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Resilience and Disaster Risk Reduction in the Danube Region

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ABSTRACT OF THESIS submitted by:
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In 2015 environmental global governance has changed officially from reactive disaster management to proactive disaster risk reduction. Defined by Sendai Framework, 2030 Agenda and Paris Agreement, a new holistic approach is set up for the topic of disaster risk reduction and resilience, development and climate change. In that motion this research was looking for an answer on the question - if the Danube Region has a regional resilience and disaster risk governance?

Research was based on qualitative analysis of existing documents and policies on global, EU and Danube macro-regional level. It was supported with case studies of flooding and landslide events, as the most common regional natural hazards with common triggering factors.

Analysis resulted with the answer that the Danube Region does not have regional resilience and disaster risk reduction, although it does have many different strategies, plans and documentations.

Keywords: Resilience, Disaster Risk Reduction, Danube Region, EUSDR, Sendai Framework, Natural Hazards, Landslides, Floods.

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1. Introduction

In recent decades, scientific authorities have recorded and confirmed significant changes in the Earth's climate systems. Events that are happening naturally as a part of a closed thermodynamic system are becoming more frequent and severe. Human and economic losses are getting bigger due to demographic pressure, and inadequate policies and management.

Consumption, demand and supply, are asking for more and more space, resources and growth. The Global South and North are trying to improve their geopolitical positions. It seems like economic development has cost time, space and waste, while Earth's climate system is getting over the final point of predictability.

Putting catastrophic rhetoric aside, the situation with overpopulation and uneven distribution of population, resources and goods is threatening to raise the possibility of disasters.

Hence, it is not surprising, that global environmental governance is putting a lot of focus into shifting its old paradigms and systems to more future-focused and holistic approaches such as sustainable development.

From the 1990s, and even more after the Indian Ocean tsunami in 2004, global governance has focused on the devastating disasters caused by natural hazards. Many practices and ideas about "natural disasters", natural hazards, disaster risk reduction and resilience in general, have been changed.

Respecting all of the above mentioned, I was interested in researching and understanding how all of this is affecting lower levels of disaster risk reduction management and resilience. Due to personal interests, research was focused on understanding how policies from ten global and EU levels are implemented and if they are on a macro-regional level of the Danube Region.

Thus, this research is structured to understand networks of global, EU and macro-regional policies that are tackling issues of resilience and disaster risk reduction in the Region. The main question of the research is to understand - **Does the Danube Region have regional resilience and disaster risk governance?**

In order to answer this questions it was needed to clarify geographical and administrative scope, as well as different levels of governance. Before any further steps were made, the scope of research was focused on flooding and landslide phenomenon as the most frequent natural hazards of the Region.

Approach for dissection of the main question and research problem in general was qualitative analysis of existing documents and policies, while overlapping with the case study in order to prove theory-practice relation.

1.1. Geographical and administrative scope of the research

Analysis of natural processes and phenomena asks for wide understanding of different natural and man-made triggering factors. Also, analysis and understanding of management and governance of these phenomena asks for clarification of administrative and legal boundaries, consensuses and definitions.

Therefore, to objectively answer the main question of this research, it was needed to define and establish its geographical scope. Since the main question is focused on understanding if the Danube Region has regional resilience and disaster risk governance, it was needed to focus on historical and existing governance patterns and practices. Accordingly, research was aligned with the new macro-regional approach of the European Union (EU), precisely – European Union Strategy for the Danube Region (EUSDR).

Reason for this decision was the understanding that natural hazards do not follow administrative borders, but borders of natural systems, such as the Danube River watershed. However, the only existing policy/governance act that is established with a mandate for a future management and implementation of actions in this area is – EUSDR.

After years of focus on Central-East European economy and planning, the European Commission (EC) introduced the first EU macro-regional development strategy in 2009. The first strategy was on the Baltic Sea region. Two years later, in 2011, the EC adopted the European Union Strategy for the Danube Region (EUSDR). With these actions, the EC tried to establish macro-regions as "a new mezzanine level between the national (member state) and the supranational (community) level" (Braun and Kovacs 2011).

The EC defined macro-region strategy as an:

> *"integrated framework endorsed by the European Council, which may be supported by the European Structural and Investment Funds among others, to address common challenges faced by a defined geographical area relating to Member States and third countries located in the same geographical area which thereby benefit from strengthened cooperation contributing to achievement of economic, social and territorial cohesion."* (EC 2017).

With a clear idea about risks for the future, the EC tried to protect the EU from further overlapping of the procedures, stating that macro-region strategies are based on *"the principles of no new EU funds, no additional EU formal structures and no new EU legislation, as an instrument for optimal use of existing financial resources, better use of existing institutions and better implementation of existing legislation"* (EC 2017).

Therefore, with this approach the EC tried to establish cooperation between regions and states with the aim to clarify strategic goals important for the Region. Already existing trans-border cooperation was a foundation for this discussion and, in a way, presented a broader and more strategic approach for certain regional topics.

"The physical boundaries of macro-regions may vary according to the content of the targeted policy area, strategies based on them should provide an integrated and facilitating framework that makes problem solving easier" (Braun and Kovacs 2011, 79). With this clarification, it is understandable why borders of the Danube Region are slightly different from the borders of the Danube river watershed (Figure 1. and 2.).

