Report with the state of the art of local IT and HR combined risk management plans

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1. Introduction

Climate change is a growing issue today and numerous countries around the world are realizing the importance of preparing for the consequences that come with it. In addition to the risks caused by climate change, there are also threats that are not caused by climate and human impact, but are natural events that can occur at any time, such as earthquakes, fires and the like. Therefore, it is necessary to reduce the harmful effects of humans on the climate and plan strategies to defend against disasters caused by climate change, as well as to act with the aim of preventing and adapting to other non-climate risks. World and European organizations such as the United Nations, the World Meteorological Organization and the European Union are trying to make changes in their policies and attitudes towards the environment precisely with the aim of preventing and adapting to various risks. In this context, summits, conferences and meetings of high state representatives are increasingly being organized to discuss ways of cooperating and combating climate change and non-climate risks, as well as measures to defend and protect against the disasters that occur as a consequence. A special aspect is the management of combined risks whose effects and consequences are multiplied in relation to individual events. Towards achieving the same goal, Croatia and Italy, through the cross-border cooperation program INTERREG V-A Italy-Croatia 2014 – 2020, are implementing the project *Preventing, Managing and Overcoming Natural-Hazards Risks to mitiGATE economic and social impact* – **PMO-GATE**. The project aims to structure and organize the entire process of combined risk management at the local level in order to avoid social and economic consequences. At the present time, there are no magamenet plans for combined risks in both Italy and Croatia.The test cases were, in Italy, Ferrara and, in Croatia, Kaštel Kambelovac. The latter site, due to its position and exposure to various types of risks, is suitable for the analysis of management plans and measures to protect against natural disasters, both individual and combined. Timely planning and quality management reduce risk and increase the resilience of infrastructure and the

population to exposure to natural disasters. Due to the above, it is important to have quality risk management plans and prescribed crisis management measures in order to reduce the negative consequences of disasters, increase the resilience of the population and infrastructure, and mitigate the consequences. Delivery 5.3.3 *Report on the state of local individual risk management plans in Croatia* presents individual risks specific to the territory of Croatia. The review of plans encompasses the national, county and local levels. Also, as a concluding part of the Report, examples of good practice of individual risk management in the form of platforms and projects are presented. This document presents the existing framework of combined risk management in Croatia, also at the three above-mentioned levels, with particular emphasis on local-level plans that administratively include the pilot location. The last chapter includes examples of good practice in managing and/or preventing combined risks or mitigating their consequences.

2. Existing framework of combined risk management

A particular challenge in risk management is the management of combined risks. The World Meteorological Organization (WMO) and the United Nations (UN), through the *South Eastern Europe Disaster Risk Mitigation*, co-financed by the European Commission, identified shortcomings in many South Eastern European countries in terms of disaster risk management, as well as insufficient cooperation between stakeholders to reduce disaster risk, at national and regional levels. As a result of the program, the document *Strengthening Multi-Hazard Early Warning Systems and Risk Assessment in the Western Balkans and Turkey: Assessment of Capacities, Gaps and Needs* was published with the aim of providing a framework for the development of individual and multiple natural disaster risk management plans. It focuses on the capacities of meteorological, hydrological and climate services to support disaster risk reduction and early warning systems in the area of Southeast Europe. There are numerous documents in Croatia that prescribe measures for defense, protection, and management during natural disasters. Taking into account the devastating earthquakes that occurred in Zagreb and near Petrinja in 2020, it was extremely important to implement quality management plans in order to increase the resilience of the population and infrastructure and mitigate the consequences of natural disasters.

2.1. National level

Given that natural disasters can have major consequences for many citizens and can greatly affect the socio-economic situation in the country, it is important to have risk management plans in place. Documents related to risk management in Croatia are as follows:

- *Strategy for adaptation to climate change in the Republic of Croatia for the period up to 2040 with an overview of 2070* (OG 46/20)
- *River Basin Management Plan 2016 – 2021* (OG 66/16)
- *Flood Risk Assessment 2018*

- *Flood Hazard Maps* and *Flood Risk Maps* 2019
- *Earthquake in Croatia from December 2020 – Rapid Assessment of Damages and Needs*
- *Risk assessments for disasters for the Republic of Croatia*, *Protection and Rescue Plan in the Republic of Croatia*.

