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STUDY ON OPERATIVE FLOOD MANAGEMENT PLANS



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Editor
László Balatonyi

STUDY ON

OPERATIVE FLOOD MANAGEMENT PLANS

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DANUBE REGION



MINISTRY OF ENVIRONMENT,
WATERS AND FORESTS

Environmental Risks

Editor:

László Balatonyi

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STUDY ON OPERATIVE FLOOD MANAGEMENT PLANS

Introduction

László BALATONYI (*EUSDR Environmental Risks Priority Area co-coordinator*)

Coordination in operative flood management is increasingly important with more floods affecting multiple countries and exceeding peak historical levels in the last years. One of the outcomes of the Flood Survey conducted by the coordination of PA5 after the extreme floods on the Danube River in 2013/14 was the need to harmonize/coordinate Operative Flood Management Plans (OFMPs) along the Danube. That is why one of the measures of the Danube Region Operative Flood Management and Cooperation Programme (DR Oper&Cooper) - included also in the DFRMP adopted by the ICPDR and all the 14 Danube countries - is to coordinate the operative flood management and civil protection plans in the Danube Basin. This includes the evacuation plans and procedures, safeguarding people, goods, emergency rescue plans, etc. considering the benefits of the civil protection mechanisms for the shared flood basins or stretches of common interest to better use the available resources. An international workshop was organized by the PA5 Hungarian co-ordination on the 27th of November, 2019 in Pécs. The aim of the workshop was to exchange information about the best intervention practices and to review flood protection equipment, materials, resources and sets available in case of an emergency situation.

EU Strategy for Danube Region, Environmental Risks Priority Area (PA 05)

EUSDR is the second macro regional strategy of EU adopted in 2011. This very heterogeneous macro region covers the Danube river basin from Baden-Württemberg in Germany down to the Black Sea is comprised of 14 countries altogether, including EU and non-EU countries as well (Figure 1). The cooperation in the framework of the EUSDR facilitates sustainable economic growth, coordination of efforts along 12 priority areas and aims to reduce regional disparities between countries.



1. FIGURE DANUBE REGION (SOURCE: [HTTPS://DANUBE-REGION.EU/](https://danube-region.eu/))

The Environmental Risks Priority Area (PA5) – coordinated by Hungary and Romania – has four major objectives to follow during its work.

The most relevant activity in terms of the coordination the operative flood management and civil protection plans is to: *“Provide and enhance continuous support to the implementation of the Danube Flood Risk Management Plan – adopted in 2015 in line with the EU Floods Directive – to achieve significant reductions of flood risk events by 2021, also taking into account potential impacts of climate change and adaption strategies”*

Further information on the current actions, more detailed descriptions and targets of EUSDR PA5 are available at: <https://environmentalrisks.danube-region.eu/>

1. Agenda of the workshop

- 09.30-10.00 h Registration
- 10.00 h Introducing the Environmental Risks Priority Area and the aim of the Operative Flood Management Workshop, László Balatonyi co-coordinator (EUSDR PA5)
- 10.15 h Flood protection activities, presentation of short and long term development strategy, (South Transdanubian Water Management Directorate) – András Domány
- 10.35 h Flood protection activities, presentation of short and long term development strategy (Lower Danube Valley Water Management Directorate) – László Tamás Vas
- 10.55 h Flood protection activities, presentation of short and long term development strategy (Hrvatske Vode) - Mario Spajić
- 11.25 h Flood protection activities, presentation of short and long term development strategy (Vode Vojvodine) – Kristina Braun
- Break 11:55 – 12:15
- 12.15 h Maintaining and coordinating the disaster management role of operational working bodies
Role and responsibility of the Hungarian Disaster Management Service (National Directorate General for Disaster Management) Árpád Keresztesy
- 12.55 h Good practices, innovations and "Strengthen Flood Resilience in the Danube Region" (Christian J. Illing project coordinator of DAREnet, THW)
- 13.15 h International disaster response and preparedness activities to support flood response (EUSDR PA5) - Kinga Perge
- 13:30 h Transboundary cooperation having regard to the ice protection of the common interest Hungarian-Croatian and Hungarian-Serbian Danube river sections (EUSDR PA5) - László Balatonyi
- 13:40 h Discussion

2. Summary of the Presentations

László BALATONYI (*EUSDR Environmental Risks Priority Area co-coordinator*)

Coordination in operative flood management is increasingly important with more floods affecting multiple countries and exceeding peak historical levels in the last years. One of the outcomes of the Flood Survey conducted by the coordination of PA5 after the extreme floods on the Danube River in 2013/14 was the need to harmonize/coordinate operative flood management plans (OFMPs) along the Danube. That is why one of the measures of the Danube Region Operative Flood Management and Cooperation Programme (DR Oper&Cooper) - included also in the DFRMP adopted by the ICPDR and all the 14 Danube countries - is to coordinate the operative flood management and civil protection plans in the Danube Basin. This includes the evacuation plans and procedures, safeguarding people, goods, emergency rescue plans, etc. considering the benefits of the civil protection mechanisms for the shared flood basins or stretches of common interest to better use the available resources.

As a first step, to facilitate the development in this field PA5 Hungarian co-coordination (MFAT) organized a meeting on the 27th of November, 2019 in Pécs. EUSDR PA5 developed a summary on the recent coordination of OFMPs in a pilot region (Hungary, Serbia and Croatia).