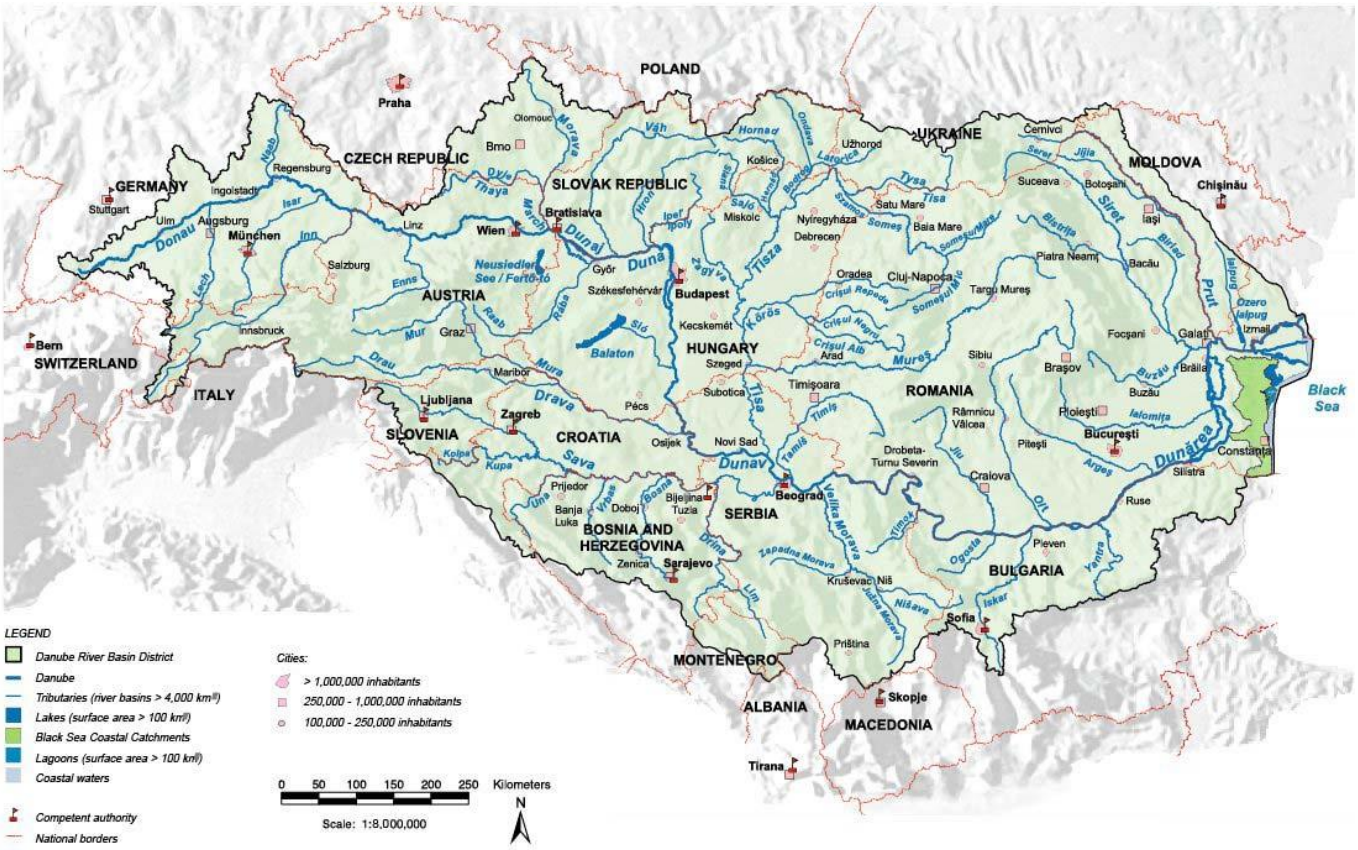

Figure 1.Danube River Watershed (Source: UNDP)

Figure 2.The Danube Region (Source: www.danube-region.eu)

The Danube Region (DR) covers a wider area than just catchment of the Danube basin with the main goal to secure the highest national involvement of the countries. It covers 14 countries, among which 9 EU members, 3 accession and 2 neighbourhood countries with a

population of 115 million inhabitants (EUSDR 2017). It is the first macro-region that combines existing EU member countries with candidates and third countries. It also tries to unite countries and regions with a long history of conflict and difficulties such as the area of the Iron Curtain or the Balkan wars.

Lastly, it covers an enormous area with high natural diversity, different socio-economic backgrounds and cultures in general. All of these differences are highlighting the importance of establishing macro-regional cooperation by showing problems and difficulties that will need to be overcome. Being part of big natural system – the Danube watershed, in cooperation with the EU, countries will have to find a way to cooperate in order to reach any of the existing goals, and also to reach resilience and disaster risk reduction.

1.2. Scope of governance levels in the research

Topic of resilience and disaster risk reduction has a long history and huge spectrum of approaches and governance. The European Union (EU) has many different directives, decisions and frameworks that are covering these topics or some parts of it. The EU legislation and governance, layered with worldwide environmental governance, but also national and trans-boundary agreements, composes an enormous amount of documentation. Considering that, for this research, analysis of policies was focused on existing documentation on the global, EU and regional levels.

Therefore, the policy scope that this research is following includes current and renewed global documents, such as Sendai Framework. On the EU level, the basis for the research was documents and directives related to the topic and still in force. At the regional level, main

documents were focused on EUSDR priority areas and actions, combined with the ICPDR plan for the Danube River.

In the process of defining a scope of the research, the assumption was made that the main national, trans-boundary and Danube tributaries documents, were derived from hierarchy documentations of the Region and the EU. Accordingly, none of the national documentation and documentation on the lower level than the Danube Region level was analysed.

1.4. Thesis structure

In order to achieve a more logical and analytical analysis, whole research was divided into seven main chapters.

The first chapter is stating the overall idea and main question, and the problem that will be the subject of the analysis. It also states and defines the geographical and administrative scope of the research, as well as governance levels that were included in analysis.

The second chapter is a literature review that presents the official basis for understanding and analyzing natural hazards (especially floods and landslides), important policies and governance documentation, and other authors' work and ideas used in order to answer the research question.

Methodology is presented in the third chapter, stating how the whole research was conducted while emphasizing all constraining obstacles and limitations.

The fourth chapter is covering the topic of resilience and disaster risk reduction in order to present the history of development of these paradigms, and to state main issues and problems concerning them.

The fifth chapter represents a small case study on severe floods and landslide events that occurred in the Balkan region in 2014. It attempts to give an overview of the scale of events in Bosnia and Herzegovina, and to present the response by the international community to the disasters.

Discussion is presented in the sixth chapter that tries to overlap all previously presented data and information in order to answer to the main research question.

The conclusion is presented in the seventh chapter, stating a summary of all facts and an overall understanding of the program.

2. Literature review

Resilience and disaster risk reduction are wide topics to cover. Intersecting with the geographical and administrative scope of this research, these topics are becoming even more complicated and layered.

In order to objectively answer the research question (Does the Danube Region has a regional resilience and disaster risk governance?) analysis of a different level of secondary data was needed.

First and foremost, it was needed to define natural hazards, why there are no "natural disasters" and, also, to present flooding and landslide processes with the aim to dissect them and present its interdependences.

Afterwards, clarification of all important policies was stated in order to understand, compare, evaluate, and summarize the current situation as well as to identify potential overlapping or gaps. Important policies were classified based on the level of jurisdiction as – global, EU and Danube Region.

The last section of supporting literature was based on already published academic works and articles on the topics of – EU macro-regionalization, the wide scope of disaster risk reduction and resilience.

2.1. Natural hazards

Events like floods, landslides, earthquakes, tsunamis etc. usually reach headlines in the news because of their impact on humans and human activates. Most of the time these events are classified as "natural disasters". However, there are no natural disasters only natural hazards.

The crucial point here is that natural hazards can trigger disasters when they cause loss of lives, injuries, devastation or damage of property, economic and social infrastructure, or in some cases, environmental damage. Thus, natural hazards are natural phenomena occurring frequently around the globe, but disasters happen only when those phenomena are intersected with human activities and misconducts. Therefore, disasters are not natural nor inevitable, but they are intersected or triggered by natural hazards (Milutinovic and Garevski 2009).

The UN adopted definition of disaster is *"a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeded the ability of the affected community or society to cope using its own resources."* (UNISDR 2015a).

However, as presented in Figure 3, disaster risk assessment usually consists of four different components (Lazarevski and Gjorgon 2017, 74):

1. Hazard – is the first part of the disaster. It represents any kind of activity, substance or phenomenon that may cause losses in population, human activities, economy or environment;
2. Exposure to a hazard – represents the "number of people, property or systems in hazard zones that can be affected by particular event";

3. Vulnerability – is "the characteristics and circumstances of a community, system or asset that make it susceptible to the damage effects of a hazard". It is an indicator of damage potential.
4. Coping capacity and resilience – the final part of disaster occurrence. Where coping capacity represents "the ability of people, organizations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters". On the other hand, resilience is "the ability to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and effective manner, including through the preservation and restoration of its essential basic structures and functions".

Figure 3. Conceptual framework for disaster risk assessment (Lazarevski and Gjorgon 2016, 75)

Therefore, this research was done in order to understand if the Danube Region has regional resilience and disaster risk governance with the focus on flooding and landslide processes, as the most common natural hazards.

2.1.1. Flooding processes

Floods are considered to be the second most common natural hazard on Earth. The most general definition of these events would state that floods are a *"general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters from the unusual and rapid accumulation or runoff of surface waters from any source"* (Geoscience Australia 2014).

Some floods can develop through days and weeks, leaving enough time for the population to be prepared or evacuate, while sometimes floods can develop suddenly with almost no time to prepare or react.

Although floods are natural events, they can also be man-made or man affected. In both cases some of the basic factors have to be fulfilled - rapid ice-melt, heavy rain, broken dams or levee, rise of ground water level, (poor) water management etc. (National Geographic 2011).

Flooding events are a big and important part of Earth's water cycle where energy and nutrition distribution happens. After a flood, a huge amount of nutrients and sediments has been moved from upstream to downstream areas. Farmers, agribusiness and economy in downstream areas, if managed well, will usually have a lot of gain from this phenomenon.

