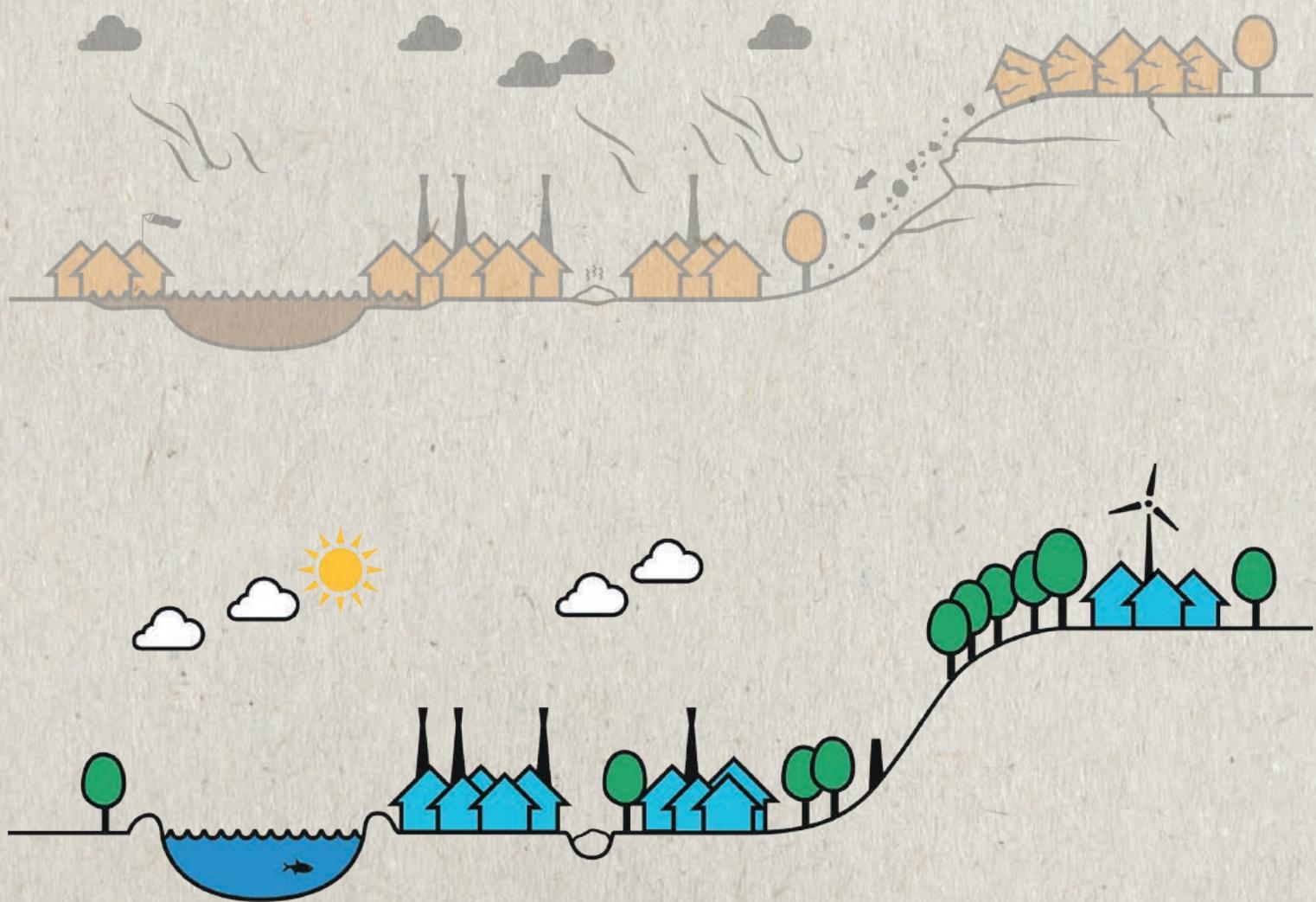


# Risk-Proofing the Western Balkans:

## Empowering People to Prevent Disasters



*"The basic purpose of development is to enlarge people's choices. In principle, these choices can be infinite and can change over time. People often value achievements that do not show up at all, or not immediately, in income or growth figures, greater access to knowledge, better nutrition and health services, more secure livelihoods, security against crime and physical violence, satisfying leisure hours, political and cultural freedoms and sense of participation in community activities. The objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives."*

**Mahbub ul Haq** (1934-1998)  
Founder of the Human Development Report

# ACKNOWLEDGMENTS

UNDP partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in 177 countries and territories, we offer global perspective and local insight to help empower lives and build resilient nations.

The views expressed in this report are those of the authors and contributors and do not necessarily represent the views of UNDP

**Project Coordinator:** Armin Sirčo

**Editor in Chief:** Shahrbanou Tadjbakhsh

**Team of Authors:**

Shahrbanou Tadjbakhsh, Nera Monir Divan, Elena Danilova-Cross, Envesa Hodžić-Kovač, Erik Kjaergaard, Aida Hadžić-Hurem, Jeremy Wetterwald, Diane Douglas, Armin Sirčo, Denis Nushi

**Contributors:**

**Albania:** Lorenc Koçi

**Bosnia and Herzegovina:** Sanjin Avdić, Raduška Ćupac, Dalila Šadinlija, Samuel Garoni

**Croatia:** Krunoslav Katić, Jasmina Papa

**the former Yugoslav Republic of Macedonia:** Anita Kodzoman, Vasko Popovski

**Kosovo\*:** Zana Hoxha-Edip

**Montenegro:** Lidiya Brnović, Tomica Paović

**Serbia:** Violeta Orlović Lovren, Daniel Varga, Žarko Petrović

**Istanbul Regional Hub:** Armen Grigoryan, Bharati Sadasivam

**Peer Reviewers:** Ben Slay, Jonathan Hall, Zahira Virani

**Proofreader:** Christopher Hughes

\* References to Kosovo shall be understood to be in the context of Security Council Resolution 1244 (1999).

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# List of Abbreviations

<b>BiH</b>	Bosnia and Herzegovina	<b>MSK Scale</b>	Medvedev-Sponheuer-Karnik scale
<b>BHMAC</b>	Bosnia and Herzegovina Mine Action Centre	<b>NASA</b>	National Aeronautics and Space Administration
<b>CRSV</b>	Conflict Related Sexual Violence	<b>OSCE</b>	Organization for security and Cooperation in Europe
<b>CROMAC</b>	Croatian Mine Action Centre	<b>OSM</b>	Open Source Mapping
<b>CRPD</b>	Convention on Rights of Persons with Disabilities	<b>PDNA</b>	Post Disaster Needs Assessment
<b>DRR</b>	Disaster Risk Reduction	<b>PGA</b>	Peak Ground Acceleration
<b>EMA</b>	Emergency Management Agency	<b>PwD</b>	People with Disabilities
<b>EU</b>	European Union	<b>QGIS</b>	Quantum Geographic Information System
<b>ESA</b>	European Environment Agency	<b>SAGA GIS</b>	System for Automated Geoscientific Analyses
<b>GAR</b>	Global Assessment Report	<b>SDG</b>	Sustainable Development Goals
<b>GFDRR</b>	Global Facility for Disaster Risk Reduction and Recovery	<b>SEE</b>	Southeast Europe
<b>GIS</b>	Geographic Information System	<b>SME</b>	Small & Medium sized Enterprises
<b>GDP</b>	Gross domestic Product	<b>SRHDR</b>	Sub regional human development report
<b>GNI</b>	Gross National Income	<b>SREX</b>	Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
<b>GRASS GIS</b>	Geographic Resources Analysis Support System	<b>UAV</b>	Unmanned Aerial Vehicles
<b>HDI</b>	Human Development Index	<b>UK</b>	United Kingdom
<b>HDR</b>	Human Development Report	<b>UN</b>	United Nations
<b>HDRO</b>	Human Development Report Office	<b>UNDP</b>	United Nations Development Programme
<b>HFA</b>	Hyogo Framework for Action	<b>UNEP</b>	United Nations Environment Programme
<b>HTE</b>	High Temperature Event	<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>ICS</b>	International Council of Science	<b>UNISDR</b>	United Nations Office for Disaster Risk Reduction
<b>IDP</b>	Internally Displaced People	<b>USA</b>	United States of America
<b>ILO</b>	International Labour Organisation	<b>USGS</b>	United States Geological Survey
<b>IOM</b>	International Organisation for Migration	<b>UXO</b>	Unexploded Ordnance
<b>IPCC</b>	Intergovernmental Panel on Climate Change	<b>WMO</b>	World Meteorological Organisation
<b>IRDR</b>	Integrated Research on Disaster Risk		
<b>MDG</b>	Millennium Development Goals		
<b>MK</b>	The former Yugoslav Republic of Macedonia		

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Concepts &  
a Framework  
for Action

Natural  
Hazards &  
Disaster Risk  
in the  
Western  
Balkans

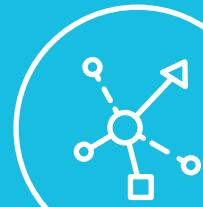
Who is  
Vulnerable  
and Why

Measurement  
and Use of  
Data for  
Risk-Informed  
Human  
Development

Elements for  
Risk-Informed  
Human  
Development

How the  
Vulnerable  
can be  
transformed  
into Agents  
of Change

Conclusions  
and Recom-  
mendations





# FOREWORD

In the past decade the Western Balkans has seen a significant growth in the number of natural disasters. Statistics not only reflect the changes in their magnitude but also tell us that this trend is likely to become more pronounced in years to come. More people are suffering the direct and indirect adverse consequences of these events and it will continue to be the most vulnerable who bear a disproportionate share of the impact. This publication looks at the steps that must be taken to reduce the risks that disasters pose to people, especially those on the margins of society. Science tells us that many hazards will not become disasters if proper risk management is applied. Therefore, investment in Disaster Risk Reduction and prevention is not only more effective but also makes more economic sense than simply dealing with the aftermath of disasters. This requires a mind-shift for practitioners: moving away from disaster response and recovery to the prevention and mitigation of disaster risks.

Understanding both the vulnerabilities and the capacities of people is at the core of preventing risks from turning into disasters. In practical terms, this means building a case for development interventions to be carried out for the people and by the people. Evidence shows that informed, empowered, active and responsible citizens are the best assets a country has when it comes to implementing a risk informed development agenda. This is considered a much more effective approach than the usual top-down policies and conventional civil protection systems that have been the norm in past decades. The floods of spring 2014 not only highlighted the power of unity and solidarity but also how empowered and informed citizens and communities make better informed choices in an emergency.

A people centred Disaster Risk Reduction approach cannot solve everything. However, given the considerable benefits that derive from it, both social and economic, it merits greater attention and expenditure. In the knowledge that yesterday's solutions are no guarantee for the future, this report represents a call for transformative action in order to help secure a better future for everyone and ensure that no one is left behind.

**Cihan Sultanoğlu**

Assistant Administrator and Director  
Regional Bureau for Europe and the CIS



# EXECUTIVE SUMMARY

Unless ‘blind’ development is replaced by risk-informed and climate-smart programming then increased exposure, growing vulnerability and climate change are likely to trigger more frequent, severe and complex disasters in the future. The countries of the Western Balkans cannot afford such a future.

This regional Human Development Report makes the case for the integration of risks and for strategies to reduce disaster risks by incorporating the role that people play, both as victims/survivors of disasters and as agents of change, within development interventions. This proactive approach can be summarised as reducing risks *for* people and *by* people. The implications of such a paradigm shift are paramount for the countries of the Western Balkans, prone as they are to natural and human-made hazards and given their willingness to build on the human potential within their societies. It would help countries safeguard existing and future investment, protect lives and livelihoods and empower people so that they are able to contribute to risk reduction.

This approach is not difficult to implement, but it requires new commitments, new knowledge, planning based on evidence, new innovative mechanisms and the involvement of people throughout the process. It requires knowing what the hazards and risks

are, where they occur, how they evolve over time and how they affect the vulnerabilities and capacities of people. Such an approach would also bring climate change into the equation as an additional layer of uncertainty about the future. In essence, this transformation requires a commitment to risk-informed development based on greater knowledge and flexibility than is usually the case.

Chapter 1, on the one hand, sets forth a framework for a risk-informed Human Development concept and, on the other, a Disaster Risk Reduction framework that places human vulnerability and capacities at its centre.

It first looks at the Human Development concept that, simply put, is about development that enhances people’s choices and capabilities and is *for* people and *by* people. In an environment prone to hazards, the goals of Human Development interventions should be to:

- recognise that the vulnerability of people and communities matter;
- protect them against disaster risks;
- build their resilience and empower them to protect themselves; and
- enhance their choices and opportunities through the process and outcome.

It then describes how the Human Development concept differs from conventional disaster management that concentrates on emergency preparedness and disaster response. The concept of Disaster Risk Reduction broadens the scope of interventions by focusing on prevention and mitigation of disaster risk. In this way, risk is understood as a function of hazard, vulnerability, exposure and capacity. In a nutshell, Disaster Risk Reduction, seen from a human perspective, requires a broader approach:

- considering that natural hazards and climate change have a spatial dimension, spatial analysis is critical in the identification of people most at risk;
- moving on from how disasters effect people to the impact that human action/inaction has on the environment, climate and disaster risk;
- recognising that the impact of a disaster depends on the kind of human development choices that are made; and
- moving on from emergency preparedness and disaster response to focus on the prevention and mitigation of disaster risks.

What can these two concepts learn from each other? Both Human Development and emergency response have evolved as conceptual and programmatic tools:

- Human Development takes into consideration that development interventions are under threat from hazards and as such should be risk-informed. This means ensuring that people and their livelihoods are protected from potential disasters and that their resilience is enhanced so that they are able to mitigate the risks.

→ Disaster Risk Reduction as a conceptual and programmatic framework should complement emergency planning by taking vulnerabilities, capacities, risks and exposure into consideration, in addition to the analysis of hazards over time. In other words, it should focus more on the way hazards affect vulnerable groups and how people can contribute to mitigating disaster risk.

→ The commonality is that both concepts place more emphasis on vulnerability reduction and prevention of risk factors.

The convergence of these concepts has been the subject of a number of recent global commitments and roadmaps, most notably the three global conferences that took place in 2015 and one that will take place in May 2016. These conferences have collectively shaped the new policy documents for Disaster Risk Reduction, the Sustainable Development Goals, climate change and humanitarian action. These include the Sendai Framework, with its Global Targets and Priority Actions for DRR for 2015-2030; the Sustainable Development Goals (SDGs), as part of the Post-2015 Agenda; the Paris Agreement on Climate Change and the output document of the World Humanitarian Summit in May 2016. Chapter 1 discusses areas of convergence between these global directives.

Chapter 2 looks at six common natural hazards to which people in the Western Balkans are exposed: earthquakes, landslides, floods, droughts, heatwaves and wildfires. It also discusses anthropogenic hazards created directly or indirectly by human action/inaction in the region: environmental and security concerns related to mining and industry, water pollution from mine voids and waste that contains toxic elements, patterns of energy use that depend on the use of coal, which makes the energy sector a major source of

greenhouse gas emissions, air pollutants and other harmful substances. In the aftermath of the wars and conflicts in the Western Balkans in the 1990s, landmines, unexploded ordnance and poor ammunition stockpile management remain a serious problem in much of the region.

The chapter shows that the distinction between natural and human-made disasters is anachronistic since many disasters are the product of unresolved risk management issues and poor development choices. Maps produced with geographic data processed through open-source software show that disaster risks are also area-based and dynamic. The chapter makes the point that in order to manage hazards, it is essential to understand where, when, how and why they occur; therefore, spatial mapping has become an important tool. This form of analysis shows that natural hazards do not respect borders, which makes cross-border risk management solutions essential.

Chapter 3 asks the question who is vulnerable in the Western Balkans and why. Structural and social characteristics, such as gender, age and ethnicity, require close consideration throughout the planning, implementation

and evaluation stages of Disaster Risk Reduction activities. Focusing on their specific vulnerabilities, enhanced by exposure to risks, makes communities more resilient. To illustrate this, the chapter presents examples of seven archetypes. These are by no means exhaustive in their representation of population groups in the Western Balkans, but do represent the types of vulnerability to hazards, natural and human-made, discussed in the previous chapter. These seven archetypes of populations and their vulnerability to risks are summarised below.

Chapter 4 addresses the question of how measurement and the use of data can draw the quantitative elements required to map out the concept of risk-informed Human Development, as advocated in this report. Part I discusses the Human Development Index (HDI), including its definition, its measurement in the Western Balkans and its components. It then looks at the possible impact of disasters on the HDI using the example of projected changes in the level of HDI resulting from the 2014-2015 floods in Serbia and Bosnia and Herzegovina. Part 2 examines the question of the use of data in general for understanding hazards and informing Disaster Risk Reduction interventions. It

<b>Population group</b>	<b>Driver of vulnerability</b>
Poor people	Limited livelihood choices, inadequate coping mechanisms and exclusion drive vulnerability for this group.
Women	They are vulnerable because of caretaker responsibilities and their limited access to resources and decision-making processes.
Children and the elderly	Their vulnerability stems from their dependency on others and weakness that hampers their capabilities and mobility.
Persons with disabilities	They are vulnerable because of physical challenges and their dependency on others and on dwindling public assistance.
Minorities	Their vulnerability stems from discrimination, marginalisation and exclusion.
Migrants, returnees and IDP	These groups are vulnerable because of their unpredictable mobility, settlement in insecure and exposed areas, and exclusion.
Farmers	They are vulnerable because their livelihood depend on the cycles of nature.

shows that the impact of disasters should not only be measured through economic costs and human mortality or injuries, but also by taking into consideration the less obvious cost of lost opportunities, such as when schools are destroyed and when the burden of care giving increases during disasters. Usually, these are not quantified in the cost of disasters.

Chapter 5 examines what is being done and what can be done to protect people from disasters in the Western Balkans. The chapter discusses the different elements of a risk-informed Human Development agenda, illustrating some of the interventions with examples taken from the countries of the Western Balkans. Besides the obvious call to improve governance capacities across the board, this chapter brings to the fore the importance of empowering people, including the most vulnerable, to become agents of change within their families and communities and the need to enhance their resilience so that ultimately they can mitigate the risks themselves. As this chapter argues, a key element is prevention and mitigation strategies focused largely on recognising the possible risks and managing them correctly *for and by* the people.

This chapter discusses possible interventions clustered around three sections. The first looks at current types of interventions that do little by way of preventing disasters from occurring and from inflicting damage on the lives and livelihoods of the people affected. It discusses more proactive and innovative types of development based approaches, which tend to place more emphasis on recognising and managing risks and vulnerabilities and are therefore more likely to lead to successful prevention and mitigation efforts.

The second section brings together interventions under different levels of responsibility. This covers community-based initiatives, fol-

lowed by initiatives at the local government level, responsibility at the national level in terms of strategies and plans, legislation, institutional mechanisms, inter-ministerial co-ordination, multi-stakeholder coordination, and finally regional coordination and cooperation.

The third section explores how spontaneous outbursts of human solidarity and human interconnectedness can be systematised within communities to form sustainable systems for future use. It also examines how to capitalise on technology and social networks in order to design inexpensive community-sourced early warning systems and emergency response tools.

Chapter 6 examines how the seven types of population groups that because of their inherent characteristics or their actions are particularly vulnerable to natural and human-made hazards can be transformed into agents of change. It places the seven groups into archetypes set against a scenario based on one of the hazards discussed in Chapter 3. These archetypes are first explained as a passive victim of a particular hazard and then as an agent of change. The difference has to do with the type of interventions that can be implemented in that particular situation at the community, local, national and regional level, as discussed in Chapter 4. These interventions are intended to protect, prepare and empower them so that they are able to tackle the risk and cope with the potential disaster and its aftermath. The purpose of these scenarios is to show how people can transform from passive individuals to empowered citizens. This is consistent with the main message of this report, which is that risk-informed, climate smart Human Development should be *for* people and *by* people.

Chapter 7 summarises the main messages that practitioners, policymakers and planners, whether they work on Disaster Risk Reduction

or on development in the Western Balkans, can draw from this report concerning a risk-informed, climate smart Human Development framework for action. The main messages, what they mean and how they can be implemented in practice are summarised in nine points.

- 1 Development should be safeguarded against risks.** Development that fails to consider the risks at the outset is endangered by hazards that are likely to result in recurring disasters that will affect the lives, health, welfare and rights of people. Investment should be safeguarded from the start by planning and implementation based on concrete knowledge of the pertinent risks.
- 2 Disaster Risk Reduction strategies should highlight the central role of people, not only as victims/survivors of disasters but also as agents of change.** A lack of risk management contributes strongly to physical hazards becoming disasters and therefore essentially a product of human inaction. It is not just about hazards, but also human interaction and how this may or may not help turn them into disasters. This means that people can influence the likelihood and intensity of risks through their choices (of settlement, use of their natural environment etc.), but also invest in capacity building and resilience.
- 3 Development interventions and Disaster Risk Reduction strategies should be carried out both *for* the people and *by* people.** '*For people*' requires protection against risks and '*by people*' means empowering them so that they can become agents of change and informed and responsible stakeholders. Informed, empowered, active and responsible citizens are the best assets a country can have when it comes to implementing a risk-in-

formed Human Development agenda. Empowered and informed citizens and communities can make better choices about the level of acceptable risks.

- 4 Time, space and unpredictability are intricate parts of a risk-informed, climate smart Human Development framework.** While spatial analysis based on historical timelines is key to understanding the occurrence of hazards at different locations in the region, future risk patterns induced by climate change need to be taken into consideration for long-term planning purposes. Climate change is likely to produce more frequent, unpredictable and intense disasters as well as new patterns of risks. In the future, significant changes in precipitation and temperature are expected.
- 5 The main component of the paradigm shift is the ability of policymakers to focus on prevention.** Yet preventive planning is a challenge. With limited budgets and the pressures of short-term mandates and immediate priorities, politicians rarely spend resources on prevention. When there is no imminent hazard on the horizon the tendency is to let their guards down and wait to react to another set of emergencies.
- 6 Commitment is needed to generate new data and new knowledge and use evidence to plan.** Intangible damage, such as the loss of opportunities for education when schools are closed or increases in unpaid labour by women who need to engage more in caring for their dependents, need to come into the equation on the cost of disasters. Shifting to risk-informed development instead of a reactive emergency response also requires new types of quantitative data that have to do with spatial exposure and socioeconomic vulnerabilities.

- 7 Vulnerable groups need to have affordable solutions and better opportunities to protect themselves against risks.** To protect vulnerable populations, civil society, governments in the region and the private sector need to boost their protective mechanisms to ensure adequate and equal coverage. This includes, among others, social services, insurance schemes, access to services, social protection and safe infrastructure.
- 8 Appropriate governance structures and mechanisms have to be in place to support risk-informed Human Development.** Appropriate structures, such as institutional mechanisms, laws and their enforcement, capacities and budgets, are already available in the region but need reinforcement and strengthening. Risk reduction strategies also need to go beyond the responsibility of security agencies in charge of emergency response through incorporation into the responsibility of all government bodies.
- 9 The countries of the Western Balkans need to adhere to their global commitments.** Commitments made by countries of the region to the Sustainable Development Goals, the Sendai Framework, the Paris Agreement (COP 21) and the upcoming World Humanitarian Summit need to be honoured. These commitments now need to be localised and national action plans developed, implemented, monitored and communicated to the wider public.

# *INTRODUCTION*

In the third week of May 2014, a massive low-pressure cyclone swept through South-Eastern Europe resulting in extensive flood damage in Croatia, Bosnia and Herzegovina, and Serbia. Within these three countries, the storm resulted in the loss of 79 lives, the evacuation/displacement of over 990,000 people and the loss of tens of thousands of homes, livestock, agricultural land, schools, hospitals and businesses. This left thousands of people without electricity, with other critical infrastructure damaged or destroyed. Flooding and mudslides washed out or buried road networks, making it difficult to evacuate people and administer aid to those trapped in areas directly affected by the storm. In Bosnia and Herzegovina alone, the estimated total economic impact of the disaster reached 2.04 billion Euros or fifteen per cent of the country's gross domestic product (GDP) for 2013. The floods that occurred in May 2014 were devastating to these countries and yet, unfortunately, flooding in this region is not a rare event. A month prior to this, four municipalities in northern Kosovo suffered serious flooding that affected dozens of agricultural plots.

Similar flood disasters have occurred in Albania and the former Yugoslav Republic of Macedonia. In 2015, over a three-day period from 31 January to 2 February, around 350 mm of rain fell in south-eastern Albania, affecting 42,000 people and flooding 12,225 hectares of arable land. A Post Disaster Needs Assessment (PDNA) completed in Albania in May 2015 determined that the economic cost of damage to the agricultural sector alone was 31.5 million Euros. In the former Yugoslav Republic of Macedonia during this same three-day period 0.75 metres of recorded rainfall affected 965,569 people in 43 municipalities and resulted in the death of one child. On 3 August 2015, a severe storm and intense rainfall in the

Polog region affected more than 85,000 people causing 6 casualties and inflicting € 30 million in damages.

The Western Balkans<sup>1</sup> cover 275, 244 square kilometres with a total population of over 25 million people. Given the climate change projections for the region, over the next eighty-five years the Western Balkans can expect an increase in the frequency, unpredictability and intensity of flooding, drought, heatwaves and wildfires. These disasters will have an adverse effect on the GDP of each country and on multiple sectors, most notably agriculture and forestry, and more importantly the lives and livelihoods of people. Increased aridity and widespread wildfires will result in the loss of vegetation, while periods of prolonged rainfall, intense rainfall events and snowmelt will increase the frequency of massive mudslides, rockslides and debris flows. Hazards place people and assets at risk and hamper the development of individuals, households, communities and nations by damaging most sectors of the economy.<sup>2</sup>

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WESTERN  
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FREQUENCY  
AND INTENSITY  
OF FLOODS,  
DROUGHTS,  
HEAT WAVES AND  
WILDFIRES

## Objectives and Methodology

The idea of this sub-regional *Human Development Report* (HDR) for the Western Balkans was spurred by the devastating impact of flooding in the region from 2009 to 2014 and is designed to evaluate the impact of natural hazards and disaster risk<sup>3</sup> through the perspective of a human development lens.

1 Croatia, Bosnia and Herzegovina, Serbia, Albania, Montenegro, the former Yugoslav Republic of Macedonia, and Kosovo. Abbreviation MK is a shortened form of the former Yugoslav Republic of Macedonia and it is used to save space in graphs and tables in this report. Croatia, as the 28th EU member-state, has a specific status of UNDP non-programme country with a Project Management Office present in Croatia since July 2014. The inputs to this report have been provided by the “Immediate response to floods” project expert team that was mobilised in 2014 due to flooding that hit Croatia, Bosnia and Herzegovina and Serbia in May 2014.

2 Hazards are usually divided into natural and human-made hazards, although this report will show that the distinction is far from clear-cut.

3 Disaster risk is commonly understood within DRR as a function of hazards, exposure, vulnerability and capacity.

## A GEOGRAPHY OF PERIL

The countries and territories of Western Balkans cover 275, 244 square kilometres with a total population of over 25 million. The geography of the Western Balkans varies, ranging from coastal islands and the sandy beaches of the mainland to inland mountains whose peaks rise 2,700 metres above sea level. The coastal lowland areas of Albania, Croatia and Montenegro are generally less than 200 metres above sea level. They rise to the Albanian Alps and central and southern mountainous regions of Albania and the Dinaric Alps of Croatia, Bosnia and Herzegovina, and Montenegro. River valleys intersect each of these countries with expansive plateaus and plains. Similarly, the inland countries and territories of the Western Balkans (Kosovo, the former Yugoslav Republic of Macedonia and Serbia) have varied terrain ranging from high mountains to lowlands bisected by numerous rivers. The rivers of the region drain into the Adriatic, Aegean and Black Seas. Stands of beech, oak, walnut, birch and elm as well as conifers such as pine, fir and larch blanket the mountainous areas that have not yet been deforested. These countries share many of the drainage basins and forests and therefore minimising the risks posed by natural flood hazards, the impact of drought and wildfires in any one country correlates strongly to minimising such risks in the neighbouring countries.

The key documents that guided the development of this SHDR were primarily global guidance documents for reducing vulnerability and increasing resilience to natural hazards and regional studies on human development, vulnerability, resilience, disaster

risk reduction planning and response and recovery published by the United Nations (UNDP, UNEP and UNISDR). Valuable information on these topics together with examples of best practice for increasing resilience to natural hazards were provided by individual or various combinations of joint publications by the World Bank, World Meteorological Organization (WMO), Finnish Meteorological Institute, Global Facility for Disaster Reduction and Recovery (GFDRR), European Union (EU), Integrated Research on Disaster Risk (IRDR), International Council for Science (ICS), and the United Nations University.

The goals and objectives of the SHDR required an analysis of how, unless countered by risk-informed development, natural and human-made hazards in the Western Balkans increase the exposure and vulnerability of people and assets. This analysis benefitted from the use of open source software and publicly available data, which have great knowledge potential and cost saving implications for governments and development agencies in the region. The analysis incorporated population and development data as well as information on the specific vulnerabilities that individual population groups face. Most countries found the provision of adequate statistics on how hazards affect women, children, the elderly, the poor, minorities and disabled groups challenging, because such disaggregated data is not collected in hazard-prone areas. Yet they were able to provide some qualitative observations on how past disasters affected vulnerable populations. Some quantitative data was gathered during post disaster needs assessments conducted in Albania, Bosnia and Herzegovina, Montenegro and Serbia and used to illustrate the differential impact of disasters.

This report urges for a paradigm shift that would result from the merging of two concepts: (1) the need for development interven-

tions to integrate risks and (2) for strategies to reduce disaster risks by taking the role that people play, both as victims/survivors of disasters and as agents of change, more into consideration.

The implications of such a paradigm shift are paramount. In the Western Balkan countries, prone as they are to natural and human-made hazards, this includes an eagerness to build on the human potential of societies. By taking a more proactive and preventive approach to risks as opposed to merely responding to disasters after they occur this paradigm shift would lead to three desired outcomes:

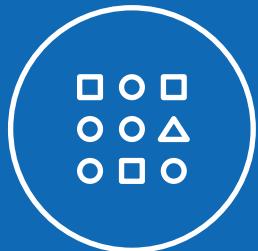
- safeguarding existing and future development and investment in the region,
- protecting the lives and livelihoods of people who live in the region, and
- empowering people so that they can act in a responsible manner and thus contribute to the reduction of such risks.

As opposed to merely providing a status snapshot of disaster risk reduction (DRR) in the countries of the Western Balkans, this report adopts a methodological and thought provoking approach to addressing all of these aspects. It therefore contributes to the current discourse on DRR and as such can be of particular benefit to governments, disaster managers and development organisations present in the region.

*HUMAN DEVELOPMENT IS  
FUNDAMENTALLY  
ABOUT MORE CHOICE*

# 1

## Concepts and a Framework for Action



---

## **1 Introduction: Why this Matters**

### **2 Conceptual Framework**

- (A) Human Development**
- (B) Disaster Risk Reduction**
- (C) Intersection and Linkages for Risk-informed and Climate Change Human Development**

### **3 Contextualisation through Global Debates**

### **4 Conclusions**

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This chapter examines the intersection between the concepts of Human Development and Disaster Risk Reduction (DRR). It provides a framework for a risk-informed Human Development concept and a DRR framework that puts human vulnerabilities and capacities at its centre. It does so by answering the following questions:

- What can Human Development learn from DRR?
- What can DRR learn from Human Development?
- What would a risk-informed, climate smart sustainable Human Development concept include?
- How have these debates found convergence in the post-2015 Development Agenda?

#### **1 Introduction: Why this Matters**

---

**SUSTAINABLE  
HUMAN  
DEVELOPMENT  
SHOULD  
TAKE INTO  
CONSIDERATION  
REDUCING RISKS  
AND BUILDING  
RESILIENCE**

their assets and livelihoods. As past disasters have shown, ‘blind’ development that does not take into account the risks or build in resilience cannot protect people or their livelihoods. Existing approaches do not allow for sufficient consideration of the way disasters impact on people or how people with their different capabilities can contribute to the management and reduction of risks associated with natural and human-made disasters.

Safeguards against natural hazards and climate change are required to protect future investment in development in the region. It is clear that sustainable human development should take into consideration the available means to reduce the risks and build resilience. Investments in *ex ante* disaster reduction and prevention measures can be significantly more cost effective than dealing with the *ex post* consequences of a disaster.

The Western Balkans provide an ideal setting for grounding such discussions on empiricism, given the experience gained whilst responding to the catastrophic floods that occurred in Bosnia and Herzegovina and Serbia in May 2014 and the parallel efforts to integrate Disaster Risk Reduction strategies into the development work of United Nations agencies supporting the governments of the region.

## 2 Conceptual Framework

Up until the post-2015 development agenda, Human Development and Disaster Risk Reduction (DRR) debates went mainly in parallel. Many development practitioners in the Western Balkans saw DRR as centred on the technical side of emergency response, risk assessment, disaster management practices etc. Yet the central role of people, not only as survivors of disasters but also as agents of change who can demonstrate resilience and overcome or mitigate risks, was forgotten.

On the other hand, Human Development discussions focused on empowerment and on aggregated levels of human progress within society, but failed to give sufficient consideration to the question of exposure and vulnerability to human-made and natural hazards. The concept of Human Security, introduced in the 1994 Global HDR, was the first attempt to look at downside risks of development. For its authors, Mahbub Ul Haq, Amartya Sen and others, the distinction was simple: Human development refers to the process of widening people's choices to be who they want to be and do what they want to do, in other words, the enhancement of capabilities and functioning. It can be ensured through economic growth strategies that include distribution, equity and enhanced freedoms. Human security, by contrast, refers to the condition that enables people to exercise these choices safely and freely, and be relatively confident that the opportunities they have today will not be lost tomorrow. The concept of Human Security introduced the notion of risks and the need for resilience. By contextualising the risks in an environment of natural and human-made disasters, the direct linkages between Human Development and DRR can be considered.

### A Human Development

As advocated by the UNDP since 1990 in its global Human Development Reports, human development is seen as a process of enlarging

people's choices: as they acquire more capabilities and enjoy more opportunities to use such capabilities. The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community. Many other things are important but these are what matter most, because many choices would simply not be available and many opportunities in life would remain inaccessible without them.

Human Development implies that people must influence the processes that shapes their lives.

#### PEOPLE

The concept of Human Development focuses on improving the lives people lead rather than assuming that growth will automatically lead to greater well-being for all. Increased income is seen as a means for development rather than an end in itself.

#### OPPORTUNITIES

Human Development is about giving people more freedom to live lives that they value. In effect, this means developing people's abilities and giving them a chance to use them. Once the basics of human development are achieved, they in turn open up opportunities for progress in other aspects of life.

#### CHOICES

Fundamentally, Human Development is about more choice. It is about providing people with opportunities, but not insisting that they make use of them. No one can guarantee human happiness and the choices people make are their own concern. The process of development should at least create an environment for people, both individually and collectively, to develop their full potential and have a reasonable chance of leading productive and creative lives that they value. As the international community defined in the new 2030 Agenda, the Human Development approach through its people centred focus can help operationalize the objectives of development and improve the well-being of people by ensuring an equitable, sustainable and stable planet.



HUMAN  
DEVELOPMENT  
OBJECTIVES NEED  
TO BE TAKEN INTO  
CONSIDERATION  
WHEN DESIGNING  
DEVELOPMENT  
INTERVENTIONS

**“  
DEVELOPMENT  
SHOULD BE ‘FOR  
PEOPLE AND BY  
PEOPLE’**

Simply put, development should be *for* people and *by* people.

In an environment prone to hazards the goals of Human Development interventions should be to:

- recognise that the vulnerability of people and communities matters;
- protect them against disaster risks;
- build their resilience and empower them to protect themselves, and
- enhance their choices and opportunities, both through the process and outcome.

managers was to understand how so-called ‘natural disasters’ impacted on human beings. These natural disasters were seen as ‘unavoidable’ acts of nature but were not perceived as products of ‘blind’ development. Now they increasingly turn to the perspective of Human Development by investigating the impact that human action/inaction has on the environment, the climate and disaster risk. There is no doubt that economic development, urbanisation and environmental degradation shape today’s disaster risk as much as the occurrence of natural events. **The level of impact depends largely on the kind of Human Development choices that countries and people made in the past and continue to make today.**

People have gotten used to the term ‘natural disaster’ and for a long time this term led them to view disasters as external events caused by natural forces beyond the control of human beings. Yet gradually people have learned that similar natural events (i.e. earthquakes, landslides, storms, floods and droughts) have dramatically different impacts, depending on the development stage of the affected community.<sup>4</sup> This observation has led to the realisation that any human activity has the potential to either increase or reduce the level of disaster risk.

The dominant global paradigm in the 1970s was ad hoc disaster response, but the 1980s saw a move towards permanent disaster management approaches that continuously deal with all phases of the disaster cycle: preparedness, response, recovery and reconstruction. During the last twenty-five years, there has been an increasing effort to meet the challenges of recurring disasters and to break out



**FIGURE 1: HUMAN DEVELOPMENT**

Source: <http://hdr.undp.org/en/humandev>

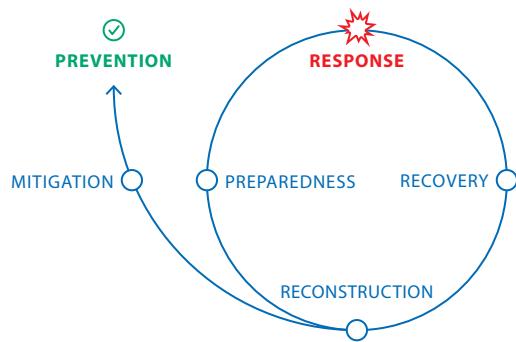
### **B Disaster Risk Reduction**

The growing understanding of disaster risk has raised a new set of questions compared to those that disaster managers used to ask. In the past, the key challenge for disaster

<sup>4</sup> Two recent Latin American earthquakes illustrate the last point. Six weeks after the magnitude 7.0 Mw earthquake that devastated Haiti on 12 January 2010 a magnitude 8.8 Mw earthquake 500 times stronger hit Chile on 27 February 2010. Despite the differences in magnitude, the death toll from the Chile earthquake was below 800 compared to more than 200,000 in Haiti. See <http://www.csmonitor.com/World/Global-News/2010/0302/Chile-earthquake-facts-Chile-vs.-Haiti-in-numbers> and <http://content.time.com/time/world/article/0,8599,1968576,00.html?iid=sr-link2>.

of the 'disaster cycle' through preventive risk management (see Figure 2). Early recovery and 'build back better' are recent disaster risk management approaches aimed at bridging the gap between disaster management and development by using emergencies as 'windows of opportunity' for improving poor development practices. New DRR and resilience concepts are even more radical and aimed at avoiding disasters in the first place through risk-informed and climate-smart development.

**FIGURE X: CHANGING DISASTER RISK MANAGEMENT APPROACHES OVER TIME**



Amongst DRR practitioners, risk is commonly understood as a function of hazard, vulnerability, exposure and capacity. A formula that has evolved over the last fifty years is often used to describe this relationship:

$$\text{Risk} = \frac{\text{Hazard} \times \text{Vulnerability} \times \text{Exposure}}{\text{Capacity}}$$

The implications of the risk formula are profound.

- FIRSTLY, the focus on risk as opposed to disaster gives DRR practitioners an opportunity to address disaster risks before they manifest in the form of disasters.
- SECONDLY, unlike in humanitarian action and security management, risk is not understood primarily as a simple equation of probability and intensity but rather as part of a complex pattern of hazards,

vulnerabilities, exposure and capacities. In other words, disaster risk needs to be understood as a product of unresolved dilemmas linked to demography, poverty, gender equality, urbanisation, environment and climate change.

- THIRDLY, most, if not all, of the concepts in the risk formula are influenced by human action and therefore highly relevant to sustainable human development. Therefore, the risk formula helps to refocus from disaster events to disaster risk and from a deterministic to development analysis.

