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RESISTANT Crisis Training Platform

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

D2.3 Third Report on *RESISTANT*'s observatory

Workpackage:	WP2 – Observatory of existing initiatives and training infrastructure
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Abbreviations and acronyms

Augmented Reality	AR
Croatian Crisis Management Association	CCMA
Deliverable	D
Expected Outcomes	EO
Enosi Ptychioychon Axiomatikon Ypaxiomatikon Pyrosvestirkou Somatos (Association of officers and sub-officers with university degrees of Hellenic Fire Corps)	EPAYPS
International Hellenic University	IHU
Konnekt-able Technologies Ltd. – Greek Branch	KTGR
Military Academy General Mihailo Apostolski	MAGMA
Non-governmental organization	NGO
Operational Objectives	OO
Rescue Team DELTA	RTD
Evia Rescue Team	S.A.R. 312
Strategic Objective	SO
Union Civil Protection Mechanism Programme	UCPM
Virtual Control Room	VCR

Executive Summary

RESISTANT is an 18-month duration project co-funded by the Union Civil Protection Mechanism Programme (UCPM-2020) under grant agreement no. 101017819.

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 characterisation 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, school children, citizens with disabilities). RESISTANT will also put 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, especially in cross-border crisis management. The 'agora' will facilitate discussion and contribute towards the development of a common prevention and protection culture.

The main purpose of this document is to present an overview of national Civil Protection Schemas, disaster education & training, and volunteering in the area of disaster management. The aim is to understand the current initiatives, procedures, and resources that are being held, or planned, in the RESISTANT network's participating countries in the area of disaster management. Finally, the deliverable updates the information provided in D2.1 and D2.2 regarding the research projects and software tools that are currently available for the training of the first responders and for emergency management.

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1. Introduction

1.1 About the project

RESISTANT (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) is a 18 months project that has been started on 01/01/2021 and is implemented by a consortium led by the International Hellenic University – IHU (Greece) in cooperation with the Association of officers and sub-officers with university degrees of Hellenic Fire Corps -E.P.A.Y.P.S. (Greece), Konnekt-able Technologies Limited, Greek Branch – KTGR (Ireland), Military academy „General Mihailo Apostolski", Skopje – MAGMA (North Macedonia), Croatian Crisis Management Association – CCMA (Croatia), Evia Rescue Team – S.A.R. 312 (Greece) and Rescue Team DELTA – RTD (Greece). The project is co-funded under the Union Civil Protection Knowledge Network: Network Partnership (UCPM-2020-KN-AG) call of the Union Civil Protection Mechanism.

RESISTANT's aim 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, school children, citizens with disabilities).

RESISTANT Operational Objectives (OO)

OO.1: Support civil protection and disaster risk management actors that promote and facilitate the development, dissemination and exchange of knowledge, good practices and expertise.

OO.2: Update and expand a training programme through further development of emergency scenarios to reflect the latest state of the art

OO.3: Implement an educational platform, where educational and training programs for primary, secondary schools, residents of endangered areas, citizens with disabilities of the aforementioned areas and tourists, as well as, for municipalities' employees, could be demonstrated with the help of Augmented Reality (AR) Techniques.

OO4: Mapping and status of current initiatives, procedures and resources for coordination, education and training for natural disasters and technological risk mitigation.

RESISTANT Strategic Objectives (SO)

SO.1: Support new and consolidate existing partnerships in civil protection and disaster risk management that enhance cooperation and synergies in prevention, preparedness and response.

SO.2: Establish a European network of trainers for first and second responders, supported by stakeholders from EU and beyond, to share best practices and facilitate dissemination of knowledge and experience generated within the RESISTANT project and relevant follow-up projects from EU to national level.

SO.3: Educate and train tomorrow's responder trainers through established and regularly updated comprehensive educational, operational and virtual reality training.

SO.4: Establish strong links between first responders' activities from different countries and constituencies and research and educational projects; Valuing the responders' experience and their feedback to enrich and harmonise harm criteria, models for hazards and risk assessment, expand communications to other stakeholders, including but not limited to legislators, technology experts, insurance companies, citizens and students to raise awareness and increase preparedness.

RESISTANT *Expected* Outcomes (EO)

EO.1: The implementation of a Trans-European Network of trainers for first and second responders.

EO.2: Design and implementation of innovative training programs for natural disaster and technological risks prevention and mitigation especially focusing on cross-border events that will be implemented in Virtual Control Room (VCR) with an integrated state of the art emergency management system.

EO.3: Implementation and deployment of a dual-purpose platform which will incorporate the training programs for natural disaster and technological risks prevention and mitigation along with a series of educational and awareness programs enhanced with AR techniques for students', citizens' and tourists' preparedness.

EO.4: Mapping of current activities in Croatia, Greece and North Macedonia in the areas of disaster management and of disasters' education and training. A comprehensive report with data derived from the mapping training exercises will allow decision and policy makers to evaluate the current state, challenges and opportunities for collaborative disaster management across Europe. Results and the mapping itself will serve as a basis for collaboration, knowledge sharing/exchanging and training among the network member countries.

1.1 Purpose of the document

The purpose of the **Deliverable D2.3 Third Report on RESISTANT's observatory** is to present the current Civil Protection Schemas, disaster training, and volunteering in Croatia, Greece and North Macedonia in the area of disaster management, the disaster education and training and to make an inventory of strategic agendas in these countries. The aim is at understanding the current activities – initiatives, procedures, and resources – that are being held, or planned, in the RESISTANT network's participating countries in the area of disaster management. The focus of the document is to investigate

how first responder organizations could better work together with society in general and specific on how they could improve the cooperation with volunteers. Finally, this deliverable updates the information provided in D2.1 and D2.2 regarding the software tools that are currently available for the training of the first responders and for emergency management (e.g., data mining and analysis tools for Natural Disaster Management).

1.2 Work Package Objective

D2.3 Third Report on RESISTANT's Observatory is a deliverable of Work Package (WP) 2: Observatory of existing initiatives and training infrastructure. The objective of WP2 is to analyse European and national research projects regarding their technical innovations, their tactical and operational recommendations and their potential to develop new guidelines and operational procedures within the field of emergency and crisis management.

1.3 Relation to other deliverables

The current deliverable - D2.3 Third Report on RESISTANT's observatory - is one of the 3 reports (D2.1, D2.2 and D2.3) of WP2 that will be released by the RESISTENT Consortium every 6 months in order to develop recommendations related to innovative approaches and new technologies, share lessons learned and common good practices in prevention, preparedness and response.

Deliverable D2.1 First Report on RESISTANT's observatory provides a thorough insight in the outcomes of national research projects of the RESISTANT participating countries (Croatia, Greece and North Macedonia) and the European research projects by making an inventory and investigation of the projects that impact operations in case of natural disasters. The focus is on nearly finished projects or on projects that are finished within the last two years. Additionally, this document presents existing technologies for emergency management (e.g. data mining and analysis tools in case of Natural Disaster Management) and for training of first responders as well as a word cloud of interconnected key indicators, which are relevant for the operations in case of natural disasters. This deliverable has been released on Month 6 of the project (June 2021)

Deliverable D2.2 Second Report on RESISTANT's observatory provides a comparison of national experiences and lessons learned in Croatia, Greece and North Macedonia during various incidents. Investigating reports on various incidents in the partnering countries gives an insight on lessons learned and lessons not learned. National experiences in case of natural incidents are examined and compared including interconnected key indicators like evacuation plans, dealing with volunteers and improving the resilience of the citizens. This deliverable has been released on Month 12 of the project (December 2021).

1.4 Intended audience

The intended audience of this deliverable consists of the following target groups:

- Representatives from civil protection and risk disaster management community - First responders (fire fighters, law enforcement, emergency services, etc.), civil protection units and civil society organisations / NGOs and their networks with interest in the Crisis Management domain;
- International and national networks of civil protection and disaster management actors
- Members of the projects funded under the same call as RESISTANT project (Union Civil Protection Knowledge Network: Network Partnership (UCPM-2020-KN-AG)
- Information Communication Technology entities (industry organisations and SMEs)
- Universities and research centres
- Civil protection authorities of European countries
- Policymakers at local, national, EU and the wider Neighbourhood level
- RESISTANT project partners and the Project Officer at the Knowledge Network and Evidence-Based Policy (ECHO.B.3) Unit in the Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO) of the European Commission

2. Research & Methodology

2.1 Research aims

The findings presented in this report are based on two main lines of research.

1. An overview of crisis management in Croatia, Greece and North Macedonia, aiming at understanding the current initiatives, procedures, and resources that are being held in the RESISTANT network's participating countries regarding Civil Protection schemas, disaster training, and volunteering in the area of disaster management.
2. An inventory of national research projects of the participating countries in RESISTANT project, namely Croatia, Greece and North Macedonia as well as the European research projects and an analysis their technical innovations, their tactical and operational recommendations and their potential to develop new guidelines and operational procedures within the field of emergency and crisis management.

The aim of the first research line is to analyze whether the civil protection and first responders from the three participating countries of the project share the same or similar or different problems and solutions. Investigating Civil Protection schemas and volunteering in the partnering countries will give an insight into the differences and overlap in experiences and operations.

The aim of the second research line is to monitor research and innovation projects with a view to recommending the uptake or the industrialisation of results.

2.2 Methodological framework

For the overview of the national approaches and experiences in crisis management and civil protection schemas in Croatia, Greece, and North Macedonia most data were gathered via desk research. Information collection and overview were structured taking into account actual operational issues and legislation as well as volunteering opportunities.

Desk research was implemented by the RESISTANT partners in order to undertake an inventory of national research projects of participating countries and European research projects that have impact on operations in case of natural disasters.

The focus was on ongoing, nearly finished projects or on projects that were finished within the last two years.

The sources of information regarding the research projects were:

- The Community Research and Development Information Service (CORDIS) https://cordis.europa.eu/
- Interreg Europe: https://www.interregeurope.eu/projectresults/
- Erasmus+ Project Results Platform: https://ec.europa.eu/programmes/erasmus-plus/projects_en
- the Projects Explorer, a common repository of relevant research and operational projects along with their results that is accessible through both, the DRMKC - Disaster Risk Management

Knowledge Centre and the CoU - Community of Users on Secure, Safe and Resilient Societies of DG HOME web-platforms: https://drmkc.jrc.ec.europa.eu/knowledge/PROJECT-EXPLORER

- A Community of Users on Secure, Safe and Resilient Societies (CoU) Mapping Horizon H2020 and EU-Funded Capacity-Building Projects under 2016-2018 Programmes - October 2019 - Publications Office of the EU (europa.eu): https://op.europa.eu/en/publication-detail/-/publication/e626e2c2-f388-11e8-9982-01aa75ed71a1/language-en/format-PDF/source-82621453
- The Knowledge DB is part of the website stores results of the DRIVER+ project systematic literature research: https://pos.driver-project.eu/en/gt/knowledge

The RESISTANT Consortium partners searched these aforementioned sources for research and innovation projects from the last 5 years (started in January 2016) and selected a number of 17 projects. At the same time a research was implemented by the RESISTANT partners in order to identify current tools for emergency management (e.g Data Mining and Analysis tools for Natural Disaster Management) and training infrastructures for first responders. The sources of information were:

- https://www.preventionweb.net
- The Disaster Risk Management Knowledge Centre
- ttps://pos.driver-project.eu/en/PoS/solutions

A template (**see Annex 1**) to be used as a guideline by the partners to present the research projects and their outcomes in terms of technical innovations, their tactical and operational recommendations was developed by IHU. The projects identified were classified and structured according to the following criteria: goal, impact, tools, results, media etc.

After the selection of the relevant research projects, the RESISTANT Consortium has used a template to present and analyse the outcomes of selected research projects.

3. Crisis management activities in Croatia, Greece and N. Macedonia

3.1 Crisis Management

Crisis Management as it is stated by European Civil Protection and Humanitarian Aid Operations and cross-referenced from the civil protection authorities' official information.