However, being mindful of the enormous destructive power water and flooding events have, it is hard to defend all man-made structures from destruction. Also, nowadays, big issues during and after floods are hazardous material and contamination of the soil and water. A large amount of fuel, sewage, pesticides and other potentially dangerous materials is quickly contaminating flooded areas. In the worst case scenario, it can spread diseases, especially in

cases where flood victims are left without basic hygienic conditions and without clean, drinkable, water.

Flooding events can also be initiated by humans. Most of the man-made floods are intentional and controlled with the aim to manage water consumption in agriculture, economy or infrastructure. The example of agricultural business connected with rice production is the best cases of human interaction with flooding events.

Throughout history, manipulation with floods was an approach to restore soil and ecosystems in general. This was a perfect way to redistribute sediments in the basins. On the other hand, hydrologists and engineers are manipulating these events as a way of flood prevention and flood control, ensuring that significant destruction can be escaped in smaller floods.

For the purpose of understanding flood processes and frequency, scientists standardized the classification of floods according to the likelihood of occurrence in a given time period (Table 1). Thus, the most common classifications are 10-year flood, 50-year flood, and 100-year flood. For the 100-year flood, it is common to be classified as a large and extremely destructive event with predicted possibility to happen only once in every century.

Table 1.Flood classification.

Recurrence interval, in years	**Probability of occurrence in any given year**	**Percent chance of occurrence in any given year [%]**
100	1 in 100	1
50	1 in 50	2
25	1 in 25	4
10	1 in 10	10

5	1 in 5	20
2	1 in 2	50

Source: USGS 2017a.

Following described logic, a 100-year flood has only a 1% chance of occurrence in any given year. However, those predictions are just numerical estimations while the last two decades are showing that 100-year floods have a higher frequency of occurrence (USGS 2017a).

The deadliest and most unpredictable type of floods are flash floods. These events are extremely dangerous since they are happening almost instantly, sweeping away anything that crosses their path. So far no adequate system for classification of flash floods is established.

2.1.2. Landslide processes

Landslide processes are worldwide phenomena that occur in terrestrial and underwater environments. Triggered by gravity, and a combination of different factors, landslides are shaping the surface and affecting the anthroposphere every day.

Generally, landslides are defined as “a wide variety of processes that result in the downward and outward movement of slope-forming materials including rock, soil, artificial fill, or a combination of these" (USGS 2017b).

Supported with gravity and the wide spectrum of atmospheric conditions, different triggering factors are initiating or affecting these events. As presented in Table 2, causes can mainly be identified as – geological, morphological and human (USGS 2017b).

Table 2.Landslide triggering factors.

Geological causes	Morphological causes	Human causes
- Weak or sensitive materials - Weathered materials - Sheared, jointed, or fissured materials - Adversely oriented discontinuity (bedding, schistosity, fault, unconformity, contact, and so forth) - Contrast in permeability and/or stiffness of materials	- Tectonic or volcanic uplift - Glacial rebound - Fluvial, wave, or glacial erosion of slope toe or lateral margins - Subterranean erosion (solution, piping) - Deposition loading slope or its crest - Vegetation removal (by fire, drought) - Thawing - Freeze-and-thaw weathering - Shrink-and-swell weathering	- Excavation of slope or its toe - Loading of slope or its crest - Drawdown (of reservoirs) - Deforestation - Irrigation - Mining - Artificial vibration - Water leakage from utilities

Source: USGS 2017b.

2.2. Existing governance and policy documentation

In order to analyze current governance and policy systems managing resilience and disaster risk reduction, it was needed to classify documentations in a different governance level. Thus, documents were classified as global, EU and the Danube Region influential documents:

- Global – Sendai Framework for Disaster Risk Reduction 2015 – 2030; United Nation Plan of Action on Disaster Risk Reduction for Resilience; Disaster Risk Reduction and Resilience in the 2030 Agenda for Sustainable Development;
- EU – Directive 2007/60/EC of the European Parliament and of the Council – on the assessment and management of flood risks;
- Danube Region – ICPDR Flood Risk Management Plan for the Danube River Basin District.

Further analysis of the documentation was not conducted in order to maintain the focus of the research, and with the assumption that any other documents are made in accordance with higher level documentation. Also, documents such as "Paris Agreement" and "The 2030 Agenda for Sustainable Development" were omitted too because they were the basis for developing all global level documentation that was taken into consideration. Thus, respecting the research question, the assumption was made that Sendai Framework and other documents developed by the UN were aligned with the Paris Agreement and 2030 Agenda.

2.2.1. Sendai Framework for Disaster Risk Reduction 2015-2030

Sendai Framework for Disaster Risk Reduction (Sendai Framework) is currently valid global environmental framework adopted for the period 2015-2030. It was adopted after the "Hyogo Framework for Action 2005-2015: Building Resilience of Nations and Communities to Disaster" mandate was finished. Thus, the Sendai Framework is an additional step in the global attempts to manage hazards, risk and disasters.

At the Third United Nations World Conference on Disaster Risk Reduction, in March 2015, in Sendai (Japan), framework was adopted as an opportunity for all countries (UNISDR 2015a, 2):

a) *"adopt concise, focused, forward-looking and action oriented post-2015 framework for disaster risk reduction;*
b) *Complete the assessment and review of the implementation of the Hyogo Framework for Action 2005-2015: Building Resilience of Nations and Communities to Disasters;*
c) *Consider the experience gained through the regional and national strategies/institutions and plans for disaster risk reduction and their recommendations, as well as relevant regional agreements for the implementation of the Hyogo Framework for Action;*
d) *Identify modalities of cooperation based on commitments to implement a post-2015 framework for disaster risk reduction;*
e) *Determine modalities for the periodic review of the implementation of post-2015 framework for disaster risk reduction."*

Therefore, Sendai Framework is based on already identified challenges, gaps and lessons of the Hyogo Framework (UNISDR 2015a). Before presenting new Framework, all parties agreed that some of the main Hyogo lessons have to be carried on in developing Sendai. Based on the question of this research, the most important conclusions after Hyogo Framework were (UNISDR 2015a, 4):

- *"It is necessary to continue strengthening good governance in disaster risk reduction strategies at the national, regional and global levels and improving preparedness and national coordination for disaster response, rehabilitation and reconstruction, and to use post-disaster recovery and*

reconstruction to "Build Back Better", supported by strengthened modalities of international cooperation.

- *There has to be a broader and a more people-centered preventive approach to disaster risk. Disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective. While recognizing their leading, regulatory and coordination role, Governments should engage with relevant stakeholders, including woman, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards. There is a need for the public and private sectors and civil society organizations, as well as academia and scientific and research institutions, to work more closely together and to create opportunities for collaboration and for businesses to integrate disaster risk into their management practices.*
- *International, regional, sub-regional and transboundary cooperation remains pivotal in supporting the efforts of States, their national and local authorities, as well as communities and businesses, to reduce disaster risk. Existing mechanisms may require strengthening in order to provide effective support and achieve better implementation.*
- *In order to reduce disaster risk, there is a need to address existing challenges and prepare for future ones by focusing on: monitoring, assessing and understanding disaster risk and sharing such information and how it is created; strengthening disaster risk governance and coordination across relevant institutions and sectors and the full and meaningful participation of relevant stakeholders at appropriate levels;*

investing in the economic, social, health, cultural and educational resilience of persons, communities and countries and the environment, as well as through technology and research; enhancing multi-hazard early warning systems, preparedness, response, recovery, rehabilitation and reconstruction. To complement national action and capacity, there is a need to enhance international cooperation between developed and developing countries and between States and international organizations."

In accordance with all mentioned parties tried to develop new framework that will cover small and large scale risks, with no difference in how slow or fast their occurrence was. Man-made or natural, technological, biological or environmental hazards and risks need to be addressed and managed with multi-hazard management "at all levels as well as within and across all sectors" (UNISDR 2015a, 5).