While conventional disaster management concentrates on emergency preparedness and disaster response, the concept of DRR broadens the scope of investigation by focusing on the prevention and mitigation of disaster risk. The United Nations defines DRR as, "the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events."<sup>5</sup>

This broad definition is also visible in international policy frameworks for DRR, including the most recent Sendai Framework for DRR 2015-2030 (see the section below).

Unless risk-informed and climate smart programming replaces 'blind' development increased exposure, growing vulnerability and climate change are likely to trigger more frequent, severe and complex disasters in the future; this is a future that the Western Balkans cannot afford.

**“**  
**DRR SHOULD BE MORE ABOUT AVOIDING DISASTERS THROUGH RISK-INFORMED AND CLIMATE-SMART DEVELOPMENT**

<sup>5</sup> UNISDR, 2009.

## The Situation prior to Development



## 'Blind' Development



## Risk-informed/ Smart Development



### IN A NUTSHELL, DISASTER RISK REDUCTION FROM A HUMAN PERSPECTIVE SHOULD ENTAIL:

- consideration that natural hazards and climate change have a spatial dimension and therefore spatial analysis is crucial for identifying humans most at risk;
- moving away from the perspective of looking at disasters purely in terms of their impact on human beings and including how human action/inaction impacts on the environment, climate and disaster risk;
- recognition that the impact of a disaster depends on the kind of human development choices that are made; and
- moving away from emergency preparedness and disaster response by focusing on the prevention and mitigation of disaster risks.

### © Intersection and Linkages for Risk-informed and Climate Change Human Development

What are the intersections and linkages between the two concepts of Human Development and DRR or, put another way, what can Human Development learn from DRR and vice versa?

How does their intersection allow for the development of a conceptual framework for policy action that, in essence, would be a risk-informed Human Development concept?

Both development and emergency response, as conceptual and programmatic tools, have evolved to meet the relevant challenges:

- Human Development has to take into consideration the fact that hazards threaten development interventions. This means ensuring that people and their livelihoods are protected against potential disasters and that their resilience is enhanced so that they are able to mitigate the risks. Development interventions need to be risk-informed and climate smart, which means strengthening spatial planning and risk analysis.
- In addition to an analysis of hazards over time, Disaster Risk Reduction, as a conceptual and programmatic framework, should complement emergency planning by taking into consideration the vulnerabilities, capacities and the risks and level of exposure. In other words, it should focus more on the way hazards affect vulnerable groups and how people can contribute to mitigating disaster risk.
- The common factor for both concepts is that they should place more emphasis on reducing vulnerability and preventing risk factors.
- This intersection is close to the concept of Human Security, introduced in the 1994 Global HDR and studied in the context of the Commonwealth of Independent

States (CIS), Eastern and Central Europe in a 2005 Sub-Regional Report. If Human Security already introduced the notion of risks and resilience, the risk-informed Human Development concept suggested here contextualises it directly in an environment where DRR is necessary, i.e. in the presence of natural and human-made hazards.

In concrete terms, a risk-informed Human Development concept should include several principles/elements.

- Development for people so that they are protected against risks:
  - risks analysed so that future disasters are prevented,
  - vulnerabilities and capacities are recognised,
  - exposure to risks is minimised,
  - measures are put in place to protect people and their livelihoods when disasters hit, and
  - coping mechanisms are enhanced.
- Development by people so that their role as agents of change is enhanced:
  - The resilience of people should be built by strengthening systems, such as social services or sub-national governance, and by empowering the most vulnerable and exposed sections of a community, including the disabled, children, youth and the elderly, with the capacity to deal with different shocks and stresses.
  - Capacities and capabilities should be enhanced so that people are able to take on active roles in response to different DRR activities: (i) the prevention and mitigation of risk, (ii) preparedness, including contingency planning and simulation exercises, (iii) disaster response and coping mechanisms, and (iv) rebuilding their lives and livelihoods.



BOTH HUMAN DEVELOPMENT AND DRR ARE PUTTING EMPHASIS ON VULNERABILITY REDUCTION AND PREVENTION OF RISK FACTORS

- People's choices (in terms of knowing the risks, living where they want to and engaging in economic activities for which they are capable and want to participate in) should be assured in the process.

### **③ Contextualising through Global Development Debates and Commitments**

The concepts discussed here have all been the subject of a number of recent global commitments and roadmaps and their convergence has given new impetus to the Post-2015 Development Agenda and its aftermath. The convergence of issues such as resilience to shocks and the importance of vulnerability reduction were discussed at three intergovernmental global conferences held in 2015 and will resonate at one that will take place in May 2016. This has collectively shaped the new policy documents for DRR, SDGs, climate change and humanitarian action. These include the Sendai Framework, with its global targets and priority actions for DRR for 2015-2030; the Sustainable Development Goals (SDGs), as part of the Post-2015 Agenda; the Paris Agreement on Climate Change and the output document of the upcoming World Humanitarian Summit. In order to gain a better understanding of how the post-2015 development debate will contribute to risk-informed and climate smart development approaches in the Western Balkans, key points from the output documents are presented below.

#### **Ⓐ The Sendai Framework for DRR**

The Sendai Framework for DRR 2015-2030 was adopted at the Third World Conference for Disaster Reduction that was held in Japan in March 2015. Like its predecessor the Hyogo Framework for Action (HFA, 2005-2010), which was endorsed by the UN General Assembly following the 2005 World Disaster Reduction Conference, the Sendai Framework places strong emphasis on disaster risk management with a view to achieving substantial

reductions in disaster losses over the next fifteen years.

The Sendai Framework for DRR improves on the previous Hyogo Framework for Action. It makes far more reference to the need to include gender, age, disability and cultural perspectives in all policies and practices. The intention is to empower women and persons with disabilities to play a greater role in response, recovery, rehabilitation and reconstruction and for the development of people centred, multi-hazard, multi-sector forecasting and early warning systems within a participatory process. It also highlights the need to collect and disaggregate data. As such, it has improved the human development framework.

Nevertheless, civil society has certain reservations concerning charting the way forward and the mechanisms for implementation as well as an overall reservation relating to a perceived lack of guidance on financial means, funding mechanisms and methods for assessing and quantifying success.

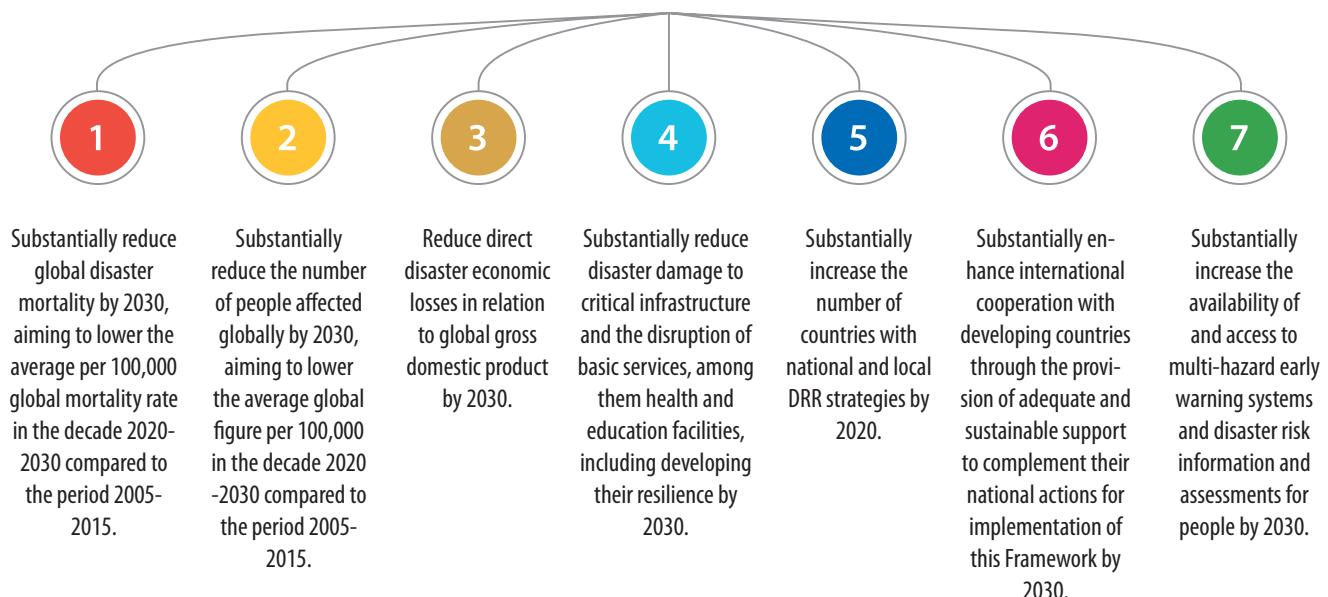
At the sixth Annual Meeting of the European Forum for DRR (held in Paris in October 2015), a five-year roadmap for achieving the goals of the Sendai Framework was adopted. Two areas were given priority in the European context:

1. development or review of national and local level strategies for Disaster Risk Reduction, and
2. integration of Disaster Risk Reduction into different sectors.

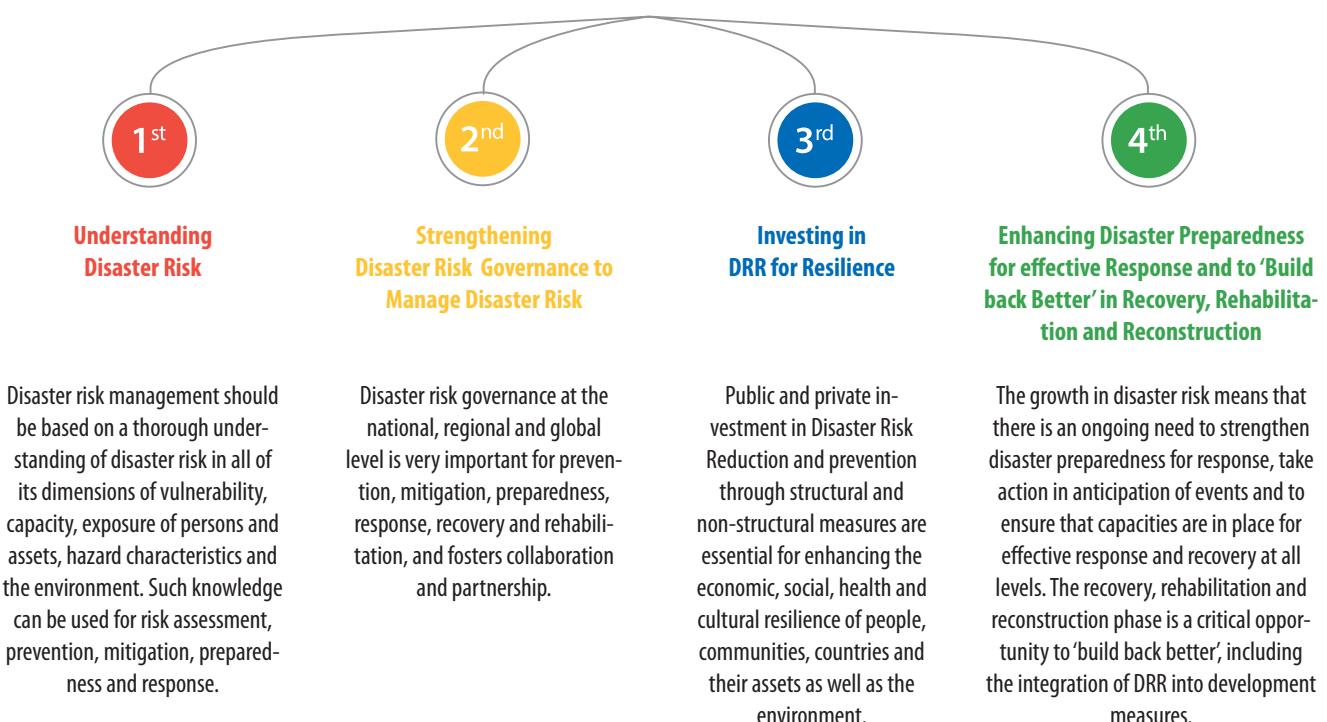
It is expected that the European Commission will issue an action plan for implementation of the Sendai Framework in 2016.<sup>6</sup>

<sup>6</sup> Please see <http://www.unisdr.org/we/inform/events/43847> and [http://www.preventionweb.net/files/43847\\_efdr2015franceoutcomesfinal.pdf](http://www.preventionweb.net/files/43847_efdr2015franceoutcomesfinal.pdf).

## The Seven Global Targets



## The Four Priorities for Action



**TABLE 1: Global Targets and Priority Actions of the Sendai Framework for DRR 2015-2030**

Source: (UNISDR, 2016).

## **(B) The Sustainable Development Goals (SDGs)**

In New York on 25 September 2015 at the UN Summit on the Post-2015 Development Agenda more than 150 world leaders formally adopted the 'Transforming Our World: The 2030 Agenda for Sustainable Development'. The 2030 Agenda for Sustainable Development includes seventeen global sustainable development goals and 169 targets. It builds on the Millennium Declaration, adopted by the United Nations in 2000, and the eight Millennium Development Goals (MDGs) which called for reductions in poverty, hunger, disease and gender inequality as well as better access to water and sanitation by 2015. However, thanks to their broader, integrative sustainable development focus, the SDGs also go beyond the MDGs, which did not fully reflect the complex relationship between human development issues and conflict, violence, security, climate change and natural hazards.

The countries of the Western Balkans have begun preparatory activities that will guide consultation on the nationalisation and localisation of the SDGs: 2016 will be the year for setting priorities and roadmaps, planning and budgeting, and the establishment of oversight and monitoring mechanisms.

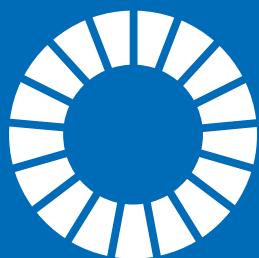
SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable) is particularly promising from a DRR perspective, as can be seen in two of its targets.

- **Target 11.5:** By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.
- **Target 11.b:** By 2020, substantially increase the number of cities and human

settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters and developing and implementing holistic disaster risk management at all levels in line with the Sendai Framework for DRR 2015-2030.

Apart from a direct link between DRR and SDG 11, with direct reference to Sendai, strong direct linkages can be found to twenty-nine targets associated with other SDGs. Agenda 2030 highlights the need for DRR across a number of sectors in line with the understanding that DRR is crosscutting and requires a comprehensive holistic and multi-sector approach.

*THE SDGs WERE DRAWN UP  
IN ORDER TO MAKE THE WORLD A CLEANER,  
HEALTHIER AND MORE EQUITABLE PLACE,  
WHERE EDUCATION, HEALTHCARE, JUSTICE  
AND HUMAN RIGHTS ARE GIVENS  
AND POVERTY IS NO MORE*



# SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION AND LINKAGES WITH SDGS



Source: Illustration based on analysis by Envesa Hodzic-Kovac as presented in the Annex II, Table 1 of this report.

### © The Paris Agreement on Climate Change

After four years of negotiations, the Paris Agreement on Climate Change was adopted at the UN Climate Change Conference that took place in November/December 2015. The Agreement sent a strong signal that countries, rich and poor, are committed to work together to keep the planet safe while advancing sustainable human development and building a more resilient and equitable world for all.

It acknowledges that climate change is a common concern of humankind and recognises human development linkages to such issues as human rights, health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations, as well as the right to development, gender equality, the empowerment of women and inter-generational equity.

The focus in Articles 7 and 8 of the Paris Agreement, which also mentions the Sendai Framework in its preamble, is on strengthening resilience and reducing vulnerability to climate change. Its language resonates with the goals of the Sendai Framework to reduce both risk and disaster losses<sup>7</sup>. Specifically, three of the Paris deal elements are instrumental in addressing DRR challenges that are conducive to human development:

- To establish a global goal on climate change adaptation, to enhance adaptive capacities, strengthen resilience and reduce vulnerability. Countries also agreed to submit adaptation communications with priorities, support needs, plans and actions.
- To establish a new Paris Committee on Capacity Building to address gaps and needs, both current and emerging.

<sup>7</sup> Source: Margareta Wahlström, 2015. See: <https://www.unisdr.org/archive/47142>.

- To recognise the importance of addressing loss and damage associated with the adverse effects of climate change.

### © The World Humanitarian Summit

The first ever world humanitarian summit is set to take place in Istanbul on 23-24 May 2016 and is a global call to action by United Nations Secretary-General, Ban Ki-moon. The Summit has three main goals:

1. Re-inspire and reinvigorate our commitment to humanity and to the universality of humanitarian principles.
2. Initiate a set of concrete actions and commitments aimed at enabling countries and communities to better prepare for and respond to crises and be more resilient to shocks.
3. Share innovations and best practice that can help save lives around the world, place those people affected at the centre of humanitarian actions, and alleviate suffering.

In the lead-up to the summit, the United Nations reached out to over 23,000 people in every region to help shape the future agenda for humanitarian action. Prior to the summit the Secretary-General prepared a report entitled 'One Humanity: Shared Responsibility' along with a new agenda for humanity that draws attention to five responsibilities.

1. Prevent and end conflict
2. Respect the rules of war
3. Leave no one behind
4. Work differently to end need
5. Invest in humanity

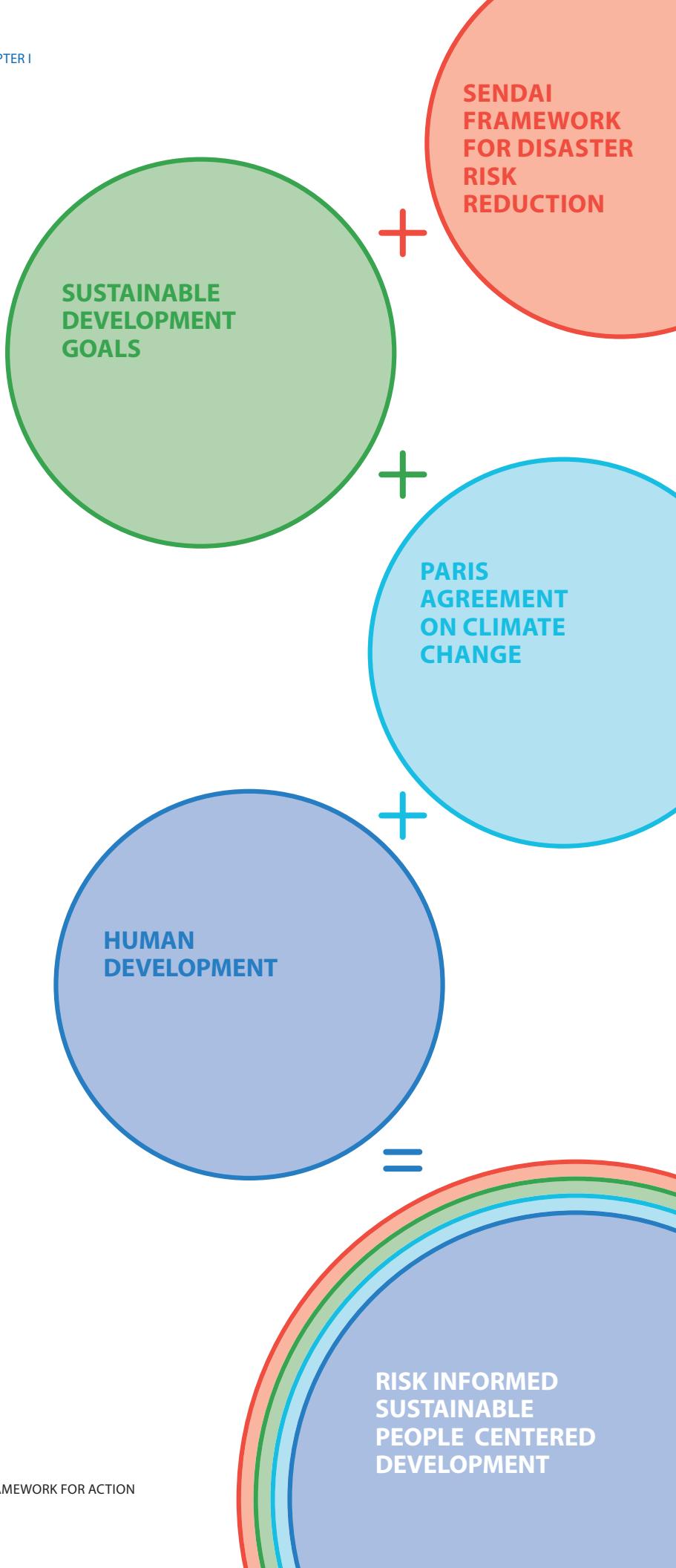
It is expected that the commitments made at the summit will galvanise transformative action on the priority areas set out in the Sec-

Secretary-General's report and take forward the key recommendations from consultations. Acting on these responsibilities will not just be a moral imperative but a strategic necessity if we are to confront the global challenges of today.<sup>8</sup>

#### 4 Conclusion

There is an emerging consensus at the global level that DRR needs to be integrated into the post-2015 development architecture as a safety net to safeguard development gains. This convergence bodes well for those countries of the region that are developing sustainable development agendas in ways that will protect people against setbacks.

As a development and governance goal, DRR moves away from the interpretation of disasters as external threats and shocks that require the protection of people and their assets from these external factors. It approaches disasters as socially constructed within development, depending on the vulnerabilities within societies. This movement paves the way for people-centered development approaches that prevent disasters and respond to risks.<sup>9</sup>



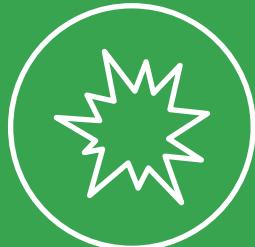
<sup>8</sup> Paraphrased from the World Humanitarian Summit (WHS) website and from the flyer 'WHS at a Glance'.

<sup>9</sup> Global Assessment Report, 2015, p. xv.

*NATURAL HAZARDS  
DO NOT RESPECT  
BORDERS*

# 2

## **Natural Hazards & Disaster Risk in the Western Balkans**



---

## 1 Introduction

### 2 Natural hazards

- (A) **Earthquakes**
- (B) **Landslides**
- (C) **Floods**
- (D) **Droughts**
- (E) **Heatwaves**
- (F) **Wildfires**
- (G) **Extreme Weather Events and Climate Change**

### 3 Anthropogenic (human-made) Hazards

#### What are human-made hazards?

- (A) **Technological/Industrial Hazards**
- (B) **Engineering Hazards**
- (C) **Societal Hazards**

#### Human-made Hazards in the Western Balkans

#### Real Story Examples from the Region

### 4 Conclusions

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## 1 Introduction

---

A variety of hazards put the lives of people in the Western Balkans at risk. Some of these hazards result from the geography of the region whereas others are a product of human action/inaction. This section examines the most important hazards that cause loss of life, injury or other health impacts as well as property damage, loss of livelihood and basic services, social and economic disruption, and environmental damage.<sup>10</sup>

Hazards are typically categorised as either natural or human-made, although most are in fact a result of the interaction between people and their environment. Natural hazards can be further categorised as geo-physical

(e.g. earthquakes and tsunamis) or hydro-meteorological (e.g. storms, floods, droughts, heatwaves and wildfires). While geo-physical hazards are unpredictable and often have a sudden onset, hydro-meteorological hazards are seasonal and sometimes have a slow onset. Due to the impact of climate change, hydro-meteorological hazards are becoming more frequent, unpredictable and severe.<sup>11</sup>

In addition to natural hazards, the region is exposed to human-made hazards (industrial hazards, structural hazards and societal hazards that can turn into conflicts). Some human-made hazards are secondary or even chronic hazards stemming from continuous conditions that accumulate over time, such as

<sup>10</sup> UNISDR, 2009.

<sup>11</sup> IPCC, 2014. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.

“

HAZARDS ARE  
EITHER A RESULT  
OF THE REGION  
GEOGRAPHY  
OR A PRODUCT  
OF HUMAN (IN)  
ACTION

## USING OPEN SOURCE SOFTWARE FOR SPATIAL ANALYSIS

Almost all of the maps in this section were developed using open source Geographic Information System (GIS) data from publicly available databases. In the era of big data, the sharing of information is as important as creating new data. Significant time and resources can be saved by capitalising on existing models, datasets and maps for disaster risk assessments. The use of analytic tools from open source software can be used to make possible low cost spatial analysis.

Unless stated otherwise, the maps in this section were produced using Quantum GIS (QGIS). This software is a user-friendly platform licensed under the General Public

License (GPL). It is an official project of the Open Source Geospatial Foundation (OSGeo) and runs on Linux, Unix, Mac operating system, Windows and Android. QGIS supports numerous vector, raster and database formats and functionalities. An active community of members that allow users to find solutions to geospatial analyses supports it. Please visit the websites listed below if you require additional information.

QGIS website:

<http://www.qgis.org/en/site/>.

OSGeo website:

<http://www.osgeo.org/>.

Tutorials:

<http://www.qgistutorials.com/en/>.

“

THE GREATEST  
IMPACT OF  
EARTHQUAKES  
IS FELT  
IN CITIES

landmine contamination, water pollution and large-scale toxic contamination.

The following subsections present six common natural hazards in the Western Balkans, including earthquakes, landslides, floods, droughts, heatwaves and wildfires, as well as human-made hazards. In addition to the characteristics and spatial distribution of individual hazards, these subsections refer to exposure and risk drivers in order to identify where people and property are most at risk.<sup>12</sup> This chapter shows that there are no natural disasters and that exposure and unresolved risk management and development dilemmas largely determine the consequences of a disaster.

## 2 Natural hazards

In order to manage hazards it is essential to understand where, when, how and why they are manifested. Spatial mapping can help to analyse the relative importance of various hazards at specific locations. Such mappings show that natural hazards do not respect bor-

ders and that cross-border risk management solutions are essential.



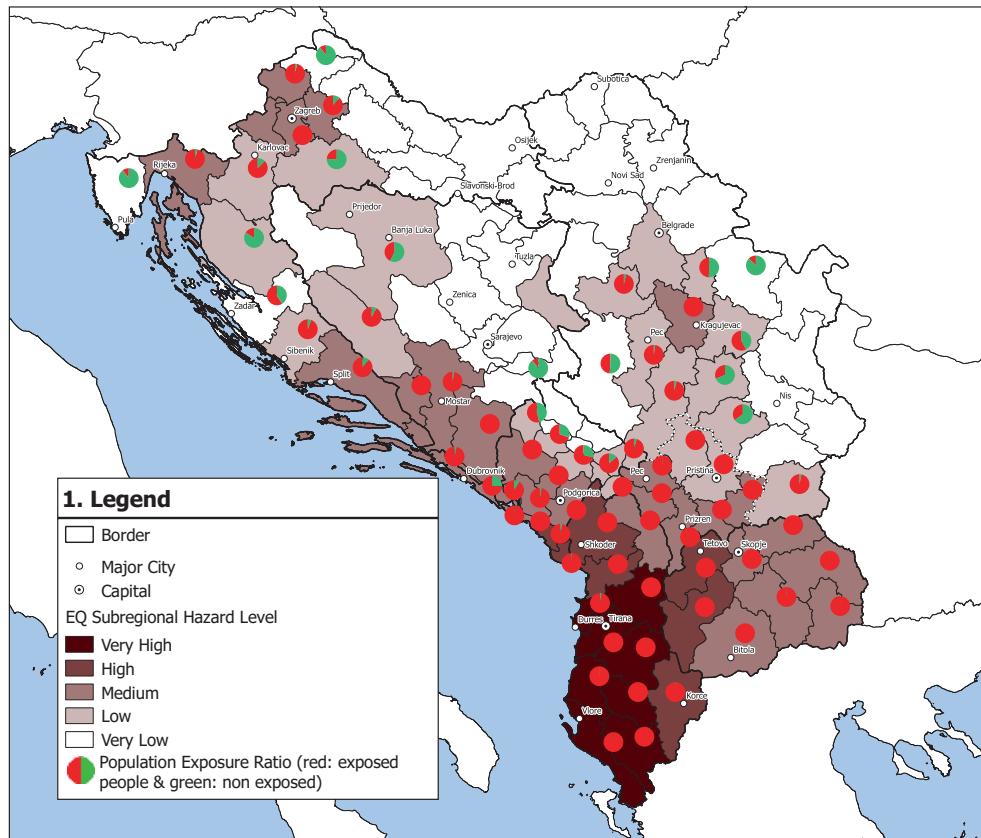
### Earthquakes

The Western Balkans region is exposed to seismic hazards clustered around fault lines. On average, at least one earthquake strikes every three years at VII intensity on the Medvedev–Sponheuer–Karnik (MSK) scale,<sup>13</sup> at VIII intensity every fifteen years and at XI intensity or higher every sixty years. Map 1, below, shows active geological fault lines and earthquake events over magnitude 4 on the Richter scale that have occurred in the Western Balkans during the period 1950–2015. This map clearly shows that Albania and the coastal region of the Western Balkans experience more tremors than the northern, western and extreme eastern parts of the region.

<sup>12</sup> For the UNISDR (2009) definition of exposure, risk drivers and disaster risk please see the same source as stated above.

<sup>13</sup> The strength of an earthquake can be measured by magnitude or intensity. Magnitude is a measure of the physical energy released by an earthquake and is commonly measured according to the Richter scale. Intensity is the effect of an earthquake at a particular place on earth's surface. It is commonly measured by the Medvedev–Sponheuer–Karnik scale (also known as the MSK scale) or the Modified Mercalli Intensity scale (MMI).

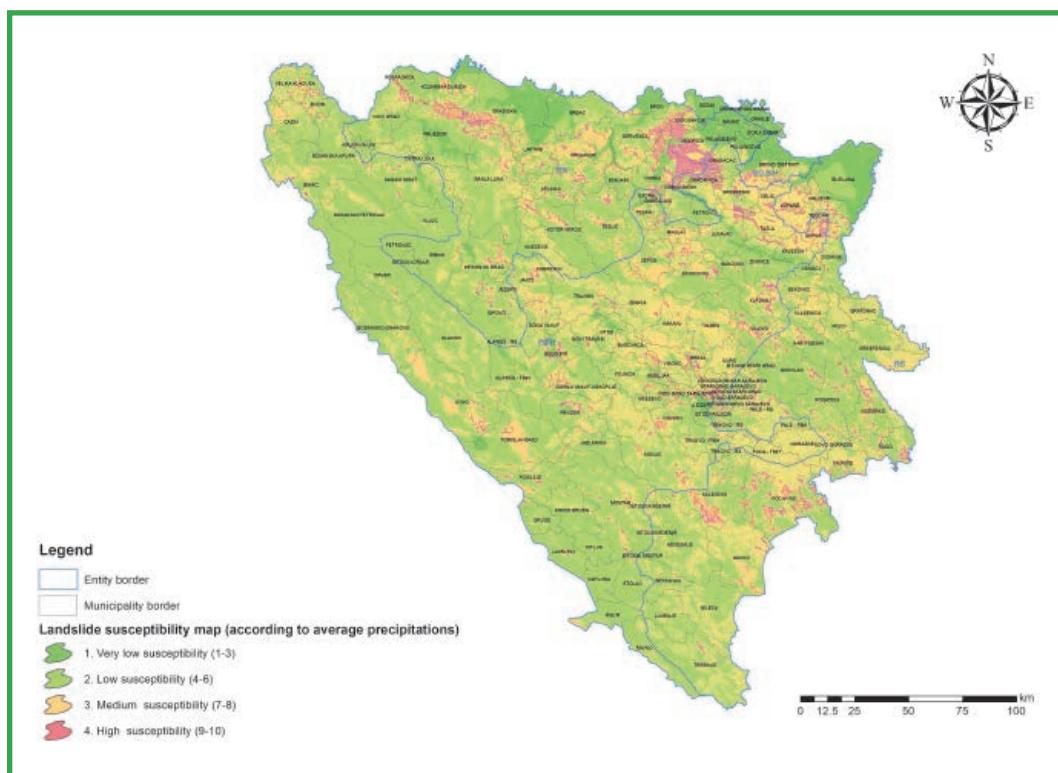
**MAP 2**  
**GDP EXPOSED TO EARTHQUAKES**



**Data Sources** → The peak ground acceleration data is provided by the Seismic Harmonization in Europe (SHARE) Project coordinated by the Swiss Seismological Service. <http://www.share-eu.org/>  
 ● The Gross Domestic Product (GDP) data is from the UNEP Grid dataset from the Global Assessment Report on Disaster Risk Reduction (GAR 2013). <http://preview.grid.unep.ch/index.php?preview=data&events=soec&evcat=1&lang=eng> ● The exposure ratio was generated using raster calculators and zonal statistics tools on these two datasets. ● Satellite background imagery by Mapquest. Map created on QGIS by Jeremy Wetterwald and Erik Kjærgaard April 2016.

Country / Territory	Earthquake GDP		Earthquake Population		Population Ratio		GDP Ratio
	GDP	Population	Exposure	Exposure	Ratio		
Albania	11.930.000	2.857.000	11.825.341	2.847.572	99%	100%	
Bosnia and Herzegovina	16.850.000	3.846.000	2.652.397	985.245	16%	26%	
Croatia	59.640.000	4.418.000	35.06.992	2.850.052	59%	65%	
MK	9.339.000	2.102.000	8.120.330	2.100.949	87%	100%	
Montenegro	4.115.000	620.078	3.613.701	486.141	88%	78%	
Serbia	39.370.000	7.291.000	10.660.874	1.737.445	27%	24%	
Kosovo	5.830.000	1.776.00	5.666.664	1.775.645	97%	100%	

**TABLE 2:**  
**EARTHQUAKE EXPOSURE IN THE WESTERN BALKANS**



**MAP 3**  
**LANDSLIDE HAZARDS**  
**IN BOSNIA AND**  
**HERZEGOVINA**  
(Hydro-Engineering-Institute-Sarajevo, 2015)

## RECURRING SMALL-SCALE DISASTERS

Vulnerabilities and a lack of capabilities to cope turn hazards into disasters of various types and sizes. While some of these disasters claim hundreds of lives and trigger large-scale emergency responses, most disasters go unnoticed beyond the boundaries of the impacted communities. Most small-scale disasters in this region are caused by landslides, erosion and flood events. The cumulative effect of these small-scale yet recurring disasters are significant and most disaster losses are borne by people with limited resources.



### Floods

The River Danube and its tributaries define the waterways for the greater part of the Western Balkans. Most river basins belong to the catchment areas of the Danube, while the southern and the south-western rivers discharge into the Adriatic Sea.<sup>16</sup>

Floods are the most challenging and recurring natural hazard in the Western Balkans region and flooding occurs in almost all river basins in the region. While predictable floods play a positive role for the livelihoods of farmers, unpredictable and severe flooding puts their crops, health and livelihood at risk.

Although floods happen throughout the year, they occur mainly in the hills and lowlands during the spring when there are high levels of precipitation and snowmelt from the mountains. Heavy rainfall can also trigger riverine floods during autumn; these are typically shorter in duration but occur suddenly and with high water flows. Furthermore, flash floods are common in mountainous areas and these can sometimes even triggering mudflows. Lastly, owing to the structural condition of aging and ill-maintained dams, it is not possible to rule out human-made outburst floods.<sup>17</sup>

16 (Hydro-Engineering-Institute-Sarajevo, 2015)

17 (UNDP, WMO, ISDR, World Bank)

## RECURRING SMALL-SCALE DISASTERS

"The most extreme flood disaster in the Sava catchment occurred in the Western Balkans in May 2014. This resulted in a severe loss of human life, considerable damage to property, land and businesses and consequently led to economic losses in Bosnia and Herzegovina, Serbia and to a lesser extent in Croatia. A meteorological event, in the form of cyclone Tamara (an extreme low-pressure air mass), that hit the region on 15 May precipitated extreme heavy rainfall. Approximately 25 % of the areas average annual rainfall fell in a few days. The subsequent floods affected several river basins in the region and resulted in unprecedented damage to assets and human life.

Flash floods from tributaries and landslides due to saturated soil destroyed houses and infrastructure, while gradual and persistent flooding along the River Sava affected a large section of urban areas and agricultural land. Thirty-eight municipalities (with a population of 1.6 million) were affected in Serbia. Thirty-two thousand inhabitants were evacuated – 24,000 from the City of Obrenovac alone – and 51 casualties were recorded. At the same time, in Bosnia and Herzegovina, flooding and more than 3,000 landslides affected over one million people; 25 casualties were reported and 75,000 homes in 46 municipalities were affected.

The impact was disastrous: in Serbia alone, the total value of loss in production and assets was estimated to reach EUR 1.7 billion, about 4.8 % of the gross domestic product. Total needs for recovery and reconstruction are estimated at 1.35 billion EUR. Furthermore, the disaster triggered an economic recession; this was partly due to the loss of jobs (some 50,000) and partly to the

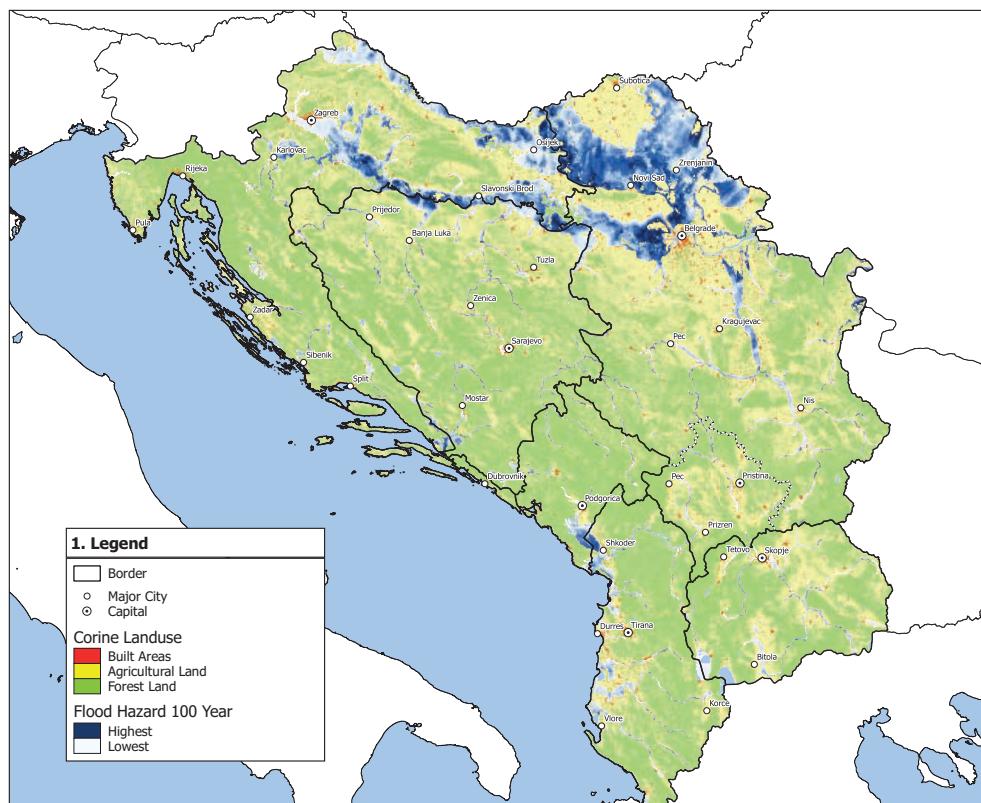
suspension of production. Consequently, macroeconomic indicators greatly worsened. Losses were concentrated in the production sector (70 %), affecting agriculture, industry, mining and energy (operation of two coalmines essential to Serbia's electrical supply had to be suspended). Although badly affected, the social sectors suffered relatively limited damage to infrastructure (12 %). The Human Development Index declined with the income of some 125,000 people falling below the poverty line. Estimates put the damage from the flood in Bosnia and Herzegovina at 1.3 billion EUR, mostly due to the extensive inundation of arable land that ruined crops and destroyed livestock. Landmines, a legacy of war, were displaced, further aggravating the situation."

Excerpt from the Flood Prevention and Management: Gap Analysis and Needs Assessment in the Context of Implementing the EU Floods Directive (pages 2-3).

Map 4, below, shows flood hazard data overlaid on land use in the Western Balkans. The EU CORINE land use dataset allows researchers and development practitioners to visualise what type of land is exposed to natural hazards such as floods. The regional overview below, modelled through hydrological analysis, clearly shows that the Sava and Danube river basins have generated multiple floods over the past one hundred years.