3.1.1 Croatia

The Government of Croatia manages the activities of the civil protection members operating in disasters, with the support of the Civil Protection Headquarters. The Government, following a proposal of the competent minister, can adopt a decision to request and receive international assistance, or to provide assistance to other countries affected by disasters.

Measures and activities in the civil protection system are implemented by the following participants:

- the Government of the Republic of Croatia
- the Ministry of the Interior, as the central state body competent for civil protection activities
- state administration bodies and other government authorities
- armed forces of the Republic of Croatia and the police
- units of local and county (regional) self-government.

Disaster risk reduction (DRR) activities fall within the competence of individual ministries. In this context, the Croatian Disaster Risk Reduction Platform was established to achieve an integrated DRR approach. Governmental decisions define its organization and tasks. A shift from a re-active to a pro-active risk management approach is currently taking place, with emphasis on DRR. Most initiatives for the implementation of activities come from the national level. However, as there is no single list of measures implemented in all sectors, this should be rectified with the drafting of the National DRR Strategy. Some regulations define sectoral DRR measures, such as the Water Act, the Act on Civil Protection System and the Act on Protecting Forests against Fires.

Moreover, The Act on Civil Protection defines the obligation to draft disaster risk assessment plans at national, regional and local levels. The manner and scope of **risk assessment** is defined by:

- Regulations on the Guidelines for the development of risk assessments of disasters and major accidents for the territory of the Republic of Croatia and the units of local and regional self-government
- Criteria for the development of the guidelines that are drafted by the heads of county (regional) self-government for the needs of the development of risk assessments of major accidents at the levels of units of local and county (regional) self-governments
- County Guidelines for certain counties.

It is worth mentioning that the National Risk Assessment was drafted and developed by the Main Working Group of the Croatian Disaster Risk Reduction Platform, consisting of representatives of ministries competent for specific risks. In this context, 15 threats have been identified and as many risk assessment plans have been developed, including the worst possible and the most probable scenarios, and an assessment of a multi-hazard risk. The National Risk Assessment identified earthquakes, floods and wildfires as 3 priorities, significant risks and they take priority of investments from all sources.

In order to promote **risk management planning**, the Act on Civil Protection System partially defines the risk management planning, where the sections of disaster risk reduction and response are more precisely defined. The national DRR Strategy needs to list the current sectoral strategies, activities currently being carried out, and the ones that need to be carried out. It also needs to align the objectives of all strategies. Disaster recovery plans are currently being developed, and the expected new legislative framework should better regulate this part of the cycle.

Pursuant to the Act on Mitigating and Eliminating Consequences of Natural Disasters, units of local and county (regional) self-government are obligated to draft action plans consisting of the following:

- list of measures and competent authorities in the event of a natural disaster
- insurance assessment of the equipment and other means of protection and prevention of damage to property, economic functions and prevention of casualties in the population
- other measures, which include cooperation with competent authorities from this Act and/or other bodies, scientific institutions, and experts in the field of natural hazards.

Furthermore, in order to raise risk communication and awareness, the Ministry inform the public of the possible occurrence of a disaster, and about its developments. This is done together with competent authorities of other government bodies, bodies of units of local and county (regional) self-government, and other professional services. In the event of a major accident or disaster, also Civil Protection Headquarters inform the public.

As far as it concerns **preparedness**, of formal and informal education are conducted as well as information and promotional activities, exercises, conferences, workshops and courses. The National Civil Protection Training Centre prepares and carries out the education (training, courses, workshops, seminars, exercises, etc.) for all the organized operational forces, as well as for members and other citizens involved in the civil protection system. Furthermore, the same centre prepares the annual plan of exercises (tabletop, simulation-communication and field exercises) for the civil protection system, which is then implemented by the operational forces and members of the civil protection system. The training is also carried out by the basic civil protection operational forces (Croatian Mountain Rescue Service and Croatian Red Cross) per their own professional expertise, and by citizens associations with no public authority.

Although, there is not an **early warning system** that can cover all civil protection issues throughout the country, the country's early warning system has 2 aspects:

- receiving alerts on various threats through designated systems (for example, EFAS – floods, EFFIS – fires, ECURIE – nuclear and radiological threats, etc.)
- warning and alarming the population on threats

The focal point for exchanging information in case of emergency is the Civil Protection Operations Centre, which communicates with the Commission's Emergency Response Coordination Centre through CECIS. Early warning is carried out through sirens and media providing additional information on threats and measures to be taken.

As far as, it concerns emergency response, when disasters strike, the Civil Protection Headquarter (HQ) - an operational and coordinating body - oversees and coordinates activities of the civil protection operational forces in the preparatory phase (before the emergency) and during the implementation of

civil protection measures and activities. The HQ is established at the national level, and at the level of units of local and county (regional) self-governments. Additionally, the Civil Protection Headquarter consists of representatives of relevant sectors from public administration bodies, operational forces of the civil protection system, and representatives of other legal entities of special importance for the civil protection system of the Republic of Croatia. County civil protection headquarters have been established at the regional level and there are 21 in total (20 counties and the City of Zagreb).

Finally, international activities involve providing urgent international assistance, participation in international training programs and exercises. International cooperation can be divided into bilateral, regional and multilateral, promoting cross-border, European and international cooperation. The Republic of Croatia has signed 13 bilateral agreements (with Austria, Albania, Bosnia and Hercegovina, France, Hungary, Montenegro, North Macedonia, Poland, Russia, Serbia, Slovakia, Slovenia, Ukraine,) and 4 Memoranda of understanding (with Israel, Italy, Kosovo, The Netherlands). The Civil Protection Directorate participates in providing urgent and humanitarian assistance within the NATO EADRCC framework, the EU Civil Protection Mechanism, and on a bilateral basis.

3.1.2 Greece

Civil protection in Greece is organized as a coordinated resource system where national, regional and local authorities work together with local and public institutions and services. The Greek bodies responsible for the implementation of civil protection measures include the General Secretariat for Civil Protection (**GSCP**) and several authorities, organizations and institutions, e.g. the ministries, the fire service, the Hellenic police, the armed forces, health authorities, the decentralized administrations, the regions, and the municipalities.

The mission of include the General Secretariat for Civil Protection is to protect the citizen's life, health and property from natural, technological and other major hazards. Additionally, it studies, plans, organizes and coordinates the country's policy concerning issues of public awareness, prevention and confrontation of natural or man-made disasters. It coordinates the actions of the public services and the civil protection volunteers.

As far as it concerns **prevention**, each ministry is responsible for prevention plans and taking preventive structural measures in the area of their competency. The General Secretariat for Civil Protection issues circulars with guidelines not only on prevention, but also in preparedness and disaster response. In this context, the key risks identified in the national risk assessment include forest fires, earthquakes, floods, and industrial accidents.

The GSCP is committed to **risk management planning** via the national Civil Protection Plan "Xenokrates" (Ministerial Decision no. 1299/2003) which sets the national framework for an effective risk management planning and provides for the development of hazard-specific plans at the local, regional and national level. In accordance with "Xenokrates", at national central level, the General Secretariat for Civil Protection issues National Plans for all kinds of natural and manmade disasters. All ministries, decentralized governmental authorities, and local government authorities should design their plans based on the national plan. The General Secretariat of Civil Protection is the general coordinator of the planning.

Furthermore, the GSCP aims to raise risk communication and awareness. To this end, public information covers the whole disaster management cycle. The GSCP has a cross-sectoral and all-hazards competence, while hazard-specific communication is provided by public authorities in their sphere of competences. Information on all kinds of natural and man-made disasters including guidelines for self-protection is available, in Greek and foreign languages (English, Spanish, French, Albanian, and Arabic). These guidelines can be found on the site of the General Secretariat for Civil Protection. Information is disseminated via various methods such as campaigns, TV and radio spots for specific disasters, publication of leaflets and brochures, electronic material, and school visits.

As far as it concerns **preparedness**, trainings and exercises are undertaken at national, regional, and local level by competent authorities while Greece participates in the Union Civil Protection Mechanism training programme. Furthermore, Greek authorities have also organised international exercises, such as, EU EVITA 2014, EU PROMETHEUS 2014, EU POSEIDON 2011, and EU EVROS, 2010. Greece has participated in others, such as, EU TWIST 2013, EU Dr HOUSE, 2012, PT QUAKE 2009, and SARDINIA 2008.

Although, there is not an **early warning system** that can cover all civil protection issues throughout the country, there is some attempts such as the daily forest fire risk map during the summer period, which is uploaded on the GSCP website and sent to all competent and local authorities involved in forest fires management, as well as the warnings about severe weather phenomena by the Hellenic National Meteorological Service. Finally, tsunami early warnings are provided by the Institute of Geodynamics, which hosts the Hellenic National Tsunami Warning Centre.

As far as it concerns **emergency response**, the GSCP, the regional authorities and the local government authorities are in charge of coordinating all operational forces depending on whether the disaster is general, regional, or local. Furthermore, bilateral agreements and/or memorandums of understanding have been signed with Bulgaria, Cyprus, France, Israel, Malta, the Russian Federation, Ukraine, the USA, and Turkey in order to promote **cross-border, European and international cooperation**. Regional agreements in force include the Black Sea Economic Cooperation (BSEC), EUR-OPA Major Hazards Agreement, memorandum of understanding in humanitarian emergency response (UN, Greece and Turkey), the Protocol in Preventing Pollution from ships and, in cases of Emergency, Combating Pollution of the Mediterranean Sea, UNECE Convention on the Trans-boundary Effects of Industrial Accidents.

Bilateral Agreements in force: Memorandum of Understanding on Cooperation in the Field of Civil Protection between the Government of the Hellenic Republic and the Government of the Republic of North Macedonia (signed in 2021).

Multilateral Agreements in force: Memorandum of Understanding of Cooperation among the Islamic Republic of Iran , Republic of Armenia, and the Hellenic Republic on Issues of Risk Management of Technological and Natural Disasters, Health & Environment.

3.1.3 N. Macedonia

Protection and rescue in the Republic of North Macedonia is organized as a single system for tracking, preventing, and mitigating consequences caused by natural disasters or other emergencies. The system is regulated by the Protection and Rescue Law. The Law indicates how responsibilities are divided

between the participants in protection and rescue activities, including the state, local authorities, private companies, public enterprises, facilities, and services. Based on the Protection and Rescue Act, rescue organizations have to participate in protection and rescue activities in case of disasters and major accidents.

As far as it concerns **prevention**, the risk assessment of the security of the Republic of Macedonia for all risks and hazards is a document of public interest and is drafted based on the Law on Crisis Management. It is regulated by the Regulation on the Methodology for drafting the threat assessment of the security of the Republic of North Macedonia. On the other hand, the Crisis Management Center assessment identifies the presence and expected dangers to which the territory of the Republic of Macedonia is exposed, their description, analysis, assessment of the likelihood of their occurrence, in time and space, expected intensity/impact strength and possible consequences. It has made a concrete link of the causative circle between the danger (as a probability of negative consequences) and the damages (as the final consequence of the negative impact of the danger) expressed in regard to the population, the environment, specific objects, infrastructure or other valuables on the territory of the Republic of North Macedonia.

The Crisis Management Center is the central office for communication and its media centre informs the public and the mass media in order to raise risk communication and awareness. The joint media centre is responsible for the preparation and transfer of information to the public and responsible ministries, preparing press conferences, and communicating with international media.

As far as it concerns **preparedness**, protection and Rescue Directorate carries out trainings of the response units, institutions and private companies. International trainings are carried out under the Union Civil Protection Mechanism, bilateral cooperation with the countries in the region and through cooperation with the international actors in the country (NATO, US, International Trust Fund.

Part of the State Operations Centre is an early warning and alert system which functions at the national level within the Crisis Management Centre.

As far as it concerns **emergency response**, after a crisis is declared in the country, the Crisis Management Center takes over the international communication and coordination with international institutions. It coordinates the requests, reception, and distributing of international assistance. Regarding disaster response resources, the Crisis Management Center developed a national platform with a database of national resources for cross-border operations. Related institutions declare their own capacities for international disaster response operations.