Participating organizations (countries):

- General Directorate of Water Management (Hungary)
- Lower-Danube Valley Water Management Directorate (Hungary)
- South Transdanubian Water Management Directorate (Hungary)
- General Disaster Management Service (Hungary)
- Hrvatske Vode (Croatia)
- Vode Vojvodine (Serbija)
- Ministry of the Environment and Spatial Planning (Slovenia)
- Croatian Mountain Rescue Service (Croatia)
- DAREnet, THW (Germany)
- Ministerul Apelor și Pădurilor (Romania)

In the upcoming chapters the study included a short summary based on the presentations, the annex included the slides.

2.1. Introducing the Environmental Risks Priority Area and the aim of the Operative Flood Management Workshop (Presenter: László Balatonyi, EUSDR Environmental Risks Priority Area, balatonyi.laszlo@ovf.hu)

Coordination of operational flood management is becoming increasingly important in recent years because the proportion of floods affecting countries has exceeded historic peaks. The preparation of operational flood management plans along the Danube should be coordinated. This includes evacuation plans and procedures, protection of people and goods, emergency rescue plans, etc. Ice defense in 2017 was in a stage of common interest Vukovar – section between the states' borders were accomplished by the deployment of Hungarian icebreakers, reducing the likelihood of an ice barrier formation outside of Hungary and the back-damming effect in the upstream country embankment crest with excess water levels.

(The aim of the workshop is to exchange good practices and cooperation, intervention practices, collect best ones. To review of flood protection equipment, materials, resources and sets available in case of emergency situation.)

2.2. Flood Management Activities, short and long term development strategy in Hungary (Presenter: László Tamás Vas Lower-Danube Valley Water Management Directorate)

The presentation was about the flood management activities and the short and long term development strategies of the Lower-Danube Valley Water Management Directorate in Hungary.

The operation area of the Directorate was reviewed, as well as the Danube reach and the levees maintained by them. The properties of the three main defense lines was characterized as well. The levees of the Hungarian lower-Danube valley have a consolidated, big cross-section. However, there are some places where the soil properties beneath the levees are adverse. The length between the levees and the Danube is various, so the levees are protected with forests against the waves. Buildings and agriculture can be found directly next to the levees.

The built-in flood-defense structures are old facilities, and their utilities cross the levee below the flood level. There is an urge to remove excess water from the protected side of the levee at the same time with the flood protection. The elevation of the levee crest and the cross-section of the levee are proper at this reach. However, there is high chance of sand boiling at some places and seepage is a significant phenomenon to deal with as well. The steps of the flood protection activities (annual preparation, pre-flood preparation, actual flood

protection, experience collection, strategy development) and the icebreaker vessel fleet was reviewed during the presentation.

The short term development strategy of the Directorate is to make necessary reconstructions and recuperations after the floods, and to replace the used materials.

The long term development strategy of them is to create identical protection capability and flood-defense possibilities along the levee.

To accomplish the goals of the long term development strategies, projects were made. Several projects (Danube project, Recuperation of the protection capability, reconstruction of the structures) were mentioned and explained during the presentation.

A few points of the long term development strategy were exposed, as well as building levee crest pavement, structure reconstructions and floodplain land management.

2.3. Flood Management Activities, short and long term development strategy in Hungary (Presenter: András Domány South Transdanubian Water Management)

A short presentation was about the flood protection lines at South Transdanubian Water Management Directorate near Drava and Danube, then about the flood protection activities in the past few years. There are three flood protection lines and four flood basins in our operational area, one protection line next to Danube, and two protection lines next to Drava. The full length of dikes is more than 107 km.

Next to Danube, the Mohács flood protection line length is almost 20 km with 18 km asphalt paving. In Mohács city there is a solid 1,5 km long dike. There are 3 dike keeper sections with 3 dike keeper's house. The size of the protected floodplain is 53 km². The flood protection dike height safety is the highest flood level plus 1,5 meter.

The latest Danube flood with the highest water levels (the peak) was in June 2013. In the end of May high amount of rain, over 100 mm fell at Danube catchment area. In Budapest the flood level was 891 cm, more than 30 cm higher level than ever before. On 12th of June the flood peak reached Dunaszekcső at our operational area. From the 5th of June, emergency dikes, sandbags were built along the Danube bank and also bed blockage was established at Lanka brook with pump platform.

On 9th of June (2013) the ferry dock was closed at downtown of Mohács. The flood peak was 964 cm, which is 20 cm lower than the highest flood level before. At the flood protection line continuous surveillance was activated, and water level was measured in every 2 hours. From 4th of June excess water warning level was at Kölked-Béda pumping station. Flood warning level was discontinued on the 23rd of June. The experience was that the main flood and

council protection line worked well, and the connection was good with other organizations. So it was a successful flood fighting without high damage. The other defense line (after Danube) is the Drava flood protection lines. There are 2 lines near Drava with a length of almost 90 km. Altogether there are 7 dike keeper sections, and the protected floodplain is nearly 300 km². In the beginning of September 2014 high amount of rain fell on Drava catchment area. The flood preparedness lasted for 5 days and after the first flood a higher flood lasted for about 10 days. In this period technical leaders were sent to 14 settlements in open floodplain but only one settlement, Heresznye had to be protected with emergency dikes. The flood peak reached 586 cm on the 19th of September, which is only 10 cm lower than the highest flood level before. This flood was the second highest flood for 60 years.