There are plenty of examples in the Western Balkans of how unsustainable development, land use and river basin practices have increased the vulnerability of people to disasters. In each country, people living adjacent to the major rivers tend to farm or run businesses on the flood plains. These homes, crops, livestock and business are at risk of flooding or have already been destroyed/damaged by flooding because they are located in a flood hazard zone. A

**MAP 4**  
**FLOOD HAZARD AND  
 LAND USE**



**Data Sources** → The Corine land cover data is provided by the European Space Agency. ● <http://www.eea.europa.eu/publications/COR0-landcover> ● The flood hazard raster data is provided by the United Nations International Secretariat for Disaster Reduction (UNISDR) Global Assessment Report on Disaster Risk Reduction 2015. ● <http://risk.preventionweb.net/> ● Projection: EPSG 3857. Map created on QGIS by Jeremy Wetterwald and Erik Kjaergaard April 2016.

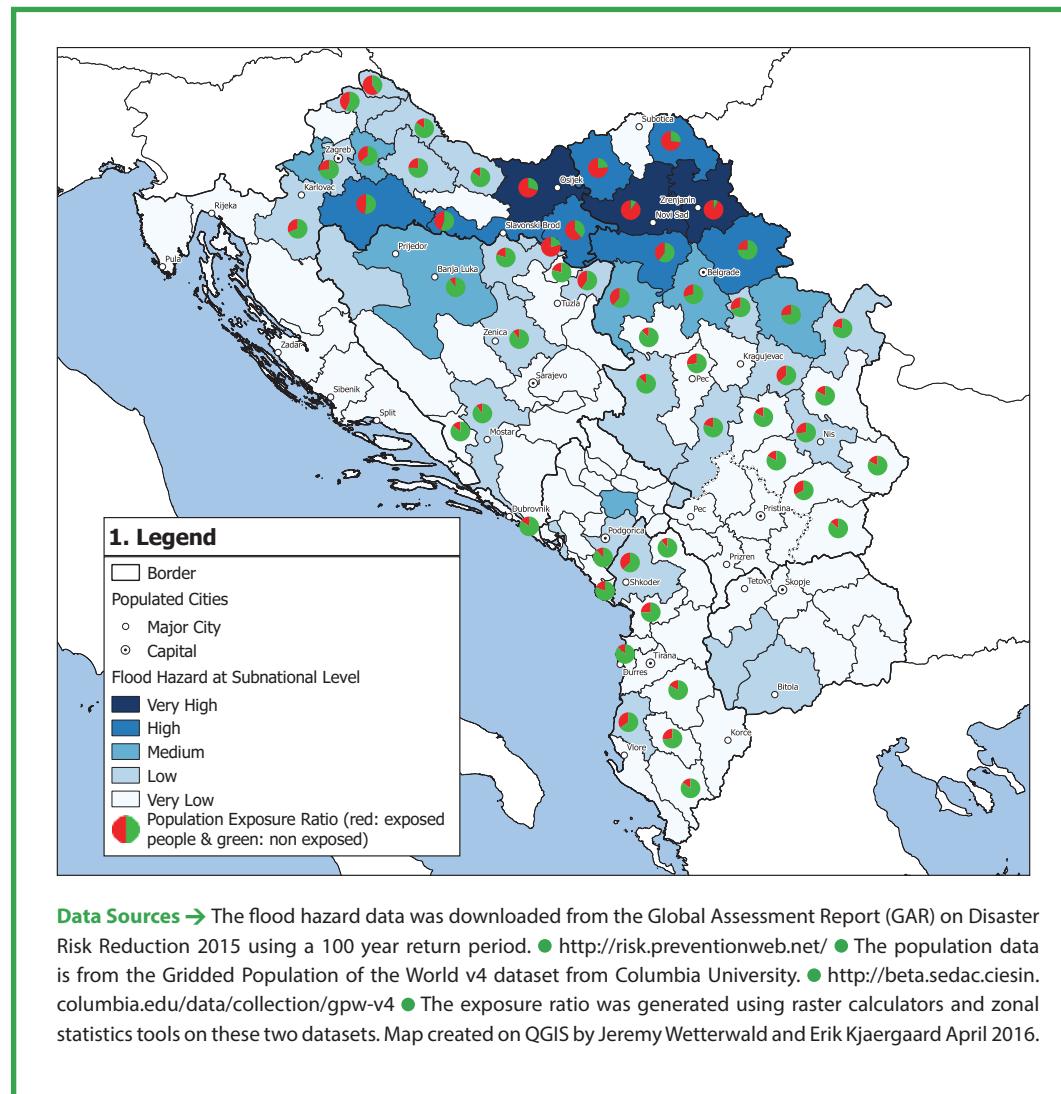
“  
**FLOODS ARE THE MOST CHALLENGING AND RECURRING NATURAL HAZARD IN THE WESTERN BALKANS REGION**

combination of low-risk local planning and poor management of ecosystem resources combine to make these communities, farms and businesses even more vulnerable.

In the context of flooding, the population at risk is a key indicator. Map 5, below, depicts the relative level of flood risk and the locations where the highest proportion of people are exposed to the risk of flooding. The population based exposure map shows that the areas with the highest relative flood risk do not necessarily correspond to the areas with the highest concentration of people at risk.

Similar to the case of earthquakes, it is possible to analyse the risk to GDP as well as the population at risk. Table 2 summarises the findings at the national level in absolute and relative terms. The summary of Table 2 depicted in Chart 2 shows that Serbia has by far the largest population at risk followed by Croatia, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Albania and Kosovo. The analysis differs only slightly in terms of GDP: the numbers are somewhat different but the ranking of countries is largely consistent.

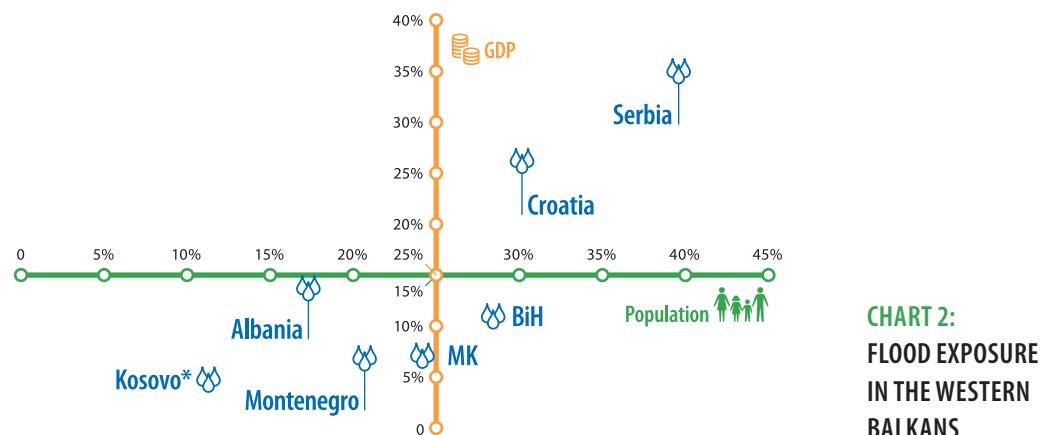
**MAP 5:**  
**POPULATION  
EXPOSED TO FLOOD  
RISK**



**TABLE 3:  
FLOOD EXPOSURE  
IN THE WESTERN  
BALKANS**

Country / Territory	GDP	Population	Flood GDP Exposure	Flood Population Exposure	Population Ratio	GDP Ratio
Albania	11.930.000	2.857.000	1.901.247	392.200	16%	14%
Bosnia and Herzegovina	16.850.000	3.846.000	4.956.804	414.066	29%	11%
Croatia	59.640.000	4.418.000	18.245.923	1.127.981	31%	26%
MK	9.339.000	2.102.000	2.241.803	136.738	24%	7%
Montenegro	4.115.000	620.078	818.941	40.987	20%	7%
Serbia	39.370.000	7.291.000	16.559.745	2.515.715	42%	35%
Kosovo	5.830.000	1.776.00	503.006	81.067	9%	5%

The graph below shows the GDP and population exposure ratios to flood hazards. The GDP and population intercept in the graph represent the average exposure of people and production in the region.



### Droughts

Droughts are less understood and are often less visible than other natural hazards. Meteorological droughts – a result of deficient rainfall – are not necessarily hazardous: a drought becomes hazardous when it becomes a hydrological or agricultural drought that is mediated by temperature and wind, which influence evaporation, transpiration and the capacity of the soil to hold moisture.<sup>18</sup> In the Western Balkans, droughts tend to result in significant economic losses, particularly in the agriculture, energy and water sectors. Owing to a dearth of information and analysis on this key area, unlike flooding, economic losses from droughts are only partially recorded.<sup>19</sup>

In the past, widespread and severe droughts occurred less frequently in the region than floods. According to a European Commission impact assessment conducted on drought and water scarcity in the European Union, meteorological droughts that were once expected once every 100 years will be likely to occur once every 50 years by 2070. Additionally, water stress in all countries in the Western Balkans, with the exception of Bosnia and

Herzegovina and Croatia, is likely to increase by at least ten per cent because of climate change and rising demand for water.<sup>20</sup> It is worth noting that this assessment does not factor in the most recent projections for climate change.



### Heatwaves

Heatwaves contribute significantly to and often accompany droughts and wild fires. A heatwave is a prolonged period of excessively hot weather compared to the usual weather pattern in the area and relative to normal temperatures for the season. Heatwaves have an impact on health and can in extreme cases result in fatalities. Heatwaves also impact on people's welfare and livelihoods through their effect on power and agricultural production.<sup>21</sup>

Milder forms of heatwave occur regularly in the Western Balkans (2002, 2003, 2004 and 2007), whereas extreme heatwaves are rare.<sup>22</sup> However, in June 2000 a severe heatwave affected the Zagreb, Split, Osijek and Rijeka



*DROUGHTS  
TEND TO RESULT  
IN SIGNIFICANT  
ECONOMIC  
LOSSES  
IN THE WESTERN  
BALKANS REGION*

18 (UNISDR, 2011)

19 (EU Commission, World Bank, UN Development Group, 2014).

20 (European Commission, 2007) Link

21 A. Bastos, C.M. Gouveia, R.M. Trigo, and S.W. Running 2014

22 Heatwaves and cold spells are considered extreme weather events.

areas of Croatia killing 40 and injuring 200.<sup>23</sup> According to IPCC, it is highly likely that the future will bring heatwaves of higher frequency and duration than previously observed. This is a direct consequence of the increase in mean global temperatures that has resulted in more frequent hot and fewer cold temperature extremes over most land areas on a daily and seasonal timescale.<sup>24</sup>



### Wildfires

Wildfires are often characterised by their extensive size, the speed at which they can spread, their potential to change direction unexpectedly and their ability to jump gaps such as roads, rivers and firebreaks.<sup>25</sup> Apart from putting people's survival and health at risk, wildfires have a detrimental effect on agriculture, forestry and tourism. Wildfires also have a substantial economic and social impact on the exposed communities. Last but not least, wildfires have an unquantified ecological impact, including the degradation of forests, soil erosion and loss of fertility, a decline in biodiversity and the emission of greenhouse gases.<sup>26</sup>

Wildfires are common in the lowlands and hilly regions of the Western Balkans region at the end of spring and during unusually warm and dry summers. Wildfires are typically the result of agricultural fires that spread to combustible vegetation in the surrounding area. According to a recent study, forest fires in the former Yugoslav Republic of Macedonia are usually caused by stubble burning, the burning of pasture and arson.<sup>27</sup> According to another regional source, in 60 % of registered cases wildfires are triggered by human actions/negligence, while just 3.3 % are of

natural origin and the remainder unknown.<sup>28</sup> Forest fires are particularly important in a region with high forest cover. Forest occupies as much as forty to fifty per cent of the land in countries/territories like Bosnia and Herzegovina and Kosovo. Forests in border regions sometimes spread to neighbouring countries. In September 2012, for example, a fire on the Albanian side of the the former Yugoslav Republic of Macedonian border spread to the Mavrovo National Park and more than one hundred hectares of grass and stubble near the forest burnt. In June 2012, fire spread from the Greek side of the border to Kajmakchalan in the former Yugoslav Republic of Macedonia, in a highly dangerous area contaminated by unexploded ordnance from the First World War.<sup>29</sup>

In addition to climate change, poorly managed forests are likely to increase the frequency and intensity of future wildfires in the Western Balkans region (see Box 3).

Map 6, below, provides a regional snapshot of High Temperature Events (HTE) recorded by the NASA Fire Information for Resources Management System for the period 2001-2016. Data points were aggregated at the sub-national level using a points in polygons analysis in order to compare fire hazards across the Western Balkans. While the HTE include slash-and-burn and similar events, these were included as they can trigger wildfires.



### Extreme Weather Events and Climate Change

Climate change is a defining challenge of our time. It affects disaster risks in two ways. The first is through the likely increase in hydro-meteorological hazards and the second through increases in the vulnerability of communities to natural hazards, particularly through ecosystem degradation,

<sup>23</sup> UNDP, WMO, ISDR, World Bank, p.18

<sup>24</sup> IPCC, 2013, p. 3

<sup>25</sup> A. Bastos, C.M. Gouveia, R.M. Trigo, and S.W. Running 2014

<sup>26</sup> UNDP, WMO, ISDR, World Bank, p. 18

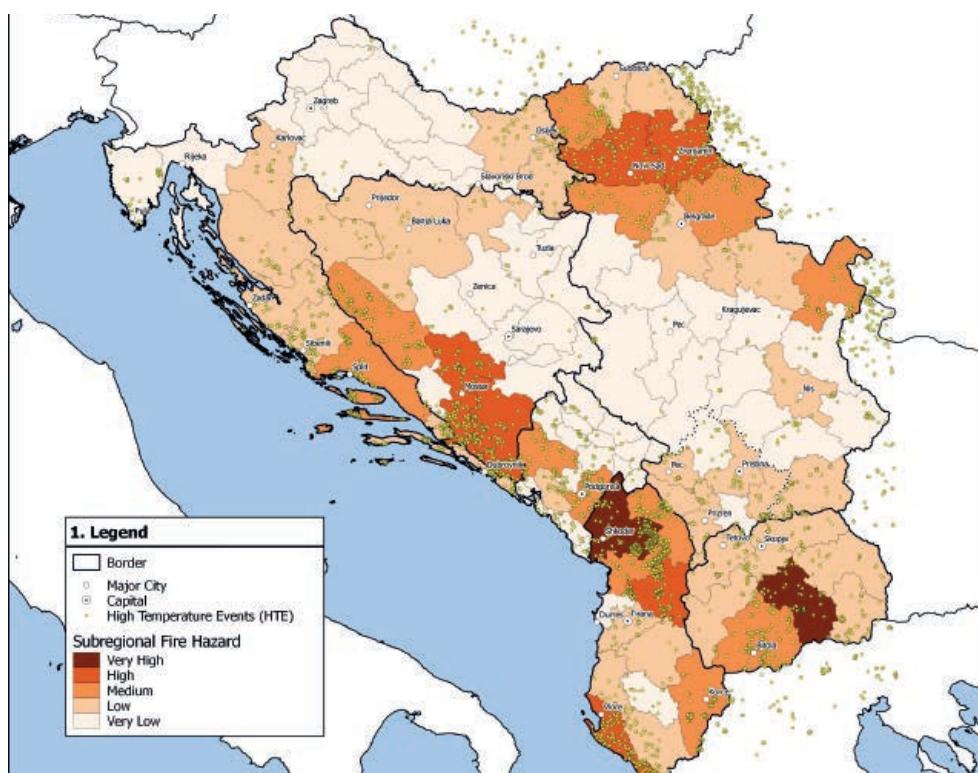
<sup>27</sup> Ibid

<sup>28</sup> Ibid

<sup>29</sup> Regional Fire Monitoring Centre, 2015, p. 28-29.

THE INCREASING  
EXPOSURE  
OF PEOPLE  
AND ASSETS  
TO CLIMATE  
RELATED RISKS  
ENTAILS HIGHER  
PROBABILITY  
OF DISASTER  
AND RELATED  
ECONOMIC  
LOSSES

**MAP 6:**  
WILDFIRE HAZARD  
MAP



**Data Sources** → High Temperature Events (HTE) downloaded from the National Aeronautical and Space Agency Fire Information for Resource Management System (FIRMS) database from the period 2001 to 2016. ● <https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms> ● Projection: EPSG 3857. Map created on QGIS by Jeremy Wetterwald and Erik Kjaergaard April 2016.

reductions in the availability of water and food, and changes related to livelihood.<sup>30</sup> At the global level, more than eighty per cent of economic losses caused through so-called natural disasters were attributable to weather related disasters in 2011.<sup>31</sup>

In 2011, the Intergovernmental Panel on Climate Change (IPCC) issued a Special Report on Climate Extreme Events (SREX) with a number of key findings:

→ It is virtually certain (99 to 100 % probability) that increases in extremely hot days and decreases in very cold days will happen throughout the world.

- It is very likely (90 to 100 % probability) that heatwaves will increase in length, frequency, and/or intensity over most landmasses.
- It is very likely that rises in sea level will contribute to upward trends in extreme sea levels and extreme coastal high water levels leading to flooding.
- It is likely (66 to 100 % probability) that the frequency of heavy rainfall will increase over this century in many regions.
- It is likely that the strength of tropical cyclones will increase, although possibly not in all cyclone prone areas.
- There is a high level of confidence in the theory that both maximum and minimum daily temperatures have increased on a global scale because of increased greenhouse gas emissions. When it comes to changes in other extremes, such as more

<sup>30</sup> ISDR (2008) briefing note

<sup>31</sup> IPCC briefing for COP19, 2013

“  
WILD FIRES  
ARE MOSTLY  
TRIGGERED  
BY HUMAN  
ACTIONS AND  
NEGLIGENCE

intense and longer droughts, the lack of direct observation and agreement on available scientific studies results in medium level confidence.

- Even without factoring in climate change, disaster risk will continue to increase in many countries as more vulnerable people and assets become increasingly exposed to weather extremes.<sup>32</sup>

The Fifth Assessment Report of the IPCC from 2014 leaves no doubt that climate change is happening, "Warming of the climate system is unequivocal and since the 1950s many of the observed changes are unprecedented over decades to millennia. The atmosphere and oceans have warmed, the amounts of snow and ice have diminished and sea level has risen."<sup>33</sup>

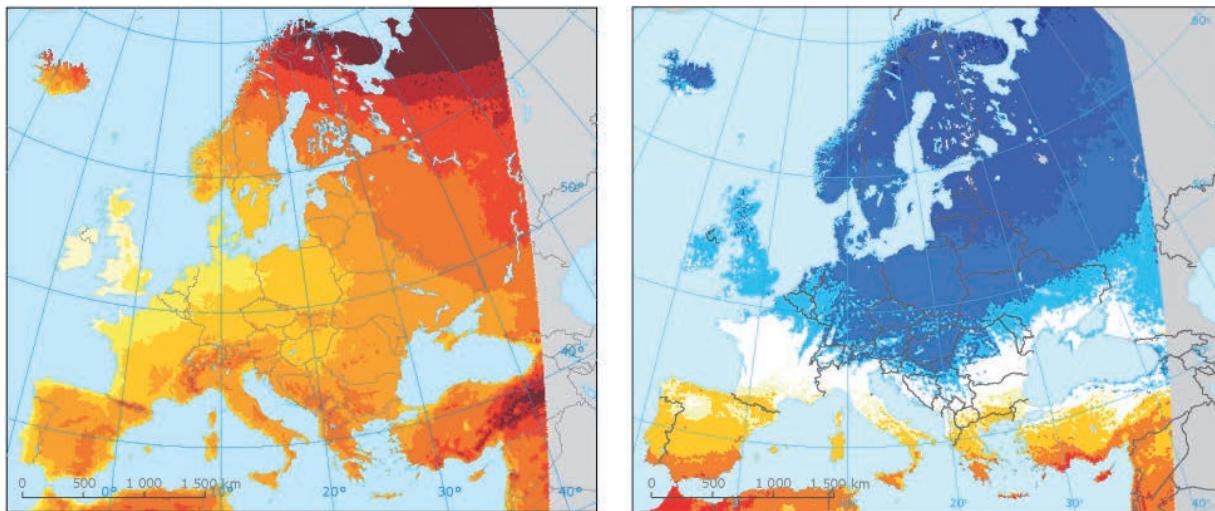
The latest IPCC flagship report identifies three key risk factors for Europe: (1) increased damage caused by rivers and coastal flooding, (2) increased water shortages and (3) increased

damage resulting from extreme heat events and heatwaves. A consequence of this increasing exposure of people and assets to these climate related risks is the higher probability of disaster and the related economic losses. While this has the significant potential to disrupt human systems, the effects of these weather extremes on the environment will generate economic and human costs that need to be made part of comprehensive sustainable development policies.

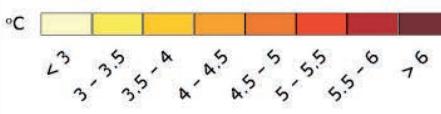
**MAP 7:**  
**PREDICTED  
TEMPERATURE AND  
PRECIPITATION  
CHANGES FOR  
EUROPE 2071-2100  
COMPARED TO 1971-  
2000**

Source: European Environment Agency, 2015.

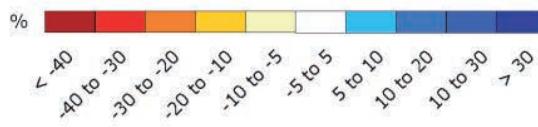
The European Union has funded research aimed at modelling two major environmental consequences of climate change: change in temperature and change in precipitation. Map 8, below, shows the projected temperature and precipitation changes expected to occur in Europe over the period 2071-2100 compared to the period 1971-2000, based on the average of a multi-model ensemble with forced Representative Concentration Pathway (RCP) 8.5 high emissions scenario.<sup>34</sup>



**Projected changes in annual mean temperature (left) and annual precipitation (right)**



Outside coverage



32 IPCC (2011)

33 IPCC (2014) p. 2.

34 EEA (2015) European Environment Agency, 2015. Projected changes in annual mean temperature and annual precipitation. Available from <http://www.eea.europa.eu/data-and-maps/figures/projected-change-in-annual-mean/>.

The European Environment Agency maps indicate that the coastal and southern regions of the Western Balkans will experience significant changes in high temperature and a reduction in precipitation, influencing drought, wildfires and overall water security. Simultaneously, the north-eastern part of the region will likely experience increased levels of rainfall and therefore increased intensity of floods.

### **3 Anthropogenic (Human-Made) Hazards**

#### **What are human-made hazards?**

Human action/inaction can create anthropogenic hazards that directly or indirectly pose a threat and a potential source of danger that could result in disasters and endanger exposed populations and environments. They are the result of both human economic and industrial activity but also individual and societal behaviour (intentional or unintentional). The common typology of human-made hazards encompasses technological/industrial hazards, created through manufacturing and other economic activities, engineering hazards created through choice of location, materials, construction processes and technology used for the construction of structures, and societal hazards, which include the behaviour of individuals and groups that could bring about hazardous events such as wars or terrorism.

#### **Anthropogenic (human-made) Hazards in the Western Balkans**

The countries of the Western Balkans are rich in mineral resources. The mining, processing and downstream exploitation of base metals, such as aluminium, chromium, cobalt, copper, iron, lead, magnesium, zinc, nickel and manganese, and precious metals, such as gold, palladium and platinum, as well as coal, natural gas and petroleum were and still are important industrial sectors in the Western

Balkans. Industrial output has dropped sharply since the dissolution of Yugoslavia in 1991 and there has been a widespread shutdown of mining operations because of privatisation and the failure to establish clear legal liability over environmental and security concerns for mining and similar industrial sites. Abandoned sites are scattered across the region. Of the 180 such sites identified one-third are considered to be of significant environmental and security concern, while a fifth are considered to pose transboundary risks.<sup>35</sup>

Water from mine waste or voids contains toxic elements in excess of tolerance levels that allow for discharge into the natural environment. Acidic mine drainage with a low pH value effects downstream ecosystems and makes water unsuitable for irrigation or other purposes; watercourses are the main vector of transboundary pollution. Irresponsible mining practices affect food production, exports and tourism and hinder economic investment. Countries of the region that aspire to join the EU must tackle the issue of mine management and the treatment of wastewater because the EU accession process enforces strict environmental legislation.

The two main domestic sources of generating electricity in the region are coal (lignite) and hydropower. Most of the energy infrastructure in the Western Balkans was built in the 1960s and 1970s and is therefore in need of rehabilitation or replacement.<sup>36</sup> Current patterns of energy use in the Western Balkans result in high carbon intensity because of the significant dependence on coal (lignite). Therefore, the energy sector is a major source of greenhouse gas emissions, air pollutants and other harmful substances. These systems are also vulnerable to extreme events and changes in river temperature. Thermal power production is dependent on the availability of water in order to maintain appropriate tem-

<sup>35</sup> UNEP, 2015, p.33

<sup>36</sup> UNEP, 2015, p.28; IEA 2008

perature, using water to cool power plants. Hydropower generation is also extremely vulnerable to extreme weather conditions, both drought and intense precipitation. The latter may cause flooding downstream.<sup>37</sup>

The transport and communications infrastructure in the Western Balkans is improving but still lags considerably behind that of the EU. Pressure on the road network is increasing and the general transport infrastructure is dated. The entire transport infrastructure, with the exception of recent transport projects, is vulnerable to extreme events such as flooding, forest fires, storms and earthquakes. Water management is fragmented. Different government departments are in charge of protecting water quality and aquatic ecosystems, ensuring water supply for public consumption and use by industry and the public sector. Other departments oversee hydroelectric power production and measures of protection against water related hazards.

In the aftermath of the wars and conflicts of the 1990s in the Western Balkans, landmines, unexploded ordinance (UXO) and surplus ammunition remain dangerous hazards responsible for considerable yet declining loss of life and injury each year in the region. The presence of landmines had a detrimental effect on post-war recovery in rural areas by reducing the amount of available agricultural land, impeding development and adversely influencing the quality of life for people living in areas affected by landmine contamination. A substantial proportion of mine/uxo contaminated land is agricultural or forestry land. Drainage channels and riverbanks are also severely affected and consequently inaccessible for maintenance. The countries most affected by landmine and UXO contamination are Bosnia and Herzegovina and Croatia.

In Bosnia and Herzegovina, according to the Bosnia and Herzegovina Mine Action Centre (BHMAC), total minefield contamination amounts to 1,176.5 square kilometres or 2.3 % of the total surface area of the country. In 9,185 suspected hazardous areas and 19,205 micro locations an estimated 120,000 landmines and UXOs remain in or on the ground. Landmines affect more than 540,000 people (approximately 15 % of the population) in 1,417 communities, of which 136 communities (152,000 people) are at high risk.<sup>38</sup> There were 1,710 casualties from 1996 to 2013, of which 597 were fatal. This includes 115 deminers of which 46 were fatal.

According to the Croatian Mine Action Centre (CROMAC), the current status of landmine/UXO contaminated suspected areas in Croatia amounts to 480.77 square kilometres. The landmine suspected area covers nine counties and sixty-nine towns and municipalities contaminated with 46,317 landmines and other unexploded ordinance. In Croatia, over the period 1996–2015, 415 landmine incidents were recorded: involving 198 fatalities and 384 injuries, of which 268 were severe. The number of incidents has decreased from 136 in 1996 to just one in 2015.<sup>39</sup>

In Serbia, antipersonnel and antitank mines were laid in so-called mixed minefields that cover an area of 5.9 square kilometres.<sup>40</sup> In Kosovo there were 77 confirmed mined areas remaining covering 2.75 square kilometres at the end of 2014.<sup>41</sup> In Montenegro a total of 1.72 square kilometres is suspected to be a mine contaminated area.<sup>42</sup>

<sup>37</sup> BHMAC, Bosnia and Herzegovina Mine Action Annual Report 2013, April 2014.

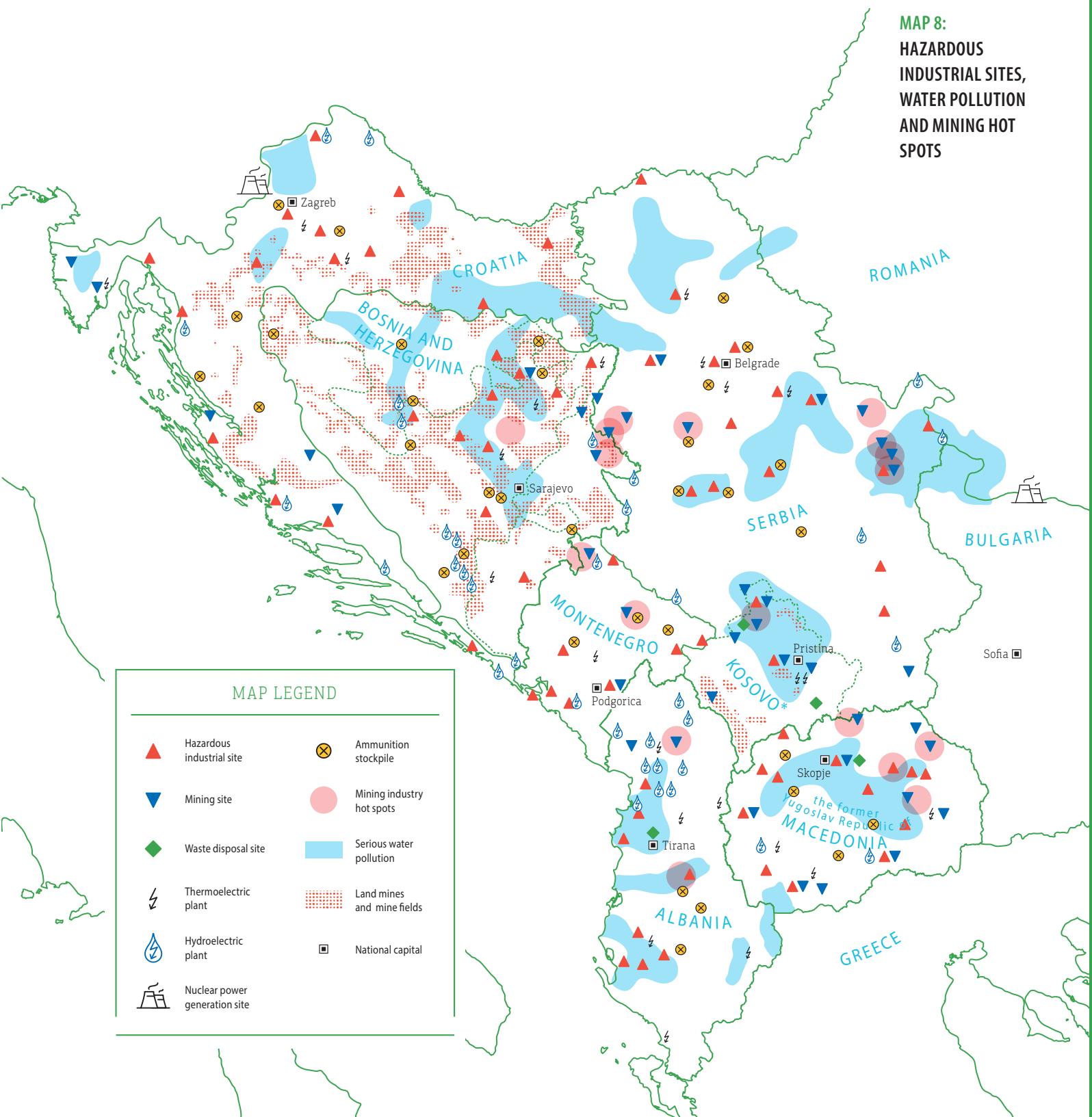
<sup>39</sup> CROMAC, (2016)

<sup>40</sup> Mine Action Centre of the Republic of Serbia, (2016)

<sup>41</sup> Monitor, (2015a).

<sup>42</sup> Monitor, (2015b).

**MAP 8:**  
HAZARDOUS  
INDUSTRIAL SITES,  
WATER POLLUTION  
AND MINING HOT  
SPOTS



**Sources** → UNEP/DEWA/GRID-Europe (2007) Hazardous industrial site, water pollution and mining hotspots map, ENVSEC (online map on major industrial sites and water pollution for the Western Balkans – info on Croatia); Crolinks.com map on industrial sites in Croatia; Philippe Rekacewicz, UNEP/GRID-Arendal Landmines map (2003); UNEP (2015) Power generation map for the Western Balkans; Gobinet, P. (2012) data used on stockpile ammunition sites in the Western Balkans.

Poor ammunition stockpile management remains a serious problem in much of the Western Balkans. Since January 1998, with the exception of the former Yugoslav Republic of Macedonia, every country in the Western Balkans has recorded at least one related accident within its territory.<sup>43</sup> Twenty such accidents resulted in 38 fatalities and 415 injuries in the Western Balkans in the period 1998 to 2011. It is significant that the majority of these twenty reported incidents in the region occurred after 2006. This apparent recent increase in the frequency of such accidents underlines the need to invest more resources in sound stockpile management in the region, particularly for the destruction of obsolete and unstable surplus ammunition. Managing ammunition requires a comprehensive approach and a mix of complex and often expensive measures relating to planning, procurement, storage, usage, infrastructure, physical security, surveillance and final disposal. Proper management of conventional ammunition and explosives stockpiles involves procedures that increase safety and security at storage sites. This enhances the military's operational capabilities, reduces the risk of unplanned explosions and prevents illicit proliferation. Examples of catastrophic accidents associated with surplus and sometimes unsafe ammunition illustrate the need to address the existing threat and hazard in the Western Balkans as soon as possible.<sup>44</sup> The heavy rainfall that caused extensive flooding in Bosnia and Herzegovina, Croatia and Serbia in 2014 had an additional adverse effect in Bosnia and Herzegovina where some 70 % of the flood-affected area (approximately 800 square kilometres) was also an area heavily contaminated with landmines and unexploded ordnance (UXO). In addition to the flooding, heavy rainfall initiated thousands of landslides across the country and this together with the floods exacerbated the issue of mine contamination. The waters and

movement of earth dislodged an unknown number of landmines and UXO from their previous locations; one stockpile site was also flooded. As a result, it was necessary to resurvey the suspect areas in order to identify areas of possible 'expansion' of the suspect locations and to reduce the threat posed by landmines and UXO in flood-affected areas and communities.

#### 4 Conclusion

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This chapter has laid the foundation for a risk profile of the Western Balkans by analysing the extent of natural and human-made hazards and the disaster risk in the region. It has demonstrated that the distinction between natural and human-made disasters is anachronistic since all disasters are in fact partially the product of unresolved risk management issues and poor development choices. It further questions the distinction between natural and human-made hazards by showing their interdependence and how most hazards are shaped by human action/inaction. The empirical analysis therefore confirms that disasters in the region are socially constructed events intrinsic to 'blind' development.

The disaster risk profile of the Western Balkans is influenced by the legacy of war and the transition from one economic system to another. Most hazards in the region have the potential to become transboundary events for which regional collaboration is essential.

The six natural and three human-made hazards described in the preceding chapters trigger recurring small scale-disasters that have a significant cumulative impact on the well-being and livelihood of the people of the Western Balkans. From time to time, the region experiences catastrophic disasters like the flooding event in May 2014 that had an impact on several countries in the region with dire economic consequences and livelihood implications. The main opportunities for

<sup>43</sup> Lazarevic, (2012)

<sup>44</sup> Small arms survey, (2015)

reducing risk lie in reducing vulnerability and understanding how, when and where hazards manifest in the region. This is especially important given the unresolved development dilemmas that often increase population and GDP exposure to hazards. Climate change is another driver that is likely to result in more unpredictable, frequent and intense hydro-meteorological events in the years to come.

The maps in the natural hazards section shows that disaster risks are area based and dynamic. In a region characterised by multiple hazards, DRR becomes prominent at specific times and locations. The risk assessments included in this chapter represent one way of strengthening spatial analysis and thereby incorporating natural hazards, climate change and human-made hazards within development practice. It is worth noting that most of the analysis is based on publicly available data and open source software, which allows for an increase in the availability and quality of spatial risk assessments. The systematic use of geographical data processed through open source software allows communities, governments and development practitioners to better understand and map risks in order to develop appropriate DRR strategies at all levels. The forthcoming chapters explore this in more detail with illustrated concrete examples in Chapter 5.

## *HUMAN-MADE HAZARDS ARE CREATED DIRECTLY OR INDIRECTLY BY HUMAN ACTION OR INACTION*



*THE MOST VULNERABLE  
GROUPS SUFFER MORE  
THAN OTHERS*

# 3

**Who is  
Vulnerable  
and Why?**



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## ① Introduction: Why are people vulnerable?

### ② Who is vulnerable and why?

- ① Poor people
- ② Women
- ③ Children and the elderly
- ④ Persons with disabilities
- ④ Minorities
- ⑤ Migrants, returnees and IDP
- ⑥ Farmers

### ③ Conclusions

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#### ① Why are people vulnerable?

As discussed in the previous chapter, it is not simply the existence of hazards that endanger the lives and livelihoods of people. The impact that disasters have on human development depends on multiple factors, including the type of hazard, its location and duration as well as the level of exposure and vulnerability of the population.

Some people are more vulnerable. Obviously, people that live in hazard prone areas are most directly vulnerable to disaster risk. However, vulnerability based on geography and other types of vulnerabilities hamper the ability of people to prevent, mitigate, prepare for and cope with the aftermaths of disasters.

The primary drivers of vulnerability relate to the inherent characteristics of people, such as gender, life cycles or age and health status. Other drivers add to these inherent characteristics to make particular groups of people even more vulnerable. This includes human-made drivers (particular forms of behaviour, such as migration, settlement and over-dependence on land) and natural factors induced by climate change and exacer-

bated by human behaviour, such as over-consumption of energy that, for example, leads to global warming.

There are also other processes at play. These can include, for example, social exclusion, a lack of access to services and economic opportunities, a lack of assets and capabilities, inequality, injustice and bad governance. In brief, drivers of vulnerability can include inherent/intrinsic characteristics and structural factors that describe a particular population group, factors that result from specific human behaviour and factors that are the result of interventions exogenous of people: how nature interacts with human lives and how policies and governance are created.

Most of these drivers have one thing in common and that is that the state and its institutions can exacerbate them through poor governance, policies and practices. At the end of the day however, even if the drivers of vulnerability are inherent or the result of external factors, such as the environment or bad policies, the capacities of people to cope with risks and make informed choices further determines their own level of vulnerability.

## DEFINING VULNERABILITIES THROUGH THE LENS OF HUMAN DEVELOPMENT

Much of the existing research on vulnerability considers people's exposure to particular risks and is often sector specific. The UNDP *Human Development Report* 2014 'Reducing Vulnerabilities and Building Resilience' takes a different and more holistic approach. It considers the factors that contribute to risks to human development and then discusses the ways in which resilience to a broad range of evolving risks can be strengthened.

The report introduces the concept of *human vulnerability* and describes the probability of eroding people's capabilities and choices. Looking at vulnerability through a human development lens, the report draws attention to the risk of future deterioration in individual, community and national circumstances and achievements. It puts forward policies and other measures to prepare against such threats and make progress in human development more robust going forward.

The report emphasises in particular systemic and perennial sources of vulnerability. It makes the case that sustained enhancement of the capabilities of individuals and societies is necessary for a reduction in these persistent vulnerabilities, many of which are structural and tied to the life cycle. It asks why some people are better at overcoming adversity. One example is personal insecurity, because almost everywhere women are more vulnerable compared to men. It also asks what structural causes leave some people more vulnerable than others. People experience varying degrees of insecurity and different types of vulnerability at different points along the life cycle. Children, adolescents and older people are inherently vulnerable. This raises the question of what types of investment and interventions can reduce vulnerability during sensitive transitional periods in the life cycle.

Advances in development will be neither equitable nor sustainable until and unless

vulnerabilities are addressed effectively and all people are able to enjoy opportunities to share in human development progress.

This was also the message that was repeated in the 1994 Global HDR that introduced the concept of Human Security, which essentially ensures that gains made today are not lost tomorrow. The subject was also examined through a regional report for Europe and the CIS through the 2011 sub-regional report on Social Exclusion.

Source: UNDP *Global Human Development Report* 2014.<sup>1</sup>

<sup>1</sup> UNDP 2014. Human Development Report 2014: Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience.