The Republic of North Macedonia takes part in various national, regional, and international exercises. These include: the open fire rescue exercise BALKAN 18 in Ptolemaida, Greece; mitigation of the aviation accident consequences in Stara Zagora, Bulgaria; regional exercise of evacuation the private medical hospital "Adzibadem Sistina" in Skopje; participation in field exercises within the EUCPM in Spain, Sweden, and Italy; NATO field exercise SERBIA 18 in Mladenovac, Serbia; CMEP simulation exercise VODNO 18, supported by USA; national field exercise AUTMN STORME.

3.2 Civil Protection Schemas, disaster training, and volunteering

3.2.1 Croatia

Civil protection is a shared competence of all levels of governance.

State authorities are responsible for:

- Coordinate the civil protection system;
- Carry out analyses and share information on all types of hazards and possible consequences of major accidents and catastrophes;
- Establish and manage the single alert system in the Republic of Croatia;
- Amend regulations and draft documents;
- Manage the operational forces of the civil protection system and coordinate their activities;
- Negotiate and implement international agreements in the field of civil protection;
- **Conduct international conferences, seminars, courses, workshops, exercises and projects in the field of civil protection**;
- Provide **trainings for members of the operational forces and other participants in the civil protection** system;
- Establish the professional, material and technical conditions that must be met by public institutions and other legal entities for the implementation of f**ormal and informal education programs in the civil protection** system;
- Provide **trainings on the civil protection** system;
- Examine the equipment and means for civil protection;
- Maintain a unique information base on the operational forces of the civil protection system, material resources and equipment, and readiness for operational action;
- Make a decision on the design of an external protection and rescue plan in case of accidents involving hazardous substances brought by regional self-government units
- Provide consent to the units of regional self-government on the methodology of risk assessment, external protection and rescue plans in case of accidents involving hazardous substances;
- Provide consent to the units of local and regional self-government to the planned protection and rescue measures in spatial planning documents and compliance with risk assessments;
- Provide consent to legal persons (authorised persons) to carry out expert tasks in drafting planning documents in the field of civil protection and keep a record of issued consents;
- Provide consent to the decisions of the executive bodies of the units of local and regional self-government on the determination of legal persons of interest to the civil protection system;
- Participate in proposing the state inventory balance sheet;
- Establish the Disaster Risk Reduction Strategy;
- Submit to the Government of the Republic of Croatia a unified proposal of the central state administration bodies, scientific institutions, public companies and associations for the appointment of the Deputy Mayor and members of the Civil Protection Staff of the Republic of Croatia;

- Coordinate the work of central and other state administration bodies in the preparation of the Disaster Risk Assessment for the Republic of Croatia;
- Perform administrative and inspection supervision over the implementation of Law on Civil Protection System and other special regulations;

At the regional level, authorities are responsible for:

- Organise activities from their own self-governing areas related to the planning, development, efficient functioning, and financing of civil protection systems;
- Strengthen and supplement the readiness of the existing operational forces of the civil protection system;
- Organise the **participation of volunteers** in implementation of measures and activities in the civil protection system;
- Consider and adopt annual budget and annual plan of civil protection system for the three year period and develop the system that is adopted every four years;
- Provides a risk assessment of major accidents.

At the local level authorities are responsible for:

- Adopt a civil protection action plan
- Adopt a civil protection exercise plan;
- Prepare and submit to the representative body a proposal for a decision on the appointment of legal persons in the civil protection system and the proposal for a decision on the establishment of civil protection units;
- Making an annual procurement plan, which includes the material resources and equipment of the civil protection force;
- Make decisions from its self-governing institutions to provide material, financial and other conditions for financing and equipping the operational forces of the civil protection system;
- Establish, develop, fund, train the operational forces in accordance with the adopted guidelines and the plan for the development of the civil protection system at a local level;
- Elaborate and submit to the representative body a proposal for a major accident risk assessment and regularly update the risk assessment and action plan for civil protection;
- Provide conditions for relocation and evacuation people at a local level;
- Provide conditions for managing and updating the database on members, capabilities and resources of the operational forces within the civil protection system
- Establish record of injured persons in major disasters and catastrophes.

Civil Protection Volunteering System

The Protection and Rescue Act and supporting legislation describe in detail the rights and obligations of individual participants in protection and rescue operations, agreements on cooperation between the National Protection and Rescue Directorate and volunteer associations regarding protection and rescue, and includes acts relating to the Croatian Red Cross, the Croatian Mountain Rescue Service, fire-fighting and protection against natural disasters. Fire-fighters and volunteers receive training in emergency response at the Protection and Rescue School of the National Protection and Rescue Directorate's Fire Fighting sector

3.2.2 Greece

Civil protection is a shared competence of all levels of governance.

The **central Government** is responsible for:

- The adoption of the National Civil Protection Plan (**Xenocrates Plan**);
- All ministries draw up special plans for dealing with disasters;
- The General Secretariat for Civil Protection is in charge of:
    - Planning policies of civil protection and present them to the ministry of citizen protection;
    - Coordinating with all relevant ministries in order to organize preparatory plans in case of emergencies and disasters;
    - Approving regional and municipal emergency plans;
    - Providing advice to the ministry of interior on how to fund the regional and local emergency programs;
    - Organizing **training activities for all employees working on civil protection**;
    - Maintaining a registrar of all **voluntary organizations** working on civil protection;
    - Promoting and supporting **research projects, training and educational program** on civil protection;
    - Conducting crisis management by mobilizing forces, coordinating activities, mobilizing and protecting citizens and repairing damages;
    - Representing the country on all civil protection issues at the international level
    - Applying for international assistance.

The Inter-Ministerial Committee for National Planning, approves every 5 years, the National Policy for mitigating the risk of disasters. The central coordination body for Civil Protection is responsible for following up and evaluating the annual national planning in regard to the response, recovery and rehabilitation of major catastrophes.

On the other hand, regional authorities are responsible for:

- Regional special plans for dealing with disasters on the basis of the National Civil Protection Plan;
- The coordination and supervision of the work of civil protection services for prevention, preparation, response and disaster recovery within the territorial limits of the region;
- The implementation of the annual national planning for civil protection as far as the region is concerned;
- The submission of proposals for the regional civil protection for the annual national planning policy of the Inter-ministerial Commission;
- The submission of proposals to the Secretary General of Civil Protection for a decision declaring an emergency in cases of regional disasters;
- The decisions declaring states of emergency as far as small intensity local destruction is concerned, as well as the coordination of all the respective regional public or private mechanisms in order to ensure the full preparation in case of destruction and damage recovery;

- The planning and organisation of measures of prevention, awareness and response to disasters or emergencies;
- The decision on the requisition of personal services, securities and real estate;
- Cooperating with the competent bodies for the suppression of forest fires; and
- Granting of the annotation of The Hague Convention on service of documents in the region.

At the local level, municipal authorities are responsible for:

- Local special plans for dealing with disasters on the basis of the National Civil Protection Plan;
- The coordination and supervision of the work of civil protection services for the prevention, preparation, response and disaster recovery within their territorial limits;
- The submission of proposals for the regional civil protection, for the annual national planning policy and for the implementation of programmes, measures and actions for their territory in the frameworks of the national and regional planning;
- The provision and coordination of the human resources and materials for the prevention, preparation, response and recovery in case of destruction in their territory;
- Aiding and supporting the fire-corps, with any available mean.

Civil Protection Volunteering System

The Civil Protection Voluntary Organizations are non-profit associations or groups of individuals which constitute part of the Civil Protection human resources. Their purpose is to provide assistance to Civil Protection state bodies in the fields of life protection, health, citizens' property rights, as well as the protection of the environment and the cultural heritage from natural, technological, or man-made disasters and threats which cause emergencies during peacetime. The General Secretariat for Civil Protection is the competent national body responsible for keeping the so-called "Civil Protection Volunteering Register" which consists of the Civil Protection Voluntary Organizations, their members, vehicles and equipment as well as their action plans. Among others, this system organizes the training of Civil Protection Volunteers as well as the mobilization and involvement of volunteers.

3.2.3 N. Macedonia

The Ministry of Defence has the overall competence in this field.

- Protection, rescue and aid programmes
- Prevention;
- Risks assessment;
- **Education and training**;
- Monitoring;
- The organisation of protection and state rescue forces;
- Self-protection, self-aid and mutual assistance;
- International cooperation;
- Organizes and provides functions of integrated communication and information system;
- Organizes and prepares the Civil Protection;
- Performs manning of the Civil Protection Forces created by the Republic;

- Organizes and performs mobilization of the units and staffs of the Civil Protection created by the Republic;

The Parliament adopts National strategy for protection and rescue (for a period of five years).

The Directorate for protection and rescue is a state body established for implementing the activities for protection and rescue from natural and other disasters.

At the local level, authorities are responsible for:

- Disaster protection and assistance;
- Plan for protection and rescue;
- Guidelines for the organisation and development of a local protection and rescue system;
- Threat assessments as well as protection and rescue plans;
- Fire-fighting;
- The clearance of local roads, streets and other infrastructures in case of natural disaster;
- First aid;
- The protection of animal and plants from diseases, vermin and other natural disasters;
- Monitoring the municipality's preparedness;
- The distribution of humanitarian aid;
- The formation of local rescue forces;
- Annual programme for protection and rescue in line with the National strategy for protection and rescue, and
- Plan for protection and rescue from natural disaster.

Civil Protection Volunteering System

Legal provisions for the engagement of volunteers in the EP&R system exist. The Protection and Rescue Directorate (PRD) was established in 2004 as a central (operational) institution for protection and rescue—activities that involve volunteers—and in 2005 firefighting units were transitioned from the Ministry of Interior to the municipalities and the City of Skopje. Investments and donations for volunteer associations are received through cooperation with various foreign foundations, programs, and initiatives. At the same time, civil society does maintain some good practices in terms of volunteering and popular education. Notable examples are the M. Red Cross, LEGIS, and the Voluntary Firefighter Association.

4. Inventory and analysis of results of research projects in the field of emergency and crisis management

4.1 R&I projects and their results

This chapter presents nearly finished projects and projects that were finished within the last two years.

4.1.1 IMPROVER

Start date 1 June 2015 - End date 30 September 2018

PROJECT NAME
Improved risk evaluation and implementation of resilience concepts to critical infrastructure

DESCRIPTION
The overall objective of IMPROVER is to improve European critical infrastructure resilience to crises and disasters through the implementation of resilience concepts to real life examples of pan-European significance, including cross-border examples.

The improvement will arise through the development of a methodology for implementing combinations of societal, organizational and technological resilience concepts to critical infrastructure based on risk evaluation techniques and informed by a review of the positive impact of different resilience concepts on critical infrastructure.

IMPROVER is aimed at developing European Resilience Management Guideline and demonstrating it through pilot implementation.

RESULTS

- **Improve our understanding of the application and interaction of different resilience concepts**

The project set out to increase our understanding of resilience concepts. This was necessary to be able to evaluate the resilience of infrastructure in terms of interruption to services. This was in turn necessary to understand and minimize the impact of incidents on society and to ensure societal resilience in support of citizens and industry. This objective included consideration of interdependencies in a cross border and pan-industry context; and the interaction and functional mechanism of resilience concepts.

- **Evaluate the baseline requirement off critical infrastructure in the event of a crisis**

In order to implement resilience concepts to critical infrastructure IMPROVER set out to better our understanding of acceptance criteria for infrastructure resilience.

- **Develop a resilience management guideline including a methodology for implementation of resilience concepts to critical infrastructure**

The principal outcome from the IMPROVER project was intended to be a generalised methodology for operationalisation of resilience to critical infrastructure.