In the presentation the development strategy by the Directorate was explained. On the Danube flood protection line they would like to establish a new mobile flood protection wall in the downtown of Mohács, at the ferry port. In Dunaszekcső there are plans to establish a mobile flood protection wall along the Danube. A gate with bed blockage is also important at Lanka brook, and on the south side of the village, 1 km long earth dam will be established. Next to Drava River, at our flood protection line there is about a 20 km long height shortage section which has to be developed to reach prescribed height safety.

2.4. Flood Management Activities, short and long term development strategy in Croatia (Presenter: Mario Spajić, Hrvatske Vode)

Floods can cause injuries and loss of life, considerable economic costs, and damage to the environment and cultural heritage. Major floods have become more frequent in Croatia as well as in Europe.

Due to hilly and mountainous areas with high rainfall intensities, alluvial lowlands of the Danube, Drava, Mura, Sava, Kupa and Una rivers and their tributaries, towns and settlements located on potentially endangered surfaces and with unfinished protection systems, the Danube River Basin District in Croatia is at considerable flood risk. High and moderate risks were identified in many areas of the country.

Protection systems along large rivers are partly unfinished and consist of defensive dikes, wide flood zones and large lowland retention areas which enable a significant reduction of peak discharges. Such approach also contributes to the reduction of flood risks in the downstream countries and at the same time preserves natural values (Lonjsko polje, Kopački rit and other areas). Protection systems for torrential floods in smaller river basins, which consist of mountain retention areas, reservoirs and lateral canals, are mostly unfinished.

Further investments in the development of protection systems for reduction of identified flood risks and mitigation of consequences of climate changes will be implemented according to the Multiyear construction programme for regulation and protection water works and amelioration water works, which are in preparation.

In Croatia, 38.000 people were affected by the May 2014 flood. In the most critical southern Slavonia region around 9,000 inhabitants were evacuated and 2 casualties were registered. The economic impact of floods in Croatia was estimated at 300 million EUR.

Flood protection in Republic of Croatia is based on the following steps, Preventative, Regular, and Emergency. Flood protection, ice protection, erosion and torrential protection are emergency services. The Hrvatske Vode manages flood protection in Republic of Croatia.

The Flood protection in Republic of Croatia is regulated by: Water Law, National flood defense plan and by the regulation on the border areas of the sub-basin, small plans and Sectors, regulation on specific conditions for performing flood defense, Master implementation plan for flood defense, Flood Defense Implementation Plans for protected areas.

National flood defense plan, regulated by the territorial flood protection units, stages of flood defense, flood protection measures (including preventive measures), holders of flood defense, flood defense management, the content of flood defense implementation plans, a notification and alert system, connection system and the ice protection measures on watercourses.

The Main Flood Defense Center (GCOP) is the central unit of Hrvatske Vode for the management of regular and emergency flood defense. The Main Flood Defense Center provides:

- central management
- main coordination
- professional and technical support to the Chief Flood Control Officer

The Main Flood Defense Center headquarters is at Hrvatske Vode Directorate in Zagreb, and its Center also operates six flood protection centers, as follows:

- Mura an upper Drava in Varaždin
- Danube and lower Drava in Osijek
- Upper Sava in Zagreb
- Middle and lower Sava in Zagreb
- North Adriatic in Rijeka
- South Adriatic in Split

FLOOD RISK MANAGEMENT PLAN

Ex-ante flood risk assessment was drafted by Hrvatske Vode as a first step in the preparation and adaptation of the Flood Risk Management Plan, which will be valid for the period 2016-2021.

Civil protection

The civil protection units have operational forces and specialist civil protection units. Civil protection is managed by the Headquarters. The Civil Protection Headquarters is a professional, operational and coordinating body for the implementation of civil protection measures and activities in disasters. Protocol on communication between the Civil Protection and the Hrvatske Vode Flood Defense Center.

- Short and long term development strategy
- Water level predictions
- Dike reinforcements
- Multi-year program for construction of water structures
- Water retaining
- Sidearm revitalization
- Structural instruments through the Operational Program Competitiveness and Cohesion (European Regional Development Fund and Cohesion Fund) in the Program 2014-2020.

2.5. Flood Management Activities, short and long term development strategy in Serbia (Presenter: Kristina Braun, Vode Vojvodine)

In accordance with the provisions of Law on Water, water management, which is a set of measures and activities aimed at maintaining and improving the water regime, is under the jurisdiction of the Republic of Serbia, and it is done through:

- The ministry responsible for water management, Ministry for Agriculture, Forestry and Water – Republic Directorate for Water
- The Provincial Secretariat responsible for water management, Provincial Sectorarijate for Agriculture, Water and Forestry in Autonomic Province of Vojvodina
- Competent bodies of local self-government units
- Public water utilities, as follows: Public Water Management Company "Vode Vojvodine" - in the territory of AP Vojvodina and in the rest of the territory of the Republic of Serbia - Public Water Management Company "Srbijavode".

Other authorities dealing with water management and flood risk management as well are institutions, respectively: Ministry for interior affairs – Sector for emergency Situations, Hydrometeorological service, etc.

Cooperation with other institutions are included regularly in process of close cooperation with the Ministry responsible for infrastructure, Republic Geodetic Authority, Statistical Office of the Republic of Serbia, ...etc.

Territorial Management

Republic of Serbia is divided into five water districts, which represent the basic water management units: Danube, Sava, Morava, Ibar and Lepenac, and the Beli Drim water district.

Surface waters in the territory of RS, according to their importance for water management, are divided into waters of the 1st order and the waters of the 2nd order.