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MOST OF THE DRIVERS OF VULNERABILITY CAN BE EXACERBATED BY POOR GOVERNANCE, POLICIES AND PRACTICES BY THE STATE AND ITS INSTITUTIONS

## 2 Who is Vulnerable in Western Balkans and Why?

Disasters have a different impact on men and women, rich and poor, young and old. Existing socioeconomic conditions mean that disasters lead to different outcomes, even for demographically similar communities. This is why structural or social characteristics, such as gender, age and ethnicity, require careful consideration throughout the planning, implementation and evaluation stages of Disaster Risk Reduction. Effective risk management and making communities more resilient require an understanding of how vulnerability is generated and how it can increase through non-resilient planning and development practices.<sup>46</sup>

In order to illustrate this through examples, seven archetypal vulnerable population

45 UNDP 2014. Human Development Report 2014: Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience.

46 [http://www.ipcc.ch/pdf/special-reports/srex/SREX-Chap2\\_FINAL.pdf](http://www.ipcc.ch/pdf/special-reports/srex/SREX-Chap2_FINAL.pdf). UNDP-UNEP 2015. Mainstreaming Environment and Climate for Poverty Reduction and Sustainable Development; Birkman, J. 2006. Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies, UNDP. 2014. Human Development Report 2014: Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience.

**“  
POOR PEOPLE  
VULNERABLE  
BECAUSE  
OF LIMITED  
LIVELIHOOD  
CHOICES,  
INADEQUATE  
COPING  
MECHANISMS  
AND EXCLUSION.**

groups in the Western Balkans are presented. This is by no means exhaustive, but their representation does reflect the types of vulnerabilities to hazards, both natural and human-made, discussed in the previous chapter. They are the ones who experience disasters as a life-altering event.

Keep in mind that these categories are neither mutually exclusive nor fixed: people can have multiple characteristics, for example, female, internally displaced or poor, through which they inherit different types of cumulative vulnerabilities. It is also possible that people find themselves exposed to different hazards throughout their lives. Therefore, most people experience a set of complex vulnerabilities and experience different risk factors during their life. The vulnerability of a person or group increases with the number of variables of vulnerability associated with them. For example, a healthy young man of the majority ethnic group with a low income may be vulnerable because of his economic status. His housing may be poorly constructed and located in an area with poor infrastructure and social services, and he may not be able to afford a smart phone on which he can receive early warnings. However, a young disabled woman from a minority group who recently migrated to the region would be far more vulnerable because of the combination of variables described in the preceding section. Therefore, gender coupled with the intersections of age, class, ethnicity and abilities governs the roles, opportunities, power and resources of women and men and girls and boys.

The seven archetypal vulnerable populations.

- ① **Poor people**
- ② **Women**
- ③ **Children and the elderly**
- ④ **Persons with disabilities**
- ⑤ **Minorities**
- ⑥ **Migrants, returnees and IDP**
- ⑦ **Farmers**



### **Poor People/Economically Vulnerable Populations**

Poor people (more precisely, economically vulnerable people who do not have access to adequate income and whose human development opportunities are lower than average) are not only poor in the basic resources. They also miss access to information that can be of vital relevance to their lives: information about the disaster risks they face and preparedness issues, market prices of the goods they sell, about health, the services of public institutions and their rights. They miss political visibility, a voice in institutions, access to knowledge, information on how to gain a means of livelihood, and education and skills that can advance their lives. Lower education also limits their understanding of early warning systems and access to response, evacuation and recovery information. Although they may have less assets to lose, the poor of the region do not have adequate coping mechanisms (be they assets, insurance, healthcare schemes or knowhow). They also tend to live in hazardous areas or in poorly constructed or ill-maintained houses that easily suffer damaged or collapse. They tend to be less educated, excluded from the decision-making process and lack the relevant information. They cannot afford adequate insurance schemes and lack the assurance of strong social networks.

Because of their limited livelihood choices, poor people are often, relatively speaking, most vulnerable to direct and indirect disaster losses and tend to rely on unsustainable coping mechanisms. The common risk management strategies of poor households include reduced food and health expenditure, withdrawing children from leisure and education activities, sending children to work and taking on debt. Since most assets in low-income households and communities are uninsured, poor people shoulder the greatest share of disaster losses.

Disaster risk is therefore increasingly becoming a poverty trap that directly affects the livelihood of many of the most vulnerable citizens in hazard-prone areas of the Western Balkans. The poverty incidence rate remains high in many Western Balkan countries within a range of 11.3 % to 29.7 % (see figure 3 below), while income disparity, particularly in urban areas, is widening. Unemployment continues to be a problem in many of these countries and territories, ranging (according to the ILO methodology) from a low of 16.9 % among males and 15.1% among females in Albania to a high of 35.3 % in Kosovo (see figure 4 below). Unemployment among internally displaced persons and ethnic minorities in ethnically homogeneous areas, especially Roma and Egyptian communities, is even higher. Persistent poverty and income disparities make communities and social groups less resilient and less able to cope with disasters.

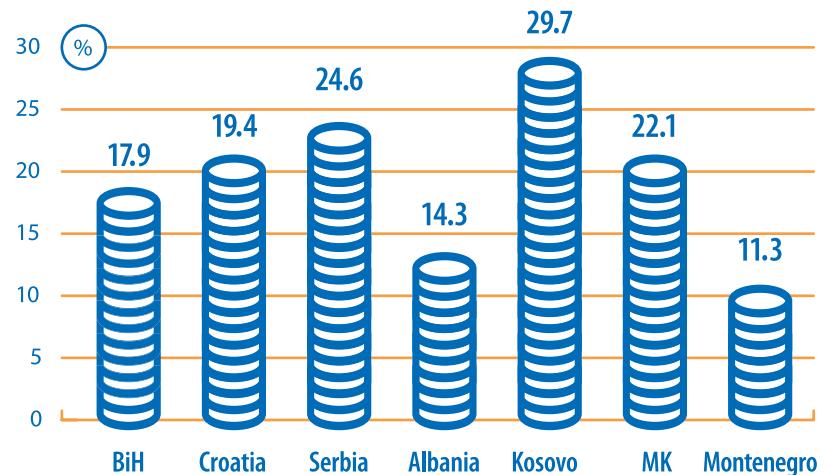
Rural poverty is another factor that shapes risk in the rural areas. Distance, isolation and lack of access to markets often limit farmer's livelihood options and coping strategies. Many rural dwellers depend on complex livelihood strategies, including seasonal migration or supplements through remittances sent from relatives living in the cities or abroad. These livelihood strategies will be even more complex in the future with the effects of climate change. The floods of 2014 and 2015, for example, resulted in a deepening of poverty in already poor municipalities and an expansion of poverty in others.



### Women

As proven globally, women and girls are at greater risk from disasters than men and boys. A study that involved 141 countries found that more women than men die during disasters.<sup>47</sup> The study clearly

<sup>47</sup> Neumayer and Plümper, 2007. The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002. Annals of the Association of American Geographers. 97 (3). pp. 551–566. The paper is available online at [http://eprints.lse.ac.uk/3040/1/Gendered\\_nature\\_of\\_natural\\_disasters\\_\(LSERO\).pdf](http://eprints.lse.ac.uk/3040/1/Gendered_nature_of_natural_disasters_(LSERO).pdf)



**FIGURE 3:  
INCOME POVERTY  
IN THE WESTERN  
BALKANS**

Source: Human Development Report 2015 and World Bank Kovodata available online. (Most recent available data)

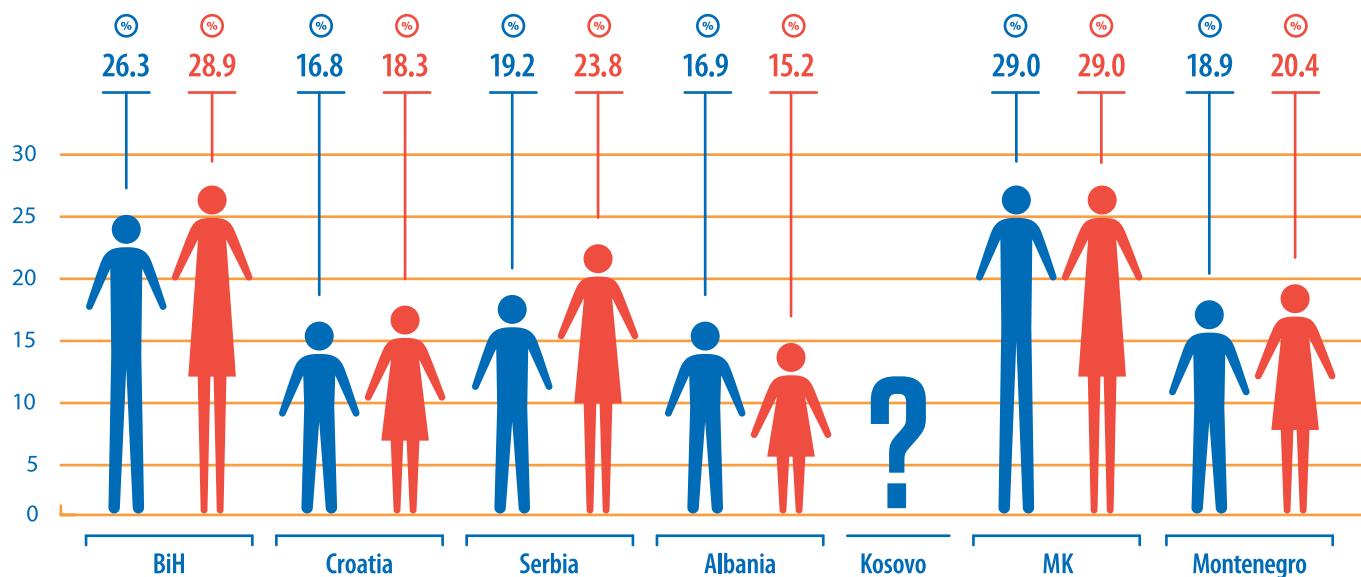
links this imbalance to the unequal socio-economic status of women, given that the locations inhabited by women with higher socioeconomic status suffered a significantly lower rate of female fatalities. The role of women and girls as caregivers for children and/or the elderly often limits their mobility. In general, women in rural areas have even less connections, networks and control over their life choices. Gender roles restrict women's mobility, particularly in rural areas; this is in part because of their reduced access to early warning and communications technology, with men being the gatekeepers. Women are also less able to respond because of the role they assume as caregivers for children, persons with disabilities and the elderly or due to pregnancy. Lower levels of education and less access to assets mean that women and girls often have less involvement in decision-making than men and boys, including decisions related to disaster risk management.

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**WOMEN  
VULNERABLE  
BECAUSE OF  
CAREGIVER  
RESPONSIBILITIES  
AND LIMITED  
ACCESS TO  
RESOURCES  
AND DECISION-  
MAKING  
PROCESSES.**

Global experience also demonstrates that gender roles change during disasters. Both sudden disasters and slow onset hazards, such as drought, desertification, deforestation and land degradation, add to the 'double burden'<sup>48</sup> of women with their domestic workload multiplied to sustain households through chores such as collecting water, food,

<sup>48</sup> 'Double burden' is a term used to describe the situation of women who perform paid work outside the domestic sphere as well as homemaking and child-care work inside the home.

**FIGURE 4:**

### UNEMPLOYMENT RATES IN THE WESTERN BALKANS

Source: Human Development Report 2015 and World Bank. (Most recent available data)

wood and medicine.<sup>49</sup> The workload of women also increases dramatically in post-disaster settings where their responsibilities increase as the men migrate in search of work. When displaced by a disaster, women and children suffer from the lack of privacy and security in temporary shelters as well increased incidence of intimate partner violence, physical violence and rape.<sup>50</sup> Pregnant and breast-feeding women have specific vulnerabilities during disasters and response due to their limited mobility and increased nutritional needs.

In the context of the Western Balkans, women in certain categories can be expected to be particularly vulnerable both during and after a disaster: the uneducated, the poor with no or limited access to land or financial assets, low-income and informal workers, the elderly, persons with disabilities or disease, the Roma community, single heads of households, particularly war widows with a large number of dependents; internally displaced and minority returnees in ethnically homogenous areas and women exposed to violence, particularly conflict-related sexual violence.

<sup>49</sup> Basnet, 2008; Boender and Thaxton, 2004; Cabrera et al., 2001; Daniell, 2007; Dankelman et al., 2008.

<sup>50</sup> Stark, L., Ager, A. Systematic Review of Prevalence Studies of Gender-Based Violence in Complex Emergencies, Sage Publications, 2015.

One of the characteristics of gender roles in the region that affects the way disasters impact differently on men and women is the extent of unpaid reproductive labour<sup>51</sup> and the care economy. Women undertake most of the unpaid care work, which mainly includes housework (preparing meals, fetching firewood and cleaning) and care work (caring for children, ill and older people) in the home and community. Disasters followed by displacement, even if temporary, place an additional burden on women's shoulders, forcing them to take up even more unpaid care work and in the process further diminishing their opportunities for emancipation and employment. Therefore, when designing interventions to respond to disasters this reality requires consideration to avoid exacerbating gender inequality.

In Albania and Serbia, for example, attempts to measure the value of unpaid care work showed that women perform more than twice as much unpaid labour as men. Women in Albania spent over five hours per day on unpaid labour compared to just under one hour by men. This disproportion was lower but still dramatic in Serbia where wom-

<sup>51</sup> Reproductive labour work refers to caregiving and domestic roles, including cleaning, cooking, child care, and the paid domestic labour force.

en spend on average around five hours on unpaid work and men slightly over 2 hours. The post-disaster needs assessments (PDNAs) that were subsequently carried out sought to avoid responses to the flooding that would widen the gender gap or further lock women into disadvantaged or marginalised roles. An attempt was therefore made to monetise women's unpaid labour when calculating the losses incurred because of the flooding, *inter alia* by using time-use survey data.



### Children and the Elderly

The vulnerability of children and the elderly has largely to do with their dependency on others and physical weakness. Transition from one phase in life to another (e.g. entering and leaving the labour market) often changes the risk profile for specific age groups.

When you consider that children and the elderly constitute more than half of the population their vulnerability is an important aspect of the overall disaster risk profile of the Western Balkans. Children are particularly sensitive to changes in climate, because their body and mind is under-developed and this limits their ability to adapt to heat, cold and other climate related extremes.

Ageing populations in the Western Balkans mean that an increasing share of people affected by future disasters will be over sixty. This is likely to result in more casualties in sudden onset disasters due to limited mobility, dependency on caregivers, medicine and medical treatment. The elderly will suffer disproportionately from disaster risk without comprehensive social protection schemes that can be scaled up during and after a disaster and an effective health system in place.

This correlation of vulnerability and life cycle is especially daunting for the region. Demographic specifics in the Balkans point to a huge dependency ratio. In Croatia, for exam-

ple, vulnerable groups of children and the elderly comprise more than fifty per cent of the population.

Very few countries in the Western Balkans have developed special protocols on how to address the special physical, medical and psychosocial needs or capacities of children and the elderly. Yet life cycle vulnerability is a critical consideration in any effort to reduce vulnerability and increase resilience. Capabilities accumulated over an individual's lifetime have to be nurtured and maintained otherwise they can stagnate and even decline. Investments made in earlier stages of life influence capabilities later in life and there can be long-term consequences of exposure to short-term shocks. A setback in early childhood, for instance, can have serious ramifications throughout the rest of a person's life, including the chances of holding onto a job, uncertainty associated with growing older and the transmission of vulnerability to the next generation. Particular attention is needed at sensitive periods in life, because investments in early childhood education, a focus on employment opportunities for youth and support for older people enhance life capabilities.

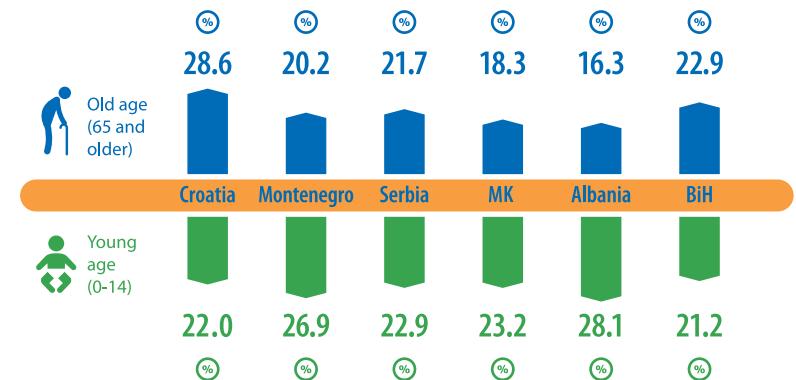
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**CHILDREN AND THE ELDERLY VULNERABLE BECAUSE OF THEIR DEPENDENCY ON OTHERS OR WEAKNESS.**

**FIGURE 5.**

### DEPENDENCY RATIO

Source: UNDP Human Development Report 2015 (Most recent available data).



### Minorities

In addition to age and gender, other social inequalities, such as ethnicity, shape the specific vulnerabilities and capacities of girls, boys, women and men in the Western Balkans. Minorities in particular

**“  
MINORITIES  
VULNERABLE  
BECAUSE OF  
DISCRIMINATION,  
MARGINALISATION  
AND EXCLUSION.**

are at risk for a number of structural reasons related to multiple vulnerabilities. These include being poor, living and working in hazard-prone areas and substandard buildings that are of poor quality and/or insufficiently maintained, having inadequate access to quality social services and being excluded from decision-making structures and processes. These compound vulnerabilities have at their root the problem of discrimination and marginalisation.

A revealing example is that of the situation of the Roma population and the flooding that occurred in Serbia in 2014. Roma, who are among Serbia's most vulnerable communities, tend to live in high risk and under serviced areas such as flood plains. They are therefore more likely to have their homes and prospects for livelihood damaged or destroyed by floods. On average, Roma represent 2.1 % of the population in the flood-affected municipalities in Serbia: 11 % live in Kraljevo, 8 % in Lazarevac, 7% in Koceljeva, 4.1 % in Ub and 2.3 % in Obrenovac. Obrenovac is the most affected municipality with a twenty per cent incidence rate of internal displacement. In ninety-three per cent of cases, the Roma owned their dwellings but had no insurance coverage.

While no serious incidents of discrimination against Roma were reported this minority group inevitably suffered. For example, food

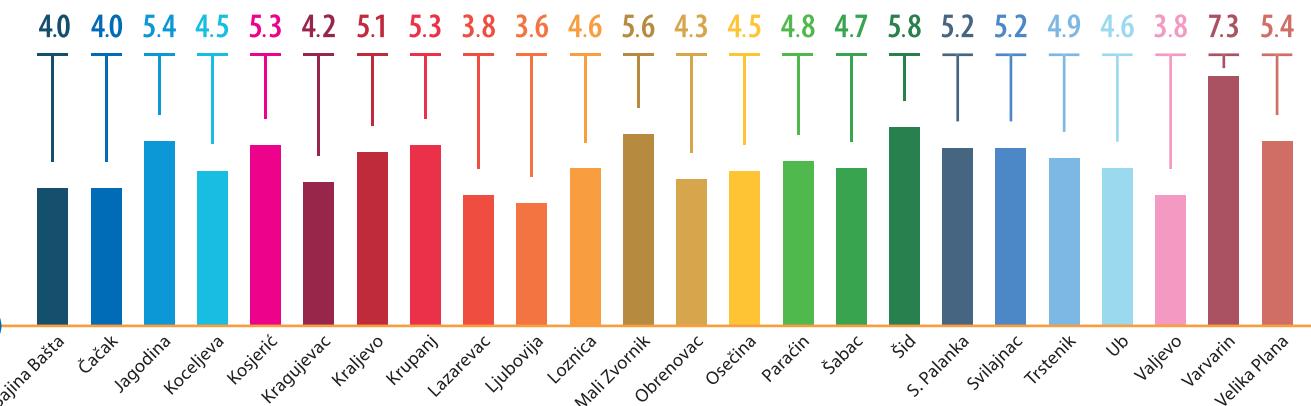
was distributed first among the working population and on average only forty per cent of Roma males and only thirteen per cent of Roma females were employed officially. A large portion of the population was engaged in subsistence farming yet the floods destroyed farms and yards. The sale of agricultural products from flood-affected areas was also banned temporarily because of possible contamination. Schools were closed ahead of time and final exams were postponed or held in nearby education establishments. Children in poor and vulnerable Roma families were also at greater risk of not enrolling in school in September 2014, due to worsened income and living conditions.



**People on the Move:  
Migrants, Returnees, IDP and  
those Moving to Urban Areas**

When it comes to vulnerability in relation to mobility, people can be affected in three ways. The first involves people on the move, such as migrants, returnees and IDPs, who can become exposed as a result of their unpredictable movement and mobility, settlement in insecure and exposed areas and lack of information and decision-making powers in their new settlements. These people become uprooted and dislocated from their societies, communities, connections, networks and safety nets and have little control over their lives. Recent immigrants, particularly refugees, are generally more vulnerable

**FIGURE 6:**  
**THE ROMA  
POPULATION IN  
FLOOD AFFECTED  
MUNICIPALITIES IN  
SERBIA IN 2014**  
Source: Statistical Office of the  
Republic of Serbia, 2011.



compared to local residents. This is because, among other things, they may be unable to understand early warnings regarding extreme events due to language barriers. They often distrust authorities because of their illegal status and they often live in ephemeral shelters in hazard prone areas such as along riverbanks. These settlements are often located in ravines, on steep slopes, along flood plains or adjacent to noxious or dangerous industrial or transport facilities. In recent years, populations from the Middle East, Asia and Africa have been using the Western Balkans as a transit route to reach countries of the European Union. Few have settled and so this type of vulnerability is not particularly pertinent to the region, although an increasingly number of migrants have become stranded in Serbia, Hungary, Croatia, Bulgaria and Slovenia awaiting opportunities to go on to Germany and other west European countries.

The second type of vulnerability can result from displacement caused by natural hazards, which can be termed as eco-migration. As the IOM defines them, environmental migrants are persons or group of persons who for compelling reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently and who move either within their country or abroad.<sup>52</sup> It is likely that this issue will become more critical in the Western Balkans in the future because of the impact of climate change and the large farming community in the region.

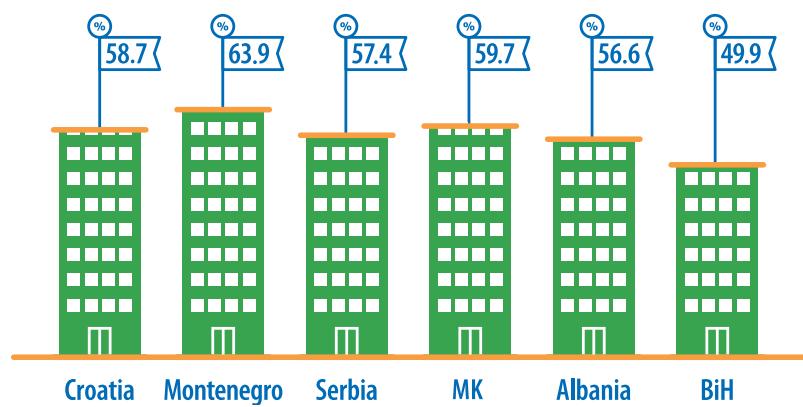
The third cause is internal migration. Urbanisation is a growing phenomenon in the Western Balkans with populations moving to the cities in search of better opportunities. This leads to the concentration of people and their wealth within certain geographical spaces.

This move towards urbanisation coupled with growing population and population density and compounded by poorly maintained and overstretched public infrastructure, which includes transport, energy, drainage systems and communications, has become an important risk driver. Cities are often located in fertile river basins, in hilly areas or near coastlines and characterised by high exposure to natural hazards. Tirana, the capital city of Albania, for example, is situated in a mountainous area with significant likelihood of earthquakes and floods. Within cities, low-income households often have little choice but to occupy areas most exposed to hazards with low land values, poorly maintained or non-existent infrastructure, high levels of environmental degradation and an absence of social protection schemes. In cities with migrant or internally displaced populations, social and economic networks tend to be lost. Many people, especially minority groups and those of low social status like Roma, suffer from social exclusion and political marginalisation, which leads to a lack of access to resources and increased vulnerability. Urbanisation is as high as 64 % in Montenegro and 61 % in Kosovo,<sup>53</sup> while in the least urbanised country Bosnia and Herzegovina half of the population resides in urban settlements.

**“  
PEOPLE ON  
THE MOVE  
VULNERABLE  
BECAUSE OF  
UNPREDICTABLE  
MOBILITY,  
SETTLEMENT IN  
INSECURE AND  
EXPOSED AREAS,  
AND EXCLUSION.”**

**FIGURE 7:  
URBANISATION RATES  
IN THE WESTERN  
BALKANS IN 2014.**

Source: UNDP Human Development Report 2015.



<sup>52</sup> IOM, 2008. Expert Seminar: Migration and the environment, International Dialogue on Migration, No. 10.

<sup>53</sup> In 2011, according to askdata.rks-gov.net.

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**PERSONS  
WITH  
DISABILITIES  
VULNERABLE  
BECAUSE OF  
PHYSICAL  
CHALLENGES,  
DEPENDENCY  
ON OTHERS AND  
DWINDLING  
PUBLIC  
ASSISTANCE.**

### STRESS ON THE URBAN HABITAT

Since the end of the Balkan wars, rural to urban migration has increased resulting in dense population centres in each country. In some areas, this has resulted in an unprecedented boom in construction, much of which is not adequately managed and is poorly regulated. In some instances, countries are still using building codes from the 1980s, which are no longer adequate. Those countries working to become compliant with EUROCODE building codes struggle with capacity issues to become fully compliant. Additionally, a lack of infrastructure maintenance and unsafe building and land use practices have contributed to structural vulnerability. For example, the Seismology Service of Serbia estimates that over 60 % of buildings are highly vulnerable to floods and earthquakes including critical public facilities such as hospitals and schools.<sup>54</sup> In addition to these challenges, according to UNISDR, enforcement of zoning and construction codes is a significant issue throughout the region.<sup>55</sup> For example, an OSCE study finds that illegal construction and informal settlements in Kosovo have proliferated, informal and illegal transactions continue unabated, illegal occupation of property remains rampant and the cadastre system and property rights register are incomplete and inaccurate.<sup>56</sup> An additional contributing factor has been the near collapse of operations and maintenance during war and its incomplete recovery and fragmentation since.

Source: UNISDR (2008) and the Internal Displacement Monitoring Centre (2007).

54 UNISDR, 2008, South Eastern Europe Disaster Risk Mitigation and Adaptation Initiative: Risk Assessment for South Eastern Europe, Desk Study Review

55 UNISDR 2008

56 Internal Displacement Monitoring Centre, 2007, 'Overview of Obstacles Faced by IDPs to Access their Land or Property' [http://www.internaldisplacement.org/idmc/website/countries.nsf/\(httpEnvelopes\)/5F66CE98DE9B8F-E7C12573AC00443A52?OpenDocument#sources](http://www.internaldisplacement.org/idmc/website/countries.nsf/(httpEnvelopes)/5F66CE98DE9B8F-E7C12573AC00443A52?OpenDocument#sources); World Bank, 2005, Kosovo Poverty Assessment: Promoting Opportunity, Security and Participation for All, Report No. 32378-XK

### Persons with Disabilities

 While people with disabilities are often a most vulnerable population group, different levels and types of disabilities (physical, intellectual, mental, sensory, combined) make generalisation about their vulnerability to disaster risks difficult.

Persons with disabilities together with family members who care for them are particularly vulnerable to socioeconomic factors. Apart from the potential physical inability to escape during a disaster, their reliance upon others to ensure their escape may involve reliance upon public services that may not be available during the recovery period following a disaster. In most instances, disability assistance is insufficient to enable a disabled person to cover the cost of relocating their home from a hazard zone. Again, minorities or recent immigrants with disabilities are often more vulnerable to disasters than other disabled population groups. This is because national criteria and restrictions means that they do not have access to public aid.

There were many lessons learned on how to better protect and empower people with disabilities during disasters drawn from the flood disaster that struck the Western Balkans. The reconstruction of public buildings damaged by the flooding should make these structures more accessible to people with disabilities with ramps constructed and flat flooring suitable for wheel chairs, handrails for visually impaired people and other such proactive measures. A registry of persons with disabilities would enable fast response and provide the various authorities with the relevant information required for effective emergency protocols. Key and highly relevant information on people with disabilities includes their location/place of residence, type of disability or disabilities, level of mobility, care arrangements and next of kin. Access to affordable assistive technologies would be another important enabler for

## THE 2014 FLOODS AND PEOPLE WITH DISABILITIES

The devastating floods that occurred in Bosnia and Herzegovina and Serbia in May 2014 provided some hard lessons on the particular disadvantages of people with disabilities. In Serbia, they comprised about 8 per cent of the population in flood-hit municipalities. The number was even greater in BiH, given the spike in the disability rate (at approximately 11 to 15 % of the population) during and in the aftermath of the war that ended in 1995. Information from the flooded regions of Doboj and Bijeljina in BiH confirmed the disastrous situation of the PwD population during the floods, due primarily to the nonexistence of early warning systems or evacuation protocols in emergency situations targeted at their need. To begin with, this population group became especially vulnerable because their lodgings, that have to be on the first floor, were flooded, suffered the most damaged or were destroyed. In the absence of records about PwD identifying their place of residence and level of disability, mobility and communication levels, civil defence found it impossible to reach this vulnerable population in a systematic way (even if there had been a proper evaluation protocol). Local communities did not have a list of persons with disabilities, which would have allowed for more informed decisions on their evacuation and aid delivery. Furthermore, the aid was delivered at points not accessible to persons with disabilities. This made access to food and medicine dependent upon the solidarity and good will of family/neighbours.

Nera Monir Divan, UNDP BiH.

moving away from the charitable model and towards independent living and resilience for people with disabilities. Neighbourhood committees and civil defence provide the main support at the community level aimed

at implementation of Chapter 11 of the United Nations Convention on the Rights of Persons with Disabilities, which provides guidelines for emergency protocols. An example of disability inclusive DRR<sup>57</sup> is featured by UNDP the former Yugoslav Republic of Macedonia who developed a handbook for disaster management and produced evacuation plans and maps for students with a visual impairment, in Braille alphabet. Similarly, videos<sup>58</sup> featuring recommended behaviour during heatwaves and extreme cold and other hazards were produced for students with impaired hearing.



### Farmers

Farmers are included here as a vulnerable group because their livelihood is heavily dependent on the cycles of nature. The Western Balkans region has diverse potential for agricultural production ranging from fertile plains and river valleys to the less productive karst, hilly and mountainous areas. Almost half of the land in the region is dedicated to agriculture (19 % pasture, 29 % arable land and permanent crops), while from forty to sixty per cent of the population lives in rural areas. Many of those living in rural areas depend on the land they live on. This applies to farmers in particular because their sole existence depends on the crops and livestock they produce. Despite the growth of industry and the service sector, agriculture remains an important part of the economies of the countries of the Western Balkans. The agricultural sector in the region contributes approximately 11 % to GDP (ranging from, for example, 5 % in Croatia to 21.3 % in Albania), compared to only 1.7 % in the EU 27.<sup>59</sup> The agriculture sector employs on average 18 % of the population. This number

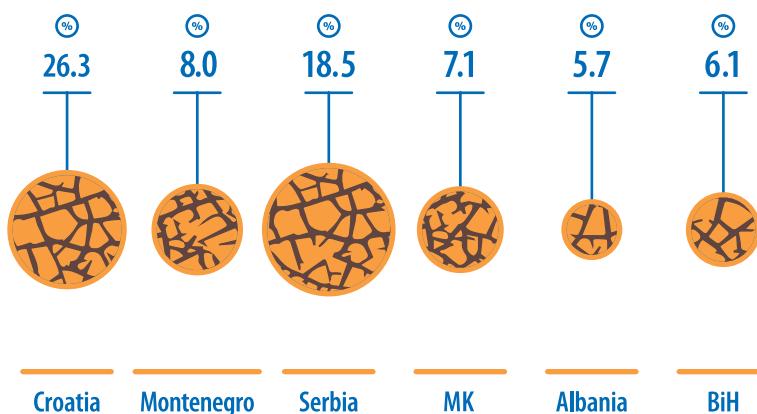
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**FARMERS  
VULNERABLE  
BECAUSE THEIR  
LIVELIHOOD  
DEPENDS ON  
THE CYCLES OF  
NATURE.**

57 [http://www.mk.undp.org/content/the\\_former\\_yugoslav\\_republic\\_of\\_macedonia/en/home/ourwork/environmentandenergy/successstories/addressing-the-needs-of-people-with-disabilities-in-the-event-of.html](http://www.mk.undp.org/content/the_former_yugoslav_republic_of_macedonia/en/home/ourwork/environmentandenergy/successstories/addressing-the-needs-of-people-with-disabilities-in-the-event-of.html)

58 <https://www.youtube.com/watch?v=vQ77tkD-6Ck>  
[https://www.youtube.com/watch?v=ffQCq79K\\_Js](https://www.youtube.com/watch?v=ffQCq79K_Js)

59 FAO, 2014.



**CHART 3:**  
**POPULATIONS LIVING  
ON DEGRADED LAND**

Source: UNDP Human Development Report 2015.

is highest in Albania at 41 %.<sup>60</sup> Agriculture is one of the sectors most vulnerable to climate change due to the growth cycles of animals and crops being highly dependent on weather conditions.

Smallholdings comprise a large proportion of farmers in the Western Balkans. By default this makes them less resilient to external events brought about by climate change and disasters in the form of drought, extreme weather events (cold spells, frost and heatwaves), fires, extreme precipitation, land degradation, depletion of topsoil, flooding and water and land contamination.

The countries of the Western Balkans face the issues of deforestation and overgrazing, which have contributed to erosion and this in turn increases the likelihood of landslides, mudflows, land depletion and loss of topsoil. Degraded soils and land are unable to retain as much water, leading to increased flooding and increased pollution and sedimentation in rivers and streams. In Albania, for example, erosion affects about twenty-five per cent of the country with the most critical areas being Shkodra, Tropoja, Saranda and Gjirokastra. In Croatia, about ninety per cent of the soil surface is exposed to water and wind erosion.<sup>61</sup>



*REDUCING  
RISKS REQUIRES  
REDUCING  
VULNERABILITY  
BY ADDRESSING  
THE UNDERLYING  
RISK DRIVERS AND  
STRENGTHENING  
CAPACITIES*

<sup>60</sup> World Bank, 2012

<sup>61</sup> UNEP/ENVSEC, 2012

The agriculture sector is heavily dependent on precipitation, yet changes in precipitation can have significant implications on the stability of the sector through drought or flooding. The sector is also dependent on water in terms of availability and quality. Most crops in the region depend on rainfall, because of very limited irrigation and storage capacities. Water pollution due to the discharge of untreated wastewater is a major source of pollution for both surface and groundwater sources; agriculture contributes considerably to this through agricultural run-off.

Without adaptation measures in place, it is anticipated that climate change will bring about a decline in agricultural output, further loss of topsoil and poorer land quality. Pastures and grasslands used for grazing livestock may also suffer negative effects caused by extreme events through a decline in the quality and quantity of animal feed, which in turn affects both production and prices.

There are several examples in the Western Balkans of how non-resilient development practices and land and river basin management have made people living in the region more vulnerable to extreme events. In each country, people living adjacent to the major rivers who farm or run businesses on the floodplains either are at risk of flooding or have already had their homes, crops, livestock and businesses destroyed or damaged by flooding because they are located in a flood hazard zone. A combination of non-resilient local planning and poor management of ecosystem resources combine to make these communities, farms and businesses even more vulnerable.

### 3 Conclusion

Since the end of the wars of the 1990s, the Western Balkans region has become a lot less prone to armed conflict. Economic growth in the last fifteen years has also reduced income poverty levels across the region. Many

problems remain nonetheless, especially for Roma, IDPs/refugees, the long-term unemployed and other vulnerable groups. Their vulnerability is further perpetuated through their exposure to natural and human-made hazards and the increased frequency, unpredictability and intensity of hydro-meteorological hazards caused by climate change. The impact of hazards is not just the result of the presence of risks but also the capacity of people and communities to mitigate them. This capacity for resilience or its absence depends on a host of structural vulnerabilities inherent within social groups, which can result from their access to assets and information and the effectiveness of policies and good or bad governance.

This is why it is important to reiterate that development interventions must start by properly identifying, analysing and managing the risks.

Reducing risks requires reducing vulnerability by addressing the underlying risk drivers and strengthening capacities, be they at the level of governance or that of people and communities. Disasters can amplify social exclusion, economic inequality, gender inequality and poverty, but they can also provide an opportunity, through risk reduction action and post-disaster recovery, to address such issues as part of the promotion of resilience and therefore help reduce inequalities in sustainable human development.

## *PERSONS WITH DISABILITY ARE PARTICULARLY VULNERABLE SOCIO-ECONOMICALLY, AS ARE FAMILY MEMBERS CARING FOR THEM*



*STORIES FROM  
REGION*



*Ali, a shepherd from Suhe Village, Albania, can now graze his sheep through the green fields*

# Albania

## **Helping Albania recover from the worst floods in living memory**

In February 2015, water overflow from the Drinos river in Albania washed away the protective embankment of Suhe Village, causing flooding over around 300 hectares of farmland, pastures, homes and local businesses. Ali, a shepherd, watched half of his flock be swept away in the flood. With funding from the EU, UNDP Albania supported the repairs of the embankment, saving valuable agricultural land and the locals' livelihoods, and avoiding the consequences of future disasters.



Premier Limited Company managed to recover and keep all its female employees after the floods 2014

# Bosnia and Herzegovina

## Supporting the employed women of BiH after the floods

The Premier Limited Company was devastated by the floods of May 2014. The building and all of the equipment were destroyed, and its 60, mostly female, employees abruptly found themselves jobless.

After only one month, with a grant from the EU Floods Recovery Programme, the company found its feet producing textiles again.

"If not for the project's support," says Rankica Panic, manager of the company, "I would have been forced to take the additional strain of a bank loan."

Ms Panic is one of 116 SME owners whose companies recovered thanks to the EU Programme implemented by the UNDP.

Cover page of the publication



ODRENOVAC - REPUBLIKA SRBIJA    GUNJA, RAJEVO Selo - HRVATSKA    DOBOJ, MAGLAI - BOSNA I HERCEGOVINA

## Croatia

**"Flood, and then Darkness!" – Balkan Waters – children's "comix" to survive after the flood is gone.**

To help the children cope with the disaster in areas hardest hit by floods in Croatia, Serbia, and Bosnia and Herzegovina, UNDP supported comic drawing workshops that resulted in Balkan Waters book of cartoons. This chronicle of the devastation of the 2014 flood seen through the eyes of a child is shared with citizens in the region in order to sensitize people to the importance of future disaster risk management in the Balkans.



*The bridge over the River Bregalnica between the village of Razlovci and the town of Delcevo, the former Yugoslav Republic of Macedonia*

# the former Yugoslav Republic of Macedonia

## Flooding cuts off rural village

The 2015 floods severely damaged the only bridge connecting the villagers of Razlovci to the rest of the country. Around a thousand people depend on the bridge to get to work and school, healthcare and shopping. Thanks to the EU Recovery Programme implemented by UNDP, this vital connection is now being restored.

*Raising awareness  
on the importance  
of using the  
free emergency  
number among  
children, Prishtina,  
Kosovo*



## Kosovo

### Raising Awareness on 112 Emergency Number

The Emergency Management Agency (EMA) and the Emergency Operation Center 112 joined efforts with the UNDP to involve communities in bolstering disaster resilience by ensuring that kids know who to call in an emergency. They organized a quiz for children at the Kosovo-wide TV station, RTV 21, as well as a fair for emergency services in a main square in Pristina.

"We were thrilled to see that all participants were well prepared and showed interest in risk mitigation," said Dea Haxhi, project officer from UNDP Kosovo Disaster Risk Reduction Project, "a concern that grows more important with each passing day."



