ who, through the study of various research, came up with the innovative conception of this invention.

Conclusions: Our team concluded that the application of the barrier reduces the risk of access to Irish crossings significantly. These bars resemble the bars found on the toll booths with the difference that they are activated with the increase (in degree of danger) of the water level of the passage and go down, prohibiting the passage.

Significance: It is estimated that if bars are applied to Irish crossings there will be an 80% reduction in incidents.

* According to the EUFF database

INFORMATION NEEDS ON NATURAL AND TECHNOLOGICAL DISASTERS FROM THE VIEWPOINT OF PRIVATE COMPANIES LOCATED IN THE EAST MACEDONIA AND THRACE PREFECTURE

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The aim of RiskAC project is the development of a new data collection and analysis centre for risk and resilience assessment studies in relation to natural and technological disasters, dedicated to the region of East Macedonia and Thrace in Greece. One goal of the program is to record the information needs of private companies who operate within the Prefecture of East Macedonia and Thrace (PAMTH) about natural and technological disasters and to identify to what extent private companies need timely information about risk and resilient assessments for the region where they are operating. To achieve this goal a questionnaire comprised of 23 questions was distributed via email to private companies operating mainly within the industrial parks of PAMTH. 73 individuals responded to the questionnaire from industries located in the regions of Kavala, Rodopi, Xanthi, Drama, Thasos, and Evros. More than half answered negatively or that they do not know if their companies have contingency and business continuity plans. Regarding the question about the execution of periodic readiness exercises, about half of the respondents answered that such exercises are not performed by their company. Almost all of them stated that they would like to receive alerts and updates about natural and technological risks, and especially about extreme weather, and floods. Many responders responded affirmatively in the possibility of receiving information on the estimated level of risk in the area where their company operates. Finally, most responders stated that they would like to be informed about the risks and the estimated resilience in a timely manner through a dedicated website. For such a service, half of the respondents stated that they were willing to pay a subscription, provided the reliability and validity of the service.

We acknowledge support of this work by the project "Risk and Resilience Assessment Center –Prefecture of East Macedonia and Thrace -Greece." (MIS 5047293) which is implemented under the Action "Reinforcement of the Research and Innovation Infrastructure", funded by the Operational Programme "Competitiveness, Entrepreneurship and Innovation" (NSRF 2014-2020) and co-financed by Greece and the European Union (European Regional Development Fund).

KNOWLEDGE OF VULNERABLE GROUPS FROM NORTH MACEDONIA, BULGARIA, AND SPAIN RELATED TO PROTECTION AND RESCUE - FUNDAMENT FOR BUILD STRONGER COMMUNITY RESILIENCE

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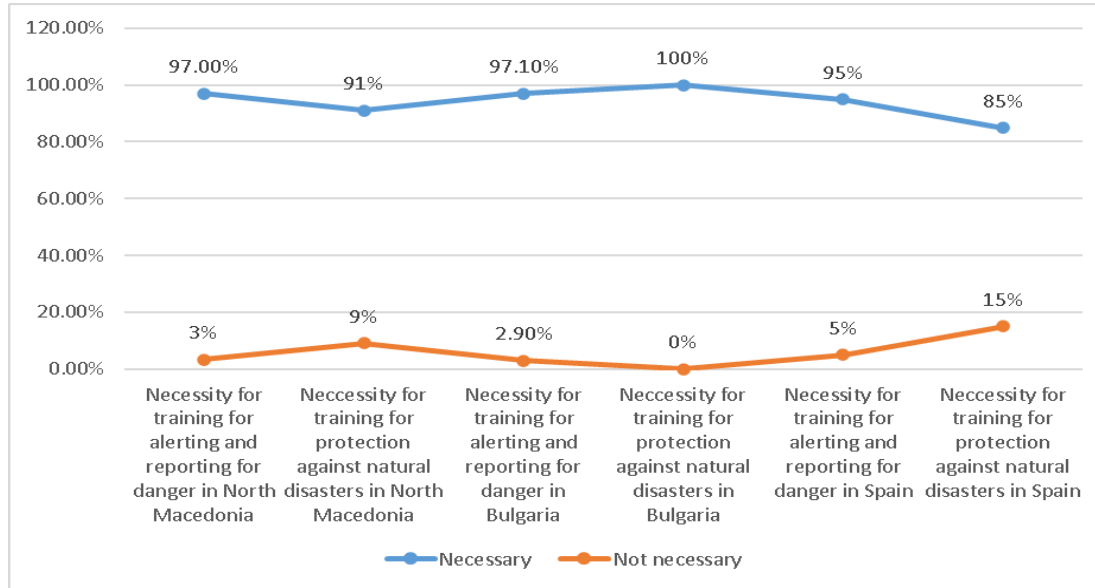
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The purpose of this paper is to discover the level of knowledge that vulnerable groups such as children, youth, as well as persons (students) with special needs, from North Macedonia, Bulgaria, and Spain have in relation to the protection and rescue system and their needs for training improvement. Taking in consideration that very often that vulnerable groups, are neglected in every stage of the disaster risk management, motivated us to conduct this research and to contribute to building stronger and inclusive community resilience. In this research we used quantitative research method (questionnaire) answered by vulnerable groups, separately in each of these countries. In our research we respected gender equality and we have almost the same distribution of female and male respondents. Questionnaire consisted of 19 questions, 3 of them were open-ended, other 16 close ended. The first 6 questions were in line with the general information about the participants, other refer to the 5 specific areas of our research. Conclusion from the research is that most of the participants are not familiar with the possible ways to give alerts for the dangers, the instructions for protection, rescue, assistance, and they need training about possible ways to report and warn about dangers, give instructions on protection, rescue, and assistance.