In terms of flood protection, management of waters of 1st order is under the responsibility of the public water management company but for waters of 2nd order is under units of local self-government.

In that sense, water facilities are under jurisdiction as mentioned above.

Directive 2007/60/EC

Directive 2007/60/EC on the assessment and management of flood risks Requirements of Directive are largely transposed in the Water Law. Short information where Serbia is in accordance with the requirements of FD: Preliminary Flood Risk Assessment - for the territory of Serbia PFRA was done 6 years ago.

Currently, Republic Directorate for water is finishing new PFRA that includes climate change as well.

FHM and FRM- FHM and FRS for Areas of Potential Significant Flood Risks should be prepared in a line with Rulebook on determining the Methodology for development of Flood Hazards and Flood Risk Maps that has been in force since February 2017.

Through several projects (EU, National) for 27 of APSFRs maps are created. National project IPA 2014-2020 covers designing FHM and FRM for rest of APSFR (74).

It is expected that maps will be done by end of 2020.

Flood Risk Management Plan will be developed on basis of conclusions of created maps.

Heavy rainfall and disastrous floods in spring 2014 have affected houses, infrastructure, livelihood, agriculture, SMEs and industries. In accordance with the Instruction of the Head of the National Emergency Management HQ, the State of Emergency was declared for the whole territory of the Republic of Serbia.

The flood disaster 2014 has made evident a number of vulnerabilities of the Serbian population and economy that – in view of climate change – deserve special attention and require the reduction of disaster risks. Improved strengthening and expansion of flood control systems, flood-forecasting and prevention activities and physical planning to avoid locating homes and production activities in flood-prone areas, are some of the required activities to be carried out.

According to the same law the flood risk management plan shall ensure risk management through the lessening of potential harmful consequences of floods to human health, the environment, cultural heritage, and/or economic

activity. The plan referred to will be delivered for the territory of the Republic of Serbia and for its water districts. The plan will be based on the flood hazard map and flood risk map, applying a methodology which shall address: flood risk management objectives, measures by which such objectives shall be achieved, priorities and the manner by which the flood risk management plan will be implemented, competent legal entities, funding required for the implementation of the flood risk management plan, the procedure for harmonization with the water management plan, and public participation. The development strategy between 2014-2020 is the improvement in river basin management planning as one of priorities in the water management sub-sector. Assistance in this respect will be provided for the harmonization with the European Flood Directive, in the fulfilment of Serbia's obligations in integrated management of the hydraulic resources field and the global protection against floods.

2.6. Maintaining and coordinating the disaster management role of operational working bodies, role and responsibility of the Hungarian Disaster Management (Presenter: Árpád Keresztesy, NDGDM)

Public administration consists of state administration and local-government administration. State administration includes – as a function of state administration – defense administration, which consists of the following tasks: home-defense, disaster management (civil protection), mobilization of the country's economic resources, and supplying the population. Home-defense administration has an ever-growing role nowadays, thanks to the continuous reorganizations and changes in its structure, since the existing military forces, as well as the special apparatus and outstanding knowledge of the civilian responders Force can provide a great deal of help in case of man-made and natural disasters. During my article, I will try to present that, beyond legislation, how law enforcement agencies and the Hungarian Defense Force co-operate with disaster management measures in everyday life.

The conception of disaster management is ruled by Act CXXVIII. of 2011, which states that disaster management is a national issue. The uniform control of protection belongs to the duties of the state. Based on these, disaster management can be defined as follows: "those complex activities of planning, organizing, coordinating, executing, controlling, establishing, operating, informing, alerting, supplying of data and surveying in the protection against different types of disasters, which are meant to provide the prevention of the formation of a disaster, the prevention of an immediate danger, the elimination of the causes, the reduction of their damaging impacts, the protection of the lives and properties of the population, providing basic vital conditions, performing rescue activities and implementing every condition for recovery".

The definition of disaster is also framed in Act CXXVIII. of 2011, and according to that, a disaster is: "a state or a situation suitable for declare an emergency, or does not reach the extent of declaring an emergency, which jeopardizes and impairs the lives, health, and valuables, of people, basic vital conditions of the population, natural environment and natural values in a way or extent, that the prevention and elimination of the damage or the elimination of the aftermaths exceeds the defensive capabilities of the organizations meant to deal with these situations in a certain decided co-operation order, and requires the introduction of special measures, the continuous and strictly coordinated co-operation of local-governments and state institutions, or the resort to international aid".

Also, according to the above act: "risk of disaster is such a process or situation, which has the rational aftermath of causing a possible occurrence of a disaster, which, therefore, jeopardizes the health of people, the environment and the life-and property security".

Types of disasters

The standardization of disasters in scientific researches and educational publications is based on various aspects. In this study, I use a standardization in respect of the NDGDM. In the regulations, plans and documents connected to the operation of the DSDM, types of disasters are characterized as the following disaster situations:

- disasters connected to forces of nature (floods, extreme weather conditions, earthquake)
- disasters connected to the use of industrial and chemical substances
- traffic accidents reaching the level of an emergency (air-transport, public roads, railways, waterways)
- disasters connected to human epidemics
- humanitarian disasters connected to uncontrolled mass human migration
- disasters connected to nuclear activities, including national institutions containing and storing nuclear or radioactive materials, transportation of nuclear and radioactive materials and space objects with nuclear energy sources when returning from space outside the area of our country

Main duties of the Hungarian disaster management

The co-operation in the preparation against disasters, defense and the elimination of the aftermaths belongs to the duties of the Hungarian Defense Force, as it is stated in the Fundamental Law of Hungary. Since the responses to disasters require a proper coordinating and controlling activities, authorities created the NDGDM in the year of 2000, with the main task of preventing disasters from happening, or, in case of a disaster, its task is to save people and properties, as well as to mitigate the aftermaths of the disaster. The disaster

management is an integrant of the national disaster management system, its operation is regulated by laws and internal regulations, while its activities are based on the existing capabilities of the Hungarian protection measures, and it consists of the appointed organizational units.