*Milinko Kojić,  
village Donja  
Trešnjica, Serbia*

# Serbia

**“The flood took everything, it was incredible.”**

Milinko Kojić from Donja Trešnjica, a small village in Serbia, watched the May 2014 floods wash his entire life away. When he and his wife were awoken by the noise of torrential floodwaters just meters from their home, they ran barefoot to their neighbor's for shelter. When they returned, their house and stable were completely gone. “The torrent took everything in its path,” said Milinko, “it was incredible.”

UNDP supported the construction of dozens of torrential barriers across mountainous parts of Serbia, protecting lives and property of thousands of people from future flash flooding.

*Residents of the village Žabljak Crnojevića on the shore of Skadar Lake, Montenegro severely hit by a devastating floods in December 2010. Photo: Miloš Vujović/UNDP Montenegro*



## Montenegro

Flood in Žabljak, Crnojevica River



*A fisherman from a village Žabljak Crnojevića on the shore of Skadar Lake in Montenegro after devastating floods in December 2010.*

*Photo: Miloš Vujović/UNDP Montenegro*



# 4

## **Measurement and Use of Data for Risk-Informed Human Development**



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## ① Introduction

## ② The Human Development Index (HDI) in the Western Balkans

- Ⓐ Measuring the HDI
- Ⓑ Human Development in the Western Balkans
- Ⓒ Inequalities in the Western Balkans
- Ⓓ Human Development affected by Disasters in the Western Balkans

## ③ The Use of Data for Understanding Hazards and Informing DRR Interventions

## ④ Conclusion

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### ① Introduction

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#### The Need to Measure the Risk to Human Development

Real progress in human development is not just about enlarging people's critical choices and their ability to be educated, healthy, have a reasonable standard of living and feel safe it is also about sustaining such achievements. Reducing the vulnerability of people to setbacks such as disasters can help achieve this. Some people are better at overcoming adversity. Those less prepared may suffer from different types of structural vulnerabilities and insecurities and find themselves more vulnerable due to their respective life cycle phase. Financial instability, a lack of job security and the increasing pressures of climate change exacerbate human vulnerability and disasters have extensive potential to undermine the progress gained in human development.

However, the question of how to measure the risk to human development remains. This chapter examines the question of how measurement and the use of data can capture the elements required for quantitative mapping of the concept of Risk-Informed Human Development advocated in this report.

- 1) Part I addresses the Human Development Index, including its definition, its measurement in the Western Balkans and its components. It then looks at the possible impact that disasters may have on the HDI by using the example of projected changes to HDI levels based on the floods that occurred in Bosnia and Herzegovina and Serbia in 2014 and 2015.
- 2) Part 2 examines the question of the use of data in general **for understanding** hazards and informing DRR interventions.

### ② The Human Development Index (HDI) in the Western Balkans

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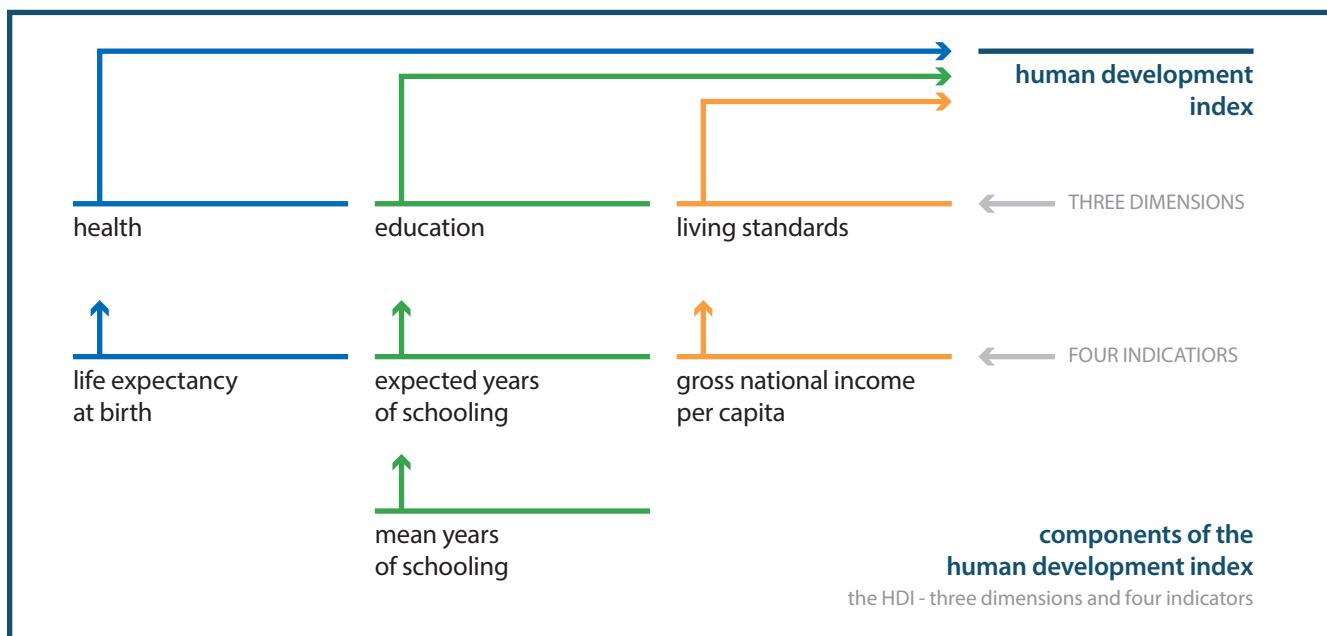
#### Ⓐ Measuring the HDI

As Amartya Sen put it in 1993, "Human Development has two sides: the formation of human capabilities – such as improved health, knowledge and skills – and the use people

“

A HUMAN  
DEVELOPMENT  
APPROACH IS  
INCOMPLETE  
IF IT DOES NOT  
INCORPORATE  
VULNERABILITY  
AND RESILIENCE  
INTO ITS  
EQUATION

In order to make people more resilient it is necessary to enhance their ability to cope with shocks and adjust to adverse events. Expanding their choices, agency and strengthening the capacities of societies and individuals through risk-informed development can help achieve this. A Human Development approach is incomplete if it does not incorporate vulnerability and resilience into its equation.



make of their acquired capabilities – for leisure, productive purposes or being active in cultural, social and political affairs. Thus, capability should be understood as various combinations of functionalities (i.e. states and activities that constitute a personal view of a ‘good life’) that a person is able to achieve.”<sup>62</sup>

This theory – known as the capabilities approach – became a dominant paradigm in the field of human development.

The Human Development Index (HDI) was created in order to emphasise that people and their capabilities should be the ultimate criteria for assessing the development of a country and not economic growth exclusively. The HDI composite index is a summary measure of average achievement in three key dimensions of human development: (1) a long and healthy life, (2) attainment in education and (3) a decent standard of living.

As one of the authors of the HDI, Mahbub ul Haq recalled that there were several principles guiding the search for a new index: (1) to find a measure that goes beyond income

whilst retaining methodological soundness, (2) to limit the number of variables in order to ensure simplicity and manageability, (3) to construct a composite index rather than an extensive set of indicators, and (4) to merge social and economic indicators.<sup>63</sup> The HDI has been gradually refined since 1990, but the main principles remain unchanged.

The health dimension is assessed according to life expectancy at birth, while the education dimension is measured by mean of years of schooling for adults aged twenty-five and above and expected years of schooling for children of school entry age. The standard of living dimension is measured against gross national income per capita (in purchasing-power-parity terms). The HDI uses the logarithm of income to reflect the diminishing importance of income with increasing Gross National Income (GNI). The scores for the three HDI dimension indices are then aggregated into a composite index using a geometric mean.

Yet the HDI simplifies and captures only part of what human development entails. It does

Source: UNDP Human Development Report Office

<sup>62</sup> Amartya Sen, *The Quality of Life*, In M.C Nussbaum & A. Sen (ed.), New York: Oxford, Clarendon Press, 1993.

<sup>63</sup> Mahbub ul Haq, ‘The Birth of the Human Development Index’, In S. Fukuda-Parr & A. K. Shiva Kumar (ed.) *Readings in Human Development*, Oxford: Oxford University Press, 2003.

**TABLE 4:**  
**HUMAN**  
**DEVELOPMENT**  
**INDICATORS FOR**  
**COUNTRIES IN THE**  
**WESTERN BALKANS**

Source: UNDP Human Development Report 2015.

HDI rank*	Country	Value	Human	Life	Expected years	Mean years	Gross	GNI
			Development	expectancy	of schooling**	of schooling***	national	per capita
			Index (HDI)	at birth	(years)	(years)	income	rank minus
				2014	2014	2014	2014	2014
47	Croatia	0.818	77.3	14.8	11.0	19,409	11	
49	Montenegro	0.802	76.2	15.2	11.2	14,558	27	
66	Serbia	0.771	74.9	14.4	10.5	12,190	20	
81	MK	0.747	75.4	13.4	9.3	11,780	9	
85	Albania	0.733	77.8	11.8	9.3	9,943	14	
85	BiH	0.733	76.5	13.6	8.3	9,638	19	

\* Out of 188 countries and territories.

\*\* This refers to the number of years of schooling that a child of school entry age can expect to receive if the prevailing patterns of age specific enrolment rates persist throughout the child's school life.

\*\*\* The average number of years of education received by people aged 25 or above converted from education attainment levels using the official duration for each level.

\*\*\*\* The aggregate income of an economy generated by its production and its ownership of factors of production less the income paid for the use of factors of production owned by the rest of the world converted into dollars using PPP rates then divided by the mid-year population.

not reflect on inequalities, poverty, human security, empowerment and such like. The Human Development Reports Office (HDRO) offers other composite indices as broader proxy for some of the key issues of human development: inequality, gender disparity and human poverty.

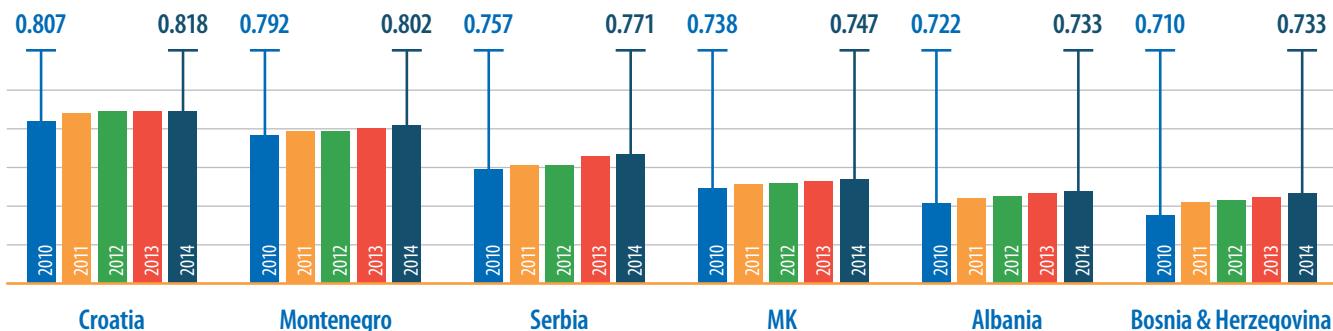
## B Human Development in the Western Balkans

Specific local conditions often determine development opportunities. These conditions include economic parameters (employment opportunities and the impact of economic crises), state of environment as well as political aspects (history of local civic participation), but increasingly exposure to climate change, exposure to risks and adaptation and mitigation capacities.

Among the Western Balkan countries, Croatia and Montenegro are classified as countries with very high human development, while the rest of the countries are classified as countries with high human development.

**FIGURES 8 AND 9:**  
**HDI GROWTH AND**  
**CHANGES IN HDI**  
**RANKING**

Source: UNDP Human Development Report 2015.



64 Purchasing power parity.

	C/I	2002	2005	2007	2008	2009	2010	2011	2012	2013	2014
Albania		0.33	0.31	-	0.30				0.29		
BiH	I	-	-	0.33	-	-	-	-	-	-	-
Kosovo	C	-	0.31	-	-	0.32	0.33	0.28	0.29	0.27	-
Croatia	I	-	-	-	0.34	0.33	0.27	0.32	0.313	0.313	0.303
MK	I	0.39	0.39	-	0.44	-	-	0.392	0.392	0.372	-
Montenegro	C	-	0.30	0.31	0.30	0.30	0.29	0.31	0.32	0.33	-
Serbia	I	0.33	0.33	0.29	0.28	0.29	0.30	0.251	0.261	0.261	0.261

C = Consumption and I = Income

1) <http://socijalnoukljucivanje.gov.rs/wp-content/uploads/2015/10/Poverty-in-Serbia-2014..pdf> (p. 15, accessed 20 April 2016).

2) <http://www.stat.gov.mk/Publikacii/2.4.15.13.pdf> (p. 7, accessed 20 April 2016).

3) <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&language=en&pcode=tepsi190> (accessed 20 April 2016).

All countries in the Western Balkans region have experienced growth in HDI and change in HDI ranking since the HDI measurement began.

HDI growth in the Western Balkans countries was driven mostly by pure economic growth, measured in GDP rather than according to the social component of the Human Development Index.

### (c) Inequalities in the Western Balkans

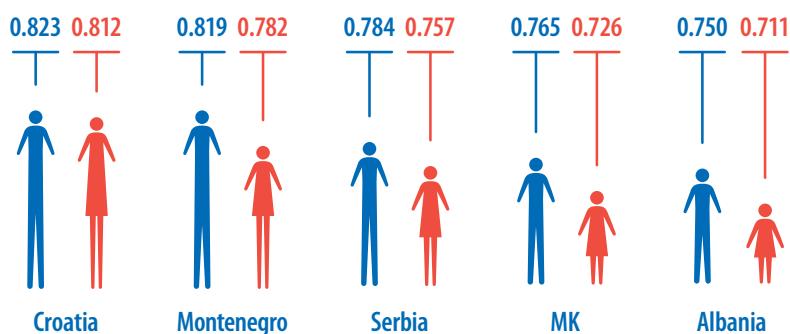
The Gini Index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Gini coefficient of zero expresses perfect equality, where all values are the same, for example, where everyone has the same income. A Gini coefficient of one expresses maximal inequality among values.

As shown in the table below, inequality is highest in the former Yugoslav Republic of Macedonia. The inequality values indicate high inequality, but not as high as, for example, in the USA and UK, whose Gini is over the value 0.45.

The gender dimension is prominent with HDI with values for females consistently lower than the corresponding values for males. The gender disaggregated HDI tells a story of gender inequality, which is most pronounced in Albania, the former Yugoslav Republic of Macedonia and Montenegro.

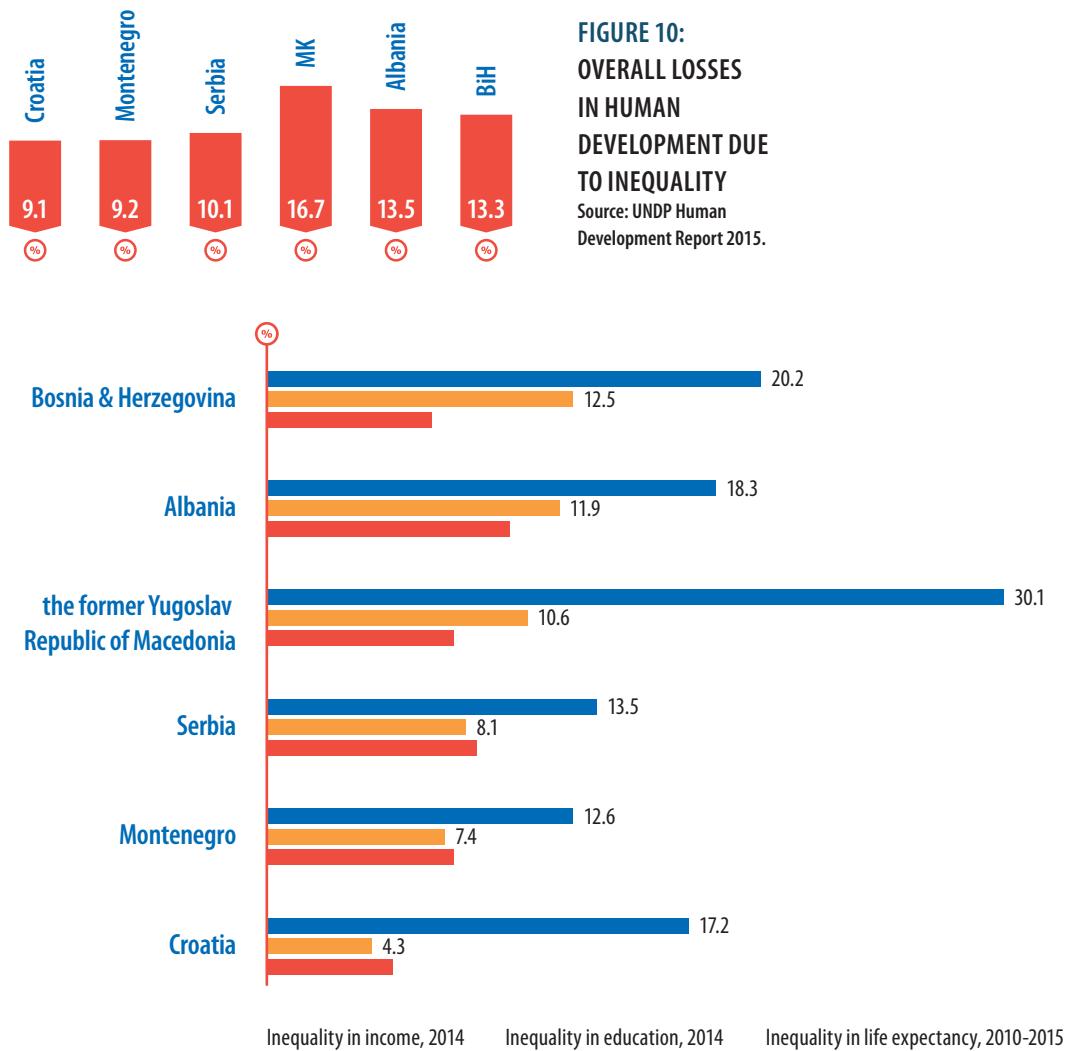
**TABLE 5:**  
**DYNAMICS OF THE GINI COEFFICIENT**

Source: National statistical offices.<sup>65</sup>



The biggest loss in sustainable human development in the Western Balkans is due to income inequalities (measured as a ratio of 10 % most rich to 10 % most poor) that are most

65 Kosovo – [http://ask.rks-gov.net/ENG/publikimet/cat\\_view/17-living-conditions](http://ask.rks-gov.net/ENG/publikimet/cat_view/17-living-conditions); Macedonia – [http://www.stat.gov.mk/PublikaciiPoOblast\\_en.aspx?id=68&rbrObl=13](http://www.stat.gov.mk/PublikaciiPoOblast_en.aspx?id=68&rbrObl=13); Montenegro – <http://www.monstat.org/eng/page.php?id=73&pageid=73>; Serbia - 1. [http://webrzs.stat.gov.rs/WebSite/repository/documents/00/01/25/92/PD10\\_366\\_engl.pdf](http://webrzs.stat.gov.rs/WebSite/repository/documents/00/01/25/92/PD10_366_engl.pdf) 2. [http://webrzs.stat.gov.rs/WebSite/repository/documents/00/01/71/58/PD10\\_083\\_engl\\_2014.pdf](http://webrzs.stat.gov.rs/WebSite/repository/documents/00/01/71/58/PD10_083_engl_2014.pdf)



prominent in the former Yugoslav Republic of Macedonia and Croatia. Inequalities in education are the second biggest loss in Bosnia and Herzegovina and Albania.

#### D Human Development Affected by Disasters in the Western Balkans

Recurring disasters experienced by those vulnerable to natural hazards will impact in a myriad of ways on their capacity to achieve and enjoy human development gains. The level of human development will also shape people's capacity to be resilient in the face of hazard stress and shock.

While large-scale high impact disasters (so-called intensive risk) attract international

attention small-scale and high frequency events (extensive risk) often go unnoticed and become part of everyday life in hazard-prone communities.<sup>66</sup> Such small-scale disasters gradually erode development assets such as houses, schools, health facilities, roads and local infrastructure. The cost of these extensive risks remain hidden and tends to be underestimated, as it is usually absorbed by low-income households and communities and small businesses.<sup>67</sup>

<sup>66</sup> Extensive risk is used to describe the risk of low-severity, high-frequency disasters, mainly but not exclusively associated with highly localized hazards. Intensive risk is used to describe the risk of high-severity, low-frequency disasters, mainly associated with major hazards (ISDR GAR 2011, x). For UNISDR definitions, please visit the terminology website: <http://www.unisdr.org/we/inform/terminology>.

<sup>67</sup> GAR 2015, p. 4.

Nevertheless, detailed disaster loss databases, such as DesInventar, show that the cumulative effects of local disasters are in fact more severe than the effects of large-scale disasters. Quantifying the effects of small-scale disasters along with their cumulative effect is a labour intensive task, given the numerous data issues identified by the team during the production of this report.

Figure 12, below, makes a comparison between the cumulative impact in the Western Balkans of the greatest flood disasters (single events) over the period 2000-2013 and this type of disaster event over the period 2014-2015. It is evident that the magnitude of disasters has multiplied considerably and that the effects of climate change are being manifested in the Western Balkans through more severe weather conditions. Their toll on livelihoods and economies in the region will increase if preventive measures are not enacted in order to reduce their impact in the future.

The impact of the floods of 2014 and 2015, with their effect on agriculture, public infrastructure and private enterprise as well as reduced productivity, led to a surge in the number of human and economic losses compared to those accumulated during the previous decade. Other direct and indirect costs, including small-scale repairs, long-term rehabilitation, lost productivity and economic decline, are harder to quantify yet must nevertheless be taken into account when analysing the overall burden of disasters.

The cost of disasters cannot be limited to loss of life, livelihood and economic costs. The Human Development approach uses other more intangible ways to measure the impact of disasters. These include, for example, the question of lost opportunities in terms of education and health when social infrastructure, such as schools and hospitals, is affected. People are often overloaded or under constant stress for many months during the recovery period.

	2000-2013	Difference	2014-2015
 Fatalities	3	<b>27 times more fatalities</b>	81
 People affected	193,384	<b>15 times more people affected</b>	2.85 million
 Economic losses	148.1 million USD	<b>31 times more economic losses</b>	4.63 billion USD

Health may deteriorate, education can be disrupted or discontinued, living standards may fall, accidents increase and relationships become strained. These problems often develop slowly without those concerned noticing, because of their preoccupation with other, on the surface, more pressing concerns. The HDI does not capture many of these underlying factors as it measures outcomes but not loss of opportunity. Some attempts have been made to calculate projections for the HDI up until 2050; however, those indices also do not take into account the risks from disasters, natural or human-made.<sup>68</sup>

**Methodologies needs to be developed to meaningfully forecast the evolution of HDI by taking into account not just outcomes of investment in development but also losses in terms of opportunity resulting from disasters at the local, national and regional level.**

The floods of April and May 2014 in the region had different development impacts on population groups and communities in the region. The magnitude and duration of local disasters combined with the length of time it took for each country to recover from the floods resulted in a marked drop in HDI forecasts for the region.

<sup>68</sup> See, for example, the 2013 Human Development Report, which made forecasting for the HDI to 2050 for all regions. Available from <http://hdr.undp.org/en/content/projection-human-development-index-growth-region>.

**FIGURE 12:  
CHANGES IN THE  
MAGNITUDE OF  
DISASTERS**  
Source: Table 2 in the Annex  
to this report.

“  
THE HDI  
CALCULATIONS  
FOR BOSNIA AND  
HERZEGOVINA  
AND SERBIA IN  
THE AFTERMATH  
OF THE FLOODS  
OF 2014  
INDICATE A HDI  
LOSS OF 0.003  
TO 0.005 POINTS  
BY 2018 OR A  
FIVE-YEAR SET  
BACK IN TERMS  
OF OVERALL  
DEVELOPMENT.

## MEASURING THE IMPACT OF FLOODS ON HUMAN DEVELOPMENT IN SERBIA AND BOSNIA AND HERZEGOVINA

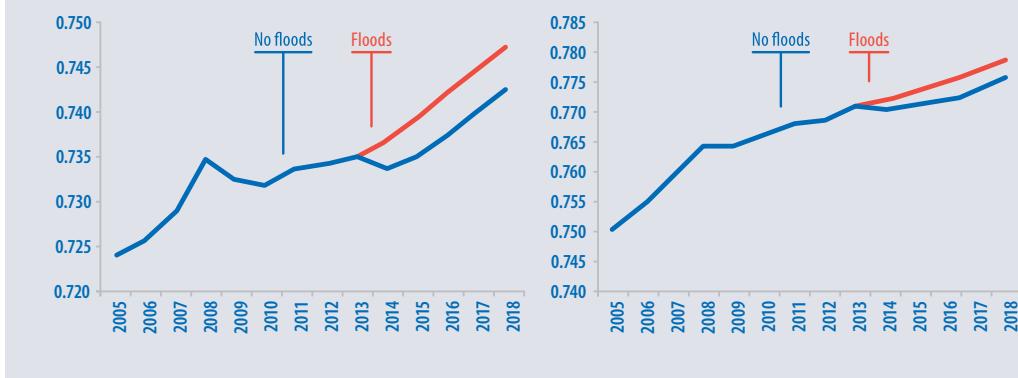
In 2014, the UNDP Regional Centre for Europe and CIS attempted to calculate the human development impact of floods in Serbia and Bosnia and Herzegovina using the methodology of the World Bank as stipulated in the 2010 Guidance Note on 'Damage, Loss and Needs Assessment' (2010). According to the Guidance Note, the impact on human development of a disaster can be measured by estimating changes in two ways. The first is by analysing performance on human development components prior to the disaster, utilising a pre-crisis baseline (pre-disaster human development trends, including key challenges and the salient features of the policies implemented pre-crisis that influenced the condition of human development for the affected populations). The second involves measuring consequences of the disaster in the short, medium and long term through business as usual scenarios, worse case scenarios and/or

best case scenarios, based on past performance had the disaster not occurred.

Projections by UNDP estimate that by 2018 the HDIs for Serbia and Bosnia and Herzegovina could be reduced by 0.003 to 0.005 points because of flood-related declines in production and income, reduced access to healthcare in flood-affected areas and possible reductions in education attainment for children living in the affected areas. Such HDI implications for Serbia and Bosnia and Herzegovina are similar to the five-year set back on targets in its achievement of greater gender equality, lower poverty rates, reduced marginalisation and greater equality for minority groups and persons with disabilities. Such projections underscore the importance of efforts to prevent future disasters from occurring and to *build back better*.

**FIGURES 13 AND 14:**  
**HDI FORECASTS**  
**FOR SERBIA AND**  
**BOSNIA AND**  
**HERZEGOVINA**  
**WITH AND WITHOUT**  
**THE MAY 2014 FLOOD**

EVENT  
Source: Calculations by  
Mihail Peleah UNDP Istanbul  
Regional Hub<sup>70</sup>



69 World Bank Damage, Loss and Needs Assessment Guidance Notes, Volume 2, 2010. Available from [http://www.who.int/hac/techguidance/tools/manuals/pdna\\_health\\_sector\\_2014.pdf](http://www.who.int/hac/techguidance/tools/manuals/pdna_health_sector_2014.pdf).

70 GNI was estimated using the WB/IMF data from a PDNA exercise 2014. Education: it was assumed as half-year loss of education for one-quarter of the population affected by floods. Life expectancy was estimated by using BiH specific lagged elasticity to GDP seen from the Human Impact of Crisis paper <http://www.tandfonline.com/doi/abs/10.1080/1945289.2011.645531?journalCode=cjhd20>

### 3 The Use of Data for Understanding Hazards and Informing DRR Interventions

A fundamental opportunity that has arisen over the last decade is the improving availability and quality of datasets, modelling tools and information sharing platforms.<sup>71</sup> However, as the World Development Report 2016 concludes, the dividends of this information revolution will not materialise unless fundamentals such as business climate, education, health and good governance are promoted.<sup>72</sup> This observation is particularly true for the area of risk assessment. When information on disaster risks does not translate into better governance in DRR or increased awareness of the potential for disasters at the local level then this major data opportunity becomes a major data crisis. This is because our ability to collect and store information surpasses our ability to analyse and understand it.

#### A Using Data for DRR

As demonstrated in Chapter 2, freely available databases on administrative borders, historical hazard data and global models can be used to conduct basic national or regional risk exposure profiles. The table below provides examples of sources used for the analysis that was conducted in Chapter 2.

Only a few of the datasets are available online and therefore accessible to DRR practitioners for risk assessment. NASA, with its Earth Data Explorer, and the UNEP and the European Union all have great examples of user-friendly datasets accessible to view, explore and download data for DRR.

Data collection, processing and visualisation is the first step in developing an analysis for use in DRR planning. There is increasing attention in developments in the area of social media activities for crowd-sourcing purposes and the use of advanced imagery for risk

**“**  
DATA AVAILABILITY IS NOT A PROBLEM PER SE BUT THE USEFULNESS, SYSTEMISATION AND CATEGORISATION OF DATA AND CALCULATION METHODS AND THE DISPERSION OF DATA IN NUMEROUS LOCATIONS MAKES DATA EXTRACTION AND DATA USAGE A PARTICULAR CHALLENGE.

Data	Source
Flood Hazard 100-year return period.	Global Assessment Report (GAR 2015) on Disaster Risk Reduction.
Peak Ground Acceleration (PGA) with 10 % probability of being exceeded in 50 years.	Seismic Hazard Harmonisation in Europe Project shared Global Earthquake Model.
High Temperature Events (HTE) with a 15-year return period.	The Fire Monitoring for Resource Management System of the United States National Aeronautics and Space Administration (NASA).
Land use	European Environment Agency (EEA)
Earthquake events	United States Geological Survey (USGS)
Population concentration	NASA, Gridded Population of the World
GDP concentration	UNEP GRID project

71 World Bank, 2014. Understanding Risk: The Evolution of Risk Assessments. Washington. <http://www.drrinacp.org/RAReferenceGuide>

72 World Bank, 2016. World Development Report. Washington. Washington. <http://www.worldbank.org/en/publication/wdr2016>

mapping. There were many successful case studies involving the use of Twitter geo-tagged messages after the Haiti earthquake and the use of Unmanned Aerial Vehicles (UAV) after Cyclone Pam in Vanuatu for needs assessment.<sup>73</sup> In order to increase awareness of these tools they need to be shared widely in an interactive manner, which again is an area where advances in information technology provide tremendous opportunities. Interactive online risk data platforms can provide valuable information to DRR practitioners. One such example is the interagency initiative INFORM.<sup>74</sup> This platform is a global, open-source risk assessment for humanitarian crises and disasters that supports decisions about prevention, preparedness and response.

Innovations in the area of disaster simulations also present a great opportunity when it comes to disaster preparedness. It is now possible to run disaster simulations in a variety of open-source GIS packages that offer an insight into the potential impact of a hazard event occurring in a certain area. One example is the use of digital elevation models that provide a three dimensional representation of an area. Another is the use of software like the open-source System for Automated Geoscientific Analyses (SAGA GIS) software package, which hydrologists can use to model estimated flood levels based on a given intensity of precipitation, runoff and drainage in a particular area. DRR professionals can conduct accurate simulations to predict the effect on population and infrastructure using these inundation models. Such examples are also provided by Inasafe,<sup>75</sup> which is a free software that produces realistic natural hazard impact scenarios for better planning, preparedness and response activities.

## **B Data Challenges**

As with most data collection and analysis, quality and consistency are key issues. Different methodologies used by different stakeholders often do not interact with each other and this creates significant challenges when comparing assessments at different levels. A recent effort to address this issue is the EU Directive INSPIRE.<sup>76</sup> This Directive is an attempt to establish an infrastructure for spatial information in Europe and geared to making spatial or geographical information more accessible and interoperable for a wide range of purposes in support of sustainable development.

Another widely recognised issue related to increased availability of data is the institutional ability to process and understand such data. As an emerging area of humanitarian and development aid, information management is still under resourced and only a few data specialists are able to process large scale and complex datasets. This has significant implications in terms of the risk of inconsistency in the evidence base used by policymakers and practitioners in the field who may draw upon and/or place undue emphasis on output from a single source. Different databases may be set up with different objectives in mind, some of which may be un-interoperable or incompatible in terms of speed and/or precision.

Furthermore, ensuring the validity of the data collected is a major challenge for DRR practitioners. Resource allocations, based on risk or needs assessments made in times of crisis or during development planning, can have lasting implications for the lives of the communities they are supposed to serve, such as increased exposure and vulnerability to hazards. In order to address this challenge the development community should ensure that studies and data analyses are validated, triangulated and shared with the communi-

<sup>73</sup> Meier, Patrick, 2015. Digital Humanitarians. New York.

<sup>74</sup> IASC, 2016. Inform: Index for Risk Management. Brussels <<http://www.inform-index.org/>>

<sup>75</sup> Inasafe, 2015. Home Page. <http://inasafe.org/>

<sup>76</sup> EU, 2007. Directive 2007/2/EC of the European Parliament and of the Council. Brussels. <<http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32007L0002&from=EN>>

ties. The World Bank<sup>77</sup> has demonstrated that by combining scientific risk assessments with local level interventions evidence-based DRR interventions have stronger ownership and buy-in at the community level.

The team writing this report faced a number of serious data issues:<sup>78</sup>

- outdated reporting of disaster data (this applied in particular to the recent disaster events, namely the flooding in the Western Balkans in 2014 and 2015 );
- economic losses/costs reported in different hard currencies (Euros and USD), including local currencies that were difficult to bring to a common denominator for comparison purposes;
- the availability of data on indicators like the number of houses flooded/damaged and the number of sectors affected (figures were extremely scarce or missing completely);
- indicators of the number of people evacuated (some donors reported on households/families rather than individuals);<sup>79</sup> disaggregation of data according to sex and age, (such data for vulnerable or income groups was very scarce).

### **Some Reflections/Considerations**

Rather than evaluate how well a database meets the objectives it was set up to address the challenge should be to evaluate how well each database or set of databases collectively provide the information required by policy-makers and/or practitioners in the field. This should be done by integrating specific practice orientated questions into databases.

The proposed role for systematic review

should be the evidence-based. Systematic reviews can help people to overcome the ever increasing 'information overload'. Their structured approach, transparency of method and detailed reporting allow systematic reviews to minimise the impact that bias may have on their findings and conclusions. One of concrete proposed tools for systematic review could be SDGs monitoring/reporting in DRR (SDGs 1, 2, 3, 5, 6, 8, 9, 10, 11, 13, 15, 17) for (sub)regional and (supra)national domains.

The disaster databases may include consideration of the precision of definition of the data, an evaluation of which would include certain key factors:

- outcome figures (including the extent of rounding or the provision of absolute counts);
- outcome resolution (disaggregated reporting of outcomes such as the number of 'cases of disease', which could be the number of people affected or the number of separate episodes);
- geographic resolution (region, country, town, section of town, family unit etc.); and
- temporal resolution (year, month, week, day).

## **Examples of Combined Data Sources and Creating New Information for better informed Development**

### **Multi-hazard Exposure and Spatial Socioeconomic Inequality in Bosnia and Herzegovina**

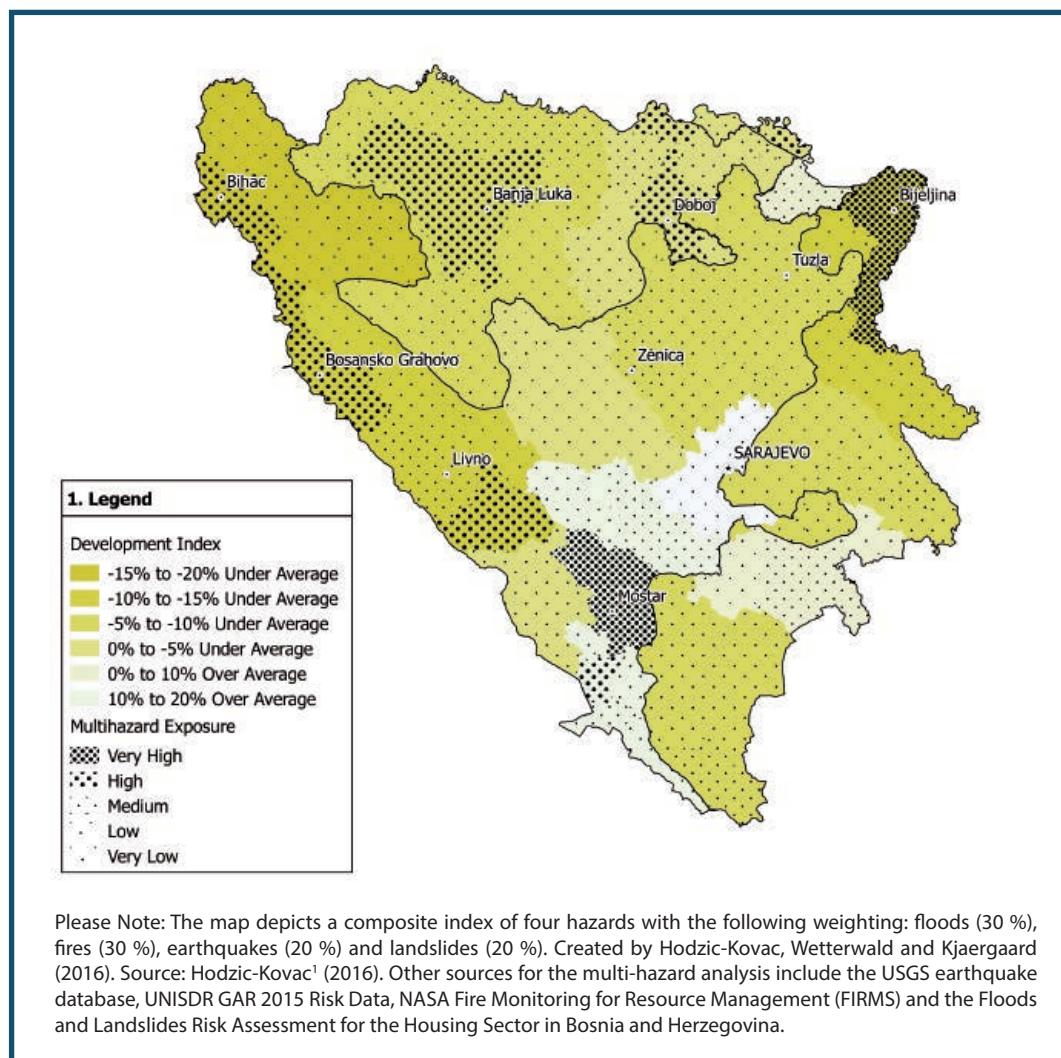
Spatial inequalities in income, health, education and poverty present significant economic and political challenges for the governments of many developing countries. Spatial patterns of inequality between and within countries have become an important focus area for the development community, as captured in Sustainable Development Goal

77 World Bank, 2014.

78 This comes in line with findings of the "The quality and accuracy of disaster data" study, commissioned by the WB - [http://www.cred.be/sites/default/files/Quality\\_accuracy\\_disaster\\_data.pdf](http://www.cred.be/sites/default/files/Quality_accuracy_disaster_data.pdf)

79 EU "Flood Prevention and Management" Study, 2015: Danube River Basin District: flood events in 2010 (ICPDR flood report 2010), FloodList, ReliefWeb, International Federation of Red Cross and Red Crescent Societies. EU study "Present Situation of Flood Management in the Western Balkans", November 2014. Western Balkans Investment Framework, Infrastructure Projects Facility Technical Assistance 4.

**FIGURE 15:**  
SOCIOECONOMIC  
AND MULTI-HAZARD  
MAP OF BOSNIA AND  
HERZEGOVINA



No. 10: Reduce inequality within and among countries.