Book of Abstracts



Gained results were very useful for creating novel approach for developing of educational materials and training of children, youth, and persons with disabilities using open educational platform, Mobile APP, and gamification.

EARLY WARNING SYSTEMS FOR CIVIL PROTECTION: EVIDENCE FROM THE EARLY USE OF EMERGENCY SERVICE 112 FOR EMERGENCY EVACUATION IN GREECE

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Employment of Early Warning Systems (EWS) is central in current disaster risk reduction policies and within the priorities of UN Sendai Framework for DRR, 2015-2030. According to UNDRR on-line glossary, a EWS is an integrated system that enables individuals, communities, and others to take timely action to reduce disaster risks in advance of hazardous events. An “end-to-end” EWS integrates: (1) disaster risk knowledge, (2) detection, monitoring, analysis and forecasting of the hazards and likely consequences; (3) dissemination and communication of warnings and information on likelihood and impact; and (4) preparedness at all levels to respond to the received warnings.

The paper discusses the use of emergency communications service 112 for emergency evacuation in Greece. Since the initialization of its outbound component in 2019, 112 is being employed to disseminate emergency information to the population and in several cases, to urge emergency evacuation.

Through on-line research, the paper constructs a record of cases in which 112 was employed in emergency evacuation and examines the efficiency of the service in terms of pertinence and promptness of alert and reliability of outreach. Moreover, it reviews compliance of the use of 112 with the present civil protection plans.

There is little doubt that the initiation of the outbound component of 112 is an important step in civil protection in Greece. Nonetheless, there is still much room for improvement in the use of the service for emergency evacuation. Furthermore, the seamless integration of the service with existing civil protection plans at all levels remains a challenge.

LOCAL GOVERNMENTS' ENGAGEMENT IN HERITAGE DISASTER MANAGEMENT; ANCIENT MESSENE'S CASE STUDY

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The purpose of this study is to examine community involvement in the risk resilience of the archaeological site of Ancient Messene, located in the Peloponnese region, Greece. Climate change is one of the factors increasing the risk of fires worldwide (Jones et al, 2020; San-Miguel-Ayanz et al, 2021; for Greece Dianeosis, 2017; NSfAoCC, 2016; BoG, 2011). Wildfires have negative impacts -among others- on climate (Van der Werf et al., 2009; Ellwanger et al., 2020) and the cultural environment (Sesana et al, 2021; MoC, 2021; Day et al, 2020). The Sustainable Development Goals (SDGs) and Paris Agreement give unprecedented recognition of the fundamental role of cultural resources in transitions to climate-resilient development pathways (ICOMOS, 2019; UNESCO 2019). Community participation at the decision-making stage and in the initial planning phases is vital (COM, 2019). Given that community involvement in heritage disaster management is not clearly defined either conceptually or empirically (Kyung, 2018; Brent, 2004), further research in this field is needed.