Thus, Sendai Framework had a huge challenge to answer to all Hyogo conclusions, but also to address and integrate new approaches and technologies, in order to fulfill needs and reach expectations. Hence, there were seven global targets defined on the global level, followed by appropriate indicators (UNISDR 2015a, 6):

1. *"Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020-2030 compared to the period 2005-2015;*
2. *Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020-2030 compared to the period 2005-2015;*
3. *Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;*

4. *Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030;*
5. *Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;*
6. *Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework by 2030;*
7. *Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030."*

In order to reach its targets Sendai Framework was structured with four main priority areas (UNISDR 2015a, 8):

1. *"Understanding disaster risk,*
2. *Strengthening disaster risk governance to manage disaster risk,*
3. *Investing in disaster risk reduction for resilience*
4. *Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction."*

Four main priorities are then defined with key activities prescribed on national and local levels, as well as on global and regional levels. Further, each priority implementation is also suggested for the best results. Every action is aligned with national regulations and laws and also respects available capabilities or capacities.

Two final segments of the Sendai Framework are focused on the "role of stakeholders" and "international cooperation and global partnership".

This approach is stating that States do carry the largest responsibility for disaster risk reduction, but its implementation will be successful only if responsibilities between Government and relevant stakeholders are shared. Thus, Sendai is stating that non-State stakeholders have a really important role in managing and implementing Framework at all levels (local, national, regional, global).

Hence, Sendai Framework is prescribed involvement of different public and private stakeholders such as (UNISDR 2015a, 19-20):

- *Civil society* - volunteers, participation of women, children and youth. As well as older people and people with disabilities. It is also highlighting the importance of, and respect for, the knowledge of indigenous people, and migrants' integration and contribution in building up resilience.
- *Academia* – with focus and further scientific research, and networks that will help to understand factors and scenarios of disasters, with a main focus on clear prediction and applicative solutions for all levels of governance.
- *Private and business sector* – including many different professional associations, financial institutions, foundations etc. to build up better and more holistic disaster risk management, business models and best practices for better disaster risk-informed investments.
- *Media* – taking an active and inclusive role to inform and educate the public, and be prepared to clearly and with good quality inform the public on needed actions. Therefore, media was taken as an important part of the early warning system for sharing life-saving measures in order to develop a culture of strong prevention and preparedness in communities.

The last part of the Sendai Framework is focused on defining international cooperation through some of the general considerations, means of implementation, defining support from international organizations and follow-up actions. In order for all included parties to have a clear understanding of cooperation throughout steps in building up resilience and disaster risk reduction, Sendai prescribes in detail the linkage between all levels and the stream of support.

2.2.2. The United Nations Plan of Action on Disaster Risk Reduction for Resilience

"The United Nations Plan of Action on Disaster Risk Reduction for Resilience" (UN Plan) was endorsed by the United Nations System Chief Executives Board of Coordination (CEB) at its Spring Session in April 2013 (UN CEBC 2013).

The UN initiated development of this plan as an act to integrate issues of disaster risk reduction into the UN level of operations, but also as a document with unified partner actions and commitment towards building up more resilient society.

After the Rio+20 Conference in Brazil (2012), it was highly requested that the topic of disaster risk reduction will have more attention in global sustainability governance. Also, the post-2015 agenda was moved towards considering disasters and resilience as important topics for a sustainable future.

To be clear and effective, the UN Plan structured three main commitments with attributed actions; "shared approach to measuring impacts and progress" and four implementation steps. (UN CEBC 2013).

Commitments defined by the UN Plan are (UN CEBC 2013, 5-8):

1. "*Ensure timely, coordinated and high quality assistance to all countries where disaster losses pose a threat to people's health and development.*
2. *Make disaster risk reduction a priority for the UN system and organizations within.*
3. *Ensure disaster risk reduction for resilience is central to post-2015 development agreements and targets."*

Each commitment has its prescribed actions in order to clearly define approach and governance of the issue on every level. To ensure implementation of these was done in the proper way, the UN Plan defined implementation of its actions, such as (UN CEBC 2013):

1. *Endorsement* – defining its formal path and its position as a guide for the post-2015 development agenda and consultations of Hyogo Framework.
2. *Implementation* – states that implementation of the UN Plan will be on the UN senior leadership group as well as efforts to align it with all other relevant initiatives and humanitarian activities connected with resilience and preparedness.
3. *Monitoring progress* – will be done by a senior UN leadership group and the Senior Management Group, but after 2015 so as to be able to align new steps with current environmental governance documents.
4. *Communication and advocacy* – visibility of the UN Plan was defined to be raised among the countries and partners by Executive Heads of UN, UN Resident Coordinators and UN Country Teams. While also stating that the UN Plan is "a main UN contribution to disaster risk reduction in support of resilience and sustainable development as part of the post-2015 development agenda".

2.2.3. Disaster Risk Reduction and Resilience in the 2030 Agenda for Sustainable Development

The United Nations Office for Disaster Risk Reduction (UNISDR) has developed "Disaster risk Reduction and Resilience in the 2030 Agenda for Sustainable Development" in October 2015. The newly developed document was a result of three important global environmental governance events – "2030 Agenda for Sustainable Development", "Sendai Framework for Disaster Risk Reduction 2015-2013", and an event that was planned for December – Paris Agreement.

Therefore, this document had a purpose to link topics of disaster risk reduction and development, as it was already visible that these are correlated and interdependent. The document is stating that by targeting issues of development, many issues of resilience and disaster risk reduction will be solved as well.

In order to fully support the idea, the UNISDR stratifies this document on 17 Sustainable Development Goals (SDGs), analyzing them from the point of view of disaster risk reduction and resilience.

UNISDR states that *"with the magnitude of losses over recent decades, the likely impact of disaster risk on development efforts and the projected increase in losses over the coming decades present a strong case for the inclusion of disaster risk and resilience in the 2030 Agenda for Sustainable Development"* (UNISDR 2015b, 12).

Hence, the document developed by UNISDR is clearly presenting interdependence of post-2015 development agreements with disaster risk reduction and building resilience in order to ensure any development goals. Also, it is stating that there is a need for better addressing the

risk factors in every SDG, suggesting that there is obvious coherence with action strategies that can be promoted.

On the other hand, alignment of targets and indicators was clarified as well as coherence in monitoring and reporting on these. There is still ongoing discussion on how to align these or how to develop shared qualitative and quantitative targets for implementation of both documents. Where the document concludes that:

> *"The Sendai Framework will have an important role in the implementation and achievement of the 2030 Agenda for Sustainable Development and vice versa. Both have the capacity to shape public and private sector efforts and build partnerships to address the underlying drivers of risk and future levels of risk and resilience if implementation is concerted. Moreover, ongoing discussions to develop the indicators framework for both the outcome document and the Sendai Framework need to be coherent to ensure and demonstrate how progress and achievements can mutually contribute to each other"* (UNISDR 2015b, 15).

2.2.4. Directive 2007/60/EC of the European Parliament and of the Council – on the assessment and management of flood risks

Directive 2007/60/EC entered into force on 23rd October 2007 as an EU directive with focus on management and assessment of flood risks. It required all Member States to assess if there is risk of flooding and to provide adequate documentation containing maps.

The main aim of directive was to establish management and reduction of risks for economy, environment, heritage and human health. It prescribes a preliminary assessment that will classify basins and coastal areas regarding risk of flooding by 2011. Defined zones then needed to have developed flood risk maps by 2013 and establish prevention, protection and preparedness by 2015 with flood risk management plans (EC 2007).

Since this directive is done in accordance with the Water Framework Directive, all of prepared documents, maps and assessment processes are publically available. Also, the whole process is aligned and coordinated in accordance with the main Water Framework Directive.

It also prescribes how Member States have to cooperate, following the rules of solidarity to "not undertake measures that would increase the flood risk in neighbouring countries" (EC 2007). In the same manner, Member States have to have long term developments that will cover topics of climate change and sustainable land use as a part of a flood risk management approach (EC 2007).