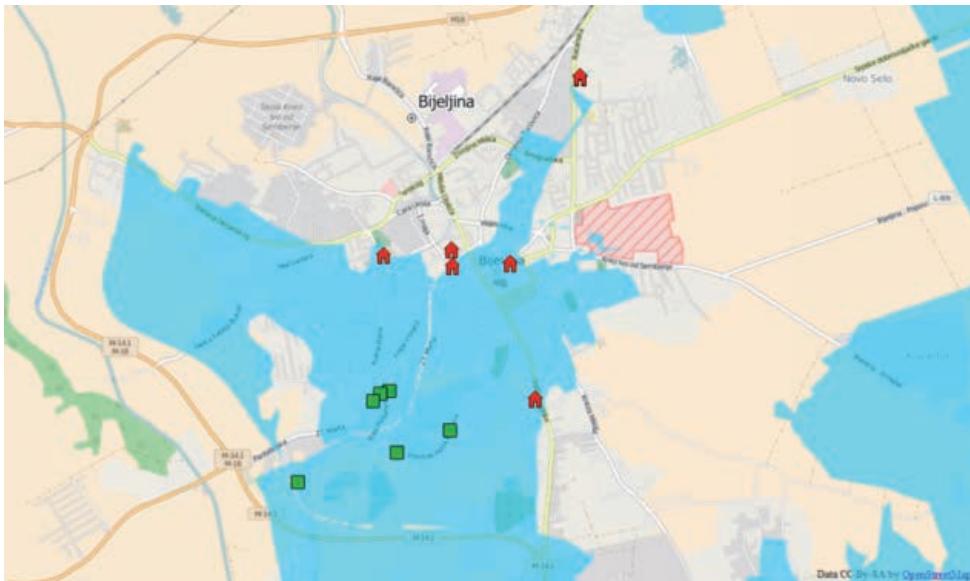
In addition to SDG 10, understanding spatial inequality is also important for adequately addressing all others SDGs and very important in relation to the extensive interconnections that exists between DRR and the SDGs covered in Chapter 1 of this report.

The Bosnia and Herzegovina UNDP office undertook a comprehensive and innovative spatial inequality analysis in 2015 that resulted in new measurement of spatial inequalities. The method developed identifies three dimensions of inequality represented through three composite indices: the Economic Index,

the Social Well-being Index and the Access to Services Index,<sup>80</sup> these in turn are part of the overall Development Inequalities Index.<sup>81</sup>

<sup>80</sup> The Economic Index consists of GDP per capita, average monthly salary, average expenditure/consumer basket cost, ILO employment rate and the ILO unemployment rate. The Social Wellbeing Index consists of the poverty rate, poverty gap, number of students per 1,000 population, number of registered travel cars per 1,000 population, share of four member households without any income and the share of four member households with two or more incomes. The Access to Services Index consists of the number of doctors per 1,000 people, the number of hospital beds per 1,000 people, percentage of households with a sewerage system and the percentage of households with potable water.

<sup>81</sup> The Development Inequalities Index BiH average value is 1,500 (15 indicators x 100 mean BiH value for each indicator). Each geographical area total index value is either above or below the BiH mean value. The same applies for each of the composite indices. The distance of each geographic area from the BiH mean value is represented in percentage terms (e.g. 21 % above the BiH average or 17.1 % below the BiH average). Based on the values, areas are classified into levels of development clusters (e.g. 10-20 % below the BiH average). All indicators have the same weighting and contribute equally to the overall Development Index.



Created by Wetterwald and Hodzic-Kovac, April 2016. May 2014 flood data polygon provided by UNDP under the Housing and Risk Assessment Project. Available from [http://europa.ba/wp-content/uploads/2015/12/HRA\\_Final\\_web.pdf](http://europa.ba/wp-content/uploads/2015/12/HRA_Final_web.pdf). Schools GPS coordinates were captured under the European Union Recovery Programme. The United Nations High Commissioner for Refugees provided Roma community GPS coordinates that draw from part of a Roma survey conducted in 2013. Projection: EPSG 3857. Sources: UNDP Bosnia and Herzegovina, 2014 Housing and Risk Assessment Project; EU Recovery Programme in BiH data, and a UNHCR Roma survey conducted in 2013.

The analysis, based on fifteen key indicators and three index dimensions, identified extensive inequality between geographical areas in Bosnia and Herzegovina that have an impact on the quality of life and choices people have depending on the location of their household. The inequality story described in the map shown below uses colour coding: from light colour representing good socioeconomic shape above average for Bosnia and Herzegovina to darker colour representing not so good socioeconomic shape well below average for Bosnia and Herzegovina. The most developed area, Sarajevo Canton, is overall 30.2 % above the average for Bosnia and Herzegovina in socioeconomic terms. At the other end of the scale is Una-Sana Canton, which is worst off socioeconomically being 16.2 % below the average for Bosnia and Herzegovina.

Socioeconomic well-being plays an important part in the overall capacity of individuals, communities and authorities to deal with the onset of disasters when they happen. Poor

socioeconomic development and inadequate access to basic services is a vulnerability in and of itself. The story unfolds even further, when overlaid on the multi-hazard exposure dimension. By overlaying these dimensions it is easy to see which areas are less developed and more exposed to different hazards (in the given example, from floods, landslides, earthquakes and fires). Whereas individual hazard maps provide baseline information and operational guidance on individual hazards, multi-hazard map provides strategic guidance on where to engage and invest. As such, they are important tools that enable policymakers, senior officials and programme planners to conduct spatial targeting of their interventions.

<sup>82</sup> Hodzic-Kovac, Envesa. 2016. SPATIAL DEVELOPMENT INEQUALITIES IN BOSNIA AND HERZEGOVINA. Social wellbeing, economic wellbeing and access to services – changes in inequalities over 2007–2014 period. WORKING PAPER - UNPUBLISHED DRAFT. February 2016.

### GIS Data at the Micro (Community) Level

Development professionals can use open source GIS software to conduct quality spatial planning and analysis. GIS data can be collected through secondary (such as global databases) or primary sources using techniques like remote sensing or coordinate capture activities.

The example shown below shows flood hazard and vulnerability data over a standard open street map (OSM). OSM is an open-source mapping platform (similar to Google Map) from which GIS data can be downloaded and imported into GIS software for analysis and planning purposes. It shows the location of schools and Roma communities in the Municipality of Bijeljina in Bosnia and Herzegovina. The main advantage of OSM is that risk mappers have access to the GIS files, which they can edit, process and analyse based on their needs.

**“**  
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 NUMEROUS  
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 MAKES DATA  
 EXTRACTION  
 AND DATA USAGE  
 A PARTICULAR  
 CHALLENGE.

the most expensive and durable investment would be in the rehabilitation and considerable improvement of riverbanks and flood defences along the rivers Sava and Drina.

### 4 Conclusion

Advances in human development are vulnerable to the effects of climate change and the corresponding threat of disasters. As such, the Human Development approach is incomplete if it does not include both the vulnerability of development and the resilience of people in the equation. The HDI calculations for Bosnia and Herzegovina and Serbia in the aftermath of the floods of 2014 indicate a HDI loss of 0.003 to 0.005 points by 2018 or a five-year set back in terms of overall development.

This chapter explores the availability of data and associated issues. A key finding is that data availability is not a problem per se but that the usefulness, systemisation and categorisation of data and calculation methods and the dispersion of data in numerous locations makes data extraction and data usage a particular challenge. The wealth of data available should not be undermined, but rather the interconnectedness of numerous data sources further explored to ensure ease of use for the end user.

A few examples are provided in order to illustrate how combining different types of data can produce new information that in turn will provide the basis for the creation of more sound development and DRR interventions. What is increasingly required is a more holistic understanding of the interconnectedness of different dimensions that affect human well-being. Paying attention to and basing decisions on just one such dimension without consideration of the others is increasingly seen as uninformed and one-sided development, which in the long term is both expensive and ineffective.

*POOR SOCIOECONOMIC  
DEVELOPMENT AND  
INADEQUATE ACCESS TO BASIC  
SERVICES IS A VULNERABILITY  
IN AND OF ITSELF*

*WHAT SHOULD BE DONE  
TO PROTECT POPULATIONS  
AGAINST VULNERABILITIES  
BUILD RESILIENCE AND  
MITIGATE RISKS IN THE  
WESTERN BALKANS?*

# 5

## Elements for Risk-Informed Human Development



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## ① Introduction

## ② Proactive/Innovative, Development focused Approaches

- Ⓐ Risk and Vulnerability Assessment
- Ⓑ Risk-Informed Planning
- Ⓒ Risk Insurance
- Ⓓ Social Protection and adapted Social Services
- Ⓔ Early Warning Systems

## ③ Levels of Governance and Responsibility

- Ⓐ Community level Initiatives
- Ⓑ Local Governance Possibilities
- Ⓒ Responsibility at the National level
  - i. Strategic and Legislative Framework
  - ii. Institutional Framework
  - iii. Inter-Agency Coordination
- Ⓓ Multi-Stakeholder Coordination
- Ⓔ Regional Coordination and Cooperation

## ④ Human Solidarity and Interconnectedness

## ⑤ Conclusion

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WHILE THE DRIVERS OF DISASTER RISK MAY BE LOCAL, NATIONAL, REGIONAL OR GLOBAL IN SCOPE THEY HAVE SPECIFIC LOCAL CHARACTERISTICS THAT MUST BE UNDERSTOOD IN ORDER TO IDENTIFY THE SPECIFIC MEASURES NEEDED TO REDUCE SUCH RISKS AT THE LOCAL LEVEL.

### ① Introduction

What is and what needs to be done in the Western Balkans to protect people from disasters and the damage that these can inflict on their lives and livelihoods?

What needs to be done to empower people and enhance their resilience so that they can mitigate the risks themselves?

In the process, how can we change people's perception that they are merely vulnerable to disasters and help them to understand how they can become agents of change?

This chapter will discuss different elements of the risk-informed Human Development agenda, illustrating some of the interventions with examples from the countries of the Western Balkans.

As this chapter will argue, the key element is prevention and mitigation strategies that fo-

cus largely on recognising the potential risks and managing them correctly, both *for* and *by* the people. Rather than adopt the conventional way of looking at disaster management by focusing on preparedness, response and recovery this chapter focuses on new elements of risk informed development.

This chapter discusses possible interventions clustered around three sections.

→ Given that current types of intervention do little by way of preventing disasters from occurring and from inflicting damage on the lives and livelihoods of those affected it is clear that more proactive and innovative development based approaches are required. Such approaches tend to put more emphasis on recognising and managing risks and vulnerabilities, which is an exercise more likely to lead to successful prevention and mitigation efforts. This is discussed in the first section of this chapter.

- The second section brings together interventions under different levels of responsibility: community based initiatives, initiatives at the local government level, responsibilities at the national level in terms of strategies and plans, legislation, institutional mechanisms, inter-ministerial coordination and multi-stakeholder coordination and finally regional coordination and cooperation.
- The final section explores how spontaneous outbursts of human solidarity and human interconnectedness can be systematised within communities into sustainable systems for future use. It also examines how technology and social networks can be capitalised upon to design inexpensive community sourced early warning systems and emergency response tools.

## **② Proactive/Innovative, Development Focused Approaches: Prevention and Mitigation of Risks**

*"Efforts often focus on enhancing the safety of human lives – by setting up early warning systems, evacuation centers, and local response teams. While those ... efforts are crucial, on their own they often do little to ensure that hazards' impact on livelihoods is reduced, and that households and communities can recover quickly."*

*(Banyaneer 2013, p. 4).*

Disaster Risk Reduction (DRR) has been proven worldwide to be the single most efficient and cost-effective way to reduce disaster risk and prevent future disaster losses from natural and human-made hazards. DRR is about putting forward a firm proposal to mitigate disaster risks through an informed, coordinated, multidisciplinary and decentralised approach that focuses on the timely identification of hazards and pre-emptive action to

reduce the risks. A number of elements that form part of DRR are discussed below.

- Ⓐ *Risk and Vulnerability Assessment*
- Ⓑ *Risk-Informed Planning*
- Ⓒ *Risk Insurance*
- Ⓓ *Social Protection and Adapted Social Services*
- Ⓔ *Early Warning Systems*

### **Ⓐ Risk and Vulnerability Assessment**

New approaches to DRR recognise the need for each community and country to assess and understand disaster risks and how they are created. This includes recognition that while the drivers of disaster risk may be local, national, regional or global in scope they have specific local characteristics that must be understood in order to identify the specific measures needed to reduce such risks at the local level. Risk assessment is therefore a key component in helping governments and citizens to understand disaster risk. The increasing availability of disaster risk data represents a unique opportunity for understanding risk in a concrete spatial manner that can improve DRR interventions<sup>83</sup>.

Participatory Hazard-Vulnerability-Capacity risk assessment puts people at the centre. It instructs on where and how to prepare for emergencies and post-disaster recovery activities in the long term. Yet this type of assessment goes beyond the mapping of hazards and data. It includes accurate information on the exposure of people and assets and the level of vulnerability and capacities of specific population groups, such as women, children, minorities, persons with disabilities and households living in severe poverty.

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**THE INCREASING  
AVAILABILITY OF  
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CONCRETE  
SPATIAL MANNER  
THAT CAN  
IMPROVE DRR  
INTERVENTIONS.**

<sup>83</sup> Not much has been done in the region in this regard. One example is found in the former Yugoslav Republic of Macedonia where, with the support of UNDP, all 80 municipalities have developed and adopted integrated risk and hazard assessments. Available from <http://procena.cuk.gov.mk/Login.aspx?ReturnUrl=%2f>.

A participatory Hazard-Vulnerability-Capacity assessment takes into consideration the fact that women face different levels of risk and have different vulnerabilities and coping capacities resulting from gender based political, cultural and socioeconomic differences and inequalities. This type of assessment also acknowledges the double burden that discriminatory land ownership practices add to the vulnerability of women by preventing them from claiming ownership, insurance or other entitlements. Just as gender roles and relations shape vulnerability to disaster they also equally affect people's capacity to prepare, survive and recover. Such an assessment therefore recognises that women have a critical insight, perspective and knowledge of natural resources, surroundings and networks in their neighbourhood. Building on this together with their experience as primary caregivers within the family could boost Disaster Risk Reduction and management. Utilising female leadership to develop community resilience to disasters would allow women farmers to move from passive and vulnerable victims to agents of change. The failure to do so would result in communities taking longer to recover.

Not much has been done in the region in this regard. However, in the former Yugoslav Republic of Macedonia all eighty municipalities have, with the support of UNDP, developed and adopted integrated risk and hazard assessments. This includes hazard profiling, analysis of the level of exposure and vulnerability of the population and of critical infrastructure. It also assesses the coping capacities of the emergency management system as a whole.

#### **(B) Risk-Informed Planning**

Risk assessment findings set DRR action planning in motion. This includes implementing spatial planning, zoning, building codes and establishing hazard monitoring systems that are up-to-date and placed in optimal loca-

tions. Putting in place an accurate, interoperable and accessible system for communicating hazard threats among all sections of the population would further complement this process. The same applies to raising awareness on hazard threats and ensuring that information on emergency and rescue plans reaches out to women, men, young and old, able bodied or otherwise. This means taking into account literacy levels, technology gatekeepers, the role of women as caregivers, religious and patriarchal norms and the accessibility of such systems at the design stage. Consultation with local communities and leaders and women's groups to identify locally appropriate ways to reduce and communicate hazard threats is another approach that has proven successful globally.

Although this publication puts forth a strong argument for using modern technology and innovation, particularly free-of-charge open source solutions<sup>84</sup> that have proven efficient in disaster prevention, mapping and recovery efforts, we should also make sure that our systems do not leave anyone behind and account for all. Therefore, making announcements in public squares/areas, key messaging using community media and simple SMS messaging and placing leaflets in public areas frequented by women are all worth exploring.

#### **(C) Risk Insurance**

The Western Balkans is at high risk of seismic activity and ninety per cent of the region is located within transboundary river basins,<sup>85</sup> making it vulnerable to flooding. The frequency and severity of disasters is on the rise in all countries of the region yet paradoxically governments allocate meagre financial resources and have only limited services to assist citizens in recovering assets and productive ca-

<sup>84</sup> QGIS: An open source software for GIS mapping and analysis, Geonode, GRASS, CAPRA-GIS, Ushaidi.

<sup>85</sup> Natural Disaster Risks and Risk Assessment in South East Europe, UNDP, EC, 2015, p. 11. Available from <http://www.gripweb.org/gripweb/?q=countries-risk-information/disaster-risk-profiles/natural-disaster-risks-and-risk-assessment-south>.

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WHILE USING MODERN TECHNOLOGY AND INNOVATION, PARTICULARLY FREE-OF-CHARGE OPEN SOURCE SOLUTIONS THAT HAVE PROVEN EFFICIENT IN DISASTER PREVENTION MAPPING AND RECOVERY EFFORTS, WE SHOULD ALSO MAKE SURE THAT OUR SYSTEMS DO NOT LEAVE ANYONE BEHIND AND ACCOUNT FOR ALL


**KNOWLEDGE  
CREATION**

- Put people at the centre when assessing risks and take into account the vulnerabilities and capacities specific to each group. Involve people and communities in generating knowledge about prevention.
- Raise the profile of DRR and climate change as fundamental development issues.
- Collect gender and age disaggregated data.
- Inform farmers about drought resistant seeds.
- Ensure the quick deployment of technologies for generating knowledge about people and areas at risk, evacuation, rescue, etc.


**MAPPING**

- Establish hazard monitoring systems.
- Regularly update maps of landslides and their margins, areas prone to flooding, etc.
- Map households and people most at risk.
- Have structures in place for cooperation with volunteers.
- Ensure proper maintenance of landslide cadastres and monitoring systems.
- Improve efforts to monitor, forecast and warn of impending events such as floods and forest fires.
- Set up mobile and web platforms for people to self-organise, post real-time feeds about imminent threats in the affected areas and for people to check to see if they are safe.


**INFORMATION  
SHARING**

- Raise awareness on hazard threats.
- Put in place an accurate, interoperable and accessible system for communicating hazard threats among all sections of the population.
- Instruct on where and how to prepare for emergencies and post-disaster long-term recovery activities.
- Combine existing research and the use of global datasets to promote risk awareness.
- Ensure that information about early warning systems and emergency and rescue plans reach out to women, men, young and old, able bodied or otherwise.
- Carry out regular drills and rehearsals.
- Ensure good coordination and information exchange between different levels of government and community during disasters.
- Encourage people to use technology and social media for collecting, sharing and communicating information.
- Ensure that outreach is also tailored to reach the margins through announcements in public squares, distribution of leaflets, SMS messaging, etc.

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**INSURANCE IS  
AMONG THE  
TOPMOST  
ELEMENTS FOR  
BOTH BUSINESS  
AND PEOPLES'  
RESILIENCE**

pacity lost during a disaster. To illustrate this point one needs only to consider the earthquake that occurred in Serbia in 1979. This earthquake caused damage worth 366 times more than the Government allocated in the national budget for emergencies in 2008. The flooding that occurred in 1994 in the former Yugoslav Republic of Macedonia caused damage worth 77 times more than the amount allocated by the Government. This is why insurance is among the topmost elements for both business and peoples' resilience.

The current global trend of government led social protection schemes that work hand in hand with market based micro credit and insurance is geared towards protecting businesses and people from losses by securing quick cash after an emergency. Ideally, this should enable risk prone entities to take on higher risk and higher return activities that will eventually empower such businesses and households to lift themselves out of pov-

erty.<sup>86</sup> Index based micro insurance is also pre-emptive in nature and pays cash for risk reduction activities prior to a disaster strikes. Nevertheless, the current outreach of micro insurance for risk prone households in the region is minimal. It is important, however, that such schemes are regarded as a replacement but rather as a supplement to social protection measures.<sup>87</sup>

Recently, the World Bank supported the former Yugoslav Republic of Macedonia and Serbia in joining 'Europa Re', which is a company that specialises in catastrophe reinsurance and helps support households, farmers, SMEs and other businesses exposed to weather related risks and geological hazards gain access to more affordable disaster insurance. This provides a safety net that empowers farmers and landowners to avoid high stress levels with each rainfall or drought fearing for their assets and livelihoods.

86

Suarez and Linnerooth-Bayer, 2011.

87

ISDR GAR 2011, p. 124-125

**“**

ACCESS TO  
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**”**

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AND REDUCES  
THE ECONOMIC  
AND MATERIAL  
IMPACT OF A  
DISASTER

#### D Social Protection and adapted Social Services

Globally, social protection is a means of protecting people and families against vulnerability and poverty both during and after a crisis. This is a set of public and private policies and programmes aimed at preventing, reducing and eliminating economic and social vulnerabilities to poverty and deprivation. Effective social protection systems usually include four components: (1) social transfers, (2) programmes to ensure access to services, (3) social support and care services, and (4) legislation and policy reform.

Social protection is perceived as an effective approach for building community resilience to the impact of climate change by ensuring basic levels of consumption, facilitating investment in productive livelihood assets and strengthening the capacity to manage risks.

Access to basic services and social protection measures has a direct correlation with the capacity to withstand, manage and recover from shocks. The philosophy behind adapted social services is that these systems should be available to all and adjusted to the specific needs of the most vulnerable and excluded, taking into account issues such as cultural and social norms and inequities.<sup>88</sup> This also implies that service providers need to ensure continuity, remain adaptive to changing circumstances, flexible to manage risk and uncertainty and able to rapidly expand the scale if needed.<sup>89</sup>

#### E Early Warning Systems (EWS)

Early warning is a major element of Disaster Risk Reduction. It decreases the death toll and reduces the economic and material impact of a disaster. The most effective actively involve the communities at risk from the design process and secure outreach to the poor and those on the margins of society. They ensure

that women are included in the technology choices, design and outreach strategy of the early warning system, because maximising accessibility to women and men alike is important. The best examples also train and increase public awareness on the risks and secure the consistent preparedness of people.

While Albania, Croatia, Montenegro and Serbia have invested extensively in DRR early warning systems, these systems do not function optimally in practice. In Albania, for example, the Military Meteorological Service has its own observation network and disseminates flood advisories to the media, but there is still no mandate to interrupt television or radio programmes or have a continuous warning stripe on the TV screen in the event of an emergency. Neither are communities warned directly about imminent disasters via SMS and relevant government institutions and NGOs are not on the direct contact list for hazards warnings.

In Croatia, a National Programme for the Establishment of an Integral Fire-Protection Monitoring System in National and other Parks (2006-2008) has been developed, but not fully implemented. Additionally, there is a need to broaden and systematise awareness raising activities on disaster risks using media, training events and mitigation activities. The efficiency of the Montenegrin EWS is hampered by hazard information not being gathered and stored systematically, which impedes the information sharing process. Although EWS in Serbia is in better shape, the 2014 flood warnings did not reach communities quickly enough and the information provided was not always accurate.

The EWS in Bosnia and Herzegovina is legislated, but there is no cross entity or cross district coordination or communication among the national civil protection agencies. Although meteorologists issued warnings on the ex-

<sup>88</sup> Antony global resilience paper 2013, p. 1

<sup>89</sup> UNICEF WCARO/ESARO 2013, p. 5

pected weather conditions in May 2014 the absence of a flood forecasting system meant that the municipalities were not able to foresee what height water levels would reach or the speed with which this would occur. The result was that the order to evacuate was issued too late. A national EWS is in place in the former Yugoslav Republic of Macedonia; however, provincial and local authorities are not assigned the responsibility to disseminate hazard warnings to communities or NGOs. Although EWS is addressed through the Kosovo Water Strategy there is currently no EWS at any level.

There has been a mixed experience with early warning systems in the region but most fail because they are not people centred. The poorest and those at the margins of society, who are most at risk and the hardest hit, have mostly not been included in the planning for EWS and outreach. Disaster communication systems call for improvement and local communities require greater awareness of the potential hazards as well as know-how on what to do in the event of a disaster. Empowering community/neighbourhood level DRR and rescue initiatives that include the active participation of women, youth and persons with disabilities has high potential. This is because local community structures are closest to people and best positioned to identify people at high risk who require immediate assistance and to respond in an appropriate manner. After May 2014, a lot of investment was made in improving flood related EWS; however, further improvement is needed to ensure a clear chain of communication and dissemination of information to people in need.

Due to the geographic, socioeconomic and cultural interconnectedness of the region and the fact that disasters do not respect human-made boundaries this report strongly points to the need to vigorously assess trans-boundary hazards at the regional level and to expedite sub-regional knowledge transfer

mechanisms to bolster the capacities for risk identification, assessment, monitoring and early warning in the region.<sup>90</sup>

### **3 Levels of Governance and Responsibility**

Experience in the region highlights the undeniable linkage between poverty and vulnerability in disasters and poor governance. Globally, it has taken a markedly long time to have such straightforward facts embedded in international documents; yet, finally, the current discourse attests to the fact that the global, national and local impact of disasters is exacerbated by 'risk drivers', such as poor governance.

Despite being cited as leading to "massive human misery and crippling economic losses"<sup>91</sup>, the political origins of poverty and of vulnerability to disaster are neither deconstructed nor given adequate attention or follow-up action. The broadcasted information too often informs us about the what, where and how related to major disasters as opposed to focusing on the why or to whom. The underlining issues and root causes still tend to remain unexplored and insufficiently addressed in praxis.

- A Community level Initiatives**
- B Local Governance Possibilities**
- C Responsibilities at the National level**
  - I Strategic and Legislative Framework
  - II Institutional Framework
  - III Inter-Agency Coordination
- D Multi-Stakeholder Coordination**
- E Regional Coordination and Cooperation**

#### **A Community level Initiatives**

Disaster risk is first and foremost a 'local' phenomenon and neighbours are usually the first

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90 South East Europe Disaster Risk Reduction Strategy Outline 2016.

91 2009 Global Assessment Report on Disaster Risk Reduction Risk and Poverty in a Changing Climate. Available from <http://www.undp.org/content/dam/rbap/docs/Research%20&%20Publications/CPR/APRC-CPR-2009-GAR-DRR.pdf>.

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*THE STRONGEST  
ASSET OF LOCAL  
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RESPONSES,  
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VULNERABLE  
GROUPS IN  
DECISION-  
MAKING AND  
HELP THEM  
BECOME MORE  
RESILIENT*

to help during disasters, even before professional rescue arrives. This is why the best practice and most solid field experiences in DRR originate from community sourced and community based DRR systems. The strength of community based DRR is that it addresses perceived problems, capitalises on local knowledge and resources, empowers people and ensures outreach to the margins of society, is cost-effective and contributes to sustainability and ownership. It promotes inclusive, bottom-up and participatory planning across different sectors. Only individual imagination limits the scope of DRR activities in the field.

Addressing environmental issues at the community level has often proven to be a good starting point. Thus, in many places across the region the millennial generation is ‘tuned in’ to climate change and to reducing their carbon footprint. In some instances, deforestation, soil erosion, overgrazing and desertification have been countered through tree planting and air and water pollution mitigation measures involving clean and sustainable energy. Such communities are also increasingly modifying their livelihood strategies, changing planting/crop cycles and taking similar action in order to reduce the risk of drought and income shocks.

Effective and realistic management plans for disaster risk that include cooperation with volunteers, work on health and social care system preparedness, usage of grey and green infrastructure, proper maintenance of landslide cadastres and monitoring systems are some examples of locally applied strategies that can improve DRR systems. However, despite innumerable community based DRR projects, most interventions are time bound and tend to fade whenever external agencies withdraw. This often happens to projects not implemented at the lowest functional administrative level where government counterparts are usually in a position to ensure sustainability. This

is why community based DRR has the highest potential for making a breakthrough.

### **(B) Local Governance Possibilities**

No central administration, no matter how good, can have an insight into the diverse needs of people the way local governance can. The smaller a governance unit is the more directly it can connect to the community and be able to reach out to the vulnerable and excluded. People, on the other hand, tend to participate in public life the most when it comes to their immediate interests; more than fifty per cent of the needs of citizens is met at the local level. This is why some of the most effective public support is likely to come from local government, especially for more frequent disasters.

Therefore, enhancing their capacity to manage disaster risk becomes the most rational investment for safeguarding service delivery and building a culture of community resilience. The strongest asset of local governance is its unique position to support community responses, engage vulnerable groups in decision-making and help them become more resilient. In order to do so they need to involve such groups in every step of the design process from setting the vision to planning and implementation up to monitoring and evaluation.

Capacitating community councils to work hand in hand with local government could be the most effective means of empowering people for DRR and crisis response and recovery. Other local agents such as civil society organisations (CSOs), centres for social work and employment offices should also be included in the process of risk assessment and preparedness within the DRR and recovery process. Improving disaster prevention, preparedness, response and contingency planning from a gender perspective would be particularly useful along with encouraging the relevant stakeholders (police, civil protection and

NGOs) to respond to the specific needs and concerns of men and women. Ensuring effective fire fighting services, trained volunteers and raising public awareness on a number of relevant preventive and emergency response issues as well as ensuring compliance with spatial planning and regular and strict inspections and making even small scale infrastructural investments in places that matter most in terms of the resilience of communities are among the most effective approaches at the local governance level.

### **© Responsibilities at the National level**

#### **I Strategic and Legislative Framework**

National integration of DRR into agricultural and development strategies, the legislative framework for building codes, proper land use, urban and spatial planning, and people centred EWS represents the backbone of legislative DRR.<sup>92</sup> All of the countries in the region have adopted a system of local, provincial and national governance to respond to disasters and this needs to be brought closer to the modern concept of Disaster Risk Reduction focused on prevention. Yet comprehensive national disaster management plans are often missing and national policies and legislation in most of the countries focuses on rescue and relief activities. Legislative changes around disaster risk management (DRM) have started to emerge but these tend to remain oriented towards disaster response rather than risk reduction.

#### **II Institutional Framework**

Increased awareness of how DRR and management can reduce death tolls, the number of persons affected and the economic damage incurred by disasters has led to improved organisational disaster management structures and a different level of success across the region. In each country, the highest level

of DRR governance starts with central government and then delegated to individual ministries and lower levels accordingly. Disaster management traditionally belongs to a strong ministry, such as the ministry of home affairs, while climate change is considered an issue for the ministry of environment. There has been a shift away from military to civil administration in disaster management structures in some of the countries, while in many others there is no clear definition of the role and responsibilities of the different governmental entities that deal with disaster response. Promoting the equal engagement of women as well as representatives of all segments of the population in the institutions and bodies responsible for DRR and emergency management adds value and brings in new perspectives.

### **III Inter-Agency Coordination**

Despite the fact that interest is still most keen on further developing capacities in emergency preparedness, response and recovery, over the last few years we have seen the establishment of high powered inter-ministerial working groups charged with raising the profile of DRR and climate change as fundamental development issues. All of the countries are, at least to some extent, currently working on the integration of DRR systems at all levels of government, starting from local communities and extending to the central level. Bosnia and Herzegovina is perhaps the most challenged when it comes to inter-agency coordination for the harmonisation of DRR planning and implementation. This is because of the complexity of the government structure wherein each level of authority has its own constitutional powers to regulate civil protection and rescue procedures.

### **D Multi-Stakeholder Coordination**

The complexity of DRR and climate change is too large for any one organisation to tackle alone. Preventing disasters requires public

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<sup>92</sup> South East Europe Disaster Risk Reduction Strategy Outline 2016.

and private agencies to work together.<sup>93</sup> For this reason, partnerships and participatory action planning have become defining features of DRR.

A further constraint is the lack of coordination between different levels of government and poor dissemination of information in either direction during disasters. For example, each level of government may collect disaster risk data within their jurisdiction but this data is collected and recorded using different methodologies and incompatible systems so that information cannot be readily shared across jurisdictions.

In terms of response to disasters, local communities often do not receive accurate information regarding imminent disasters quickly enough to mitigate the impact of the disaster, whereas higher levels of government often do not receive information about the localised extent of the impact of a disaster and thus fails to disseminate aid quickly enough.

More than seventy-three countries globally have established national platforms for DRR. Such platforms cover a range of national mechanisms for coordination and policy guidance on DRR. Ideally, they should be multi-sector and interdisciplinary in nature with public, private and civil society participation.

#### **E      Regional Coordination and Cooperation**

While national policies and legislation can be enablers of resilience in the Western Balkans, the absence of capacities to implement these laws means that the region will continue to be vulnerable to the natural hazards that threaten the region. Each country, to varying degrees, participates in regional cooperation schemes that contribute to efforts to monitor, forecast and warn of impending events, such as floods and forest fires, and exchange information and knowledge on DRR. The countries

of the Western Balkan also coordinate with a degree of success with several United Nations agencies on DRR; many participate in the EU Meteoalarm Programme, which provides alerts regarding the occurrence of severe weather, such as heavy rain with risk of flooding, severe thunderstorms, gale-force winds, heatwaves, forest fires, fog, snow or extreme cold with blizzards, avalanches or severe coastal tides.

Over the past decade, some projects have been initiated to support of the strengthening DRR actions across SEE. Recognising the importance and benefits of regional cooperation on building capacity and reducing disaster risks, the Stability Pact for SEE<sup>94</sup> launched the Disaster Preparedness and Prevention Initiative<sup>95</sup> to develop a cohesive regional strategy for disaster preparedness and prevention. In time, member countries developed into a largely independent and consultative mechanism for cross border cooperation. Countries also work on cross-border projects, like the Joint Emergency Response Units in Case of Floods,<sup>96</sup> to provide training and a planning platform. The Sub-regional Forum for DRR in the Western Balkans confirmed that its countries are more or less in a similar position with regard to levels of prevention, capacities, training and equipping of personnel.

The Western Balkans countries also carry out different kinds of risk assessments and hazard mapping. Initiatives such as the Southeast Europe and Caucasus Catastrophe Risk Insurance Facility project, the Building Resilience to Disaster in the Western Balkans and Turkey, and the Bosnia and Herzegovina Housing Risk Assessment have assessed risks related to certain key hazards, although these efforts are mostly tailored to disaster management

94 <http://www.stabilitypact.org/default.asp>, succeeded by the Regional Cooperation Council in 2008

95 The goal of the DPPI SEE is to foster regional cooperation and coordination in disaster preparedness and prevention for disasters. See <http://www.dppi.info/content/about-us>.

96 <http://www.dppi.info/programmes-activities/projects>.

**“**  
BY COMBINING  
THE EXISTING  
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COMMUNITY  
BASED ACTIVITIES  
AND THE USE  
OF GLOBAL  
DATASETS  
THE WESTERN  
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CAN RAPIDLY  
BECOME A RISK  
AWARE REGION  
THROUGH  
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INVESTMENT  
IN BOTH  
PROFESSIONAL  
RISK ASSESSMENTS  
AND IN  
LOCAL LEVEL  
INTERVENTIONS

93 UNSG Five-Year Action Plan, 2012

professionals. As a result, there is a tremendous opportunity to capitalise on the information generated by these regional projects and share them at the community level. This would have two positive effects: (1) to allow risk mappers to validate and triangulate the results of their analyses and (2) to raise awareness on and ownership of risk data at the level that matters most that of the community, which often provides first responders when disaster strikes.

By combining the existing research, community based activities and the use of global datasets the Western Balkans can rapidly become a risk aware region through limited investment in both professional risk assessments and in local level interventions. Some key considerations should be included: consistent methodologies, resorting to open-source software and efforts to communicate via user-friendly and accessible to all interoperable platforms that can be used by schools, hospitals, investors and municipal authorities.

In this context, tapping into currently underutilised EU funding schemes<sup>97</sup> that target renewable energy, promote energy efficiency, the use of ICT for independent living, smart cities and developing assistive technologies for people with disabilities has tremendous empowerment and emancipatory potential. This can be an important enabler for lifting hundreds of thousands of people in the region out of disaster induced poverty.

#### **4 Human Solidarity and Interconnectedness**

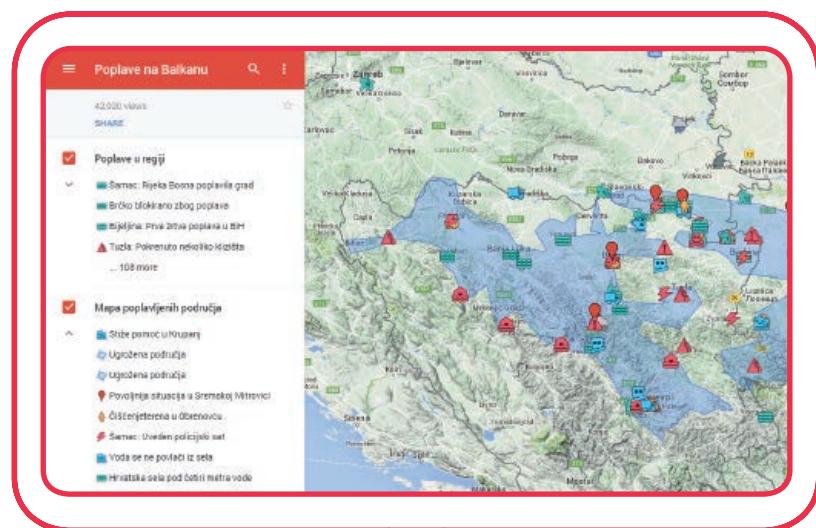
The disasters caused by the recent floods in the region revealed the gaping holes and red tape that exist within the coping capacity of government in the Western Balkans. Yet they also taught us a lesson about our common

humanity and the solidarity that transcends the boundaries of class, ethnicity and entity borders. It showcased the use of technologies up until then not applied in disasters in the region and how people used social media to collect, share and communicate information.

The voluntary mobilisation of citizens was breathtaking. In a blink of an eye, thousands of people teamed up into bottom-up relief efforts donating and collecting essentials and distributing food, water and medicine.

In Serbia, thousands of volunteers joined the police and army in building barriers to stop the River Sava from ravaging the town of Sabac. In Bosnia and Herzegovina, rafting teams and mountain climbers volunteered to form rescue teams that worked day and night across the entities without regard for ethnicity or political affiliation. Soldiers in both countries worked around the clock to evacuate and deliver food and water. On 18 May, seven hundred Sarajevo youth joined the recovery effort to remove debris in the towns of Maglaj, Zavidovici and Olovo. Hotel owners hosted the displaced without charge, while both public and private transport companies used their buses and trucks to distribute essential aid.

THE FIRST INTERACTIVE MAP OF THE FLOODED AREAS IN BOSNIA AND HERZEGOVINA.



<sup>97</sup> The Multi-country and country Instrument for Pre-Accession Assistance, Horizon 2020: The EU Framework Programme for Research and Innovation.

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*SELFLESS SOLIDARITY AND UNITY SHATTERED THE MYTH OF THE LACK OF TRUST AMONG THE BALKANS PEOPLE AND QUESTIONED THE LAST TWENTY YEARS OF DIVISIVE RHETORIC AND DISCOURSE PERPETUATED BY SOME POLITICIANS IN THE REGION. THE FLOOD DISASTER EXPOSED THE LACK OF CAPACITIES OF INSTITUTIONS AND AT THE SAME TIME HIGHLIGHTED THE POWER OF CITIZENS AND COMMUNITIES WHEN THEY COME TOGETHER FOR THE COMMON GOOD*

Interestingly, a vibrant community of computer wizards united to set up mobile phone and web platforms to help people to self-organise and post real-time feeds on any imminent threats in the affected areas in order to enable people to find out if they were safe. People throughout Bosnia and Herzegovina offered shelter via Facebook and Airbnb to those who had lost their homes. Crowdfunding platforms were set up locally and by the diaspora to raise funds, while convoys of humanitarian assistance collected by Bosnians, Serbs and Croats living abroad reached the affected areas.

Regional solidarity was heart-warming with neighbouring countries sending rescue teams and humanitarian assistance. Montenegro placed all of its resources at the disposal of Bosnia and Serbia, while the former Yugoslav Republic of Macedonia sent in rescue teams and humanitarian and technical assistance. In just one day, citizens of the former Yugoslav Republic of Macedonia collected more than 60,000 USD for Bosnia via humanitarian phone lines.

Such selfless solidarity and unity shattered the myth of the lack of trust among the Balkans people and questioned the last twenty years of divisive rhetoric and discourse perpetuated by some politicians in the region. The flood disaster exposed the lack of capacities of institutions and at the same time highlighted the power of citizens and communities when they come together for the common good. Real-time inputs of citizens served as the basis for institutional response teams. SMS messages from flooded areas arrived faster than official warnings and it was these people who enabled government by giving a better understanding of the extent of the catastrophe and thus allowing government to make better informed decisions. After such a long time, the people of Bosnia and Herzegovina came to the forefront. Through their common response, people demonstrated they could do better than an oversized and ethnically

divided state apparatus that consumes 55 % of GDP.