This paper examines the perceptions of local government stakeholders using quantitative and qualitative research. The preliminary results indicate that the local community is eager and ready to engage actively in all stages of heritage disaster management, especially in planning processes.

Nevertheless, this study and its results so far contribute to the need for increasing coordination between and within the different risk management strategies among various governmental sectors relating to disaster management of cultural heritage (Bonazza et al, 2018). Additionally, following the SDGs during our research, we endorse a more anthropocentric aspect in heritage disaster management's policy planning, as climate change is primarily a socio-political and not a technological challenge (Bee Green, 2022).

ROBOTIC SOLUTIONS IN THE FIELD OF RESCUE

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A manmade, natural disaster or even an accident, is a sudden incident that disturbs the normal conditions both intensively and extensively by threatening human life and property where resources required for combating the scenario substantially exceeds what is locally available. In this paper, we make an endeavor to analyze an intelligent Unmanned solution in the field, for supporting faster and more effectively the efforts of the firefighters, the first responders, the authorities and the companies, by managing the prevention or the support when needed, in a new, advanced, technological manner, while protecting human life. The way to succeed that is by entering robotic solutions like the Unmanned Ground Vehicles (**UGV**) in the field of rescue.

UGV is the vehicle which operates while in contact with the ground and without the on-board human presence. It can be used for many applications where it may be inconvenient, dangerous or impossible to have the human operator present. The vehicle is controlled wirelessly by his operator, either with direct visual observation or from a long distance with the use of sensors & view digital cameras.

The UGV's have sets of sensors to observe the environment, and will either be semi-autonomously or pass the information to a human operator at a different location who will control the vehicle through teleoperation. Unmanned robotics are being actively developed for both civilian and military use to perform a variety of dull, dirty, and dangerous activities.

This paper presents **the Multiscope UGV**, a family of modular platform that is able to withstand harsh conditions and can reach areas that are difficult to reach with larger vehicles or too dangerous for firefighters and rescue services. The functionality of the Multiscope can be modified onsite which widens the use of the platform.

The Multiscope Rescue Systems were designed to provide a durable and flexible platform with rescue-specific plug-and-play payloads for various rescue missions. The functionality of the Multiscope can be modified onsite which widens the use of the platform.

Indicative use of the Multiscope Rescue:

- ✓ For putting out fires by being equipped with is fully customizable modular foam and/or water monitor. It can be used for industrial, warehouse, tunnel, and wildfire extinguishing.
- ✓ For transferring Hose Cartridge as one of the most physically demanding and time-consuming tasks is laying out fire hoses to reach urban or rural areas that are inaccessible with main fire trucks or too dangerous for firefighters to enter. This UGV can reach the problematic area considerably faster than a standard size firefighting team helping them start the extinguishing process much quicker.
- ✓ For rescue transport of critical supplies, equipment and teams. It is an ideal tool for (pre or post)-operation logistics. It can be utilized to pack up gear faster and with less manpower thus enabling firefighters to be ready faster for upcoming challenges. It can also be used to transfer people away of danger, creating safety zones by pulling heavy obstacles (like fallen or cut trees) or even trapped in snow cars.
- ✓ For snow removal of streets while spreading salt and sand on the street

FIRE SAFETY TECHNOLOGIES

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When talking about the changing climate in 2022, one needs to look at the human history in the EU. During the Ice Age, the soil in southern Europe was free from ice. Homo Sapiens lived in the ice-free area, known today as the country of Greece. Daily life in Greece, went on as usual, with multiple use of fire for daily activities, like shifting cultivation, cooking of food. During this 15-20 000-year period during the Ice Age, the soil in northern EU, was ice covered.

The thousands of years of use of fire in Greece, had gradually changed the ecology into what we today call “fire adapted ecology”. This means, that the entire vegetation consists of species, which can withstand annual use of fire. Species like Cork Oak and Pine, are typically found in this ecology, combined with a mosaic of easily flammable bushes and grasses.

To be able to sustain the present ecology in Greece, one needs to concentrate on the education of the entire population. There is a need to reduce annual incidents of fire, which destroy remaining forests. Prescribed burning, with the aim of constructing Fire Breaks, need to be carried out before the annual fire season.

This way, wildfires are destroying less infrastructure, as well as not killing human lives. The fire and rescue personnel locally, need to be educated in how to use fire safely, when burning these Fire Breaks nighttime. Uphill burning should never be allowed. The Jurvelius’ Taxonomy of Learning Objectives will indicate how well your education has achieved its target.