The organizational structure of the disaster management

The disaster management is double-duty organization. Its primary function is to save and rescue the personnel and property at risk, to mitigate the effects of the aftermaths and to eliminate them from the sector in case of disasters or severe emergencies affecting the home-defense sector. At the same time, it has to co-operate in performing disaster management tasks on national and international levels, based on the Government's decision, or the invitation of the Interdepartmental Coordinating Committee for Disaster Management or its steering operation body and the organizations of defense administration.

The three cores of the disaster management

The disaster management can be divided into three, well-separable parts: three core tasks. The first core is to elaborate the operational regulations of the protection system for disaster management and to determine the management system, i.e. the upper level part of the regulation. Its activities are: legislation, calculating the whole budget of the home-defense administration and the professional management of the whole system of the Disaster Management. These tasks are performed by the Administrative State Secretary for Defense with the support of the Planning and Coordinating Department for the Ministry of Defense. The second core task includes disaster management tasks of the system connected to other sectors and bodies of public administration, which also belongs to the responsibility of the Administrative State Secretary, and the professional background is ensured by the Defense Administration Office of the Ministry of Defense.

The third core task of the system is the unit ensuring the actual military force that can be used in case of a disaster, which belongs to the main responsibilities of the Chief of Defense Staff. This is the place where the Military Sectoral Disaster Management Plan is being prepared and where the decisions on the preparations and applications of the military forces of the Hungarian Defense Force in disaster management are made, and the actual managing of the measures assigned for the task of disaster response.

2.7. Good practices, innovations and "Strengthen Flood Resilience in the Danube Region (Presenter: Christian J. Illing, DAREnet)

On behalf of the DAREnet (received a Letter of Merit from EUSDR PA5 in 2018) project management team Mr. Illing (coordinator) presented the main outputs

of the project. Danube River Region Resilience Exchange Network (acronym: DAREnet) DAREnet will build a dynamic multi-disciplinary community of practitioners, operating in a network of civil protection organizations. The network will be supported by a broad range of stakeholders from policy, industry and research. Together they will build an interdisciplinary ecosystem to foster synergies, innovation and its uptake across the Danube Region.

DAREnet supports flood management practitioners across the EU Danube River region to deepen and broaden their Research, Development and Innovation (RDI) related collaboration. The project is financed by EU Horizon2020 program. DAREnet builds a multi-disciplinary community of practitioners, operating in a network of civil protection organizations, and supported by a broad range of stakeholders to foster synergies, innovation and its uptake. DAREnet presents a regularly updated RDI Roadmap highlighting promising innovation opportunities to cope with the main challenges in the region. It provides concrete perspectives for further development, industrialization and uptake of innovations of highest relevance for practitioners, and lays the basis for concrete innovation initiatives, practitioner-driven and “bottom-up”. DAREnet draws upon synergies with the modules and facilities of the EUCPM and the regional strategies for flood prevention and risk management of the ICPDR and EUSDR.

DAREnet will be organized as a network of national Practitioner networks, led by DAREnet National Contacts (DNC), in charge of mobilizing and involving their national communities into the region-wide DAREnet Community responding to and involved in managing floods. Practitioners are involved in smaller workshops and online questionnaires. During the project's lifetime four major events are hosted, where the RDI Roadmaps are presented.

Innovation Strategies to Enhance Region-Wide Flood Resilience

DAREnet will deliver an annual roadmap highlighting promising innovation opportunities to cope with the main environmental and societal challenges of the region. The DAREnet Roadmap will lay the basis for concrete innovation initiatives, practitioner-driven and “bottom-up”, building a unique portfolio of joint innovation concepts for the Danube River Region. Both, Roadmap and Initiatives, will be proactively promoted towards national and European Policy Makers to support future innovation strategies in the region.

- Establishing a structured multi-level practitioner dialogue for strengthening flood resilience through interdisciplinary collaboration
- Improving innovation capacity and integration of new knowledge by forming an Innovation Community across disciplines and country borders
- Supporting the uptake of concrete innovation initiatives and future collaboration, and preparing the ground for policy innovations

2.8. International disaster response and preparedness activities to support flood response (Presenter: Kinga Perge, EUSDR Environmental Risks Priority Area, danube.envirisks@mfa.gov.hu)

How does Environmental risks priority area relate to disaster response?

Prevention and water management activities are key areas of Environmental Risks priority area (PA5) as they focus on risk reduction before the disasters occur. Due to climate change the number and intensity of disasters are increasing in the region. Many of these events can be prevented, however many results in emergencies when response is required.