2.2.5. Flood Risk Management Plan for the Danube River Basin District

"The Flood Risk Management plan for Daube River Basin District" (Flood Risk Plan) was developed by International Commission for the Protection of the Danube River (ICPDR) on 10th November 2015. It was a result of a newly adopted EU Flood Directive 2007/60/EC and it is absolutely aligned with flood risk management cycle prescribed in the Directive.

Hence, Flood Risk Plan consists of (ICPDR 2015):

- *"Conclusion of the preliminary risk assessment, as required in Chapter II in the form of a summary map of the River Basin District/Unite of Management delineating the areas of potential significant flood risk;*
- *Flood hazard maps and flood risk maps;*
- *Description of the objectives;*
- *Summary of measures and their prioritization, including those taken under other Community acts (such as EIA, SEA, SEVESO, WFD), aiming to achieve the objectives;*
- *Description of the cost-benefit methodology, when available, used in transnational context;*
- *Description of how implementation progress will be monitored;*
- *Summary of public information and consultation;*
- *List of competent authorities*
- *Description of the co-ordination process in international river basin districts/other unit of management;*
- *Description of the coordination process with the Water Framework Directive."*

Since this Plan was the result of a new EU Directive, but also many years of previous experts experience throughout ICPDR, it is one of the most important bases for understanding flooding processes and risks in the Danube River watershed.

The document is stating different objectives in order to avoid new risks, reduce existing risks, and strengthen resilience. Also, a major part of it is public awareness and the solidarity principle among the countries.

Measures are stated through prioritization of the hot-spots, but are also following action from the EU Strategy for the Danube Region. However, the majority of measures are following described objectives, and in that manner measures are focused on avoiding new risks, reducing existing ones, strengthening resilience and building awareness and solidarity.

As a major win-win solution in integrated flood risk management, water retentions are presented and analyzed as a possibility along the river flow. Hence, the Flood Risk Plan states that "retentions can be provided by reservoirs, detention and retention basins, flood polders and by wetlands/floodplains" (ICPDR 2015). Also, the Plan states possible retention areas in every 12 riparian countries followed by a chapter that provides cost-benefit analysis for these countries as well.

In the last chapters, the Flood Risk Plan analyses current issues of the Danube River watershed countries cooperation as (ICPDR 2015, 77):

- *"The overlap of legal and planning instruments in many Member States;*
- *Planning and management under Water Framework Directive and EU Flood Directive generally use the same geographical unit i.e. the river basin which acts as natural "reference area" for both water quality and flood risk management;*
- *Aiding the efficiency of the implementation of measures and increasing the efficient use of resources. Measures taken under on Directive may have an influence the objectives under the other. Coordination provides an*

opportunity to reduce conflicts and maximize synergies by identifying cost-effective measures which serve multiple purposes and can result in "win-win" measures being implemented;

- *An expectation from many stakeholders that an integrated approach will be taken."*

2.3. Academic papers

In order to understand natural hazards and processes, governance and management, as well as existing approaches, analysis of current scientific articles was needed. Since research was done in a few stages and different levels (global, EU and Danube Region), supporting academic papers were also following that approach. Therefore, certain ideas and approaches were adopted into the foundation of this research as a basis for further academic discussion.

2.3.1. The Danube Region level

The main premise of European division into the macro-region and the Danube Region was following work of B. Gabor and Z.L. Kovacs stating that action will "result in policies within geographically alternating borders based on functional regions" (Gabor and Kovacs 2011). Also, authors are highlighting that (Gabor and Kovacs 2011, 80):

> *"Bundling policies targeting different sectors and cooperation enhance efficiency and the chance for success, they allow for new division of work and specialization. At the same time it is only possible to raise added value and uncover untapped potential if the solutions are custom tailored to the specifics of a given macro-region".*

Therefore, Gabor and Kovacs are clarifying that the new macro-regional division will actually "establish a new mezzanine level between the national (member state) and the supranational (community) level (Gabor and Kovacs 2011, 79).

In the same manner, Sielker F. in her work "New approaches in European governance? Perspectives of stakeholders in the Danube macro-region" states that (Sielker 2016):

> *"Macro-regional cooperation in the EU are networks that use the horizontal and vertical dimension of the multilevel governance system to influence both strategic decision-making as well as implementation activities."*

Also, Sielker is explaining her opinion that this kind of new macro-regional cooperation is encouraging cooperation in countries with a long history of conflict, but also a long history of cooperation, as well as different levels of EU involvement and development in general (Sielker 2016, 90).

2.3.2. Resilience and Disaster Risk Reduction

Revised policies represent currently or recently influential policies and documents important for governance of disaster risk reduction and resilience issues. However, it was important to analyze and comprehend its historical development and interdependence.

Throughout analysis of policies, it was obvious that sustainable development, climate change and resilience/disaster risk reduction are becoming more aligned and synchronized. It was also important to make a clear distinction between these two.

Therefore, Lazarevski is supporting the idea of a changing paradigm from disaster management, to disaster risk management, but also classifying four concepts and shifts regarding these topics in general. Lazarevski is defining (Lazarevski and Gjorgon 2016):

1. *"From "natural disasters" to nature of disasters – understanding disaster risk*
2. *From disaster management to disaster risk management*
3. *From monistic perspective to holistic approach*
4. *Voluntarily vs. obligatory DRR implementation: disaster resilience index"*

On the other hand, Fleming B. is proving that sustainable development is not going to be successful in fields of urban planning, policy and design since it is "the utopianism" (Fleming 2016). Author is stating that resilience is a more pragmatic approach, and that it has to be understood separately from sustainability. Besides pragmatism, he is highlighting that resilience is different from sustainability because (Fleming 2016, 34):

> "*The concept of sustainability emerges from a stable-state view of the world. It is premised on that idea that a balance between humanity and nature can always be struck. But if such relationship is in fact possible, modern humans have yet to achieve it. Thus, part of the allure of resilience theory flows from its embrace of dynamic equilibrium – or brief moment of stability in an otherwise tumultuous world – and the power that comes from understanding and managing the structural shifts that it implies. This is particularly important given the uncertainty and volatility expected as climate change descends on the planet during the twenty-first century".*

3. Methodology

The main question of this research is to clarify if the Danube Region has a regional resilience and disaster risk governance. Thus, this research is a case study research based on the literature and documentation analysis. The case was to do inventory of existing documentation and policies that were aligned within the research area, and covering the main aspects of resilience and disaster risk reduction. Area was a geographical area defined by the EUSDR as the Danube Region. While the main focus was on flooding and landslide processes as the most common natural hazard of the Region.

Particular governance and management policies that were analyzed were disaster risk reduction and resilience documentation on the global, EU and macro-regional level. Criteria for choosing documentation was made based on:

- Documentation mandate – it had to be a document that is making influence on the EU and the Regional level governance, and it had to be a currently applicable document.

- Topic – documents were directly or indirectly connected with the topic of resilience and disaster risk reduction. Hence, some of the documents on the EU and regional level were more connected with the topic of water and flooding, than directly or explicitly with resilience or disaster risk reduction.

Research was done in four stages. The first stage was focused on defining a main question and clarifying which natural hazards should be included and reviewed, as well as deciding on the geographical and governance scope to be reviewed and analyzed. This was followed with collection of different documentation, frameworks, academic papers and publications on all

three levels defined as important for the research (global, EU and DR). The second stage included reading and studying of collected documents and papers, analyzing patterns and overlapping. While in the third stage, it was needed to find examples of case studies that will unbiasedly represent how all of the existing documentations and knowledge are applied in-situ, and if they are applied, as well as if a good practice is well-balanced over the whole area of the Region. The fourth stage asked to discuss and overlap data gathered and generated through policy and secondary analysis, in order to highlight the current regional situation.