FLEXIBLE AND AVAILABLE COMMUNICATION NETWORKS FOR EFFECTIVE DISASTER MANAGEMENT

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A manmade and natural disaster is a sudden incident that disturbs the normal conditions both intensively and extensively by threatening human life and property where resources required for combating the scenario substantially exceeds what is locally available. In this paper, we make an endeavor to analyze an intelligent solution for managing the entire communications ecosystem and an advanced tactical communications solution to generate an effective response necessary to meet the constraint of the hour in case of an incident.

It has been observed for several decades that lack of timely and right information from the incident area leads to an undesirable delay in the procedure of mitigation resulting in an increase of death toll and loss of property. Moreover, the lack of efficient management makes the total disaster scenario worst which is irreversible. Thus, efficient communication channels is the need of time to handle disaster scenario in a better way.

In this paper, we present **mACS** (Modular Audio Control Solution) for Communications Interoperability & Consolidation and **CellBOX** as a Complete mobile standalone 4G/LTE Network.

1. mACS is an intelligent solution for managing the entire communications ecosystem. By consolidating all communication assets, including radio, telephony, cellular, LTE, intercoms, conference services and any other relevant channel, mACS enables seamless connectivity and interoperability between the various forces and delivers far-reaching operational benefits.

Through simple network architecture, mACS unifies and optimizes the various communications channels and provides full interoperability between the different networks. At the heart of the solution, the Radio Gateway uses unique network bridging technologies to unify all RF channels by converting them to a common Radio over IP. Non-radio channels (landlines, cellphones, satellite phones and intercoms) are converted into Voice over IP, creating an instant IP centric network and providing access to any channel from any endpoint.

Macs includes an Audio Control Box, touch-screen dispatcher console that displays all communications assets and provides complete monitoring and control of all related networks. It allows operators to transfer any channel to any operator and enable interoperability between various radio and non-radio devices through standard IP connectivity.

An essential part of any Command & Control or dispatch center for, emergency response and first responder forces, fire and emergency medical services, defense C4I and command post; mACS is a flexible and expandable solution that can operate on any scale, from a single-site to a cross-agency, and

even nationwide multi-site network, providing complete interoperability with no geographical limitations.

2. CellBOX is a compact LTE Network-in-a-Box, that provides fully-independent, high-speed broadband communications. Designed as an advanced tactical communications solution, CellBOX is lightweight and easily deployable, creating a secured network within seconds. It Enables First Responders and Security Forces to quickly and simply establish an independent Ad-Hoc 4G/LTE network where network coverage is unavailable.

CellBOX is operated through a simple and intuitive user interface and compatible with any endpoint device (smartphones, tablets and dongles), CellBOX provides a wide range of applications, including PTT (Push-to-Talk), file and image sharing, Bi-directional, HD video sharing, chat and GPS positioning. Customizable and available in various configurations, the network also supports secure and encrypted interoperability with other communications platforms, situational awareness, connectivity to various sensors (CCTVs, drones, environmental sensors and more), and includes various backhauling capabilities; enabling personnel to focus on their mission, improves operational efficiency and saves lives.

CellBOX can work either as a Standalone LTE Bubble or to provide LTE Connectivity Through Satellite and create Bridge between two LTE groups.

I-REACT PREPARATION & RESPONSE TO DISASTERS

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This paper presents the outcome of a development for a multi-hazard, multi-service, next generation, early warning (action) system – EW(A)S designed to manage the whole process of disasters (manmade & natural) through Prevention, Preparation, Response & Recovery.

The same platform can be used to manage multiple hazards simultaneously, including overlapping and cascading hazards, using earth observation (EO), sensors, models, social media, historical data and weather forecasts – all presented in a simple easy to use interface.

LAYERS within the EWAS will allow the operator to look at e.g. fire load, wind speed & direction as well as forecasts separately and as cascaded events.

Early warning of hazards will allow first responders, volunteers, citizens, property & utility owners to take action to protect themselves and their assets. Services such as FPaaS (Flood-Protection-as-aService) will allow for mobile flood barriers to be deployed early to protect critical infrastructure, for example.