Disaster response is listed amongst the current actions of PA5 of EU Strategy of the Danube Region (EUSDR). It focuses “to strengthen operational cooperation among the emergency response authorities in the Danube countries and to improve the interoperability of the available assets”. The Action Plan of EUSDR was under revision since the end of 2018, and according to the new proposal, this topic will be included and elaborated even more:

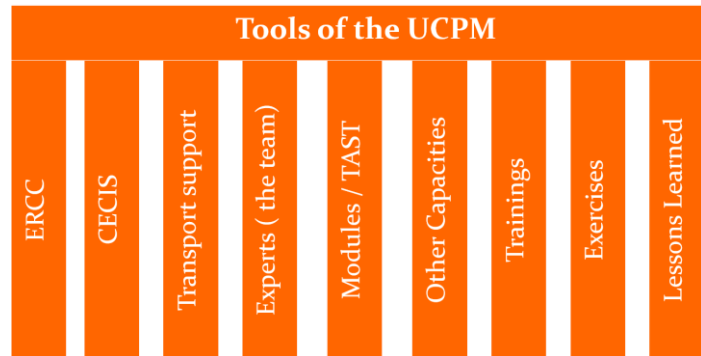
- *Strengthen disaster prevention and preparedness among governmental and non-governmental organizations*
 - *3.1. Support joint preparedness activities of disaster response actors (professionals and volunteers at operational, tactical and strategic level)*
 - *3.2. Harmonized training and capacity building of civil protection units (based on UCPM) to improve coordination, interoperability, procedures and self-sufficiency*
 - *3.3. Support disaster risk reduction at regional and local level, raising public awareness*
 - *3.4. Innovation and technology to support disaster response (VR, drone, IT solutions, mapping)”*

Furthermore, one additional target is proposed to be added: “To support the assessment of disaster risks in the Danube Region, encouraging actions to promote disaster resilience, preparedness and response activities in line with the European Union Civil Protection Mechanism.”

The EU Civil Protection Mechanism and its new Decision (EU) 2019/420 of the European Parliament and of the Council of 13 March 2019 (amending Decision No 1313/2013/EU on a Union Civil Protection Mechanism, UCPM) includes the importance of regional level disaster prevention and management, highlighting that their response capacities need to be appropriately involved in coordination and deployment activities. It should minimize overlaps and foster interoperability. “Such authorities can play an important preventive role

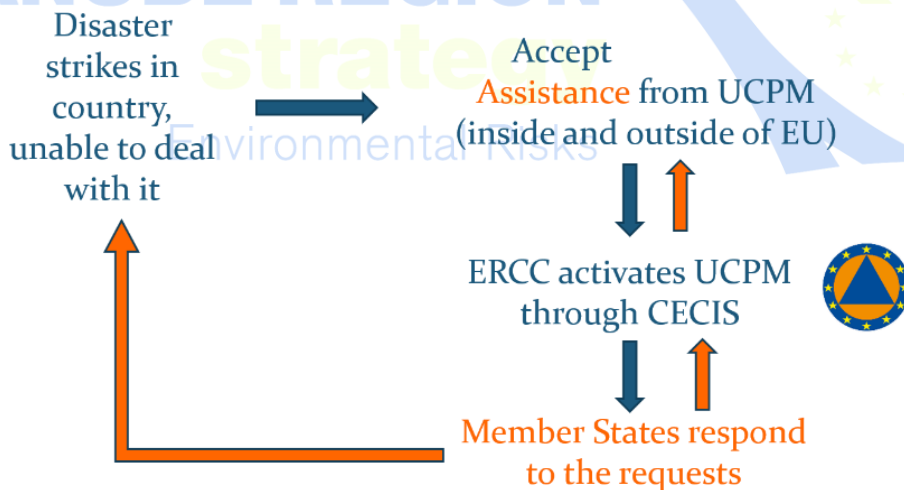
and they are also the first to react in the aftermath of a disaster, together with their volunteers' capacities. Therefore, there is a need for on-going cooperation at local, regional and cross-border level with a view to establishing common alert systems for rapid intervention prior to the mobilization of rescEU as well as regular public information campaigns on initial response measures."

Regional solutions specific to environmental risks and involvement of volunteer non-governmental organizations and authorities are therefore needed.



2. FIGURE TOOLS OF THE UCPM

There are certain tools in the UCPM which are supporting disaster response at international level, which has great focus on flood response as well. In case there is a need for assistance from the member and participating states (EU Member States (28), EEA (Iceland, Norway), North Macedonia, Montenegro, Serbia, and Turkey), the UCPM is being activated:



3. FIGURE UCPM ACTIVATION PROCESS

There are so called Modules in the system, which are response teams offered by the member and participating teams. Certain requirements need to apply, as the Modules should:

- Be specialized emergency response capacity,
- Be pre-defined and registered capacities (CECIS database),
- Perform tasks according to international standards,

-
- Be deployed in very short notice,
 - Be self-sufficient,
 - Be interoperable.

The flood response related modules are the following: Flood rescues with boats, (Extreme) High capacity pumping, Water purification, Flood containment. These assets can be offered and requested through the UCPM in case of a large-scale emergency.

In order to prepare these response capacities, there are full-scale field exercises and also Modules exercises, which are focusing on creating a realistic training environment for the participants for better preparedness.

Disaster response related activities and plans of PA5

Regional level or cross-border emergencies does not necessary require the activation of the UCPM, however they do require assistance from the region or the other side of the border. Civil protection organizations and fire and rescue services are involved in these response activities. They are key actors in responding to disasters, have responsibility in the field of special rescue and take part in cross-border interventions based on bilateral agreements as associations, NGOs, volunteers.

PA5 established the Disaster Management Working Group (DM WG) which concentrates on the emergency response and preparedness elements of managing environmental risks. DM WG supports the development of standards, procedures, training and network, by avoiding duplicating services and rather be a complementary service in case of regional emergencies.