It is also important to mention the Regulation on guidelines for the preparation of risk assessments for disasters and major accidents for the territory of the Republic of Croatia and local and regional self-government units (OG 65/16) and the *Croatian Platform for Disaster Risk Reduction*. In addition to these documents, in the context of disaster risk management, it is also important to emphasize that the development of the *2030 Disaster Risk Management Strategy* is underway, which includes the *Action Plan for Disaster Risk Management for the period from 2021 to 2024*. It is evident that, at the national level, there is no document exclusively focused on the management of combined risks. However, important documents are the *Assessment of vulnerability of the Republic of Croatia to natural and technical and technological disasters and major accidents* simulating and describing combined risk scenarios (e.g. earthquake in the area of the City of Zagreb), and the *Protection and Rescue Plan in the Republic of Croatia*, which prescribes the operational action plan of intervention specialist civil protection units of the Republic of Croatia against natural, anthropogenic and complex hazards.

2.2. County level

Risk management plans at the county level are generally more specific and less comprehensive than those at the national level. However, they are important for local self-government units since they are primarily a competent body that can provide assistance and ensure easier and uninterrupted transmission of risk management between various instances. County management plans were exclusively observed in the Split-Dalmatia County (SDŽ) as an area that administratively includes this pilot location. These include:

- *Marine and Coastal Planning and Management Plan of the Split-Dalmatia County* (SDŽ Coastal Plan)
- *Strategy for the Development of the Split Urban Agglomeration Area for the period up to 2020*
- *Business Development Strategy of Vodovod i kanalizacija d.o.o. Split for the period from 2019 to 2030*
- *Spatial Plan of the Split-Dalmatia County*

In the field of combined risk management, the *Action Plan of the Split-Dalmatia County in the field of natural disasters for 2021* is in force, which contains measures with associated holders of combined risk management, as well as assessments of equipment and means of protection and prevention of property damage. Also, *Guidelines for the preparation of risk assessments of major accidents for the Split-Dalmatia County*have been adopted, which contain risk assessments, possible scenarios and probabilities and analysis of the civil protection system. Possible combined risk scenarios concern primarily earthquake and flood protection, and are defined as multiple related events or threats for each of the risks listed in the document (fires, landslides, epidemics, pandemics and others).

2.3. Local level

At the local level, the area of the Town of Kaštela was observed as a local self-government unit to which the Kaštel Kambelovac pilot location belongs, which is also one of its constituent settlements. Risk management in the area of the Town of Kaštela is carried out using the following documents:

- *Coastal Zone Management Plan of the Town of Kaštela*
- *Environmental Protection Study – upgrading the water supply, drainage and wastewater treatment system of the Kaštela – Trogir agglomeration*

- *Protection Plan – Mobilization (activation) and increase of operational forces, measures of temporary relocation, care and providing shelter for the citizens, organization and implementation of evacuation*
- *Protection and Rescue Plan – Warning, preparedness, mobilization (activation) and organization of operational forces. Measures for protection and rescue from floods, earthquakes, technical and technological, sanitary, radiological and nuclear hazards.*

Other documents important for risk management in the area of the Town of Kaštela are:

- *Action Plan in the field of natural disasters for 2021*, which prescribes the list of measures and holders of measures and cooperation with competent bodies and institutions during natural disasters
- *Risk assessment of major accidents for the Town of Kaštela*, where the risks of natural disasters were assessed and analyses for preventive action were provided
- *Assessment of the endangerment of the population, material and cultural goods and the environment of the Town of Kaštela* individually represents the types, intensity, effects, and possible consequences of natural disasters.

It is important to note that, at the local level, there are no documents related exclusively to the management of combined risks. Also, these documents do not describe a scenario or event that involves the action of several different hazards and risks at the same time.

3. Examples of good practice

Multi-Hazard Platform (*MHP*) for the creation of disaster-resistant cities, created in Kuala Lumpur, is a good example of a project outside of Europe that deals with combating combined risks. MHP is a tool that provides three-day high-resolution forecasts for precipitation, temperature, and air pollution, and combines them with information on landslide, torrential, and sinkhole susceptible areas in order to develop a hazard map that can be used to prepare responses to combined threats.