The use of social media as a means of communicating with and warning citizens is a unique and important part of I-REACT. It enables 1st responders to get first hand, timely information from people at the scene whilst communicating in-real time and updating responses

Uniqueness of an EW(A)S:

- Easy interpretation of a hazard as it unfolds
- An everyday tool for municipalities to manage & be ready to respond to hazards
- Complements existing processes & procedures – aids decision making
- Multi-hazard management across multiple blue light responders
- Enables decision making at national/regional & local level & importantly across borders
- Allows preparations to be readied at key trigger points
- The science of the EWAS is in the background with an easy to understand user interface

LONG-DISTANCE MASS NOTIFICATION VOICE MESSAGING SYSTEMS

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This paper presents **Clear Voice**, a family of planar speakers that developed in response to the global demand for an acoustic hailing device that has the ability to effectively communicate with large crowds over great distances. The planar transducer, Clear Voice, is able to achieve distance and clarity levels that are unmatched by any conventional speaker and horn.

Clear Voice planar transducer reaching distances in excess of 600m (which can reach over 1KM through arrays of CV Systems) and are able to broadcast an intelligible message 10 decibels below the ambient noise level, while conventional speakers and horns need to be 6 to 10 db above the ambient noise level in order to be audible.

In the event of a disaster, it is very important to quickly evacuate to evacuation sites in order to minimize the number of victims of the disaster. Governmental authorities only present their citizens with information about the locations of evacuation sites and anticipated damages in the event of disasters such as Urban and forest Fires, tsunami and earthquakes. Thus, in the event of a disaster, people present at various places will not be sure about the evacuation routes that they should take individually. Accordingly, there is a need for a Long-Distance Voice Messaging System in order to offer voice message guidance to the potential victims such as quickly determining evacuation routes and guiding people in accordance with the status of the traffic network, the locations of evacuation sites, and the number of victims.

Clear Voice systems are the ideal solution for Police and fire officials communicating to large crowds, Public safety & rescue personnel responding in emergency situations, Maritime hailing, warning, and safety commands. By using Clear Voice Systems, the First Responders can offer guidance from a safe distance in a safe (in hearing) way, and lead people to safety without putting themselves in danger.

First Responders uses of clear voice systems for in-door and out-door needs:

- Mobile Solutions for the field (Handheld, on tripod, on a vehicle, on a helicopter etc).
- Fixed Solutions for constant voice networks in municipalities, critical structures etc.
- Wearable Solutions (Customized Sound Vests) for in-door building evacuation guidance etc.

COMPARISON OF THE SUPPRESSION SYSTEMS FOR WILDLAND FIRES

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The aim of the study is to compare the effectiveness of Water and Bonpet liquid for suppression of forest fires and WUI Fires.

Water is suitable for fire class A and Bonpet liquid is suitable for fire class A, B in F and the consequences from the fire class C. Bonpet liquid is a water solution of inorganic salts and organic compounds: Ammonium carbonate $\text{CH}_2\text{O}_3\text{-xH}_3\text{N}$, Ammonium hydrogen carbonate $\text{CH}_2\text{O}_3\text{-H}_3\text{N}$, Towalex AFFF 3% UL. BONPET liquid absorbs at least 10 times more energy from the burning surface than water would.

We will present tests that have proven that mixing only 6% of BONPET Liquid with water will increase fire extinguishing performance. This means that 20 times less consumption of water is needed, and the collateral damage caused by a fire is smaller when extinguishing with BONPET liquid. Furthermore, non-decomposed components of BONPET liquid that remain on the surface after the fire has been extinguished, have the ability to disintegrate and cool the surface if there is a slight increase in temperature

The most significant benefit of using BONPET liquid is that it will greatly reduce extinguishing times due the enhanced extinguishing capabilities. This also means far less CO₂ emissions from the fire and less burned area to restore back to its original state.

The second benefit is cost-effectiveness. The liquid can be premixed with water to the optimal ratio for many types of fires including larger ones. This means that the cost can be greatly reduced, and the extinguishing effect still obtained.

The third benefit is regarding the environment. The liquid is designed to not produce any harm when extinguishing and after. It is not harmful to any wildlife or plant life, therefore being environment friendly.