PA5 already started these activities, by arrainging a large-scale field exercise in the Upper-Tisza River, where over 100 participants took part and trained together. It was arranged as a participant driven exercise which serves as a great platform for the responders to improve their interoperability and readiness for floods.

Summary

EUSDR PA5 intends to further concentrate on disaster response aspect of environmental risk management. With a group of experts from the Danube Region recommendations for civil protection and fire and rescue services will be developed with standardized requirements regarding their training and capacities. Extending the cooperation and joint efforts of the countries in the Danube Region presents an opportunity for reaching a common understanding. Besides policy development activities, PA5 will continue to support the responders with organizing events related to preparedness which will ensure practical realization of the ideas. The DM WG will serve as a platform to achieve those aims.

2.9. Transboundary cooperation having regard to the ice protection of the common interest Hungarian-Croatian and Hungarian-Serbian Danube river sections (Presenter: László Balatonyi, EUSDR Environmental Risks Priority Area, balatonyi.laszlo@ovf.hu)

Ice is a special type of water scarcity and the due effects are less predictable. The climate change/alteration scenario analyses point out generally that the hydrologic extremities will be more frequent in future. In publicities commonly the global warming related floods and drought events are highlighted as potential scenarios. Although the other end of the temperature scale could result in comparable devastating consequences – in among much worse circumstances to fight against them. The „lower end” is the freezing zone and icy condition, where permanent ice cover, ice jams and ice floods can appear on the rivers, endangering the hazard areas with inundation and erosion by the overwhelming force of mass movement.

Due to the meteorological circumstances January 2017. was the 10th coldest January since 1901 and the coldest since 1985. The minimum temperatures were below the freezing point all month long and were dropped below -20–23°C on the coldest mornings over snow covered territories. Water temperatures decreased very quickly due to typically low water levels across all rivers and the ice development was constant. It escalated to a 170 km continuous ice formation on the Danube River where the thickness reached four meters in some areas. Based on the trilateral treaty, Croatia and Serbia initialized the ice-breaking activities.

The operations took place on two locations for 17 days:

- „Icebreaker XI.” and “Icebreaker VI.” ship couple were deployed to the section Dunaföldvár-Vukovár. The most important task was to create a route through the ~10 km ice cover near Dalj (1348-1358 rkm)
- „Széchenyi” flagship and the “Icebreaker VII.” ship couple was ordered the section Vukovar-Belgrade to minimize the damages in ports, marines, bridges etc. The main goal was opening of 80-100 m width channel on the jammed ice and keeping clean the opened channel. Icebreaker XI. and Széchenyi are stronger ships and they were the ones to go forward.

Icebreaker VI. and VII. provided backup. The leading ship broke into the ice barricade twice, some 40 meters apart. Between the two entering the ship's wave's broke the congested ice into pieces. The pieces were shredded further into smaller ones by the secondary unit, ensuring that the ice do not close the opened channel. The direction of the opened channel was chosen to follow the alignment of the fairway. In order to speed up our progress they tried to

make the channel more narrow, but in that case the broken ice could not be able to flow away, closed it and they had to clean it repeatedly.

The operation was successful and the problematic sections could have been broken through. However the work was exceptional because both ships had to cut themselves through the icefield from upstream. Cutting from upstream of the congested ice involves considerable risks as the ice has no place to clean behind the ship. It can slip back to the ship's aft and can close her (as it happened with Jégtörő VI and VII as well). For successful crossing, it is necessary for the ships to keep moving in the ice and this requires „scrolling” ships. Without scrolling equipment it is impossible to cut through an ice-wall from upstream. It also became apparent that without the high-performance two-engine vessels the crossing would not have been possible.

The ice breaking activity was necessary in order to stop the upraising of the water level due to the ice blockade. The elevated water levels could cause inundation or endanger assets in Croatia, Serbia and Hungary as well. The conditions were suitable to operate with the ships and available time frame was also enough, because no serious flooding appeared from upstream. The cooperation among the countries is a great example of efficient resource sharing for mutually understood purposes and jointly defined criteria based on legally binding agreements.

Efficient management of ice transport requires overarching approach from the countries in Danube River Basin. The platform for the discussions is provided by ICPDR FP-EG and EUSDR PA5 SG meetings. Both organizations working closely to reach this step forward and numerous project ideas and activities are ready to support the regional cooperation and joint planning. The subject is not kept on ice and the earlier the funding will be provided the sooner the risk management will develop.

3. Conclusions

László BALATONYI (*EUSDR Environmental Risks Priority Area co-coordinator*)

On a Danube basin level three legal frameworks are relevant with respect to flood risk management. The first one is the Water Framework Directive (WFD) and Flood Directive (FD) management, the third is the European Union Civil Protection Mechanism (UCPM).

General preparedness is being enhanced through measures that establish or enhance flood event institutional emergency response planning. These include flood-related inspection on rivers, water reservoirs and water structures, updates of the flood protection plans and the hydrological characteristics such as design flood levels, discharge return periods reflecting also the climate change projections and joint trainings and exercises to improve cooperation. These activities lead to updates of operation plans of flood protection systems and of operative flood defense plans and their harmonization with other stakeholders such as civil protection.

Coordinate the operative flood management and civil protection plans (evacuation plans and procedures, safeguarding people, goods, emergency rescue plans, etc.) considering the benefits of the civil protection systems for the shared flood basins or stretches of common interest to better use the available resources.