- **The methodology was intended to be scalable from the system level to the level of a network of interconnected systems (a system-of-systems). Such a methodology was anticipated to be of use not only for critical infrastructure owners but for policy and decision makers and for disaster recovery planning.**

The methodology needed to account for not only the level of risk which infrastructure is exposed to but also the level of risk which the operators and which society are willing to accept. The methodology was intended to be presented in a proposed European Resilience Management Guideline.

PARTNERS

- RISE RESEARCH INSTITUTES OF SWEDEN AB
- DANSK BRAND- OG SIKRINGSTEKNISK INSTITUT FORENING
- INSTITUT NATIONAL DE L ENVIRONNEMENT INDUSTRIEL ET DES RISQUES - INERIS
- UNIVERSITY OF LEICESTER
- RISE FIRE RESEARCH AS
- INOV INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES INOVACAO
- UNIVERSITY COLLEGE LONDON
- ASSOCIATION CENTRE SISMOLOGIQUE EURO-MEDITERRANEEN
- UNIVERSITETET I TROMSOE - NORGES ARKTISKE UNIVERSITET
- JRC -JOINT RESEARCH CENTRE- EUROPEAN COMMISSION
- THE UNIVERSITY OF SHEFFIELD
- BUDAPESTI MUSZAKI ES GAZDASAGTUDOMANYI EGYETEM

LINKS

https://cordis.europa.eu/project/id/653390

https://improverproject.eu/

4.1.2 RESILENS

Start date 1 May 2015 - End date 30 April 2018

PROJECT NAME

Realising European ReSiliencE for CritIcaL INfraStructure

DESCRIPTION

Critical infrastructure (CI) provides the essential functions and services that support European societal, economic and environmental systems. As both natural and man-made disaster and crises situations become more common place, the need to ensure the resilience of CI so that it is capable of withstanding, adapting and recovering from adverse events is paramount. Moving resilience from a conceptual understanding to applied, operational measures that integrate best practice from the related realm of risk management and vulnerability assessment is the focus of the RESILENS project.

RESULTS

RESILENS will develop a European Resilience Management Guideline (ERMG) to support the practical application of resilience to all CI sectors. Accompanying the ERMG will be a Resilience Management Matrix and Audit Toolkit which will enable a resilience score to be attached to an individual CI, organisation (e.g. CI provider) and at different spatial scales (urban, regional, national and transboundary) which can then be iteratively used to direct users to resilience measures that will increase their benchmarked future score. Other resilience methods including substitution processes and measures to tackle cascading effects will also be developed.

The ERMG and resilience management methods will be tested and validated through stakeholder engagement, table-top exercises and three large scale pilots (transport CI, electricity CI and water CI). The ERMG and accompanying resilience methods will be hosted on an interactive web based platform, the RESILENS Decision Support Platform (RES-DSP). The RES-DSP will also host an e-learning hub that will provide further guidance and training on CI resilience. Overall, RESILENS aims to increase and optimise the uptake of resilience measures by CI providers and guardians, first responders, civil protection personnel and wider societal stakeholders of Member States and Associated Countries.

The RESILENS project is coordinated by Future Analytics Consulting, an Irish based planning, research and economic SME. The consortium includes 12 partners across Europe including universities, municipalities, CI providers, SME's and research and technical organisations.

PARTNERS

- FUTURE ANALYTICS CONSULTING LIMITED
- THE UNIVERSITY OF WARWICK
- FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- THE PROVOST, FELLOWS, FOUNDATION SCHOLARS & THE OTHER MEMBERS OF BOARD, OF THE COLLEGE OF THE HOLY & UNDIVIDED TRINITY OF QUEEN ELIZABETH NEAR DUBLIN
- M T R S 3 SOLUTIONS AND SERVICES LTD
- FACTOR SOCIAL - CONSULTORIA EM PSICO - SOCIOLOGIA E AMBIENTE LDA
- SFJ AWARDS LIMITED
- BUNDESANSTALT FUER STRASSENWESEN
- E-REDES - DISTRIBUICAO DE ELETRICIDADE SA
- EASTERN AND MIDLAND REGIONAL ASSEMBLY
- CAMARA MUNICIPAL DE LISBOA
- IRISH WATER

LINKS

https://cordis.europa.eu/project/id/653260

http://resilens.eu/

4.1.3 RESOLUTE

Start date 1 May 2015 - End date 30 April 2018

PROJECT NAME

RESilience management guidelines and Operationalization appLied to Urban Transport Environment

DESCRIPTION

Increasing Europe's resilience to crises and disasters is a topic of highest political concern in the EU and its Member States and Associated Countries. Regarding the specific case of transport systems, it can be said that those have developed a prominent safety and business critical nature, in view of which current management practices have shown evidence of important limitations in terms of resilience management.

Furthermore, enhancing resilience in transport systems is considered imperative for two main reasons: such systems provide critical support to every socio-economic activity and are currently themselves one of the most important economic sectors and secondly, the paths that convey people, goods and information, are the same through which risks are propagated.

RESULTS

Emergency Support Smart Mobile App (ESSMA)

The Emergency Support Smart Mobile App (ESSMA) aims to assist the resilience of a community keeping civilians updated and guided for their reactions under danger situations. The main objective of the ESSMA application is to give the opportunity to civilians to be aware of emergencies and to know the most appropriate way to reach in order to be safe.

[RESOLUTE] 1st Evacuation Scenario

Participants:

- 1 ESSMA user (to be rescued)

- 1 CRAMSS Operator

Story:

- The ESSMA user sends a SOS message to the operator, requesting path to safe point.

- The CRAMSS operator receives the SOS message.

- The CRAMSS operator set the safe point & request for evacuation route.

- The evacuation route is calculated by the eDSS.

- The CRAMSS operator sends the evacuation plan to the Central Decision Manager (CDM) for approval.

- Once the evacuation plan is approved the ESSMA user receives the route.

- During the evacuation the operator communicates through chat with the ESSMA user.

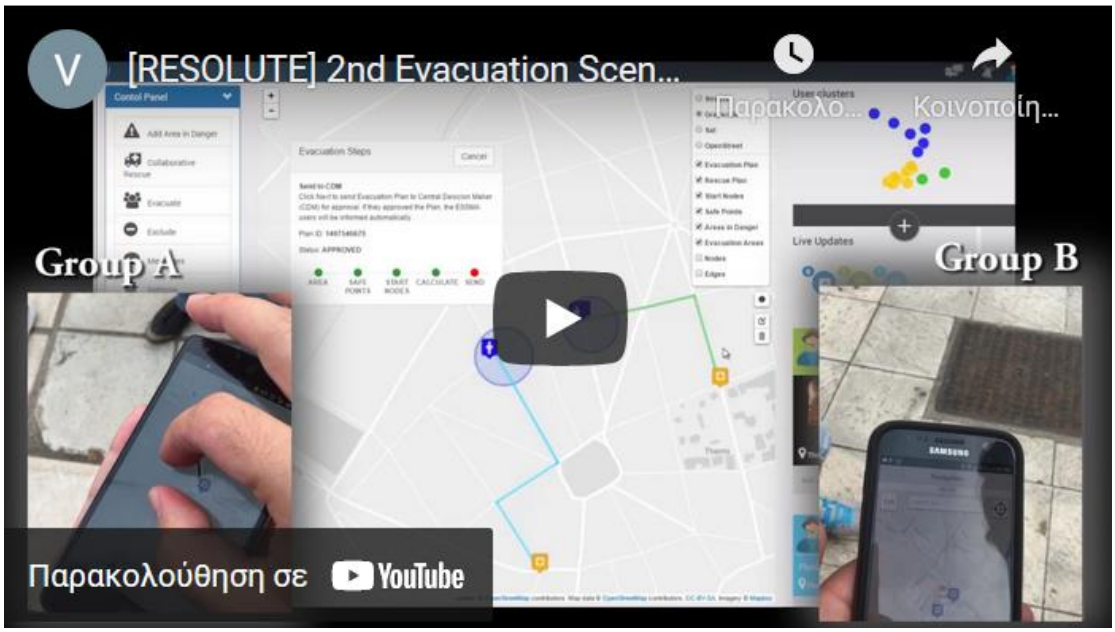

Figure 1 RESOLUTE

RESOLUTE Serious Game

https://www.insightfulstories.com/index.html

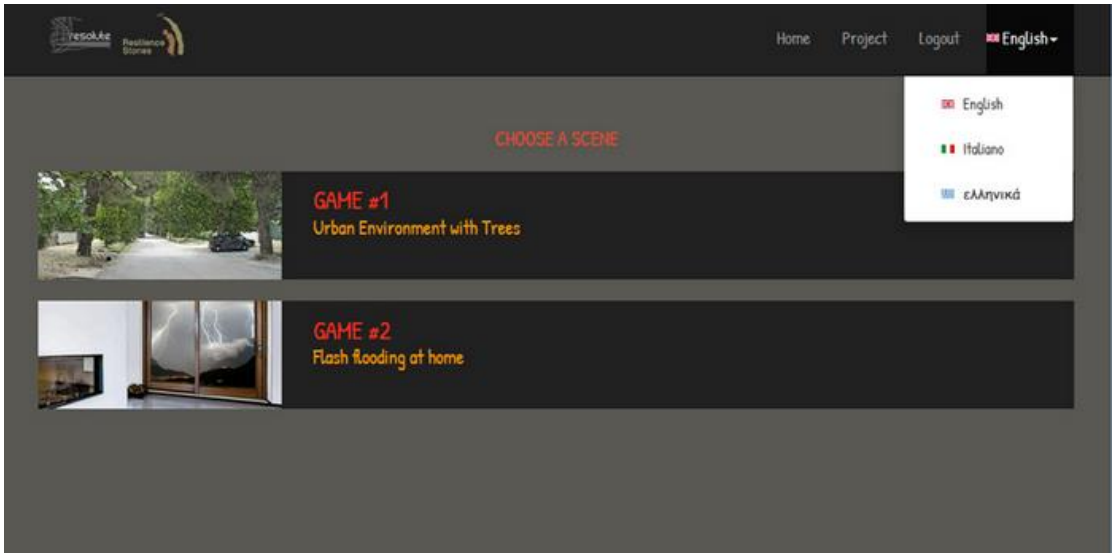

Figure 2 RESOLUTE Serious Game

The RESOLUTE UltraHD (4K) Dashboard is available by clicking in the following link:
http://dashboard.km4city.org/dashboardSmartCity/view/index.php?iddasboard=MTI5

The Resilience Dashboard represents the synthesis of the status of the Urban Transport System (UTS) and it is thought for being installed in each control room of the interested stakeholders. The

Dashboard has been designed to be used by different users such as Civil protection, Mobility dept., Urban Police, etc.