3.1. Research limitations

However, this research had its limits in all of the stages. To fit format and scope of the Master thesis level, the details had to be generalized, which was the main reason for not going further with analysis on national or transboundary approaches. With that, the main reasons to keep the research general were the time limitation, as well as issues with different languages, data collection and data existence.

The biggest challenge was doing interviews with researchers in charge of supporting all EU and regional policies, which in this case were researchers at the Joint Research Centre. The Joint Research Centre is a hub for all EU research institutions and has all necessary documentations and data in order to fulfill its main purpose – feeding EU decisions with research and academic facts and data. After many failed attempts to get into touch with the Joint Research Centre in Ispra (Italy), and trying to schedule interviews on the topic, I decided to change the research approach and gather more practical and in-situ perspective. Thus, analysis was done on the case of the severe flooding and landslides event that were happening in the Balkan region in 2014.

Besides the limitation of my research and Master Thesis format, the Danube Region has its own limitations that were too challenging to overcome. Some of the major issues were:

- Fragmentation of the Region. It is covering a huge area and countries that have different languages, approaches and backgrounds.
- No one is officially taking the leadership on the issues of the Danube Region, although many parties are working on different segments and topics of the Region.
- Lack of data, especially historical and long term data and measurements. However, if there is data in different countries, they are collected with different mechanisms and approaches. Thus usually it is hard to compare them.
- There is no strategy that covers the topic of disaster risk reduction on the macro-regional level. There are flooding plans, but no plans or documents are covering disaster risk approach or resilience, not to mention possible zoning on susceptibility to other natural hazards besides floods.

4. Resilience and Disaster Risk Reduction

The topic of disaster risk reduction has been developed through many decades, and it is still changing. It moved from a focused technical discipline towards a broader global movement that is presently focusing on reaching sustainable development as a goal. The UN general Assembly proclaimed the 1990s to be the International Decade of Natural Disaster Reduction. In 1994 that decision was revised at the First World Conference on Natural Disaster Reduction where "The Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation" was adopted together with its Plan of Action.

In 1999, the UN International Strategy for Disaster Reduction (UNISDR) was established (Lazarevski and Gjorgon 2016, 70):

> *"to serve as the focal point in the United Nation system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the UN system and regional organizations and activities in socio-economic and humanitarian fields"*

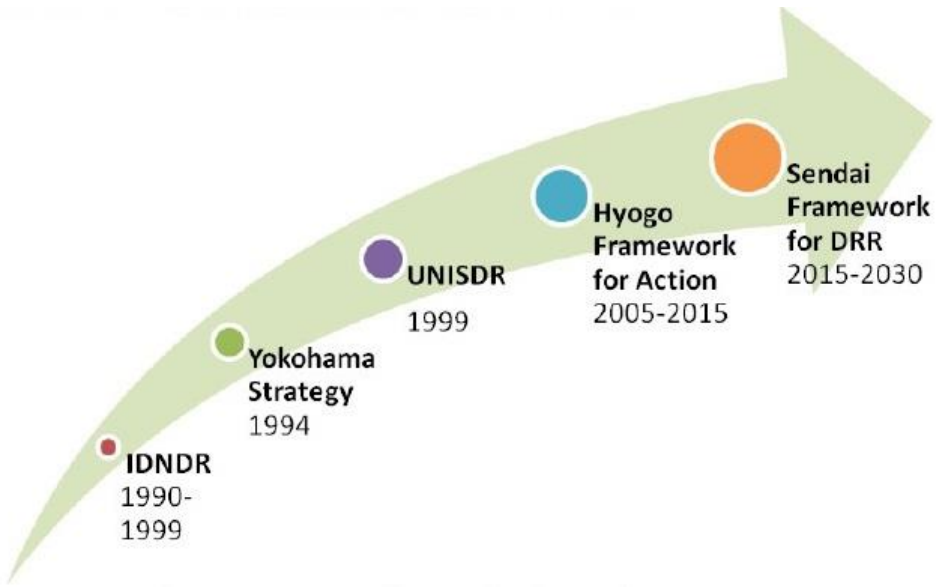

Figure 4. 25 years of international commitment to DRR (Source: Lazarevski and Gjorgon 2016)

However, some unfortunate events triggered the international community to start discussing disaster the risk reduction topic in a more structural way. Thus, in 2005, a few weeks after 2004 Indian Ocean tsunami killed 230,000 people, the international community joined in the development of the "Hyogo Framework for Action 2005-2015: Building the Resilience for Nations and Communities to Disasters". From Hyogo it was expected to secure "substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries" (HFA, 2005) through five priorities for action:

1. *"Ensure that DRR is a national and a local priority with a strong institutional basis for implementation;*
2. *Identify, assess and monitor disaster risks and enhance early warning;*
3. *Use knowledge, innovation and education to build a culture of safety and resilience at all levels;*
4. *Reduce the underlying risk factors;*
5. *Strengthen disaster preparedness for effective response at all levels."*

During the mandate of the HFA, many gaps and challenges were faced. In a period of 10 years, numbers of disasters increased as well as numbers of affected people and economic losses. Approximately 23 million people have been made homeless and 1.5 billion people were affected by disasters (Lazarevski and Gjorgon 2016).

However, from today's perspective the biggest gap HFA had was the issue that the global topics of sustainable development, climate change and disaster risk reduction frameworks were not synchronized or aligned. National and local policies and actions suffered major implementation gaps, while there was limited space for local communities to participate in policy and decision-making processes. These issues were critically addressed and redefined in the next global environmental governance done through adoption of "The Sendai Framework

for Disaster Risk Reduction 2015-2030" (Sendai). In that manner Sendai was the first international document that was developed in the context of the post-2015 development agenda.

Sendai has a scope and purpose focused on:

> "*The risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risk. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors" (UNISDR 2015a).*

Hence, its goal is:

> "(…) *to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery and thus strengthen resilience" (UNISDR 2015a).*

In order to reach its goal while respecting its scope and purpose, Sendai was developed with seven main targets, four priority areas and 13 guiding principles.

Thus, in comparison to the HFA, Sendai is *"more far-reaching, holistic and inclusive, and emphasizes the need to address disaster risk management, to reduce existing vulnerability and to prevent the creation of new risks"* (Lazarevski and Gjorgon 2016, 73).

In the case of Sendai Framework, local communities have higher importance while states have primary responsibility in defining and coping with disaster risk reduction.

Hence, throughout almost three decades of history, global and local disaster risk reduction and resilience approaches have changed a lot. From "natural disasters" towards understanding of the nature of disaster processes; from closed technical approach towards an inclusive broad and globally based platform for a resilient and sustainable future.

Today, aligned with climate change and sustainable development frameworks and policies, resilience and disaster risk reduction are opening a new chapter in global involvement and cooperation on these topics. Now we can see climate change being understood as a "disaster risk amplifier" (Lazarevski and Gjorgon 2016, 78) through three aspects:

1. "*Vulnerability of communities caused by ecosystem degradation and reduced water food availability;*
2. *Communities' exposure to ever more frequent, extreme and rapid weather events like floods and draughts;*
3. *Results: climate change increases Disaster Risks and decreases Sustainable Development. "*

Therefore, many authors and policy-makers are stating that disaster risk reduction and resilience has to be integrated in multilevel and multidimensional contexts, and ask for integration and synergy with sustainable development and climate change adaptation global and local frameworks (Figure 5) (Lazarevski and Gjorgon 2016, 79).

Figure 5.The Links between Disaster Risk Reduction, Climate Change Adaptation and Sustainable Development (Source: Lazarevski and Gjorgon 2016, 79)

5. May 2014 Balkan Floods and Landslides

In the period between the 13th and 18th of May 2013, the Balkan region has been under low-pressure cyclones Tamara and Yvette which resulted in extremely high levels of precipitation. Serbia and Bosnia and Herzegovina have had the heaviest rains in the last 120 years of recorded weather measurements. Towns Obrenovac in Serbia, and Doboj in Bosnia, suffered the most after being flooded by several meter high water waves from nearby rivers. (Independent.ie. 2014).