The humbling experience of the flood disaster that struck the Western Balkans in 2014 taught us an invaluable lesson about the importance of bottom-up approaches and the value of civic participation and the role of community and solidarity in action planning.

The burning question now, two years after the floods, is how to learn collectively from such a successful community based response to disasters in the region and most importantly how to apply the lessons learned to strengthen DRR. How can we scale up and capitalise on such an unprecedented engagement of women, youth and minorities to ensure effective, inclusive and sustainable approaches in the future? How can such a spontaneous outburst of human solidarity be systematised within communities into sustainable systems for future use? How can such organic deployment and transformative use of technology and social networks be translated into inexpensive community sourced early warning systems and emergency response tools? These questions remain, but high broadband internet and mobile penetration combined with the soaring absorption of social networks in the region has certainly proven to be a strong enabler.

## 5 Conclusion

This chapter explores the current reality of DRR and coping mechanisms in the region along with what it will take to improve the level of protection for people against disasters and the damage they cause to their lives and livelihoods. Besides the obvious call for improving governance capacities across the board, this chapter brings to the fore the importance of empowering people. This includes enabling the most vulnerable to become agents of change within their families and communities and enhancing their resilience so that they can ultimately mitigate the

risks themselves.

This chapter argues that acting pre-emptively to reduce risks is the single most efficient and cost-effective way to reduce disaster risk and prevent future losses from hazards. This requires a shift from conventional disaster management to Disaster Risk Reduction and management. A participatory Hazard-Vulnerability-Capacity assessment is highly recommended as it places people at the centre. It reveals the primary risks and hazards and their impact on the entire population through inclusive and gender and age sensitive analysis. As such, it provides the foundation for planning based on the actual risks and preventive risk management *for and by the people*.

The experiences of the recent flood disaster in the region have highlighted the undeniable link between poverty and vulnerability and poor governance in disasters. They attest to the political origins of vulnerability to disaster and provide evidence that poor governance exacerbates the impact of such a disaster. Therefore, proper investment in pre-emptive measures and enabling strategic, legislative and institutional frameworks is an essential piece of the puzzle that need to be secured by the national governments. While national machinery with robust inter-ministerial coordination and sound multi-stakeholder coordination are at the heart of securing overall strategic support and coordination mechanisms, this chapter argues that the core of efficient DRR lies in strong and inclusive community and local governance approaches and initiatives.

The chapter argues that the strength of bottom-up approaches lies in their direct connection to people, local knowledge and resources along with the ability to reach out to the vulnerable and excluded. Sustainability and buy-in is guaranteed, because of people's vested interest in keeping their families and neighbourhoods safe. Furthermore, the chapter explains why focusing on activating the

agency of women and youth can be the single most effective strategy for strengthening community resilience.

In response to the geographic, socioeconomic and cultural interconnectedness and joint vulnerability to disasters of the region this chapter recommends a vigorous assessment of the transboundary hazards at the regional level and calls for the expedition of knowledge transfer mechanisms to boost the capacities for risk identification, assessment, monitoring and early warning in the region.

It concludes with a call for action, warning that the solidarity of people and community based responses witnessed during the recent floods should not be forgotten. Rather, it supports the concept that such responses should be collectively learnt from, analysed and systematised within communities to provide sustainable systems for future action. It prompts the reader to consider how the unprecedented engagement of women, youth and minorities can be capitalised upon and scaled up to ensure effective, inclusive and sustainable approaches in the future. It reiterates the advantages of utilising the high internet and mobile penetration rates and local IT expertise present in the region as a whole new dimension of ESW. Therefore, sourcing technologies and social networks for smart and inexpensive disaster prevention and resilience building, early warning systems and emergency response tools and recovery efforts emerges as an important strategic tool.

Various funding tools are there to be explored and tapped into. The currently underutilised EU funding schemes that target renewable energy, promote energy efficiency, the use of ICT for independent living, smart cities and developing assistive technologies for people with disabilities has tremendous empowerment and emancipatory potential and can be an important enabler for lifting hundreds of thousands of people in the region out of disaster induced poverty.

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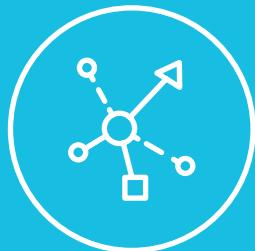
*REAL-TIME INPUTS  
OF CITIZENS  
SERVED AS  
THE BASIS FOR  
INSTITUTIONAL  
RESPONSE  
TEAMS. SMS  
MESSAGES FROM  
FLOODED AREAS  
ARRIVED FASTER  
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AND THUS  
ALLOWING  
GOVERNMENT  
TO MAKE BETTER  
INFORMED  
DECISIONS*

**IN THIS CHAPTER**, we present the seven scenarios representing the seven types of hazard discussed in Chapter 2, convert the seven types of vulnerable groups presented in Chapter 3 into archetypes and describe the different interventions discussed in Chapter 4 in more detail. Here we present two archetypes. The first focuses on a passive victim of a hazard, whereas the second describes someone who through the appropriate types of intervention is prepared and empowered to become an agent of change and thus to tackle disaster risks and cope with the disaster and its aftermath. The goal is not to be exhaustive and address all possible interventions and initiatives but to present selected samples of interventions that specifically target the vulnerability of particular groups. The choice of the country is also not indicative beyond the fact that such a scenario would be plausible given the envisaged situation, history etc. The interventions/initiatives represent the type of action that could be taken (1) at the community level, (2) by local government, (3) by national governments and (4) by states at the regional level, in that order.

The purpose of these scenarios is to show how people can transform from passive individuals to empowered citizens. This is consistent with the main message of this report, which is that risk-informed, climate smart human development should be for people and by the people.

# 6

**How the Vulnerable can  
be transformed into  
Agents of Change**



**HAZARD SCENARIO**

Landslides affect the structural safety of houses, infrastructure and livelihoods in a high landslide susceptibility area in Tuzla.

**CH II****ARCHETYPE**

A vulnerable returnee without a durable solution to his or her housing needs.

**CH III**

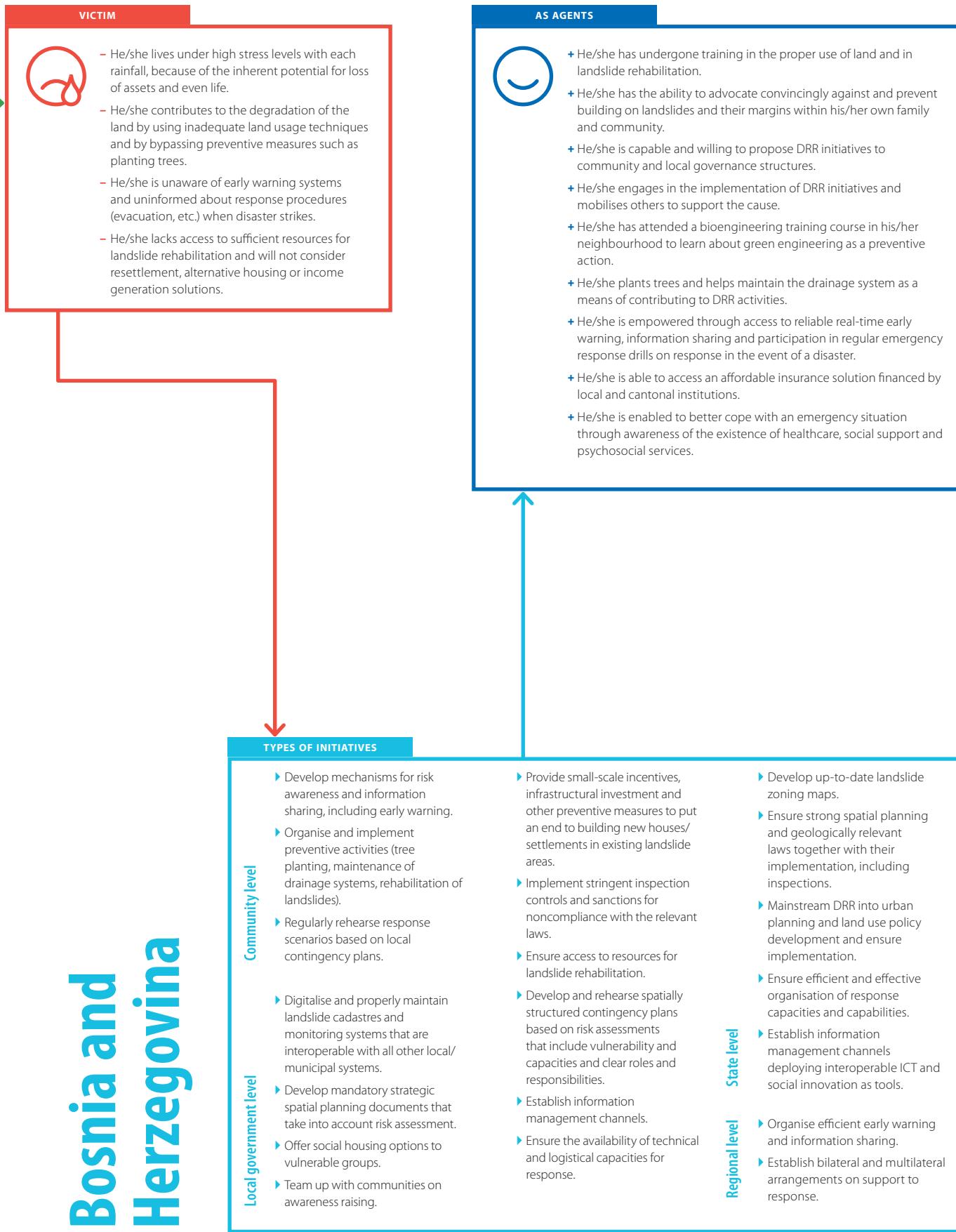
The vulnerability of people on the move, including returnees, migrants and those moving to urban areas, relates specifically to the unpredictability of their mobility, their settlement in insecure and exposed areas and their exclusion from information and decision-making powers within their new communities. They often lack information about local customs, the occurrence of past disaster and overall land characteristics, such as flood plains and areas prone to landslides. Interventions could protect and empower them by teaching them how to protect themselves through local knowledge. Efforts that target resettlement in safe areas with safe housing will help protect and empower these people. Returnees can become an active force in support of DRR measures if protected by special measures and laws, empowered through inclusion in local urban and housing planning and given access to information and training.

**Returnee (person on the move)**

Vulnerable because of unpredictable mobility, settlement in insecure and exposed areas, and exclusion.

Empowered through inclusion in local plans, access to resources and information, and inclusion in local housing and urban planning.

# Bosnia and Herzegovina



**AS AGENTS**

- + He/she participates in advocating for a private-public master plan for seismic safety that will enable the municipality and the state to ensure strict enforcement of building codes in high risk areas.
- + He/she networks with disabled persons organisations and their community at large and has joined a disability NGO or support group that advocates for disability-friendly evacuation plans and post disaster care giving options.
- + He/she has the ability to use assistive technologies for better preparedness and response (e.g. smart phone applications).
- + He/she advocates for a safe public infrastructure and smart housing solutions that allow for basic social services, shelter and evacuation in case of emergency.
- + He/she is empowered with the knowledge and skills to act in the event of an earthquake and to administer first aid to treat minor injuries before they become a serious health threat.
- + He/she is informed about congregation points and information sharing platforms in case of emergency.
- + He/she has the ability to access an insurance solution financed by local and cantonal institutions and specifically targeting at his/her needs.

**AS VICTIM**

- He/she is unaware of what to do in the event of an earthquake and has no knowledge of evacuation procedures.
- He/she lives in a house with poor accessibility and no easy escape route (e.g. third floor in a multi-story building).
- He/she lives in fear of losing his/her life and property.
- He/she lacks an information sharing capacity and is thus at risk of losing contact with loved ones and caregivers.
- He/she could be evacuated to a location that lacks access for the disabled, thus causing more stress.

# Albania

**TYPES OF INITIATIVES**

- Community level**
- ▶ Create an updated inventory of persons with disabilities that includes the location, type and degree of disability, next of kin contact details etc.
  - ▶ Develop risk awareness and information sharing mechanisms.
  - ▶ Provide information on peer support and solidarity neighbourhood contacts.
  - ▶ Improve rescue operations and social services in disasters, together with organisations for disabled people.
  - ▶ Devise contingency plans that takes into account the requirements of people with special needs.
  
  - ▶ Include the perspective and needs of people with disabilities in the design of early warning systems, information sharing mechanisms, preparedness and response plans, and local decision-making.
  - ▶ Conduct training on search and rescue for first responders.
  - ▶ Allocate rewards and recognition to the most accessible municipalities.
  - ▶ Invest in making public institutions and public

**State level**

- transport accessible to people with disabilities in order to reduce dependency.
- ▶ Ensure the enforcement of building codes.
- ▶ Raise awareness on the risk of earthquakes.
- ▶ Impose laws on barrier-free public institutions and the public transport infrastructure.

**Regional level**

- ▶ Promote public private partnerships that design assistive technologies to empower persons with disabilities to live independently and better prepare them for disasters.
- ▶ Prepare adaptive social protection systems to deal with the consequences of disasters.
  
- ▶ Coordinate hazard and disaster risk information with the countries of the region.
- ▶ Adhere to the Convention on the Rights of Persons with Disabilities, including through DRR activities.
- ▶ Tap into funding schemes aimed at independent living, healthy ageing, smart housing and smart cities (Multi country IPA, Horizon 2020).

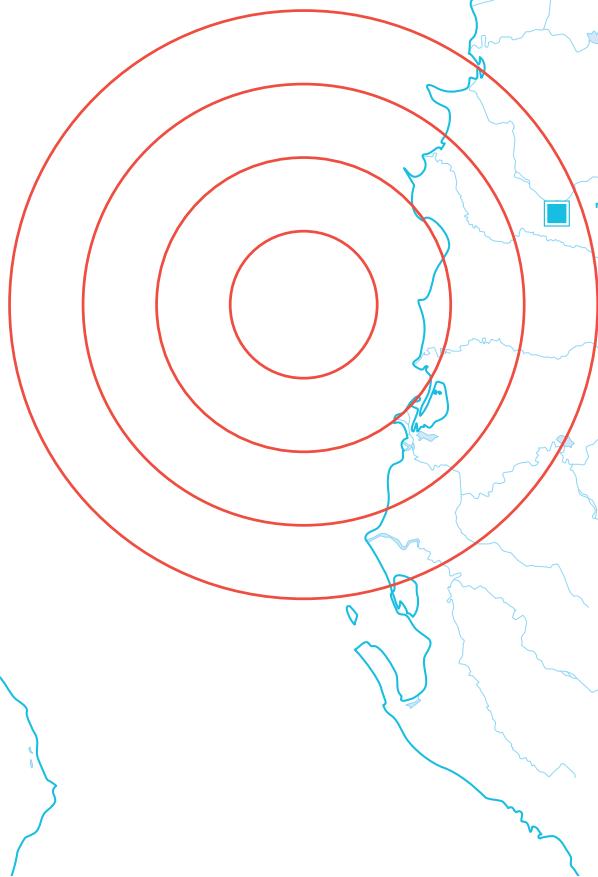
**Vulnerable because of physical challenges, dependency on others and on dwindling public assistance.**

**Person with disabilities**

**Empowered through information sharing, networking among local organisations, proper infrastructure, training and access to accessible ICT.**

**HAZARD SCENARIO**

A magnitude 7.0 Mw earthquake strikes the western Albanian coast significantly damaging infrastructure in Tirana and Durrës.

**CH II****Tirana****ARCHETYPE**

A person with physical disabilities.

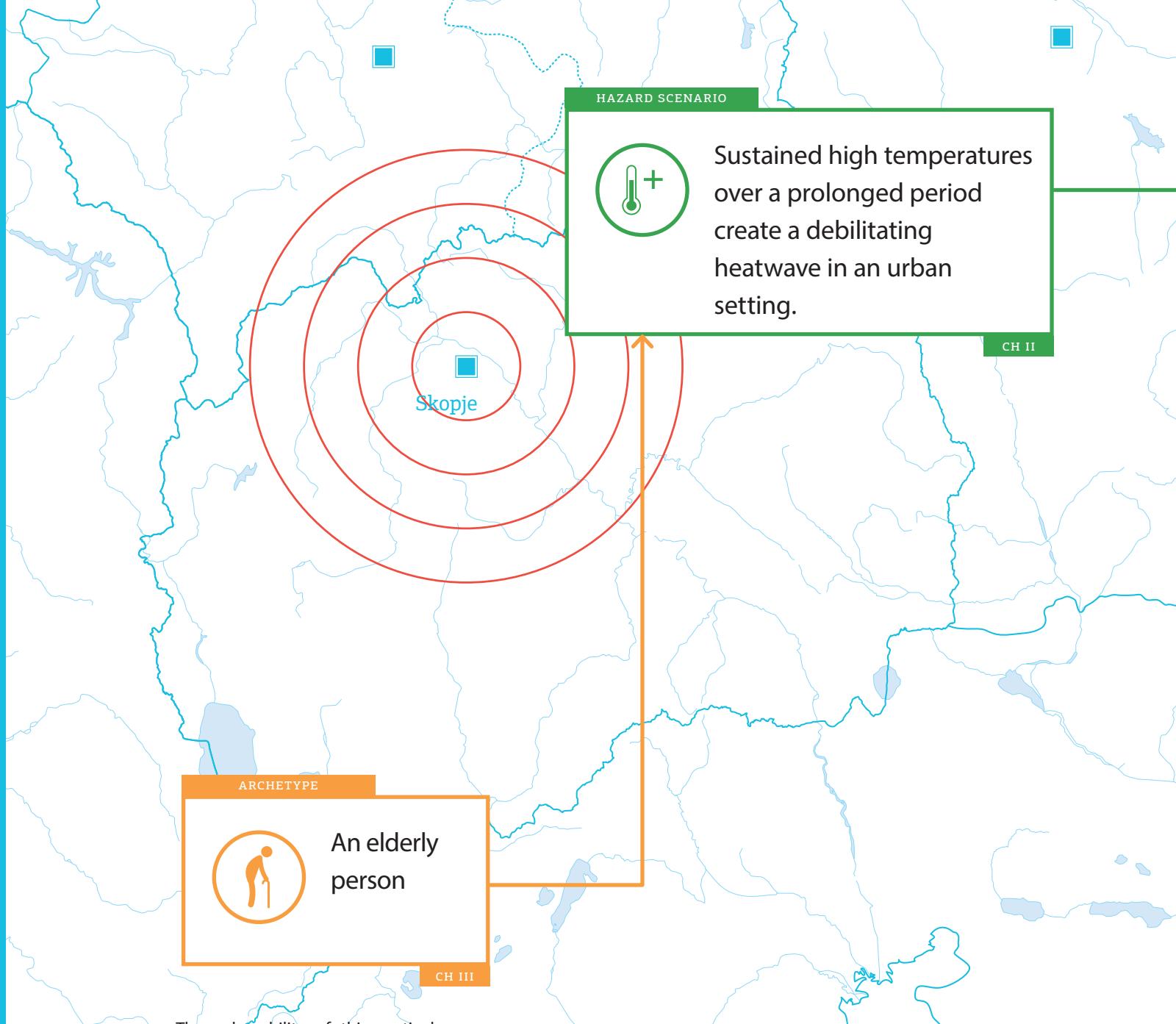
**CH III**

The archetype of the person with disabilities is especially vulnerable because of his/her physical challenges, lack of proper awareness, dependency on others and on dwindling public assistance. These make him/her especially vulnerable during an earthquake and in its aftermath when he/she may lose contact with those on whom he/she depends or get relocated to a place inappropriate for his/her condition. The authorities must maintain relevant information about their location and level of disability and implement specialised awareness raising campaigns for people with disabilities. In addition to ensuring barrier-free public infrastructure, they have to ensure proper support for them in the aftermath of an emergency.

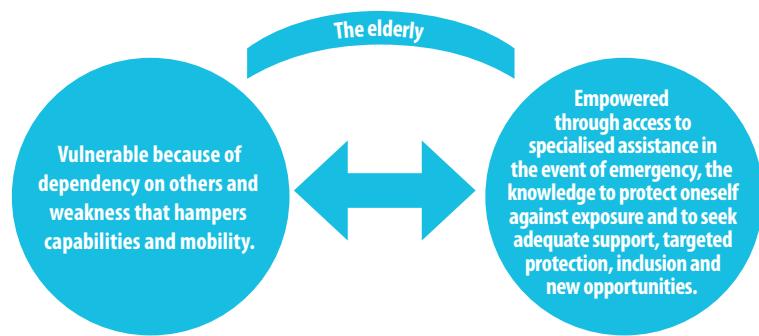
If well networked within disabled persons' organisations and their local community, people with disabilities can lobby for the creation of proper record keeping on the disabled with an interface to rescue operations and centres for social work. Action at the community level could be directed at advocating for accessible public infrastructure (construction of ramps, flat flooring for wheelchairs and

hand rails for the visually impaired), disability-friendly evacuation plans, ensuring that food, medicine and aid are delivered at accessible points, better caregiving options post-disaster and making social services more adaptive to the post disaster needs of the disabled. Through Disabled People Organizations (DPO), people with disabilities can empower themselves with the knowledge and skills to act properly in the event of an earthquake.

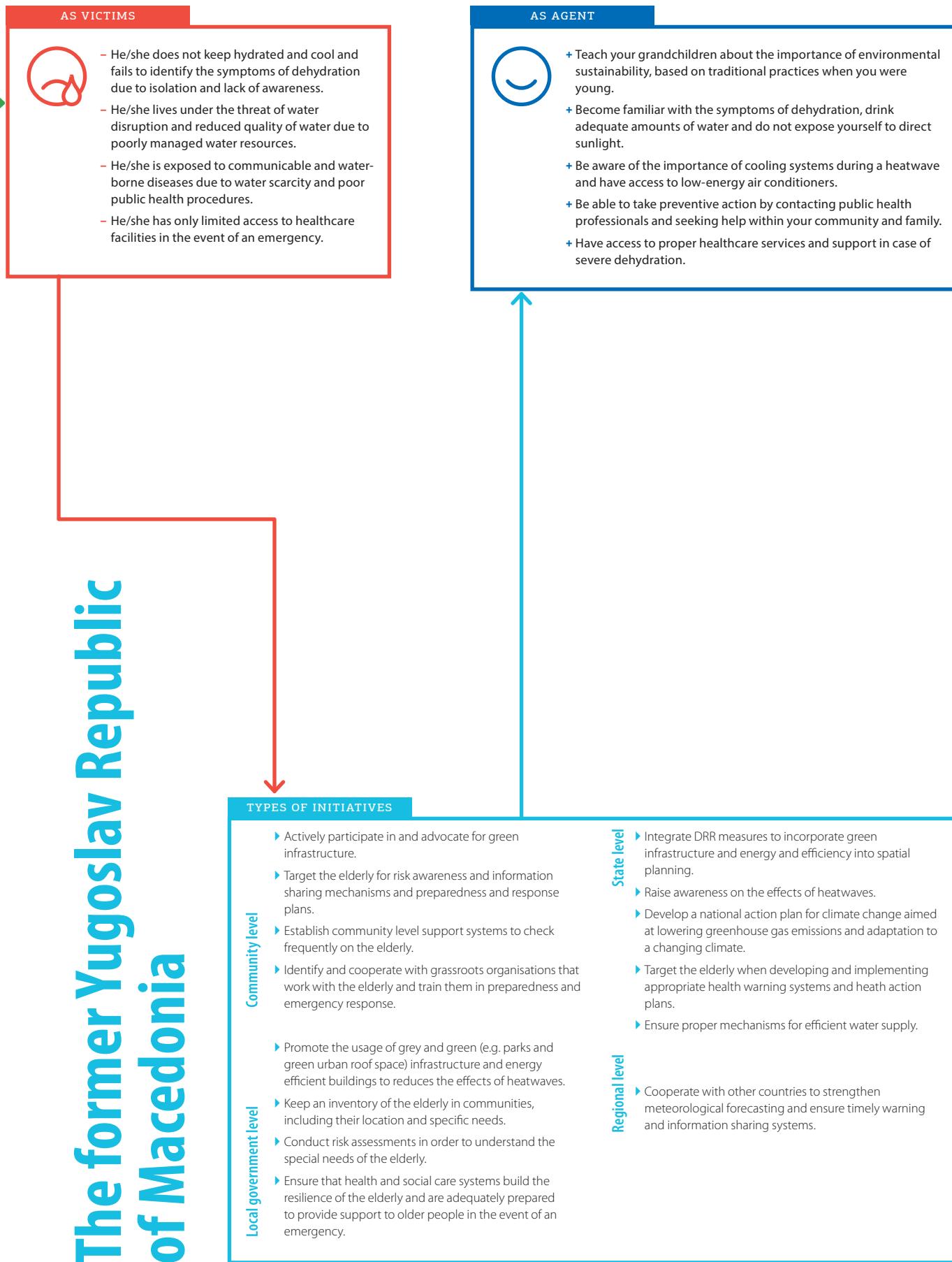
They would benefit from specialised training on search and rescue given to first responders and be able to remain well informed about congregation points and information sharing platforms in case of emergency. If EWS were made accessible through available ICT channels then people with disabilities could be more easily reached through EWS and therefore reduce their reliance upon others to escape. They could more readily access web-based platforms and smart mobile applications to feed content on equal terms with able-bodied citizens, report on their situation and check in to confirm that they are safe.

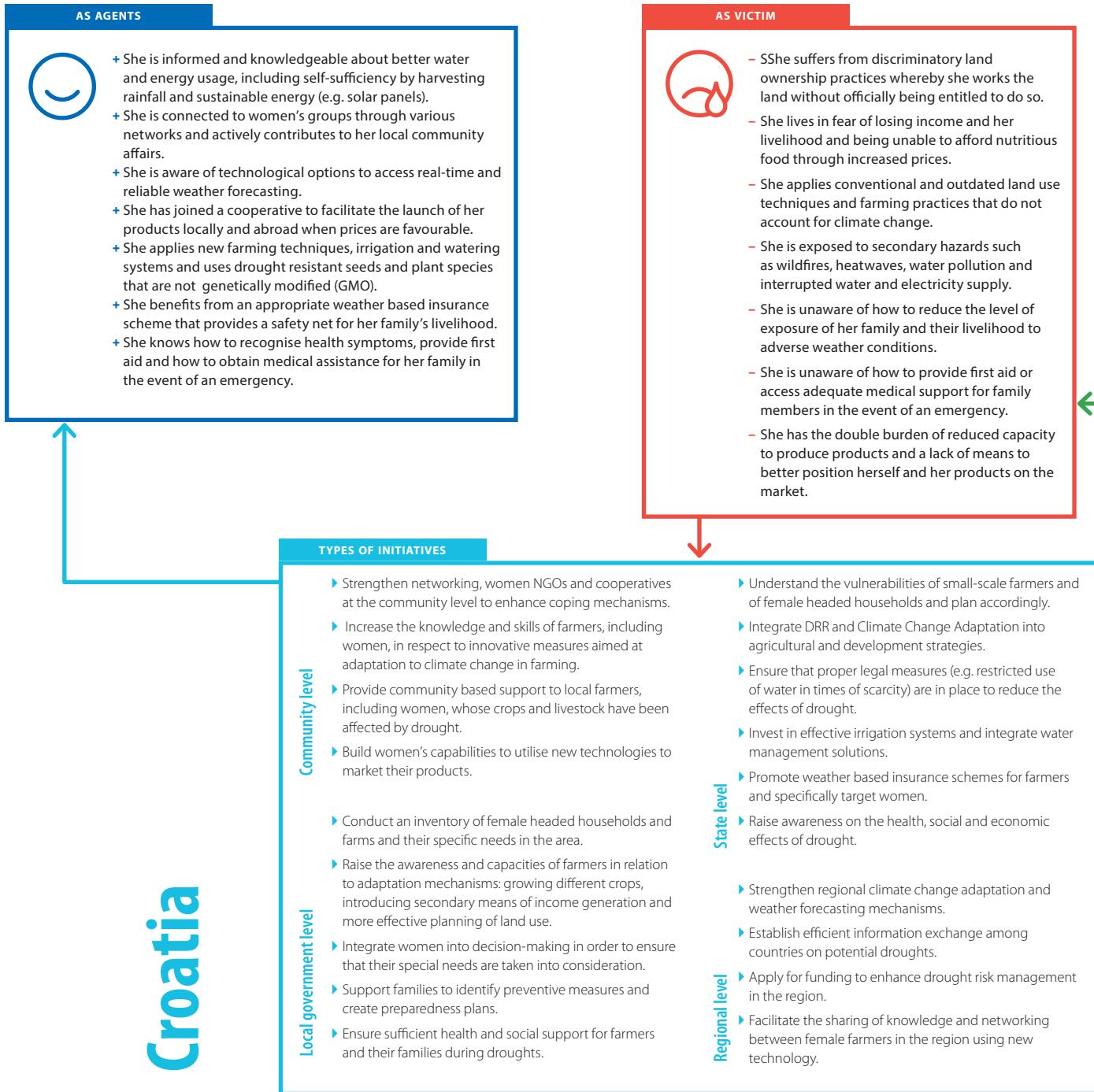


The vulnerability of this particular archetype, the elderly, has to do with dependency on others and weakness that hampers his/her capabilities and mobility. He/she has limited knowledge about ways to protect himself/herself in extreme situations and requires assistance to reach healthcare facilities. In addition to developing and planning interventions that help mitigate the impact of climate change, such as rises in temperature, in such cases, decision-makers and planners should also specifically target the elderly for awareness raising. This should be centred on the risks of exposure and how to protect oneself and seek adequate assistance if necessary.



# The former Yugoslav Republic of Macedonia

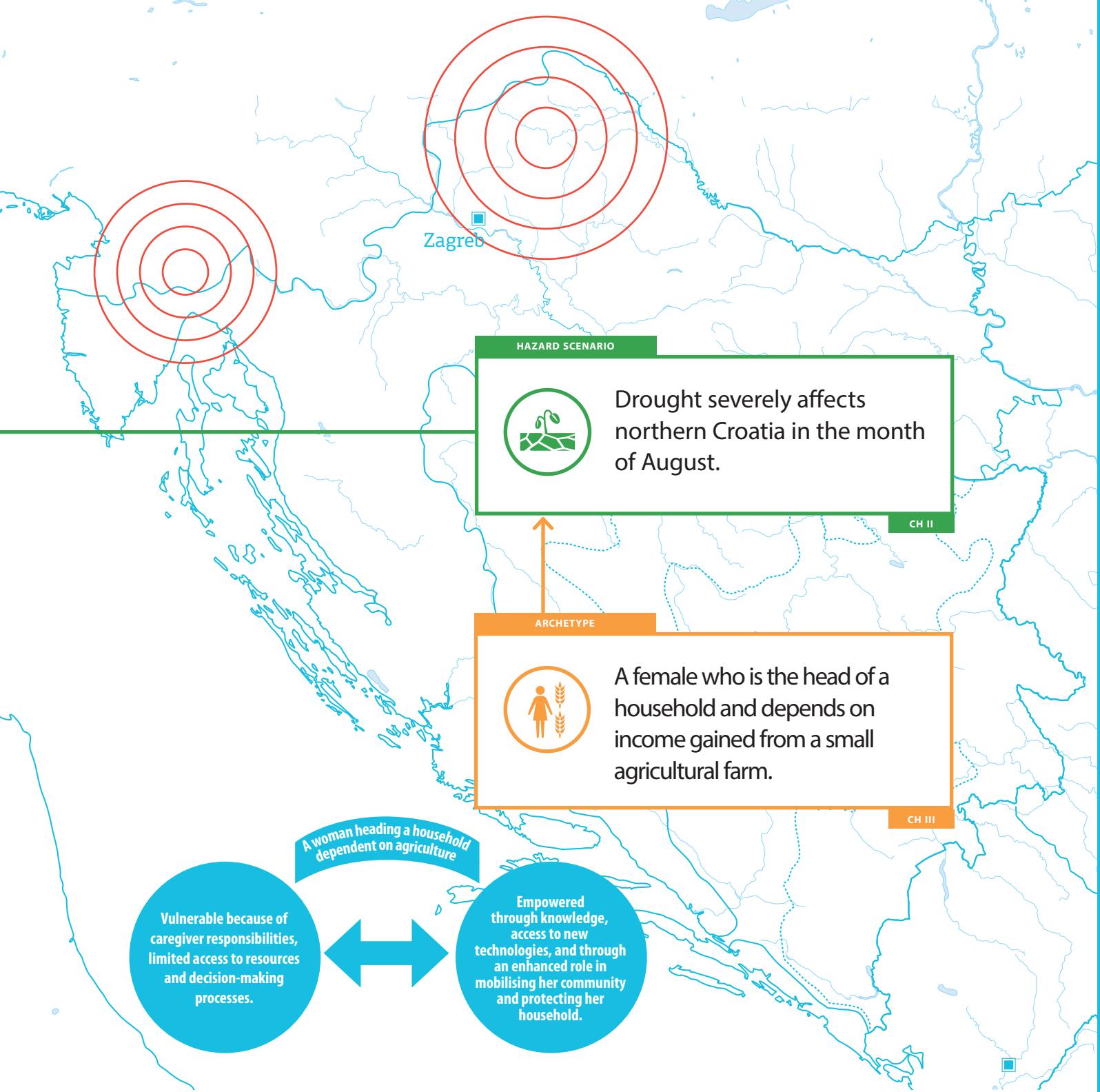




In this scenario, the archetype has two types of vulnerability: as a woman and as a head of household. She has caretaking responsibilities that increase with the onset of the disaster. She suffers from incomplete knowledge on how to protect herself, her family and her land and she has limited access to resources and decision-making processes. The fact that her household depends on agriculture makes it even more vulnerable to the risk and impact of drought.

The types of DRR interventions that could increase the resilience of people in such scenarios could be those that strengthen the leadership capabilities of women, building on their critical insights, perspectives, knowledge of natural resources, neighbourhood networks and experience as primary caregivers within the family and community at large. Efforts aimed at protecting farmers affected by drought should bear in mind the special situation of women, some of whom may not be

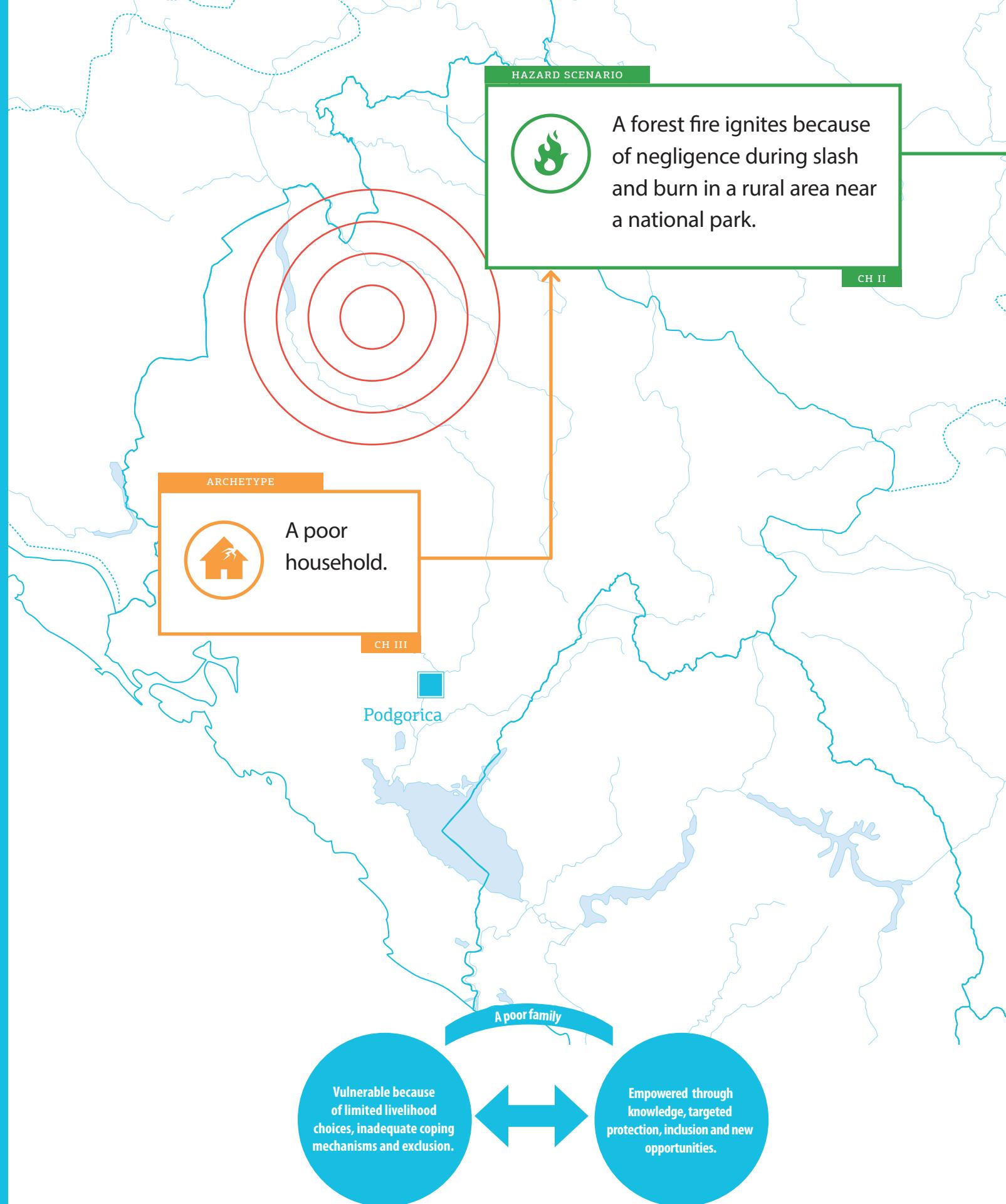
properly registered as landowners. They should target women in awareness raising about adaptation techniques, water conservation and such like. Women who are well informed and knowledgeable about better water and energy usage would also be better equipped to apply new farming techniques, irrigation and watering systems as well as the use of drought resistant seeds and plant species. Women empowered with access to affordable ICT would be able to harness the potential of modern

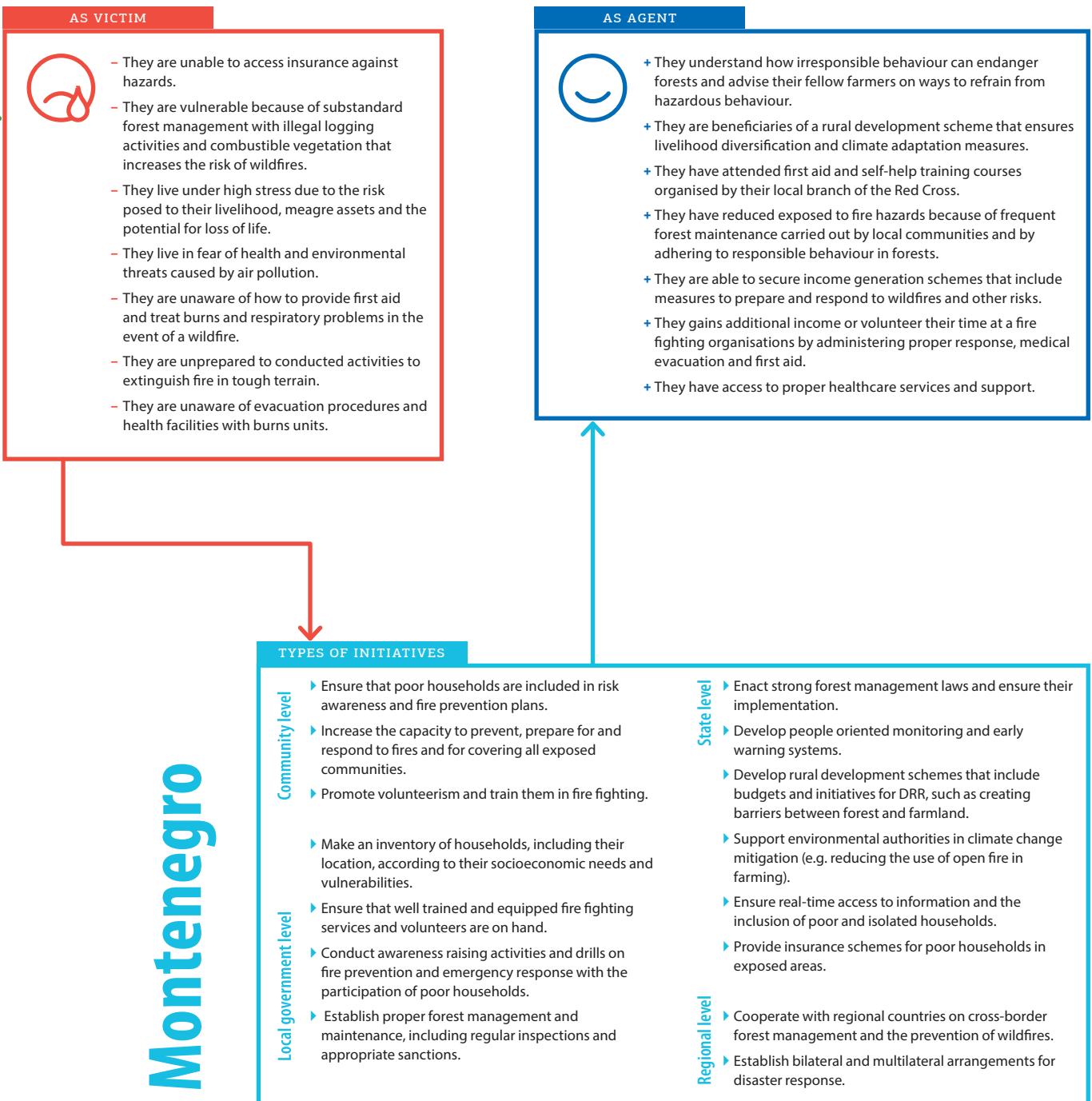


technology and innovation. This includes access to real-time and reliable weather forecasting, mapping and recovery efforts.