As shown in the following image, the widgets have been grouped according to the domain they refer to:

A. messages coming from the different DSS and published in the ESB (ESB column);

B. indicators referred to the most important environmental aspects (Environment column)

C. indicators referred to mobility aspects (Mobility column)

D. indicators referred to resources availability in the system (Resources column)

E. Social media section

F. Location on the map of the events received by the ESB (1)

G. Clustering representation of the WiFi Access Points

H. Real time people movements based on the wifi streaming

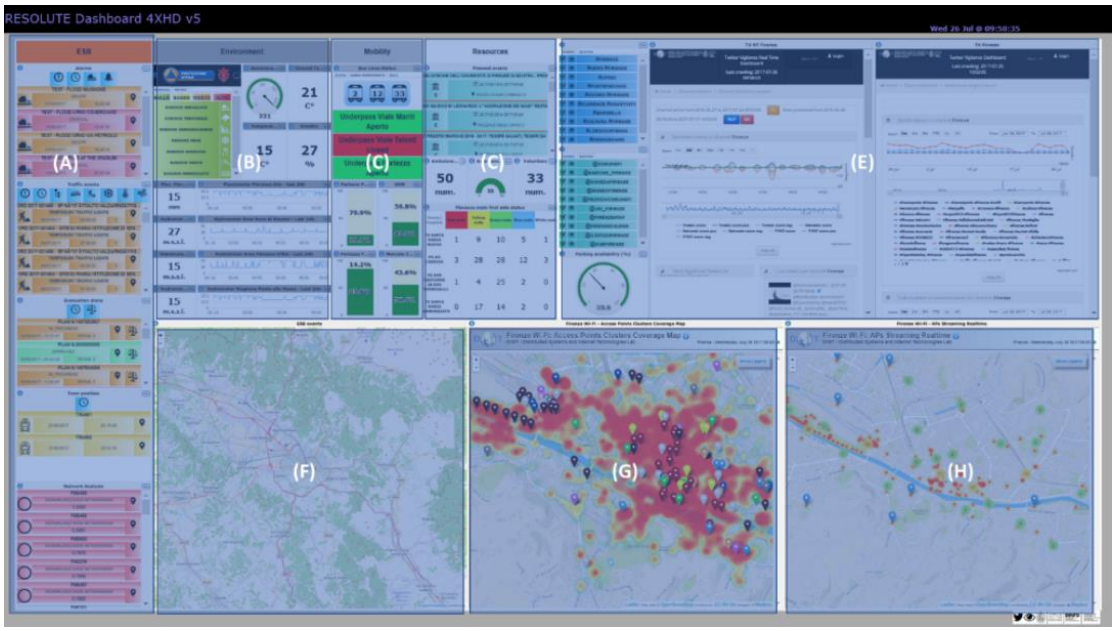

Figure 3 RESOLUTE UltraHD (4K) Dashboard

PARTNERS

- UNIVERSITA DEGLI STUDI DI FIRENZE
- THALES ITALIA SPA
- ATTIKO METRO AE
- COMUNE DI FIRENZE
- ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS
- FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- HUMANIST

- SWARCO ITALIA SRL
- ASSOCIACAO PARA O DESENVOLVIMENTO DA INVESTIGACAO NO INSTITUTO SUPERIOR DE GESTAO
- CONSORZIO MILANO RICERCHE
- COFAC COOPERATIVA DE FORMACAO E ANIMACAO CULTURAL CRL

LINKS

https://cordis.europa.eu/project/id/653460

http://www.resolute-eu.org/index.php

4.1.4 PLACARD

Start date 1 June 2015 - End date 31 May 2020

PROJECT NAME

PLAtform for Climate Adaptation and Risk reduction

DESCRIPTION

PLACARD's (PLAtform for Climate Adaptation and Risk reDuction) mission is to be the recognised platform for dialogue, knowledge exchange and collaboration between the Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) communities. In the large and complex landscape of stakeholder networks, research, policy initiatives and information sources, the PLACARD hub will enhance the coherence of and give direction to CCA and DRR research, policy and practices, strengthening cooperation and countering fragmentation between the domains.

The programme will establish a comprehensive coordination and knowledge exchange platform for multi-stakeholder dialogue and consultation to address gaps and fragmentation challenges, and support the development and implementation of an evidence base for research and innovation policies.

RESULTS

Connectivity Hub

Our "search and discovery" tool helps users find knowledge and organisations working on CCA and DRR issues.

Foresight for policymakers

A comprehensive stocktake of foresight approaches employed across the CCA and DRR communities.

Strengthening institutional coordination & capacity

Hands-on insights and policy advice to encourage activities to strengthen collaboration and capacity.

PLACARD Manifesto & legacy

Adapting to extremes: Key insights for bridging CCA and DRR in the European Green Deal.

Stories to inspire climate action

Through emotional connections created within a story, we can inspire people to think differently and more positively about difficult subjects.

CCA, DRR & global agreements

Three reports highlight where taking adaptation and risk reduction activities into account could improve the outcomes of international agreements.

ECCA 2019 – we need action now!

The 4th European Climate Change Adaptation conference highlighted the urgency of action on climate change, and research and practice gaps.

Knowledge management & network analysis

Efficient information knowledge management, and communication with your stakeholders are vital elements for successful practice.

Participate! online course

Our online course teaches skills for facilitating CCA and DRR-related workshops, and suggestions for hosting effective events.

PARTNERS

- FCIENCIAS.ID - ASSOCIACAO PARA A INVESTIGACAO E DESENVOLVIMENTO DE CIENCIAS
- STIFTELSEN THE STOCKHOLM ENVIRONMENT INSTITUTE
- HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH - UFZ
- FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI
- THE CHANCELLOR, MASTERS AND SCHOLARS OF THE UNIVERSITY OF OXFORD
- UMWELTBUNDESAMT GESELLSCHAFT MIT BESCHRANKTER HAFTUNG (UBA GMBH)
- UNIVERSITE DE GENEVE
- STICHTING INTERNATIONAL RED CROSS RED CRESCENT CENTRE ON CLIMATE CHANGE AND DISASTER PREPAREDNESS
- STICHTING WAGENINGEN RESEARCH
- FUNDACAO DA FACULDADE DE CIENCIAS DA UNIVERSIDADE DE LISBOA FP

LINKS

https://www.placard-network.eu/

https://cordis.europa.eu/project/id/653255

4.1.5 RESILOC

Start date 1 June 2019 - End date 30 November 2022

PROJECT NAME

Resilient Europe and Societies by Innovating Local Communities

DESCRIPTION

RESILOC aims at studying and implementing a holistic framework of studies, methods and software instruments that combines the physical with the less tangible aspects associated with human behavior.

RESULTS

The study-oriented section of the framework will move from a thorough collection and analysis of literature and stories from the many approaches to resilience adopted all over the World. The results of the studies will lead to the definition of a set of new methods and strategies where the assessment of the resilience indicators of a community will be performed together with simulations on the "what-if" certain measures are taken. These studies and methods will serve for designing and implementing two software instruments:

1. 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).

2. The RESILOC Cloud-based platform for assessing and calculating the resilience indicators of a city or a community, for developing localised strategies and verifying their impacts on the resilience of the community. The Cloud platform, a combination of SaaS and PaaS, includes the inventory as its repository.

The project will make use of built solutions in four field trials and includes a high-profile communication plan, heavily based on Social Media platforms.

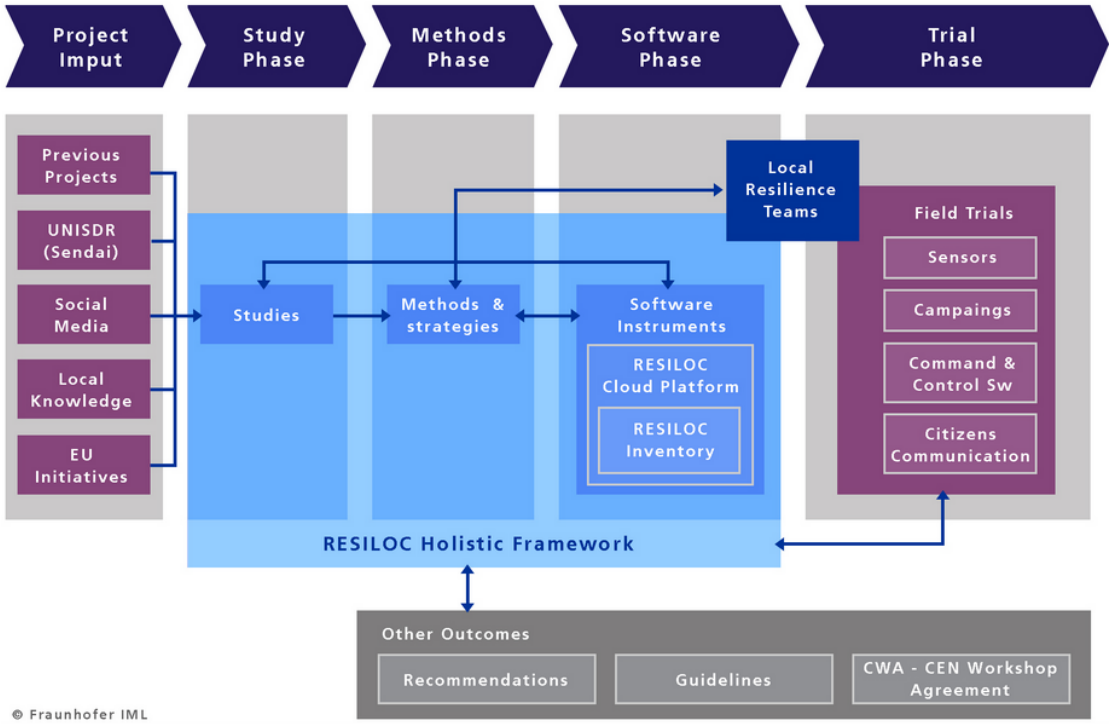

Figure 4 RESILOC

PARTNERS

- FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- INTELLIGENCE FOR ENVIRONMENT AND SECURITY SRL IES SOLUTIONS SRL
- ETHNIKO KAI KAPODISTRIAKO PANEPISTIMIO ATHINON
- TAVISTOCK INSTITUTE OF HUMAN RELATIONS LBG
- ISTITUTO DI SOCIOLOGIA INTERNAZIONALE DI GORIZIA ISIG
- INSTITUT JOZEF STEFAN
- STIFTINGA VESTLANDSFORSKING
- RESILIENCE ADVISORS LTD
- BALKANSKI INSTITUT PO TRUDA I SOCIALNATA POLITIKA ASSOCIATION
- COMUNE DI CATANIA
- DIMOS DITIKIS ACHAIAS
- BERGEN KOMMUNE
- Regione Sicilia
- BULGARIAN RED CROSS
- MINISTRY OF NATIONAL DEFENCE, GREECE
- Uprava RS za zaščito in reševanje, Ministrstvo za obrambo
- COMUNE DI GORIZIA

LINKS

https://cordis.europa.eu/project/id/833671

https://www.resilocproject.eu/

4.1.6 BuildERS

Start date 1 May 2019 - End date 30 April 2022

PROJECT NAME

Building European Communities' Resilience and Social Capital

DESCRIPTION

BuildERS shall target for increasing the social resilience capital of European communities and citizens. It will do this genuinely co-designing processes and tools with citizens, first-responder organisations and tool developers.

RESULTS

- Handbook to Improve Societal Disaster Resilience
- Innovations
    - Board Game
    - Vulnerability Assessment Tool

  - Guidelines for Ethics Assurance
  - Mobile Positioning Tools
  - Guidelines for Collaborating with Social Media Influencers
  - Natural Disaster Mapping Tool
  - Inclusive Crisis Communication Canvas
  - Training Course for Law Enforcement Agencies Officers
  - Guidelines for Using Supportive Technologies to Collect Data
- Policy Briefs
- Fact Sheets
- Videos

PARTNERS

- Teknologian tutkimuskeskus VTT Oy
- STOCKHOLMS UNIVERSITET
- UNIVERSITETET I STAVANGER
- TRANSPORTOKONOMISK INSTITUTT
- TARTU ULIKOOL
- UNIVERSITA DEGLI STUDI DI TRENTO
- POLIISIAMMATTIKORKEAKOULU
- ESTONIAN RESCUE BOARD
- STIFTELSEN THE STOCKHOLM ENVIRONMENT INSTITUTE
- Positium OU
- GEONARDO ENVIRONMENTAL TECHNOLOGIESLTD
- ARMEE DU SALUT
- EBERHARD KARLS UNIVERSITAET TUEBINGEN
- DEUTSCHES ROTES KREUZ EV
- PROVINCIA AUTONOMA DI TRENTO
- UNIVERSITY OF INDONESIA
- GEORGE MASON RESEARCH FOUNDATION, INC

LINKS

https://buildersproject.eu/

https://cordis.europa.eu/project/id/833496

4.1.7 ENGAGE

Start date 1 July 2020 - End date 31 December 2023

PROJECT NAME

Engage Society for Risk Awareness and Resilience

DESCRIPTION

When disaster strikes, whether it's an earthquake or a terrorist attack, communities come together to respond and cope. Citizens play a big role at the grassroots level. The EU-funded ENGAGE project will explore how individuals and local practices can interrelate effectively with planned preparedness and response, practitioners and technology. By studying the current strategies, methods, tools and practices, the project will combine and extend these to create innovative solutions to disaster management. Led by a consortium of government officials, first responders, NGOs, SMEs, industries, academia and citizen associations, the project will use empirical data on individual and collective contributions to societal resilience. It will also consider the contextual aspects such as socioeconomic conditions, digital literacy, culture, gender, social capital, trust and diversity.