This sudden and unexpected rain phenomena has started over 2,000 landslides across the Balkan region, and together with flooding events has paralyzed and affected lives of 1.6 million people over Serbia and Bosnia (Independent.ie. 2014).

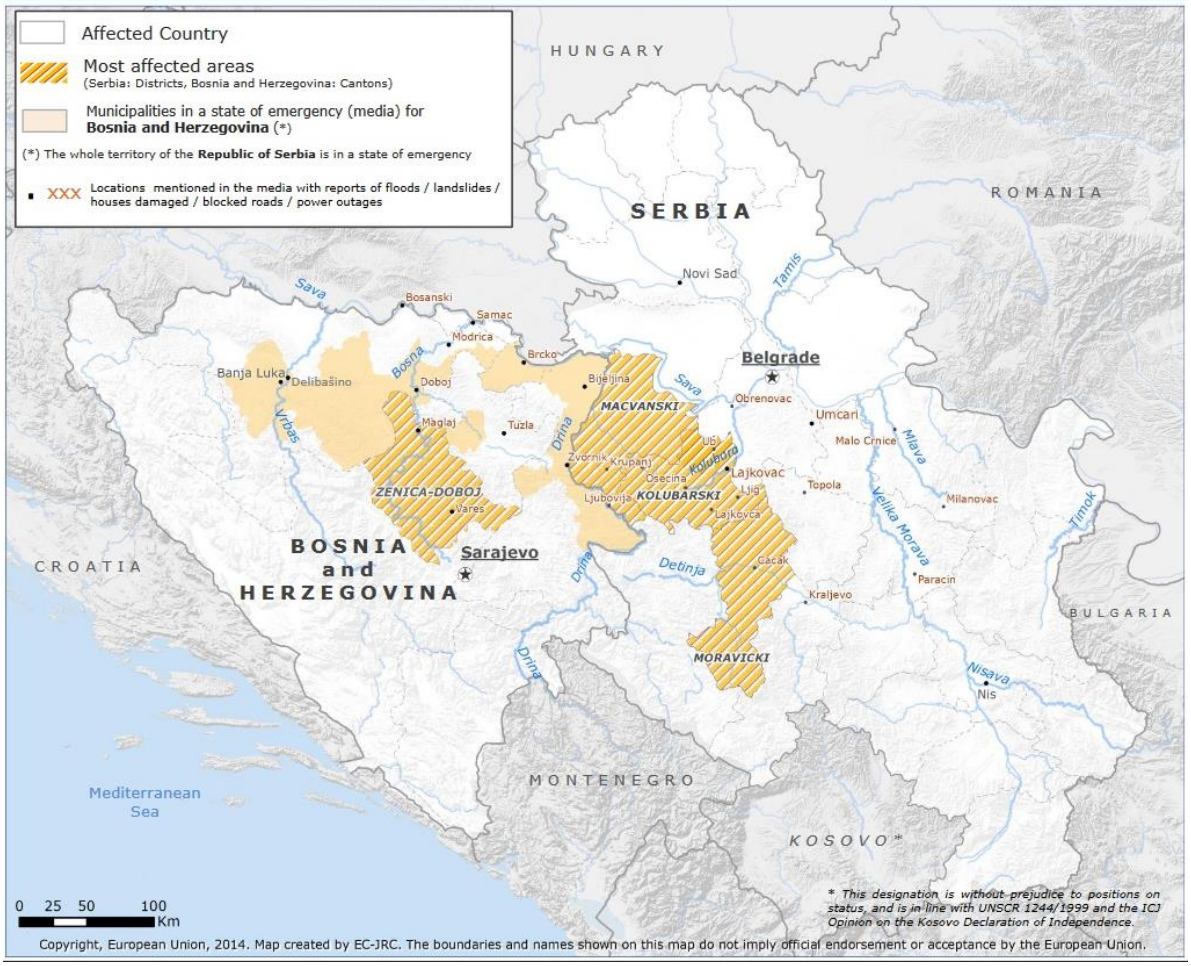

Figure 6. Affected areas in Bosnia and Herzegovina and Serbia (Source: EC-JRC)

In just a few days, both countries officially declared the highest level of emergency and asked for support and help from the international community. Internally, many issues of resource and capacity discrepancies occurred. Dated, ineffective, and not well-coordinated actions were the biggest local and national problems. Civil society and the local population started self-organized actions to help those in need, which were helpful but also dangerous for those involved.

Luckily, large international aid has been received from the UN, EU, US and Russia. However, the most practical aid was from neighboring countries, mostly Croatia which helped with military rescue support.

In Bosnia and Herzegovina, river Sava with its tributaries have caused the biggest problems when water levels exceeded the emergency flood protection levels. Different cantons in the Federation of Bosnia and Herzegovina (Zenica-Doboj), as well as some major cities in Republic of Srpska (Banja Luka, Doboj) were alarmed and trying to prepare for water.

As a capital of the Republic of Srpska Banja, Luka had priority in managing water waves but the biggest problem was regulating water level in hydro-power plant “Bocac” and its accumulation lake. Dame itself was endangered with water and dangerous flooding with trees, infrastructural constructions, etc. washed out upstream.

Throughout affected regions in Bosnia and Herzegovina municipalities, Maglaj and Doboj were completely under water. Besides issues with flooding, big problems were landslides that damaged major infrastructure (main and regional roads, electricity and water infrastructure).

Also, more than 2,000 activated landslides triggered issues of landmines remaining from the 1990s war, which made matters of rescuing and recovery highly dangerous.

In total, more than 40,000 people have been displaced, 38,500 households were without electricity, while 1 million people were cut off from clean water (reliefweb.int 2014)

Table 3.Situation analysis

IMMEDIATE PRIOIRTIES	CONSTRAINTS
• Search and Rescue • Evacuation • Shelter • Access to clean drinking water • Sanitation • Food • Emergency medical care	• Access to rural and remote areas will be a critical challenge in the coming days and weeks. • Damaged roads and bridges are major obstacles in gaining access to, and evacuating affected people, and certain areas are only accessible by boat or helicopter until the flood waters recede. • The floods and landslides have raised the risk of injury or death from land mines left over from the wars in the 1990s, due to the fact that landslides swept away many of the warning signs around the minefields.
PRIORITIES FOR INTERVENTIONS IN THE COMING WEEKS	**HUMANITARIAN AND OPERATIONAL CONSTRAINTS**
• Dewatering • Debris removal • Restoration of utilities • Access to food and clean water • Emergency shelter and support for re-building damaged houses • Food and non-food items • Psychosocial support • Safe drinking water, sanitation, and hygiene items • Basic health services (medical supplies and transportation/evacuation to the hospitals)	• Access to rural and remote areas will provide significant challenges in the coming days and weeks. • Roads, bridges and utility infrastructures are damaged. • There are serious shortages of emergency response vehicles and equipment necessary to respond to a disaster of this scope and scale. • The lack of financial and physical resources will further constrain the response

Source: reliefweb.int 2014.

5.1. International response and actions

Being faced with severe losses and not being able to respond without international cooperation, Bosnia and Herzegovina has requested international help through the EU Civil Protection Mechanism.

Red Cross, UN, EU, US and many others helped with different resources and equipment duringg flooding and landslide events, but also after in the recovery and rebuilding phase.

Figure 7. International assistance and aid for Bosnia and Herzegovina (reliefweb.int 2014).

RED CROSS ACTIONS

Rescue and operation activities, as well as relief and help throughout temporary centers and accommodations were established by Red Cross Society of Bosnia and Herzegovina. The majority of the help in most endangered areas was in evacuation or providing food and clean drinking water and sanitation products; disinfection of affected people and areas; building up sand banks etc.

However, aggravating circumstances were infrastructure that was completely or partially destroyed, lost telecommunications, and really hard conditions in the field.