DANUBE REGION
strategy
Environmental Risks

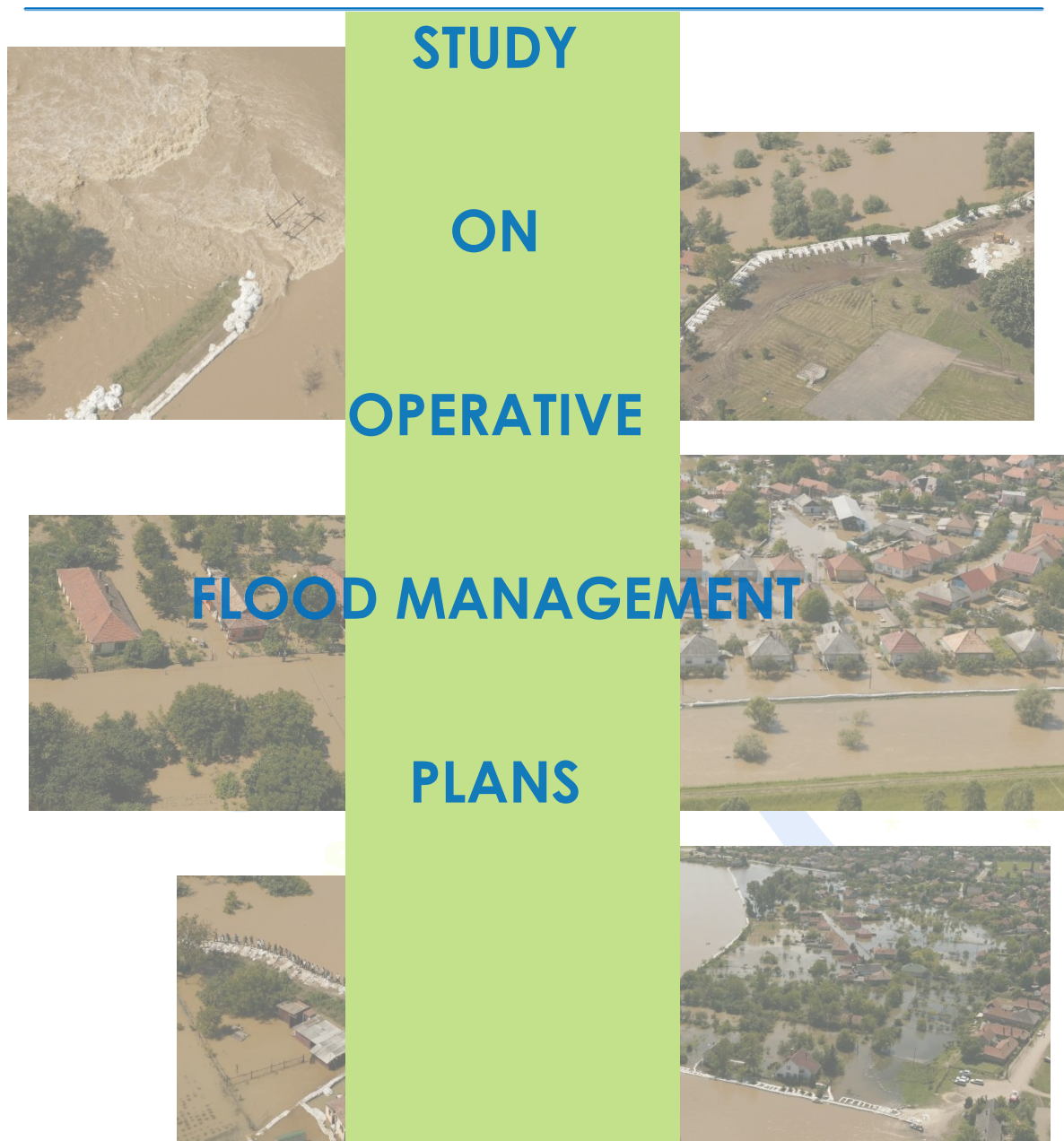
4. Recommendations

László BALATONYI (*EUSDR Environmental Risks Priority Area co-coordinator*)

1. Set up a project consortium from international Flood Management and Emergency Rescue institutions
2. Identify financing and develop a project proposal in order to harmonize the planning and operative protection of transboundary watercourses
3. Ensure an integrated approach of the three legal frameworks relevant at the Danube basin (Water Framework Directive, Floods Directive and the Sendai Framework for Disaster Risk Reduction and in line with EU Civil Protection Mechanism)
4. Increase general preparedness with measures that establish or enhance flood event institutional emergency response planning (flood-related inspection on rivers, water reservoirs and water structures, updates of the flood protection plans and the hydrological characteristics such as design flood levels, discharge return periods reflecting also the climate change projections)
5. Strengthen international cooperation (workshop, information sharing, trainings, exercises, etc.), develop a mutual, flood-defense related data exchange system
6. Coordinate the operative flood management and civil protection plans (evacuation plans and procedures, safeguarding people, goods, emergency rescue plans, etc.) considering the benefits of the civil protection systems for the shared flood basins or stretches of common interest to better use the available resources
7. Launch a project focusing on the international coordination on OFMPs
8. Identify pilot areas for the coordinated action and organize flood and civil protection cross-border exercises regularly

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9. Update operational plans of flood protection systems and operative flood defense plans based on the international experience, harmonize them with other stakeholders such as civil protection
 10. Develop a joint flood forecast system
 11. Maintain and improve the defense system
 12. Prepare an Annual Joint Review of all international activities





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