RESULTS

How

We analyze past natural emergencies, terrorist attacks, and man-made disasters to understand how citizens supported formal intervention practices during emergencies under specific contextual conditions.

Together with real practitioners from our Knowledge and Innovation Community of Practice (KI-CoP), we propose emergency response strategies to bring the population closer to rescuers and authorities, bridging the gap between formal and informal guidelines in specific contexts.

We validate our solutions with real users ensuring that they can be transferable to different contexts and can produce actionable knowledge and validated risk management guidelines.

Impact

The long-term vision of the ENGAGE project is to achieve the United Nations Sustainable Developments Goals (SDG) with particular effect on the objective eleven: make cities and human settlements inclusive, safe, resilient and sustainable.

Also, the solutions proposed by ENGAGE contributes to the SENDAI Framework for Disaster and Risk Reduction, managing to establish a broader, people-centric approach to disaster risk.

Knowledge and Innovation Community of Practice (KI-CoP)

One of the key components of the ENGAGE Project's methodology is the participatory collaboration with real emergency workers from the fields of safety and risk management.

The KI-CoP is an open association including practitioners, NGOs, Virtual Operations Support Teams, researchers scientists, and citizens' representatives supporting ENGAGE as users and co-owners of its solutions.

PARTNERS

- SINTEF AS
- DEEP BLUE SRL
- UNIVERSIDAD DE NAVARRA
- TEL AVIV UNIVERSITY
- TRONDHEIM RODE KORS

- EUROPEAN EMERGENCY NUMBER ASSOCIATION ASBL
- MINISTERUL AFACERILOR INTERNE
- EVERBRIDGE NORWAY AS
- ECOLE NORMALE SUPERIEURE
- GOBIERNO VASCO - DEPARTAMENTO SEGURIDAD
- ASSOCIAZIONE CITTADINANZATTIVA ONLUS
- AZIENDA SANITARIA LOCALE ROMA 1
- OSTERGOTLANDS LANS LANDSTING
- NTNU SAMFUNNSFORSKNING AS
- ONE2MANY BV

LINKS

https://cordis.europa.eu/project/id/882850

https://www.project-engage.eu/

4.1.8 RiskPACC

Start date 1 September 2021- End date 31 August 2024

PROJECT NAME

Integrating Risk Perception and Action to enhance Civil protection-Citizen interaction

DESCRIPTION

Building disaster resilience helps ensure that countries and their citizens are better prepared to deal with and recover from disasters such as earthquakes, wildfires or flood events. The EU-funded RiskPACC project aims to increase disaster resilience in society by understanding and closing the risk perception action gap (RPAG) using a co-creation approach to risk communication. In doing so, the project will facilitate greater interaction between citizens and civil protection agencies to collaboratively identify their needs and develop potential procedural and technical solutions to build enhanced disaster resilience. The work of the project will not only lead to a framework and methodology to understand and close the RPAG, but also to the design and prototype of novel digital and community-centred solutions.

RESULTS

1. Increase understanding of the Risk Perception-Action Gap (RPAG) and vulnerabilities in Europe in order to reduce disaster risk and increase resilience in line with the Sendai framework and the European Commission's Sendai Action Plan.
2. Developing and field-validating a framework and methodology for Civil Protection Authorities (CPAs), Civil Society Organisations (CSOs) and citizens for reducing the RPAG in communities of varying socio-economic conditions. This will draw on a range of existing and emerging international practices.

3. Increase information exchange between different stakeholders as part of RiskPACC's co-creation and gamification approaches to develop the final product (the "Risk Pack") and facilitate collaboration across the risk cycle.
4. Advance multi-disciplinary understanding of disaster resilience by drawing on social science, humanities, technical, digital, geographical, and human factors concepts.
5. Provide recommendations for decision makers and disaster resilience stakeholder groups on how to reduce the RPAG and facilitate engagement between CPAs, CSOs and citizens including volunteers.
6. Increase knowledge on the use of new technologies, media and practices to close the RPAG in relation to their role, value and impact for CPAs, CSOs, citizens and other actors across different disaster phases.
7. Develop a platform to serve as a knowledge base consisting of existing tools, technologies and guidelines. This will be structured to link to relevant stakeholders and with the establishment of knowledge networks under the revision of the Union Civil Protection Mechanism.
8. Combine the use of crowd-sourcing and volunteered geographical information (VGI) solutions with the RiskPACC solutions for use in disaster prevention/preparedness, response and recovery.
9. Assess the impact of novel technologies to increase risk perception and to bridge the RGAP, such as tracking apps, and develop guidelines for development and implementation of future technological solutions.
10. Develop collaboration formats, guidelines and training material for RiskPACC outputs and platform. This will include physical material and games as well as online material and videos.
11. Develop bespoke training and guidance material for CPAs and citizens for the consideration of human factors and bridging the digital divide.

PARTNERS

- FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- TRILATERAL RESEARCH LTD
- INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS
- THE UNIVERSITY OF WARWICK
- KENTRO MELETON ASFALEIAS
- EUROPEAN ORGANISATION FOR SECURITY
- FORUM EUROPEEN POUR LA SECURITE URBAINE
- CESKA ASOCIACE HASICSKYCH DUSTOJNIKU SDRUZENI
- UNIVERSITY OF STUTTGART
- SERVICE PUBLIC FEDERAL INTERIEUR
- UNIVERSITEIT TWENTE
- MUNICIPALITY OF EILAT
- MAGEN DAVID ADOM IN ISRAEL
- UNIVERSITY COLLEGE LONDON
- CROWDSENSE BV
- STAM SRL
- I.S.A.R. GERMANY STIFTUNG GGMBH
- THE CHIEF CONSTABLE OF LANCASHIRE CONSTABULARY

- DIMOS RAFINAS-PIKERMIOU
- COMUNE DI PADOVA

LINKS

https://www.riskpacc.eu/

https://cordis.europa.eu/project/id/101019707

4.1.9 CORE

Start date 1 September 2021- End date 31 August 2024

PROJECT NAME

sCience and human factOr for Resilient sociEty

DESCRIPTION

Recent natural and man-made disasters in Europe have uncovered gaps in the level of preparedness. Increasing risk awareness is vital for disaster-resilient societies. The EU-funded CORE project will identify and implement best practice and knowledge, learning from seven past cases and from countries like Japan which has high levels of seismic and tsunami risk, but where risk awareness is high. Blending this European-specific and global best practice, CORE will provide optimised actions and harmonised solutions to rebuild socio-economic structures after a disaster. Through transdisciplinary collaboration involving environmental science and social science communities, it will define common metrics related to the different types of disasters, and how to measure, control and mitigate their impact.

RESULTS

The CORE overall objective is to develop a harmonized vision of crisis management awareness and capability. There is indeed a need to strengthen disaster resilience at the level of municipalities, Member States and EU agencies, which must take into account the diversity of European society, and the variability of human factors. This can only be achieved through transdisciplinary collaboration involving the environmental science and social science communities. In this way, human factors, social, societal and organisational aspects can be supported by the scientific results obtained in research on environmental and anthropogenic risks. The meeting of two communities: social sciences and the results obtained in research on environmental risks is essential for the coherence and effectiveness of the project to be carried out.

To achieve this goal, the following specific objectives are identified:

1. To define and apply a crisis modelling framework able to describe disaster scenarios and dynamics according to human, social and societal variables and organizational aspects under cascading effects.
2. To define and test suitable indicators to assess the weight of Human Factors, social and societal aspects in societal resilience to disasters, providing an insight into resiliency diversity among European regions and social groups at local scale.
3. To define and apply a suitable methodology for more efficient use of social media in disaster situation based on the analysis of information flow prior, during and after the disaster as well as on analysis of how information in social media is influencing risks perceptions and how tools to fight misinformation could be used by various groups of stakeholders during the crisis management.
4. To deliver a set of guidance materials to implement and monitor initiatives with local communities to improve preparedness, adaptability, and resilience to risks by and for all social groups.

PARTNERS

- UNIVERSITA DEGLI STUDI DI SALERNO
- INSTITUTE FOR SUSTAINABLE SOCIETY AND INNOVATION
- EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH
- INTERNATIONALES INSTITUT FUER ANGEWANDTE SYSTEMANALYSE
- UNIVERSITY OF HUDDERSFIELD
- SVENSKA HANDELSHOGSKOLAN
- SAHER (EUROPE) OU
- PUBLIC SAFETY COMMUNICATION EUROPE FORUM AISBL
- INSTITUT DE SCIENCE ET ETHIQUE
- THE COLLEGE OF LAW AND BUSINESS
- MTO SAKERHET 2010 AB
- SIXENSE ENGINEERING
- ASSOCIATION CENTRE SISMOLOGIQUE EURO-MEDITERRANEEN
- MINISTERO DELL'INTERNO
- ASSOCIAZIONE DELLA CROCE ROSSA ITALIANA
- COMUNE DI SAN GIUSEPPE VESUVIANO
- HOCHSCHULE FUR DEN OFFENTLICHEN DIENST IN BAYERN
- OSTERREICHISCHES ROTES KREUZ
- MINISTERO DELLA CULTURA

LINKS

https://cordis.europa.eu/project/id/101021746

https://www.euproject-core.eu/

4.1.10 BRTE

Start date 1 November 2017- End date 31 December 2022

PROJECT NAME

Building Resilience through Education

DESCRIPTION

The Building Resilience Through Education (BRTE) programme aims to serve as a model of how education can drive transformative resilience in areas subject to recurring and protracted crises.

RESULTS

The Building Resilience Through Education (BRTE) Consortium brings together partners from academia, the private sector and the NGO sector to find innovative ways to strengthen the resilience of communities affected by recurring disasters. This project has its origins in an ex-post impact evaluation of Concern Worldwide's twenty-five year engagement in Wolaita, Ethiopia. Conducted by University College Dublin's Centre for Humanitarian Action in collaboration with Wolaita Sodo University, the evaluation found that, despite significant improvements in communities' capacities to both absorb the effects of recurring disasters and to adapt their livelihoods based on experience of recent disasters, they remain extremely vulnerable to their natural and environmental context. As a result there is an urgent need for a novel approach that moves beyond supporting the mere absorption of or adaptation to recurring shocks and that transforms the capacity of exposed communities. The BRTE partnership has identified the importance of education in bringing about this transformative change. It aim is to build the capacity of Wolaita's educational institution in pursuit of the following objectives:

• To build the requisite critical infrastructure to enable resilience education and research;

• To establish an educational platform that will build human capital and transform livelihoods;

• To develop research and innovation capacity that will radically promote social and economic well-being.

The BRTE programme will serve as a model of how education can drive transformative resilience in areas subject to recurring and protracted crises.

PARTNERS

- UNIVERSITY COLLEGE DUBLIN, NATIONAL UNIVERSITY OF IRELAND, DUBLIN
- CONCERN WORLDWIDE LBG
- RESEAU POUR L'ACTION HUMANITAIRE (NETWORK ON HUMANITARIAN ACTION)
- FUTURE ANALYTICS CONSULTING LIMITED
- INSTITUTE OF TECHNOLOGY CARLOW

LINKS

https://cordis.europa.eu/project/id/778196

https://buildersproject.eu/eu-projects/7/brte

4.1.11 NAIAD

Start date 1 December 2016 -End date 31 August 2020

PROJECT NAME

NAture Insurance value: Assessment and Demonstration

DESCRIPTION

NAIAD aims to operationalise the insurance value of ecosystems for water-related risk mitigation, by developing and testing concepts, tools and applications on 9 demo sites across Europe, under the common concept of Nature Based Solutions (NBS).