UN RESPONSE

The UN disaster assessment experts were assigned by the UN Secretary General for Humanitarian Affairs to help the region. Actions were delegated through the UN World Food Program (WFP), the UN Refugee Agency (UNHCR), the UN Children's Fund (UNICEF), the UN Development Program (UNDP) and the International Organization for Migration (IOM).

EU RESPONSE

The EU supported Bosnia and Herzegovina with assistance in the form of motor boats, pumps, helicopters and rescue teams to help cope with first waves of problems and the rescue phase.

Technological help was provided by the European Commission in providing satellite imagery of flooded areas.

US RESPONSE

The US embassies in Bosnia and Herzegovina through USAID have provided additional funds and different resources in affected areas

6. Discussion

To understand the situation in the Danube Region it was needed to set a global and the EU setting first. In that manner, Sendai Framework was the main global document for this research especially because it represents the newest global environmental governance motion. Understanding its alignment with Agenda 2030 (and SDGs) and Paris agreement provides much wider understanding of the direction governance is taking in general.

Through priority areas of the Sendai Framework the shift in main idea is visible. From manly technical and reactive approach globally, disaster risk reduction is moving towards more preventive and holistic approach. Therefore, as Lazarevski and Gjorgon are stating, disaster risk reduction is not anymore about survival and facing disasters but it is rather about building resilience regarding the same disasters (Lazarevski and Gjorgon 2016).

In recent years, conceptual shift has been into place as a movement from "disaster management" towards "disaster risk reduction. In this case, disaster management can defined as *"the organization, planning and application of measures preparing for, responding to and, initial recovery from disasters"* (UNISDR 2015a). While, on the other hand, disaster risk reduction is described as *"the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses"* (UNISDR 2015a).

Following the lessons learned throughout Hyogo Framework for Action, Sendai Framework is becoming much more proactive rather than being just reactive. Further, following Hyogo lessons, global governance on these topics also shifter towards bigger harmonisation of the

main documents. Thus, for the first time we have more aligned documents such as 2030 Agenda, Sendai Framework and Paris Agreement.

Throughout history, climate change, development and disasters were always managed in similar motion but they were never as aligned as they are now. UNISDR has even published official document to clarify and state out connections between disaster reduction and resilience on one hand, and development on the other hand ("Disaster Risk Reduction and Resilience in the 2030 Agenda for Sustainable Development").

Globally it is important to understand that development and disaster risk and resilience are highly correlated and interdependent. In simple words, if we reduce exposure and vulnerability of poor areas by building up better, resilient, infrastructure, we will definitely have influence on development in general. If these actions are aligned with sustainable development motion, then we can be assured that these development will have to be done in holistic approach, meaning with high level of inclusion and participation.

However, the UN, and global actions in general, are more guidelines and descriptive measures for regions and nations to follow up rather than obligatory rules. These documents are usually consensus and a mutual effort to tackle certain problems and issues. Anyhow, in the field of resilience and disasters, the UN prescribed and developed commitments and actions for States to follow. "The UN Plan of Action on Disaster Risk Reduction for Resilience" was a connection in transition between Hyogo Framework approaches towards Sendai Framework.

Following up global motions, the EU level has a hard job to align its internal decisions, needs and actions. Being aware of this situation, the EU and global community in general has

developed several different departments to tackle issues of disasters and resilience. For the purpose of this research the main two institutional departments would be:

- The United Nations Office for Disaster Risk Reduction (UNISDR),
- International Commission for the Protection of the Danube River (ICPDR).

Distributer between Brussels, Geneva and Vienna, these offices are trying to bring innovation and theoretical policies towards more technical and applicable action *in-situ*. Supported but the UN and European Commission, they have a mandate to define zones, priority areas and suggest new approaches.

However, a new regionalisation in the EU brought many administrative and governance changes on every level. Europe has a long history of trying to find the best solutions to group certain areas around same topics or issues, but the macro-regional approach based geophysical element was fairly new approach. Being defined as "mezzanine level", new macro-regions, become middle management in vertical governance of the Europe.

After Baltic Sea Region in 2009, 2011 brought up new Strategy for the Danube Region with the main focus on its four basic pillars (EC 2011):

1. Connecting the region
2. Protecting the Environment
3. Strengthening the Region
4. Building Prosperity

The EU Strategy for the Danube Region tries to defined detailed actions and timelines, throughout topics of 11 priority areas (EC 2011):

1. Waterways mobility & Rail-Road-Air Mobility
2. Sustainable Energy
3. Culture & Tourism
4. Water Quality
5. Environmental Risks
6. Biodiversity & Landscapes
7. Knowledge Society
8. Competitiveness of Enterprises
9. People & Skills
10. Institutional Capacity & Cooperation
11. Security

Every priority areas has its preferable actions and already defined projects in order to reach success during planned period. Majority of actions important for flooding events and disasters are covered in pillars - Protecting the Environment and Strengthening the Region. However, none of these pillars or priority areas is defining disaster risk reduction or resilience. Taking into consideration that the EUSDR was developed before 2011 and adopted at that same year, there can be justification that it is not aligned with new resilience and disaster risk reduction approaches.

However, it is interesting to see that in the EUSDR landslides are not mentioned in any of priority areas or actions, although the Region is covering hilly areas that have high susceptibility for occurrence of this phenomenon.

Furthermore, through analysis of the existing documentation and practices applicable on the Region, it could be concluded that the topic of flooding and flood risks is highly covered in the Region.

For a many years ICPRD has been developing sub-basin flood action plans with detailed technical analysis of the current situation, setting up targets and respective measures in order to reduce impacts and likelihood of floods. Also, ICPDR documentation was prescribing importance of public awareness, preparedness and, in general, flood forecasting and early-warning systems. Followed up with technical documentation and regulations on spatial planning and land use, ICPDR was determining and recommending retentions and detentions, defence with technical flooding, preventive actions etc.

Since, ICPDR has a mandate over the Danube River watershed, but under European Commission, published documentation has to be aligned with EU directives. The most important and relevant directives for the topic of flooding are:

- EU Water Framework Directive 2000/60/EC,
- EU Directive 2007/60/EC on the Assessment and Management of Flood Risks.

Aligned with mentioned directives, the main ICPDR document for the management of risk in the Danube Region is – Flood Risk Management Plan for the Danube River Basin District. It is covering historical events, understanding of the present situation in order to develop maps and actions as prescribed in the WFA and Flood directives.

7. Conclusion

The main question of the research was - **if the Danube Region has a regional resilience and disaster risk governance?**

In order to develop an answer different aspects of its content were reviewed and analysed – geographical, administrative, governance levels; as well as flooding and landslide processes; policies and governance documentation, followed with existing academic papers, and overview of case study explaining sequence of the events and responses.

Being absolutely aware of constraints and shortcomings of this research it is possible to state that - **the Danube Region does not have a regional resilience and disaster risk reduction**.

Following existing Regional documentation and aligning it with previous and current global documentation and motion it is visible that the Danube Region is still in the phase of "disaster management" rather than "disaster risk reduction and resilience".

It is also important to mention that all of reviewed documents on the Danube Region are highly well developed and technically perfect documents. The EUSDR and Flood Risk Management Plans are fully aligned with the EU regulative and directives, but on the other hand both are providing outdated and more technical solutions as a result of reacting on the hazards and disasters rather than preventing and developing preparedness or resilience.

Also, it is evident that focus of the EU and macro-regional governance is on floods with no further discussion on other natural or man-made hazards or potential disasters. However, with

this research did not provide enough information to conclude about the reasons for this situation, but it is still important to state it. Exactly this was the main interest and the reason of including landslide phenomenon in the research. The aim was to understand if there is any regional regulation concerning this topic. A case study was presented to support understanding that flooding and landslide processes are highly interconnected and both equally dangerous and devastating for the Region.

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