The European Union also pays special attention to combating climate change, non-climate risks, their effects and adaptation, preventing and/or mitigating their consequences. Accordingly, a platform for cooperation in the field of major natural and technological disasters between Europe and the southern Mediterranean – EUR-OPA Major Hazards Agreement, has been developed. The platform addresses issues of disaster risk reduction, primarily prevention, preparedness, risk management, and post-crisis analysis. The aim of the platform is to strengthen and promote cooperation between member states in a multidisciplinary context in order to ensure better protection and greater resilience to natural disasters. Additionally, other projects are being implemented and/or are implemented at the EU level, which also aim to reduce exposure to natural disasters, and some of them which concern combined risks are presented below.

Title: ARISTOTLE-eENHSP

Description: *All Risk Integrated System TOwards Trans-boundary hoListic Early-warning - enhanced European Natural Hazards Scientific Partnership*

Goal: Continued strengthening of the monitoring and analysis system of the European Emergency Response Coordination Center (ERCC) by providing a single combined risk advisory service at global and operational level and with ongoing developments.

Partners: Finland, Sweden, Great Britain, Netherlands, France, Spain, Portugal, Italy, Austria, Slovakia, Romania, Greece, Turkey

Website: http://aristotle.ingv.it/tiki-index.php

Title: BORIS

Description: *Cross BOrder RISk assessment for increased prevention and preparedness in Europe*

Goal: Increasing protection against cross-border disasters by developing a shared methodology for individual and combined risk assessments, as well as online platforms for shared effective cross-border risk assessment.

Partners: Slovenia, Austria, Montenegro, Italy, Turkey

Website: https://www.borisproject.eu/

Title: IPA DRAM

Description: *Programme for Disaster Risk Assessment and Mapping*

Goal: Increasing the capacity of users to ensure proper disaster risk management at national, regional, and EU levels

Partners: Sweden, Italy, Slovenia, Croatia, Albania, Kosovo, Bosnia and Herzegovina, Northern Macedonia, Montenegro, Serbia, Turkey

Website: http://www.ipadram.eu/

Title: MATRIX

Description: *New Multi-HAzard and MulTi-RIsK Assessment MethodS for Europe*

Goal: Improving risk assessment and implementing resilience plans in important infrastructure facilities for the protection against natural disasters

Partners: Germany, Italy, France, Norway, Austria, Great Britain, Netherlands, Switzerland, Portugal, Canada

Website: https://cordis.europa.eu/project/id/265138

Title: MYRIAD-EU

Description: *Multi-hazard and sYstemic framework for enhancing Risk-Informed mAnagement and Decision-making in the EU*

Goal: Development of a harmonized framework for managing multiple risk systems across multiple sectors.

Partners: Netherlands, Italy, Germany, Austria, Belgium, Norway, Spain, Romania, Great Britain

Website: https://cordis.europa.eu/project/id/101003276

Title: PHAROS

Description: *Project on a Multi-Hazard Open Platform for Satellite-Based Downstream Services*

Goal: Development of a sustainable preoperative service platform that integrates space-based observation, communication, and navigation technologies for forecasting and early detection of emergencies and crisis management

Partners: Germany, Spain, Great Britain, Greece, Netherlands, France

Website: https://cordis.europa.eu/project/id/606982

Title: RECIPE

Description: *Reinforcing civil protection capabilities into multi-hazard risk assessment under climate change*

Goal: Development of guidelines and tools to strengthen civil protection in emergency management and planning strategies in order to deal with combined risks

Partners: Austria, Italy, Portugal, Germany, Spain

Website: https://recipe.ctfc.cat/

Title: SEE-MHEWS-A

Description: *South-East European Multi-Hazard Early Warning Advisory System*

Goal: Ensuring a timely and precise system for warning of weather disasters and hydrological events in order to protect the population, infrastructure, and industry

Partners: Albania, Bosnia and Herzegovina, Bulgaria, Cyprus, Greece, Croatia, Hungary, Israel, Jordan, Lebanon, Northern Macedonia, Moldova, Montenegro, Romania, Slovenia, Serbia, Turkey, Ukraine

Website: https://public.wmo.int/en/projects/see-mhews-a