At the core of the project is the physical and socio-economic analysis of demos sites, supported with complex modelling and forecast activities, which will, in cooperation with the insurance sector, strive to propose NBS as technically sound and financially viable option for investors at local level and higher and especially for the insurance sector.

RESULTS

NAIAD is a project aiming to:

- Develop concrete Nature Based Solutions (NBS) approaches in response to flood and drought risks at 9 demo sites across EU,
- Deliver replicable methods for its implementation,
- Work on development of financial instruments and novel business models in support of their implementation,
- Contribute to academic knowledge on NBS planning, increase the capacity of policy decision makers to integrate NBS in development planning and contribute to the general awareness of the need of NBS and socio-economic opportunities arising with their implementation at local, regional or EU level.

Figure 5 NAIAD

PARTNERS

- CONFEDERACION HIDROGRAFICA DEL DUERO
- BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES
- KING'S COLLEGE LONDON
- I-CATALIST SL
- EUROPEJSKIE REGIONALNE CENTRUM EKOHYDROLOGII POLSKIEJ AKADEMII NAUK
- ZAVOD ZA IHTIOLOSKE IN EKOLOSKE RAZISKAVE REVIVO
- CONSIGLIO NAZIONALE DELLE RICERCHE
- AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS
- HELMHOLTZ-ZENTRUM HEREON GMBH
- AMBIOTEK COMMUNITY INTEREST COMPANY
- STIFTELSEN STOCKHOLM INTERNATIONAL WATER INSTITUTE
- INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU GEOLOGIE SI GEOECOLOGIE MARINA-GEOECOMAR
- Geological Survey of Denmark and Greenland
- BUSINESS DEVELOPMENT GROUP SRL
- CAISSE CENTRALE DE REASSURANCE
- UNIVERSIDAD POLITECNICA DE CARTAGENA
- ZAVOD ISKRIVA, ISKRISCE ZA RAZVOJ LOKALNIH POTENCIALOV

- INSTITUT NATIONAL DE RECHERCHE POUR L'AGRICULTURE, L'ALIMENTATION ET L'ENVIRONNEMENT
- UNIVERSITE COTE D'AZUR
- STICHTING IHE DELFT INSTITUTE FOR WATER EDUCATION
- KOBENHAVNS KOMMUNE
- FIELD FACTORS BV
- STICHTING DELTARES

LINKS

http://naiad2020.eu/

https://cordis.europa.eu/project/id/730497

4.1.12 RESISTO

Start date 1 May 2018- End date 31 October 2021

PROJECT NAME

RESIlience enhancement and risk control platform for communication infraSTructure Operators

DESCRIPTION

RESISTO platform is an innovative solution for Communication CIs holistic situation awareness and enhanced resilience (aligned with ECSO objectives). Based on an Integrated Risk and Resilience analysis management and improvement process availing all resilience cycle phases (prepare, prevent, detect, absorb, etc.) and technical resilience capabilities (sense, model, infer, act, adopt). RESISTO implements an innovative Decision Support System to protect communication infrastructures from combined cyber-physical threats exploiting the Software Defined Security model on a suite of state of the art cyber/physical security components (Blockchain, Machine Learning, IoT security, Airborne threat detection, holistic audio-video analytics) and services (Responsible Disclosure Framework) for detection and reaction in presence of attacks or natural disasters.

RESULTS

- The RESISTO project will foster the following key innovation areas:
- Enlarged Threat Landscape considered (Cyber/Phy/ Cyber+Phy)
- Holistic approach to System Modelling
- Integrated Risk and Resilience management
- Convergence of PSIM and Cyber Protection technology
- Perspective: new challenges posed by 5G evolution (IoT/IoE, LPWAN)
- New Technology for detection/protection/response (blockchain, drones, machine learning algorithms, software defined security)
- Cyber Intelligence

PARTNERS

- LEONARDO - SOCIETA PER AZIONI
- UNIVERSITA DEGLI STUDI ROMA TRE
- AGENZIA PER LA PROMOZIONE DELLA RICERCA EUROPEA
- TELECOM ITALIA SPA
- TELECOM ITALIA SPARKLE SPA
- ORGANISMOS TILEPIKOINONION TIS ELLADOS OTE AE
- BRITISH TELECOMMUNICATIONS PLC
- ORANGE ROMANIA SA
- RETEVISION I SA
- ALTICE LABS SA
- ERICSSON TELECOMUNICAZIONI SPA
- ERICSSON TELECOMUNICACOES LDA
- FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS
- BERGISCHE UNIVERSITAET WUPPERTAL
- DIREZIONE GENERALE PER LE TECNOLOGIE DELLE COMUNICAZIONI E LA SICUREZZA INFORMATICA - ISTITUTO SUPERIORE DELLE COMUNICAZIONI E DELLE TECNOLOGIE DELL'INFORMAZIONE
- INTEGRASYS SA
- GUARDTIME OU
- ADDITESS ADVANCED INTEGRATED TECHNOLOGY SOLUTIONS & SERVICES LTD
- TREELOGIC TELEMATICA Y LOGICA RACIONAL PARA LA EMPRESA EUROPEA SL
- BIT SENTINEL SECURITY SRL

LINKS

https://cordis.europa.eu/project/id/786409

http://www.resistoproject.eu/

4.1.13 AI-ARC

Start date 1 September 2021- End date 29 February 2024

PROJECT NAME

Artificial Intelligence based Virtual Control Room for the Arctic (AI-ARC)

DESCRIPTION

It is expected that in the years to come marine traffic to the Arctic will increase. For practitioners such as coast guards, this can present key challenges to ensuring the safety and security of all actors in the area. Addressing this, the EU-funded AI-ARC project aims to develop the Virtual Control Room (VCR), a novel, user-friendly and robust system based on artificial intelligence that can provide a situational picture in the Arctic Ocean region. The VCR will aid decision-making and communication

in the area as well as boost maritime safety. The information-exchange platform can also be used by private operators.

RESULTS

The AI-ARC proposal presents a highly innovative and user-friendly artificial intelligence (AI) based platform known as the Virtual Control Room (VCR). Due to the vast amounts of information collected the potential for information overload is real. This reality can complicate the operational picture; reduce situational awareness and often results in delayed and impaired decision-making. On the other hand, areas such as the Arctic Sea suffer from a lack of communication, surveillance data and rescue assets and without action taken to address these vulnerabilities, the consequences are potentially dramatic in terms of accidents, pollution, border infringements and criminal activities.

The AI-ARC VCR supports all these challenges by applying AI, machine-learning and virtual reality (VR) technologies to filter numerous validated and statistical data streams and databases to a user-friendly interface. The VCR improves situational awareness by assisting end users to customize a "smart" operational picture. The VCR will permit users to specify their preferences in terms of threat levels, abnormal behavior, interoperability and risk management by flagging detected anomalies with confidence and providing threat or risk levels according to a predefined model based on user preferences. This means that users can create awareness for their own purposes that reflects their needs without increasing their workload.

AI-ARC's principal objectives align fully with the H2020 BES-SU-open, and are of crucial relevance to it. The Virtual Control Room (VCR) has the power to greatly improve maritime situational awareness, decision-making, communication, available rescue resources, and thus the safety of all maritime actors, particularly in the Arctic Sea. Furthermore, the enhanced communication and collaboration provided by AI ARC's innovative technology encourages, and enables further development of symbiotic services and fosters much needed Arctic cooperation.

PARTNERS

- LAUREA-AMMATTIKORKEAKOULU OY
- TURUN YLIOPISTO
- FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
- EUROPEAN ORGANISATION FOR SECURITY
- VENTURA ASSOCIATES FRANCE
- MUNSTER TECHNOLOGICAL UNIVERSITY
- MARITIME AND COASTGUARD AGENCY
- LANDHELGISGAESLA ISLANDS (ICELAND COAST GUARD)
- HELLENBERG INTERNATIONAL OY
- HOVEDREDNINGSSENTRALEN
- Swedish Coast Guard
- TREE TECHNOLOGY SA
- UNIVERSITY OF PORTSMOUTH HIGHER EDUCATION CORPORATION
- DEPARTMENT OF DEFENCE
- THALES ALENIA SPACE FRANCE SAS

- Sampas Bilisim Ve Iletisim Sistemleri Sanayi Ve Ticaret A.S.
- RISE RESEARCH INSTITUTES OF SWEDEN AB
- TELESPAZIO FRANCE SAS
- ATHANOR ENGINEERING
- EUROPEAN UNION SATELLITE CENTRE
- UNIVERSIDAD POLITECNICA DE MADRID
- STUDIOBDM SRL

LINKS

https://ai-arc.eu/

https://cordis.europa.eu/project/id/101021271

4.1.14 SIXTHSENSE

Start date 1 May 2020- End date 30 April 2023

PROJECT NAME

Smart integrated extreme environment health monitor with sensory feedback for enhanced situation awareness

DESCRIPTION

Innovation for first responders' safety

Natural disasters occurring in inaccessible rural areas are on the rise, leading to the multiplication of first responders' missions. However, engagement in fighting wildfires or participating in rescue missions includes risks for the well-being of the engaged first responders. Consequently, a system that monitors their actions and provides real-time and actionable information without obstructing their operational capacity is needed. The EU-funded SIXTHSENSE project aims to improve the efficiency and safety of first responders' engagement in difficult environments by optimising on-site team coordination and mission implementation. The project proposes an innovative wearable health monitoring system based on multimodal biosensor data that enables first responders to detect risk factors early on and allows real-time monitoring of all deployed responders.

RESULTS

SIXTHSENSE is a multidisciplinary innovation and research action with the overall aim to significantly improve efficacy and safety of first responders' deployment in hazardous environments by optimising on-site team coordination and mission execution.

Between the booming EU economy and the climate change, the number and consequences of disasters occurring in inaccessible rural areas is on a constant rise. First responder deployments in extreme conditions such as fighting wildfires or alpine search and rescue missions have gone from exceptional to regular events in only a couple of decades. As this trend is likely to continue, the risks for wellbeing of the engaged first responders continue to grow. To avoid the loss of life or lasting

consequences on the first responders' health, it is important that the key physiological parameters of deployed operatives are monitored in a way that provides timely and actionable information, without hindering their operational capacity.

The SIXTHSENSE is a wearable health monitoring system with closed loop tactile biofeedback, that allows first responders in hazardous situations to sense their current health status. It allows early detection of risk factors that could lead to rapid deterioration of health or operation capabilities of first responders, by leveraging predictive models based on multimodal biosensor data. As a team management tool it enables real-time monitoring of all deployed operatives, helping increase team effectiveness and operational safety.

To help accelerate the pace of technological advancements aimed at first responders, beyond the scope of the project, SIXTHSENSE will establish a novel research methodology for sustainable inclusion of first responders in a co-development process. A comprehensive framework will allow practitioners to significantly contribute in all stages of the development process, without excessively burdening the first responders with activities outside the domain of their expertise.