THE IMPACT OF CLIMATE CHANGE ON THE RISK OF HYDRO-METEOROLOGICAL DISASTERS

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Today, humanity is facing enormous natural disasters, such as floods, droughts, cyclones, and blizzards. The intensity and frequency of occurrence of such extreme natural phenomena show a strong upward trend, a fact that has been of particular concern to the scientific community. There is now significant evidence of the impact of global climate change on the occurrence of extreme natural disasters. In the present work, an attempt is made to correlate the intensity and frequency of extreme events with the problem of climate change, with particular emphasis on hydro-meteorological disasters, such as floods, hurricanes and cyclones. The investigation of this correlation is based on an extensive literature review of relevant scientific studies, after analysing a total of 100 articles published in the last 20 years were selected. Projections show that climate change is likely to increase the frequency, intensity, duration, and spatial distribution of a range of extreme weather events over coming decades. The results demonstrate the magnitude of the problem of climate change in Greece, Europe and the world, and emphasize the need to create integrated strategies to deal with the increasingly severe hydro-meteorological disasters.

TRAINING AND KNOWLEDGE SHARING PLATFORM FOR FIRST RESPONDERS AND EDUCATIONAL TOOLS FOR STUDENTS' AND CITIZENS' AWARENESS AND PREPAREDNESS AGAINST NATURAL AND MANMADE DISASTERS AND RISKS

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The overarching objective of the RESISTANT project is to build the first European Crisis Training Platform to train first responders through threefold comprehensive training: educational training with the state-of-the-art knowledge in safety, including tools for characterization of hazards and associated risks, operational training on mock-up real scale transport, and innovative virtual reality training reproducing the entire accident scenarios, intervention strategies and tactics, including the whole chain of command and communications between all members of the first responders team, facility managers, and public (e.g. volunteer fire fighters, children, citizens with disabilities). RESISTANT put also in place a virtual 'agora' for first and second responders, academia, market practitioners, volunteers, and other civil protection stakeholders to share knowledge and exchange best practices. This article presents the RESISTANT's educational and training infrastructure which will be used to train first responders through threefold comprehensive training: educational training, operational training, virtual reality training. The educational training aims to equip first responders with state-of-the-art knowledge in safety. The operational-level training consists of practical exercises (table-top and Full-Scale Exercises) based on different emergency scenarios, designed in a way that they capture the current needs of the key stakeholders defined in target groups, while the virtual reality training is based on a virtual reality facility that will expand training potential and the effect of educational and operational training. It will reproduce the entire accident scenarios, intervention strategies, and tactics, including the whole chain of command and communications between all members of the first responders' team, facility managers, and public.

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SAFETY RE-IMAGINED

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Motorola created the first and only end-to-end technology ecosystem that unifies voice, video, data and video analytics on one single platform, providing you with the foundation of safety for your operations. Assuring law-enforcement officers and first-responders that when situations arise there is technology in place to resolve issues as quickly as possible to prevent them from escalating beyond control.

Safety has been reimagined, so that the technologies are used to help keep your area-of-interest safe, minimize downtime, improve response and recovery, generating better results throughout all phases of the emergency. Because safety, response and recovery are deeply interconnected. With the right technologies, you can be faster, smarter, more focused, and more resilient.

Our newly-introduced ecosystem allows data and intelligence to advance outwards, giving you eyes and ears faster than never before. Information can move where and when it's needed: using cameras, radios, smart devices, sensors, artificial intelligence algorithms and on-site or off-site control centres to provide meaningful and actionable procedures. Technologies integrate seamlessly across diverse areas and functions to provide efficiency and visibility across zones.

This ecosystem consists of the following 4 pillars:

DETECT – Integrated video security controlling multiple points using artificial intelligence.

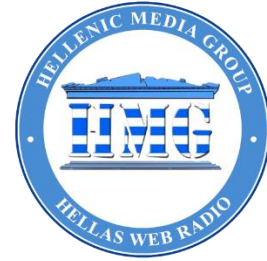
ANALYZE – Advanced Search capabilities identifying unwanted individuals, tracking and recognizing situations.

COMMUNICATE – Connected across devices, networks and locations ensuring high awareness at all times.

RESPOND – Enabled incident rapid responses and past incidents analysis to prevent future incidents.

Effective managing a complex ecosystem can be complicated. You need the right human capital and management to ensure your day-to-day needs are taken care of and ensuring smooth operations. Our services also cover technical support, hardware maintenance and software updates to ensure your system will remain always working at peak performance.

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