Figure 6 SIXTHSENSE is a wearable health monitoring

PARTNERS

- FUNDACION TECNALIA RESEARCH & INNOVATION
- AALBORG UNIVERSITET
- TECHNISCHE UNIVERSITAET CHEMNITZ
- UNIVERSIDAD DE LEON
- JOANNEUM RESEARCH FORSCHUNGSGESELLSCHAFT MBH
- BIONANONET FORSCHUNGSGESELLSCHAFT MBH
- TECNALIA SERBIA DOO BEOGRAD
- JOBST TECHNOLOGIES GMBH

- METROHM DROPSENS SL
- SMARTEX SRL
- SENETICS HEALTHCARE GROUP GMBH & CO. KG
- GLOBAL ELECTRONIC SOLUTIONS DOO NOVI SAD
- TELEGROUP GERMANY GMBH
- TELEGROUP DRUSTVO SA OGRANICENOM ODGOVORNOSCU ZA INZENJERING I PROMETTELEKOMUNIKACIONE OPREME I USLUGA,BANJA LUKA
- TELEGROUP DOO PREDUZECE ZA TELEKOMUNIKACIONI INZENJERING
- BIFLOW SYSTEMS GMBH
- FEISCHL RICHARD
- FREIWILLIGE FEUERWEHR GUMPOLDSKIRCHEN
- CENTRO EUROPEO DI FORMAZIONE E RICERCA IN INGEGNERIA SISMICA
- UDRUZENJE GORSKA SLUZBA SPASAVANJA SRBIJE
- SAVEZ GORSKIH SLUZBI SPASAVANJA U BOSNI I HERCEGOVINI GSSUBIH
- PROSTOVOLJNO GASILSKO DRUSTVO POSTO
- JAVNA VATROGASNA POSTROJBA GRADARIJEKE

LINKS

https://cordis.europa.eu/project/id/883315

https://sixthsenseproject.eu/

4.1.15 SHOTPROS

Start date 1 May 2019- End date 31 October 2022

PROJECT NAME

SHOTPROS: A HUMAN FACTORS BASED (VR) TRAINING FRAMEWORK FOR DECISION-MAKING AND ACTING CAPABILITIES UNDER STRESS AND IN HIGH-RISK SITUATIONS FOR EUROPEAN LEAS

DESCRIPTION

VR training for police response to emergencies

Police officers are typically the first emergency personnel to arrive to the scene of a high-risk or crisis situation. Emergency preparedness is vital in such cases. Oftentimes, police officers are forced to make decisions in dangerous high-stakes situations with ambiguous information under severe time constraints. The EU-funded SHOTPROS project will investigate the impact of psychological and contextual human factors on decision-making in high-risk operational situations. It will use virtual reality to measure the impact of these factors and design better training modules for police officers. The aim is to improve their overall performance under stress and to minimise the use of force while maximising safety.

RESULTS

Objective 1: Evaluated and validated Human Factors Model for Decision-Making and Acting under Stress and in High-Risk situations (DMA-SR Model)

Objective 2: Virtual Reality (VR) Environment that allows to manipulate Human Factors in the Context of DMA-SR and observe related Behaviour

Objective 3: (European Police) Training Framework and Curriculum for DMA-SR

Objective 4: Guidelines for VR Training (as a complement to theoretical and real-case practical training)

Objective 5: European Network for Knowledge Transfer on VR Training and creating a Policy-Maker Toolkit

PARTNERS

- USECON THE USABILITY CONSULTANTS GMBH
- AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH
- KATHOLIEKE UNIVERSITEIT LEUVEN
- STICHTING VU-VUMC
- AUTONOOM PROVINCIEBEDRIJF CAMPUS VESTA
- RE-LION GROUP B.V.
- MINISTERUL AFACERILOR INTERNE
- POLISMYNDIGHETEN SWEDISH POLICE AUTHORITY
- POLIZEI BERLIN
- RUPRECHT-KARLS-UNIVERSITAET HEIDELBERG
- THE NATIONAL POLICE OF THE NETHERLANDS
- SERVICE PUBLIC FEDERAL INTERIEUR
- LANDESAMT FUR AUSBILDUNG, FORTBILDUNG UND PERSONALANGELEGENHEITEN DER POLIZEI

LINKS

https://shotpros.eu/

https://cordis.europa.eu/project/id/833672

4.1.16 RESCUER

Start date 1 July 2021- End date 30 June 2024

PROJECT NAME

first RESponder-Centered support toolkit for operating in adverse and infrastrUcture-less EnviRonments

DESCRIPTION

RESCUER aims to design and develop a First-Responder-centered technology toolkit that will empower the next generation of First Responders (FR) by enhancing their operational capacity and safety, specifically in adverse conditions, both environmental and infrastructure-wise.

RESULTS

Adopting the "HERO" (enHanced nEw eRa first respOnder) concept, RESCUER will deliver a toolkit offering:

1. Sense augmentation,
2. Precise and infrastructure-less self-positioning,
3. Cognitive support and multi-sense AR interfaces,
4. Robust ad-hoc intra-team communications for both verbal and data exchanges.

RESCUER will also introduce the capability of extracting environment information "in situ and infrastructure-wise.

Figure 7 RESCUER

PARTNERS

- UNIVERSIDAD POLITECNICA DE MADRID
- ENGINEERING - INGEGNERIA INFORMATICA SPA
- CS GROUP-FRANCE
- THEON AISTHITIRES MONOPROSOPI AEVE
- BRAGI GMBH
- PANEPISTIMIO DYTIKIS ATTIKIS
- UNIVERSITY OF GREENWICH
- ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS
- INOV INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES INOVACAO
- DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV
- Elliniko Idryma Evropaikis kai Exoterikis Politikis (HELLENIC FOUNDATION FOR EUROPEAN AND FOREIGN POLICY)

- SERVICE DEPARTEMENTAL INCENDIE ET SECOURS DE LA SAVOIE
- I.S.A.R. GERMANY STIFTUNG GGMBH
- SERVICIO MADRILEÑO DE SALUD
- FUNDACIÓN PARA LA INVESTIGACIÓN E INNOVACIÓN BIOSANITARIA DE ATENCIÓN PRIMARIA
- COMUNIDAD DE MADRID
- ISEM-INSTITUT PRE MEDZINARODNU BEZPECNOST A KRIZOVE RIADENIE, NO
- ELLINIKI OMADA DIASOSIS SOMATEIO
- OSTERREICHISCHES ROTES KREUZ
- ECOLE NATIONALE SUPERIEURE DES OFFICIERS DE SAPEURS-POMPIERS (ENSOSP)
- FUNDACION CENTRO DE TECNOLOGIAS DE INTERACCION VISUAL Y COMUNICACIONES VICOMTECH

LINKS

https://rescuerproject.eu/

https://cordis.europa.eu/project/id/101021836

4.1.17 MED1stMR

Start date 1 June 2021 - End date 31 May 2024

PROJECT NAME

Medical First Responder Training using a Mixed Reality Approach featuring haptic feedback for enhanced realism.

DESCRIPTION

The role of medical first responders (MFRs) in mass casualty incidents like natural disasters and attacks on public transportation is crucial today. The capabilities of MFRs are essential since they are first on the scene to provide life-saving assistance to victims. But there are critical training gaps that need to be filled. In this context, the EU-funded MED1stMR project will provide a new generation of mixed reality training by adapting haptic feedback and enabling mixed reality to prepare MFRs for disasters. It will provide flexibility for adapting to trainee needs manually or by applying AI-driven smart scenarios.

RESULTS

1. Developing a pioneering MR training approach for enhanced realism
2. Developing effective training scenarios and a training curriculum through agile and user-centred design with cross-sectoral MFR
3. Realisation of a physiological signal and trainee behaviour feedback loop and smart scenario control to enhance effectiveness of MR training
4. To position the pioneering MR training approach across Europe

PARTNERS

- AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH

- RUPRECHT-KARLS-UNIVERSITAET HEIDELBERG
- UMEA UNIVERSITET
- UNIVERSITAET BERN
- MONTANUNIVERSITAET LEOBEN
- REFENSE AG
- PLUX - WIRELESS BIOSIGNALS S.A.
- D2D HOLDING BV
- IDENER RESEARCH & DEVELOPMENT AGRUPACION DE INTERES ECONOMICO
- USECON THE USABILITY CONSULTANTS GMBH
- MINDCONSOLE GMBH
- SIMCAMPUS ZENTRUM FUR NOTFALL KRISEN UND KATASTROPHENSIMULATION UND KATASTROPHENDIPLOMATIE GMBH
- ELLINIKI OMADA DIASOSIS SOMATEIO
- JOHANNITER OSTERREICH AUSBILDUNG UND FORSCHUNG GEMEINNUTZIGE GMBH
- SERVICIO MADRILEÑO DE SALUD
- FUNDACIÓN PARA LA INVESTIGACIÓN E INNOVACIÓN BIOSANITARIA DE ATENCIÓN PRIMARIA
- UNIVERSITAETSKLINIKUM HEIDELBERG
- REGION JAMTLAND HARJEDALEN
- JOHANNITER INTERNATIONAL
- AUTONOOM PROVINCIEBEDRIJF CAMPUS VESTA

LINKS

https://cordis.europa.eu/project/id/101021775
https://www.med1stmr.eu/

5. Conclusions

This study following the previous observatory report, confirmed the finding as far as it concerns the main actions of projects that deal with issues related to hazards and crisis management. More specifically, more projects were studied which are among the most up-to-date in the field as they have either been implemented in the last two - three years or they are still running. This last part of the inventory confirmed that all efforts made or proposed in projects are targeted at four (4) main actions.

The first action refers to the **cooperation-training**, international and cross-border cooperation is needed in order to deal with natural hazards. This is the case not only when hazards hit cross-border areas but also when severe disasters hit areas of a country that require assistance from foreign services and volunteers. To this end, the development of a communication network is a high priority in order to make cooperation possible and effective.

The second action refers to the **collection of information**, which should utilize every possible means for gathering information about natural hazards. Authorities and volunteers should have access to such information channels before and during a crisis in order to react more efficiently.

The third action is to **awareness** and the development of appropriate warning systems, which will be achieved by utilizing the two previous actions. The warning system can also be used during the action / mobilization of the first responders in order to have a clear picture of the evolution of the phenomenon around them.

The final fourth action is related to a **crisis management** model that will utilize all the above. Handling a crisis requires the coordination of multiple types of stakeholders and volunteers, sometimes even from different countries hence Situational Awareness is needed. All researchers and involved authorities recognize the need to develop specific standards that will enable various public and private organizations within Europe or internationally to be effectively coordinated ensuring as much as possible a smoothly cooperation before, during and after an event.

Additionally, to the above findings, the study proceeded with an analysis of civil protection schemas, crisis management, education/training, and volunteering in the participating countries, namely Croatia, Greece, and North Macedonia. For this purpose, based on a literature review, an analysis of the approaches in terms of managing authorities, volunteering, etc was conducted in order to reveal similarities as well as differences. First of all, the National Emergency / Disaster Management Authority although they have different organizational structures presents mostly the same principles, services, and goals. In this context, the key tasks and perspectives of each authority/country were presented. Another quite similar context is that of volunteering, although it is not encouraged to the same degree in each country.

Although from a conceptual and empirical perspective there are differences, there is undoubtedly organizational similarity in all countries. All three countries, similar to other countries in South Eastern and Central Europe, organize the civil protection on local, regional, and central levels providing appropriate legislation. Another similarity was the acknowledgment of the importance of a civil protection volunteering system. Despite the legal differences, in all countries volunteers are considered important and the public is enhanced to participate and get appropriate training. Volunteers organizations involved in civil protection (e.g. volunteers firefighters and Red Cross local groups) are

very effective and all counties try to enhance volunteering. Civil protection authorities intervene to protect, promote and recognize volunteer organizations, although they use different organizational structures. At each of their operational levels, bodies and institutions involved in civil protection must follow their plans, as well as EU crisis management policies. In this context, all countries try to take advantage from EU and national funding as well as private corporate social responsibility to support an equitable and effective resilience policy. Yet, some differences were detected too. The assessment and crisis management structure defers from country to country. Croatia and Greece prefer political actors such as civil defense and ministries while the Republic of North Macedonia have set responsible the Ministry of Defence.

Finally, it is worth mentioning that a great number of research programs and initiatives pay attention to education in civil protection, promoting a Civil Protection culture through the implementation of national and transnational training courses, involving volunteers from different countries, which supports the ability to operate and communicate overcoming territorial barriers.

Annex I: Template for project presentation and analysis

To keep the time-consuming data collection work to a minimum level, we only added information of projects relevant to the RESISTANT project as listed and explained below.

Field Name	Description
Acronym	Abbreviation of the project, if any
Duration	Start and end date of project
Project Name	Complete name of the project. Brief explanation, if applicable
Description	Main objectives and key topics of the project
Results	Results of the project
Partners	Lead partner (first in of the list)
Links	Link to website of project, if available

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