Yet true empowerment through ICT does not stop at mere access, but also means the inclusion of women in technology choices and the design of early warning systems to maximise their usability and accessibility to women. Well-networked women would be able to lobby other women and their households to use good

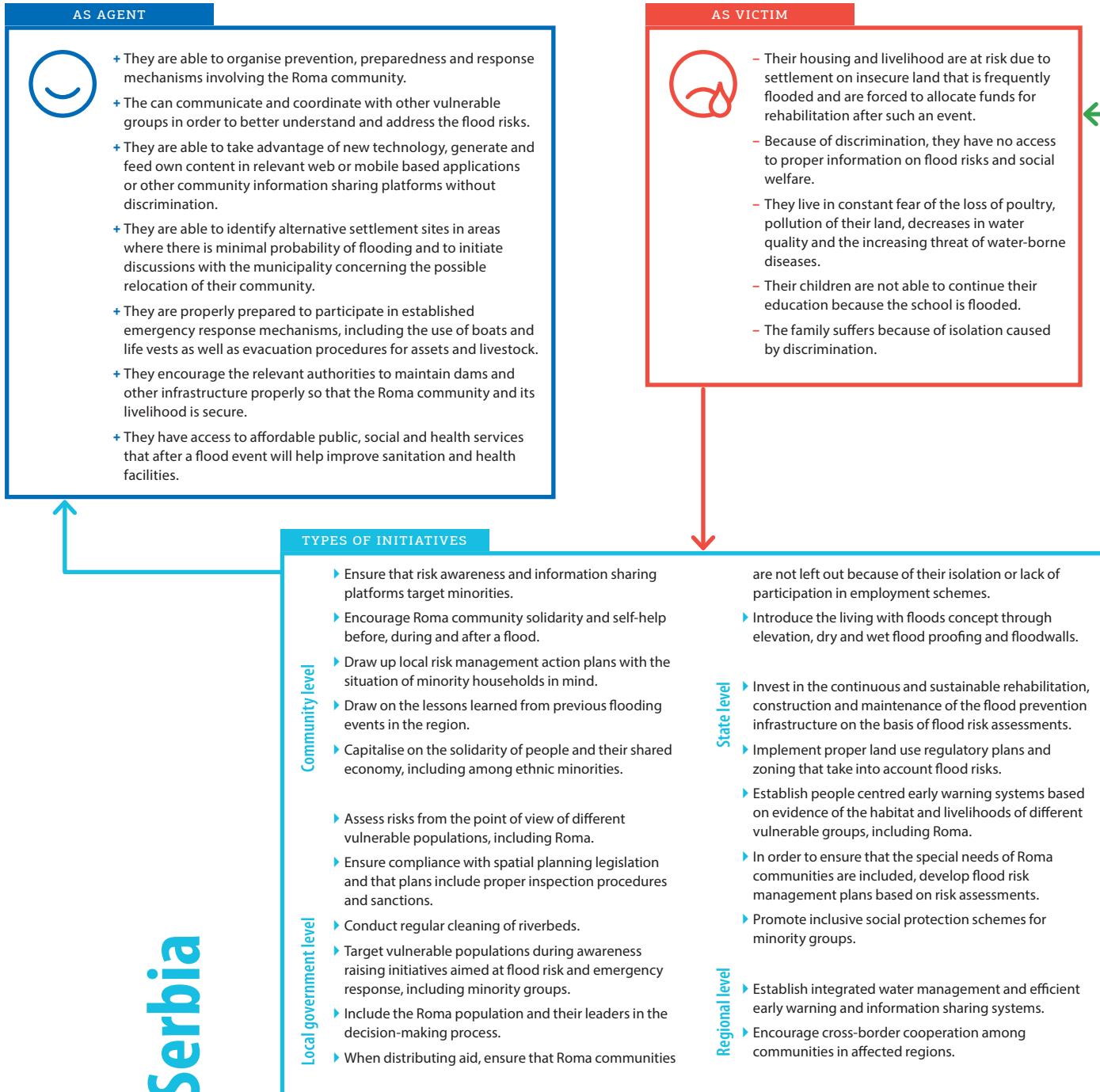
water conservation practices. As agents of change, women would also be able to support families to identify preventive measures and preparedness plans. They would benefit from appropriate weather based insurance schemes to secure a safety net for the livelihood of their family and benefit from investment in effective irrigation systems and integrated water management solutions.





The poor household in this scenario is vulnerable because of limited livelihood choices, inadequate coping mechanisms and lack of proper knowledge about behaviour in risky situations. The types of interventions targeted in such a situation need to start by making sure that the authorities are properly informed about the location of households and their socioeconomic status. Those implementing DDR strategies should also make specific efforts to include poor households in risk awareness plans, preparedness,

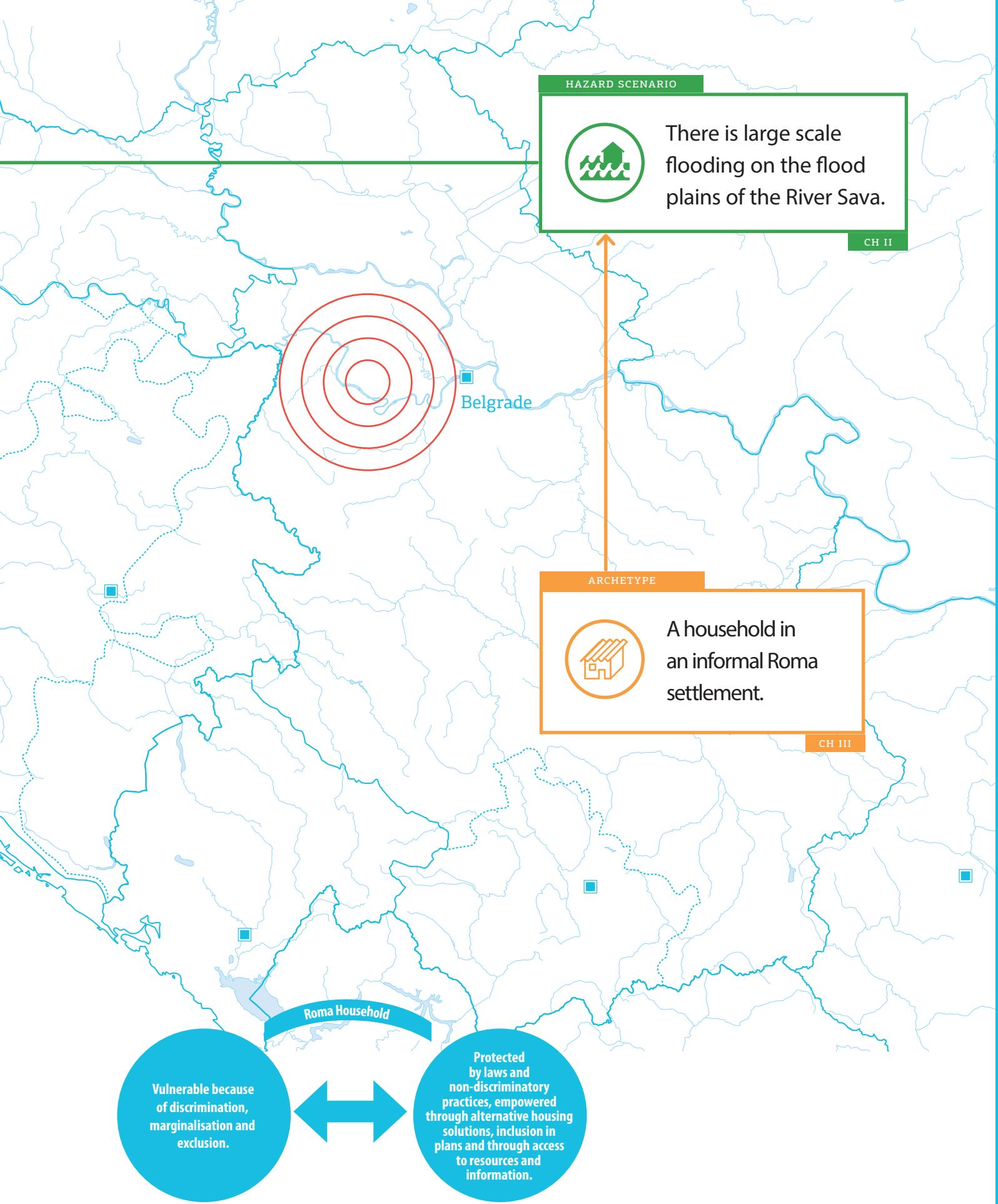
response and recovery. Specific insurance schemes and social services should ensure that the poor do not suffer even more by losing the very meagre resources they have to begin with. In this case, the most important measure of empowerment is to raise the level of knowledge and the capacity of the poor to prevent, prepare for and respond to the hazard of wildfires. The members of the poor household could also gain inclusion by volunteering their time and services in joining efforts to fight the fires.



serbia

The exclusion of minorities from decision-making and community planning is a major issue that causes them to live on the margins of society. This further reinforces their isolation when disaster strikes, for example, through discrimination with regard to access to relief supplies. To stop this vicious cycle, local authorities have to inform them about the dangers of behavioural patterns such as inhabiting hazard prone areas and offer them an alternative solution. Minority communities can contribute their own experiences and knowledge for the purpose of DRR when empowered through

knowledge on preparedness and response plans and given access to proper communications channels. By maintaining disaster prevention mechanisms (i.e. compliance with legislation on land usage, flood protection and fire prevention) that primarily protect minority settlements and ensure that adequate public services are available and non-discriminatory to these groups, it allows them to become better integrated within the community and protected against the potential effects of a disaster.



## AS AGENT



- + They have an environmental club at school that creates awareness about pollution and mobilises their peers and adults to take action against industrial accidents and respond to them in the event of an emergency.
- + They write articles about the risks of pending disasters and send them to the local newspaper.
- + Together with family members, they take part in a participatory risk assessment in their village/town/city to create awareness on and possible counter measures for an industrial hazard.
- + They benefit from good preparedness measures at home and school aimed at securing access to clean water and better health outcomes.
- + They are empowered by coordinated real-time information channels that ensure accurate information on the status of water and air pollution.
- + They are aware of proper and timely emergency response measures that can reduce the negative effects after an industrial disaster.
- + They are beneficiaries of a 'natural hazard' insurance scheme that their parents joined, financed by local and national institutions.

## AS VICTIM



- They are unaware of how to react and where to evacuate to in the event of the sudden onset of an industrial accident.
- They live in fear of family separation and dramatic changes in their and their parents' lives due to loss of family assets and livelihood.
- They have insufficient knowledge about how to contact loved ones if an industrial accident occurs.
- They are uninformed about how and where to continue their education activities.
- They are incapable of recognising health symptoms such as vomiting and nausea caused by contaminated soil, water and air and therefore unprepared to report such symptoms in a timely manner to family members or other adults in their community.
- They lack a support system to deal with possible long-term pollution related health impacts.

# Kosovo

### TYPES OF INITIATIVES

#### Community level

- ▶ Develop mechanisms for risk awareness and information sharing, including early warning systems using, for example, radio, TV and smart phones to target vulnerable groups, including children.
- ▶ Ensure preparedness measures are in place (e.g. evacuation points and air pollution masks) and rehearse emergency responses.
- ▶ Put communication systems in place and adequately train children to use them.

#### Local government level

- ▶ Continually raise awareness on industrial risks, targeting children and young adults.
- ▶ Ensure compliance with the appropriate legislation, especially directed at the protection of children.
- ▶ Conduct regular internal and external drills based on preparedness plans and ensure that families rehearse these plans with their children.
- ▶ Provide training for children on how to recognise the symptoms of contamination and how to alert others.

#### Central level

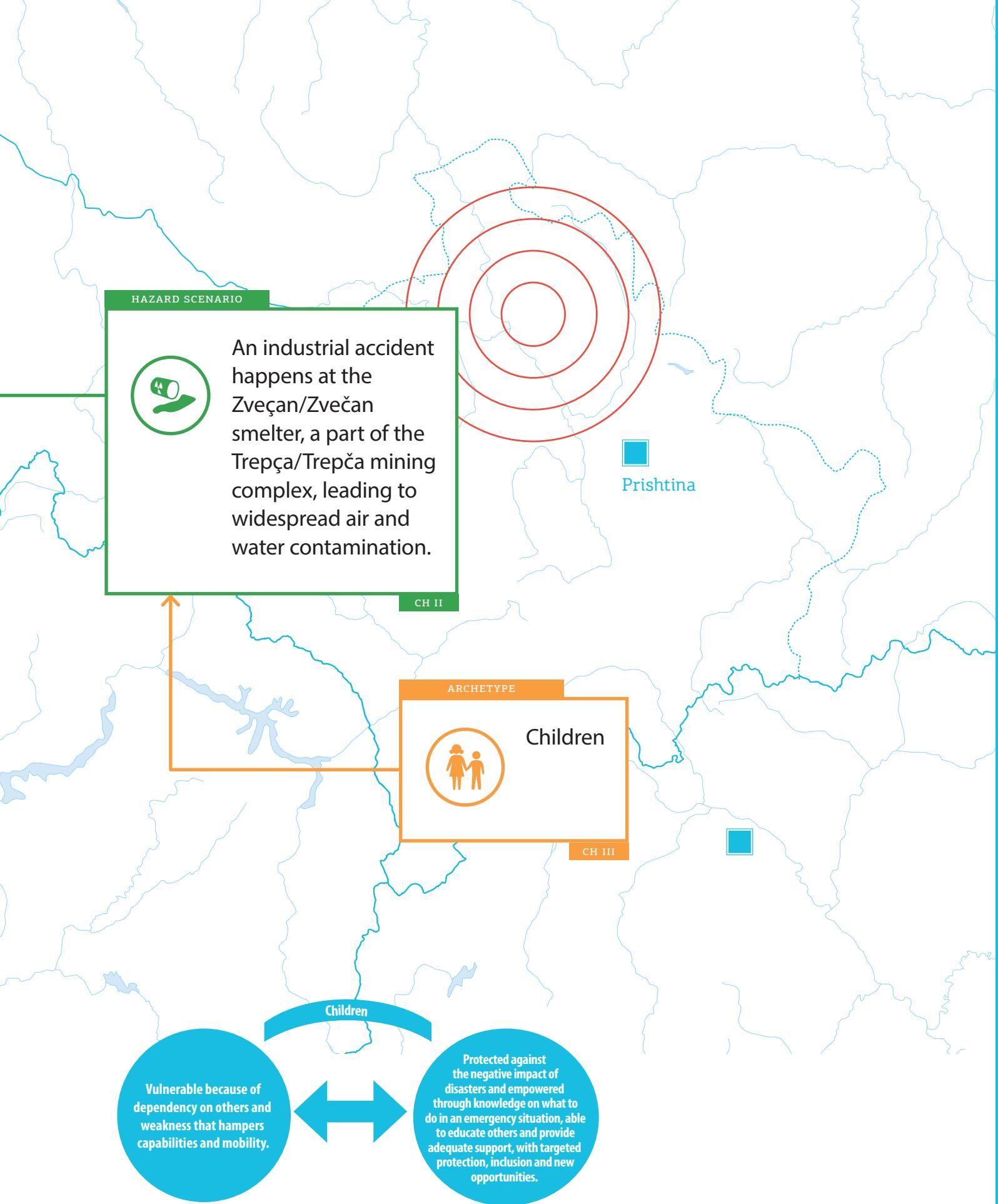
- ▶ Ensure that appropriate regulations on the operation of industrial sites and strict safety standards as well as land zoning regulations are in place.
- ▶ Establish insurance and risk transfer measures that ensure adequate coverage for children, both for the present and the future.
- ▶ Ensure measures for real-time access to information and information sharing during a disaster.
- ▶ Organise efficient specialised response capacities.

#### Regional level

- ▶ Establish efficient information sharing on past, present and future industrial accidents.
- ▶ Develop a regional action plan to address biological, chemical and radiological accidents.

Much like for the elderly, the vulnerability of children has to do with dependency on others and weakness that hampers their capabilities and mobility. When faced with a sudden disaster, like an industrial accident, they may have little knowledge on what to do and their survival may depend on those people who care for them. Authorities need to gear awareness raising and information sharing campaigns towards children. Children should be informed about hazards and what to do in the event of a hazard related emergency. While continuing to protect them against the risks when a disaster strikes, the authorities need to ensure the

continuation of children's education in a safe environment. Through proper interventions, children would not only be protected from the impact of a disaster, knowledgeable about what to do in the event of a disaster but also able to play an active part in educating their peers through an environmental security campaign.



*IT IS NO LONGER SUFFICIENT  
TO LOOK AT HOW NATURAL  
DISASTERS IMPACT PEOPLE,  
BUT HOW PEOPLE CAN  
BECOME AGENTS OF CHANGE*

# 7

## **Conclusions and Recommendations**



This report makes the case for a paradigm change or mind shift that comes from the meeting of two concepts. The first is the need for development interventions to integrate risks, while the second is for strategies to reduce disaster risks and to take more account of the roles that people play both as victims/survivors of disasters and as agents of change.

The implications of such a paradigm shift are clear. The countries of the Western Balkans are prone to both natural and human-made hazards and are therefore eager to build on the human potential that exists within society. By taking a more proactive and preventive approach to risks, as opposed to merely responding to disasters after they occur, this paradigm shift will lead to three desired outcomes.

1. It would help safeguard the existing and future development and investment made in the region.
2. It would help protect the lives and livelihoods of the people who live in this region.
3. People would be empowered to act in a responsible manner and contribute to a reduction in the risks.

DRR from a Human Development perspective is a two-way street. On the one hand, it requires

government to protect citizens by utilising knowledge about the risks and vulnerabilities and, on the other hand, people need to supplement such initiatives by taking preventive action themselves and empowering their family members, neighbourhoods, communities and nations to become agents of change. This is why DRR combined with the Human Development perspective can be described as '*reducing risks for people by people*'.

This shift is not difficult to implement but does require a new commitment and new knowledge, evidence-based planning, new innovative mechanisms and the involvement of people throughout the process. It requires knowing what the hazards and risks are, where they occur, how they evolve over time, which people and assets are exposed, and how the vulnerabilities and capacities of people expose or protect them from hazard risks. Effective risk reduction therefore requires an understanding of what the structural vulnerabilities of people are and how to overcome them by action *for* and *by* people. Such an approach must also bring climate change into the equation as an additional layer of uncertainty about the future. This transformation in essence requires a commitment to risk informed development based on increased knowledge and flexibility, which is currently not the case.

Whether they work on DRR or on development in the Western Balkans, what can practitioners, policymakers and planners take away from this report's discussion on a risk-informed and climate smart Human Development framework for action? The main messages are highlighted below, with the understanding that none of these pillars can function in isolation but together they can move towards sustainable, risk free and human centred development.

#### MESSAGE

**1**

#### **Development should be safeguarded against risks**

##### **What does this mean?**

Hazards endanger development that fails to consider the risks at the outset. This is likely to result in a recurrence of disasters that affect the lives, health, welfare and rights of people. Given the high exposure of the Western Balkans to natural and human-made hazards, such unresolved development issues and high susceptibility to climate change is particularly evident in the region. Planning and implementation of development interventions based on concrete knowledge about the existing and potential risks will protect investments aimed at risk reduction from the start.

##### **How can this be achieved?**

- Identify the risks and the way they are constructed socially through human perception and action/inaction. Risk should be seen as a function of hazards, vulnerability, exposure and capacity.
- Identify vulnerable groups and the structural reasons for their vulnerability. Exposure yes, but there are also inherent characteristics that relate to specific population groups. These include but are not limited to dependency on others or on specific land, economic vulnerability, dis-

crimination, deprivation and mobility.

- Conducting a geographic analysis to understand the spatial dimension of risk and identify where hazards occur and where people are most exposed.
- Understand how the impact of climate change influences the occurrence of hazards and effects the risk profile of vulnerable groups.
- Identify and build on people's own capabilities and resilience. Resilience is what helps them bounce back, cope with shocks and stress and to use their own capacities to prevent risks or mitigate their impact.
- Empower people to become agents of change and therefore stakeholders that can contribute to solutions that safeguard development interventions.
- Develop policies and plans based on concrete data and understanding of risks.

#### MESSAGE

**2**

#### **Disaster Risk Reduction strategies should highlight the central role of people, not only as victims/survivors of disasters but also as agents of change.**

##### **What does this mean?**

Disasters and even natural hazards should not be seen as isolated events. The effects and in some respects even the cause of a physical hazard or disaster can be influenced to a varying extent by a lack of risk management and human action/inaction. This is a strong message for practitioners in a region used to responding to emergencies after they have happened. They need to realise that it is no longer sufficient to look at how disasters impact people, but also – more importantly - how people can become agents of change and address risks before they become emergencies. They can influence the likelihood and intensity of risks through their choices, such as choice of settlement, use of their natural environment, and can invest in capacity

building and resilience. It is not just about hazards but how human interaction contributes to or helps prevent them from turning into disasters.

#### **How can this be achieved?**

- The main shift that is required is to go from responding to emergencies after they have happened to understanding what the hazards and risks are and plan accordingly. It means moving away from disaster response and recovery to focusing on prevention and mitigation of disaster risks as well as emergency preparedness.
- Understanding peoples' capacities as well as their vulnerabilities allows proactive planning to prevent risks from turning into disasters.
- Risk assessments that include spatial analysis, to understand hazard exposure, and socioeconomic analysis, to explain vulnerability, should be mapped, analysed, used and shared. This form of concrete analysis should form the basis for proactive interventions.
- Awareness of the risks and the capacities and responsibilities of people to prevent and mitigate such risks should be considered when determining the acceptable level of risk.
- Committing to act proactively through investment in disaster reduction and prevention measures is more effective and cost-effective than dealing with the aftermath of a disaster.

#### **MESSAGE**



**Development interventions and Disaster Risk Reduction strategies should be carried out for the people by the people.**

#### **What does this mean?**

Because the goal of Human Development is to enlarge people's choices and capabilities and Disaster Risk Reduction is dependent on human action/inaction it follows that all inter-

ventions should take into consideration the role that people can play either as objects or subjects of such interventions. 'For people' requires protection against risks whereas 'by people' means empowering them so that they can become agents of change and informed and responsible stakeholders. Informed, empowered, active and responsible citizens are the best assets a county has when it comes to implementing a risk informed development agenda. This is particularly true in a region that for decades has relied on top-down policies and conventional civil protection systems. Empowered and informed citizens and communities can make better choices about the level of acceptable risk.

#### **How can this be achieved?**

- Protection and risk reduction '*for people*'.
  - Identify the vulnerabilities of people and the structural reasons for such vulnerabilities and design appropriate interventions to address them.
  - Conduct spatial analysis and socioeconomic mapping to better understand hazard exposure and plan accordingly.
  - Inform people about their right to know about risks and make public information sources and open-source software available to people at risk.
  - Ensure access to social services, safety nets and insurance schemes.
- Empowerment '*by people*'.
  - Recognise and build upon people's capabilities to overcome disasters and prevent risks, such as adaptation skills and coping mechanisms.
  - Build on people's resilience through social services, mutual community support, skills enhancement and formal and informal life skills gained through the education system.
  - Raise awareness about the ways people harm the environment and the importance of reducing their exposure by ending harmful practices such as

- irresponsible farming, unplanned settlement, lack of compliance with building codes and regulations through illegal building and land use. Encourage innovation by referring to EU standards and apply sanctions against illegal behaviour in order to ensure compliance.
- Empower citizens and communities to prevent risks through community based DRR. Solidarity schemes and awareness raising campaigns need to be encouraged.

**MESSAGE****4**

**Time, space and unpredictability are intricate parts of a risk-informed, climate smart Human Development framework.**

**What does this mean?**

Climate change is likely to produce more frequent, unpredictable and intense disasters as well as new patterns of risks in the future. It is expected that significant changes in precipitation and temperature will affect the occurrence of hydro-meteorological hazards, such as floods, drought, heatwaves and wildfires, as well as the related vulnerabilities of people at risk in the Western Balkans. While spatial analysis based on historical timelines is key to understanding the occurrence of hazards at different locations in the region, future risk patterns need to be taken into consideration for the purposes of long term planning. Relying on past experience is no longer sufficient for understanding natural hazards and planning for future disasters. Instead, risk analysis and risk management action planning needs to incorporate climate change scenarios.

**How can this be achieved?**

- Understand how the patterns and different scenarios for climate change are likely to affect people, their livelihoods and settlements in the future.
- Practitioners need to incorporate climate

change scenarios into risk analysis and risk management action planning. While emergency response is necessary, preparedness options are better and prevention the best solution.

- Human development and DRR are de facto long-term endeavours and therefore commitment in the long term is required. Short-term measures, projects and pilot interventions need to give way to long term and holistic investments in vulnerable people and communities at risk.
- The existing flood prevention infrastructure in the Western Balkans is extremely vulnerable to changing climatic conditions. In order to prevent secondary hazards, it is essential to properly maintain and upgrade dams and embankments to cope with extreme weather events.
- New approaches, methods and knowledge are necessary in the Western Balkans region in order to cope with the impact of growing disaster risk and climate change. In a period of increasing uncertainty, it is essential for people to learn to live with risk and rely on community based interventions and their own resilience and coping capacity rather than relying on external assistance and structural solutions.

**MESSAGE****5**

**The main component of the paradigm shift is the ability of policymakers to focus on prevention.**

**What does this mean?**

Moving towards risk-informed, climate smart human development planning is common sense but is also a challenge to implement. This is mostly because of the short-term focus of planners and policymakers in the region. It is human nature to be reactive rather than preventive and policymakers and planners are no exception. With limited budgets and the pressures of short-term mandates and

immediate priorities, politicians rarely spend resources on prevention. When there is no imminent hazard on the horizon the tendency is to let their guards down and wait to react to another set of emergencies.

#### **How can this be achieved?**

- The move away from merely responding to disasters to preventing risks requires systematic data collection, knowledge, analysis and proactive planning.
- Risks may be difficult to quantify before they manifest in the form of emergencies; however, risk assessments should be able to learn from science, study lessons from past disasters, incorporate the impact of climate change and tally this up with knowledge about the existing vulnerabilities and capacities of people. Such complex risk analyses should become the foundation for effective prevention strategies.
- Policymakers and planners should understand that yesterday's solutions are no guarantee for the future.
- More investment is required in new technologies, methodologies and know-how for risk prevention in the region.

#### MESSAGE



**A commitment to generate new data, new knowledge and use evidence-based planning is needed.**

#### **What does this mean?**

When a disaster strikes, the tendency is to discuss impact in terms of mortality or injury rates, humanitarian needs and the cost to the economy. Less tangible damage, such as the loss of opportunity for education when schools are closed or increased unpaid labour by women who need to engage more in caring for their dependents, is usually not measured. These need to come into the equation on the cost of a disaster. Furthermore, shifting to risk-informed development instead of reactive emergency

response also requires new types of quantitative data that have to do with spatial exposure and socioeconomic vulnerability. Proactive and preventive planning needs to incorporate this.

#### **How can this be achieved?**

- New databases need to be developed at the sub-national, national and regional level and properly correlated to better understand the risks and level of exposure. They should include spatial information (where hazards and risks are concentrated) combined with socioeconomic data on population groups residing in hazard-prone areas.
- Data should be properly managed and understood: there is plenty of insufficiently or inappropriately analysed, used or shared data in the region.
- Risk informed planning should be based on solid evidence, such as scientific hazard and climate change assessments.
- Assessments of potential risks that incorporate qualitative analysis and quantitative data need to be shared with communities at the sub-national level and across the region in real-time in order to allow for proper planning.
- Knowledge about the probability of future disasters and their possible impact needs to be developed and shared widely. Populations should have free access to open data to make informed decisions on their risks and responsibilities.

#### MESSAGE



**Vulnerable groups need to have affordable solutions and better opportunities to protect themselves against risks.**

#### **What does this mean?**

In order to protect vulnerable populations, civil society, governments in the region and the private sector need to boost their protective mechanisms to ensure adequate and equal coverage. This includes, amongst others, insur-

ance schemes, access to services, social protection and safe infrastructure. In addition, these need to target the specific vulnerability of given populations. However, insurance schemes cannot compensate for the failure of states to provide social services for all.

#### **How can this be achieved?**

- Social protection systems need extending to all population groups at risk and enhanced to share the current and future burden of risk.
- Insurance schemes need to be available and affordable to safeguard the livelihoods and property of people at risk.
- Detailed needs assessments of exposed populations groups (such as those presented in chapter 3) are required in order to ensure adequate social services and insurance schemes. Women, for example, require different types of basic services/insurance schemes, as do farmers, migrants and the elderly. Infrastructure that is safe, smart and innovative needs to be designed to safeguard against hazards, including climate change. This requires changing design criteria for new infrastructure and retrofitting the existing one, especially state schools, hospitals, health centres, social service centres, industrial and power generation infrastructure. Critical lifelines, such as electricity, water supply, drainage and gas pipelines, also need to be safeguarded against hazards.
- Building codes for safe construction need reinforcing and updating based on new building practices, materials and legislation.

#### **MESSAGE**



**Appropriate governance structures and mechanisms need to be in place to support risk-informed development.**

#### **What does this mean?**

The shift to risk informed, climate smart Human Development requires appropriate structures: institutional mechanisms, laws and their enforcement, capacity, budgets etc. Much of these are already available in the region, but they need to be reinforced and strengthened. Risk reduction strategies also need to go beyond the responsibility of security agencies in charge of emergency response. In the Western Balkans region, DRR practices, approaches and strategies must be incorporated into the responsibility of all government bodies at various administrative levels.

- Institutions need to have the appropriate capacity to plan for risk informed development: they need, amongst other things, training in prevention methods, risk assessment, participatory approaches and data analysis.
- The plans, policies and systems responsible for emergency and disaster response require adjustment to the new realities and concepts of disaster risk management. Risk reduction need to be the responsibility of a variety of public and private institutions and not just the security sectors in the countries of the Western Balkans. DRR action plans at various levels need mainstreaming across sectors and integration into agricultural and development strategies.
- Good practice in risk reduction needs to be adapted and shared with stakeholders and communities at risk in the region.
- Communities at risk need to be capacitated in order to address disaster risk and encourage, educate and allow citizens to take preventive action.

- The many good laws adopted by countries in the region need to be implemented and their compliance enforced.
- Where necessary, legislative frameworks need strengthening in terms of building codes, proper land use, urban and spatial planning, and people centred EWS.
- Risk reduction strategies and mechanisms need to be based on interoperable and well-coordinated systems at the national and regional level.
- Budget resources allocated to development investment must take in account the long-term risks. Any investment that is not risk informed is wasted.
- An appropriate budget should also be allocated to preventive measures, such as, for example, clearing riverbeds, planting trees and finding alternatives to illegal construction and dams.
- Transparency is necessary in data gathering, sharing and planning.

## MESSAGE



**The countries of the Western Balkans need to adhere to their global commitments.**

**What does this mean?**

As discussed in Chapter 1, the commitments necessary to implement a risk-informed, climate smart Human Development paradigm shift were all part of recent global agendas to which the countries of the Western Balkans have all adhered: the Sendai Framework for DRR, the SDGs, the Paris Agreement (COP 21) and the upcoming World Humanitarian Summit. These commitments now need to be localised and national action plans developed, implemented and monitored, and communications about them made explicit to the wider public.

**How can this be achieved?**

- Global commitments are important for the provision of solutions and bringing about a change in perception and exchange of experiences; however, they need to translate into local action and communicated to local audiences in ways that bring about changes in behaviour. Their contextualisation and national communication requires vigour. Unless they trigger action at various levels, they remain mere directives/guidelines that governments have adhered to in principle but not in practice.
- After participating in the consultative process on the development of the SDGs, the countries of the Western Balkans adopted their universal goals. While not legally binding, governments are expected to take ownership and establish country level frameworks for monitoring implementation of the SDG objectives. When developing their national action plans to implement the SDGs, the countries of the Western Balkans should integrate the principles of DRR into all of the targets and not just those of SDG 11.
- By contributing to the development of the Sendai Framework for DRR, the Western Balkans countries are expected to scale up and monitor the implementation of the four Sendai priorities for action agreed at the Third World Conference on Disaster Reduction.
- All recognised United Nations members in the Western Balkans signed the COP 21 agreement on the 22 April 2016. At the Paris meeting, the heads of states of Serbia, Montenegro, and former Yugoslav Republic of Macedonia and the prime ministers of Croatia and of Bosnia and Herzegovina were in attendance. Appropriate national strategies for combating climate change and mitigating its risks need to be developed.

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# **Annexes**

# ANNEX I: GLOSSARY

## GLOSSARY TABLE OF HUMAN DEVELOPMENT TERMINOLOGY

**Agency:** Agency refers to what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important.

**Capability:** Capability represents the various combinations of functioning (beings and doings) that a person can achieve. Another definition of 'capabilities' is "the substantive freedoms he or she enjoys to lead the kind of life he or she has reason to value."

**Capability(ies) approach:** The philosophical foundations of human development translated in policies that promote human rights, respect for disability, health, growth and democratic practice, and the position of disadvantaged groups.

**Empowerment and agency:** Enabling people and groups to act and drive valuable outcomes. The term 'opportunities' means access to resources and assets, and active participation in the formation or use of their advantages. In accordance with A. Sen, human capabilities depend not only on the individual's quality but also on the social and economic choices provided by society. Human development implies "giving people the opportunity to exercise individual choice and to participate in the formation

of these choices and gain benefit from the processes occurring in a household, in communities and at the national level". This is one of three components of human development, including the expansion of rights, agency and justice.

### Major Components of the Concept of Human Development

**Efficiency:** People must be productive agents of the economy so that they possess the economic means to broaden their choices. Therefore, economic growth is a significant dimension of human development.

**Equality:** People must not be discriminated against, because this narrows their choices in life and reduces their potential for human development. Consequently, the society also fails to attain its full development.

**Sustainability:** Access to capabilities must be secured both for the present and future generations. In order to support the sustainability of human development, any model of development that only supports the present and deprives future generations is clearly not feasible.

**Capabilities expansion:** Development is to be carried out in the interests of and with the efforts of people, who should participate in the decision-making processes that determine their lives.

**Resilience:** (1) The United Nations defines the term as, "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner." (2) Yet according to UNDP, these and other definitions focus too narrowly on responding to shocks rather than preventing or preparing for them, while their stated goal is only to return beleaguered communities to their original state. UNDP therefore proposes to define resilience as a, "transformative process of strengthening the capacity of people, communities and countries to anticipate, manage, recover and transform from shocks."

**Vulnerability:** Vulnerability is the threat of deprivation in multiple dimensions that reduces core human capabilities below the threshold. Vulnerability is a human condition or process resulting from physical, social, economic and environmental factors that determine the likelihood and scale of damage from the impact of a given hazard.

**Well-being:** Well-being is the expansion of people's real freedoms so that people can flourish (one of the three human development components: justice, empowerment and agency).

Source: UNDP publication, 2013.<sup>98</sup>

<sup>98</sup> Glossary of Human Development Terms and Definitions / English, Uzbek and Russian languages, 1st edition, UNDP, 2013. Compiled by

## GLOSSARY TABLE OF KEY TERMS FROM THE UNISDR TERMINOLOGY ON DISASTER RISK REDUCTION

**Adaptation:** The adjustment of natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

**Capacity:** The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.

**Disaster:** A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

**Disaster risk:** The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

**Disaster risk management:** The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, poli-

cies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

**Disaster risk reduction:** The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

**Early warning system:** The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

**Extensive risk:** The widespread risk associated with the exposure of dispersed populations to repeated or persistent hazard conditions of low or moderate intensity, often of a highly localized nature, which can lead to debilitating cumulative disaster impacts.

**Hazard:** A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

activities to intense hazard events, which can lead to potentially catastrophic disaster impacts involving high mortality and asset loss.

**Vulnerability:** The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

UNISDR. (2009). Terminology on Disaster Risk Reduction. Available from [http://www.unisdr.org/files/7817\\_UNISDRTerminologyEnglish.pdf](http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf).

E. Danilova-Cross (UNDP), L. Tashpulatova (UWED), M. Bakhamova (UWED). Available from [http://www.uz.undp.org/content/uzbekistan/en/home/library/human\\_development/Glossary-of-human-development-terms-and-definitions-1st-edition.html](http://www.uz.undp.org/content/uzbekistan/en/home/library/human_development/Glossary-of-human-development-terms-and-definitions-1st-edition.html).

**Intensive risk:** The risk associated with the exposure of large concentrations of people and economic

## GLOSSARY OF HUMAN-MADE HAZARDS AND DISASTERS

**Technological/industrial hazards** are created through manufacturing, extraction industries, power generation, transportation, storage, waste disposal and any other economic activity that involves the use of hazardous, toxic and/or radioactive materials and substances that are harmful to humans and the environment. If such hazards are not recognised as such and are not addressed in an anticipatory fashion then over a long period of time or in singular or multiple hazardous events can result in air, land and water pollution, hazardous waste contamination, toxic spills and serious industrial and even nuclear disasters.

**Engineering hazards** are created through the choice of location, materials, construction processes and technology used during construction of all structures used by people for economic or any other activity. If structures are not built in an anticipatory fashion to stand extensive structural stresses and extreme external conditions (e.g. not applying earthquake building codes), are built on hazard-prone land or are not maintained regularly and are used beyond the safe usage date (e.g. outdated hydropower dams) then they may collapse or be easily affected by extreme external conditions causing extensive damage and/or disasters.

**Societal hazards** include the be-

haviour of individuals or groups which may bring about hazardous events and disasters such as human-made fires, landslides (due to inappropriate use of land), land degradation, pollution, contagious diseases (due to poor sanitation or lack of vaccination), social unrest, conflict, war, acts of terrorism and ultimately result in injury, loss of life and/or environmental degradation. Conflict that leads to war clearly is the most pronounced societal hazard that, if initiated, involves physical force inflicted by the use of weapons. Warfare has destroyed entire cultures, countries, economies and inflicted great suffering on humanity. In the aftermath of war, many countries have to deal for decades with extensive war remnants, arms stockpiles and landmines, which pose a particular direct and long lasting human-made threat to the populations affected.

### MULTIPLE, SECONDARY AND CHRONIC HAZARDS

Human intervention may also cause natural hazards where none existed before while disasters might cause other hazards in the same area, arising in a **multiple hazards** situation. These different hazard events may occur at the same time or be spaced over time. **Secondary/cascading hazards** are hazards that follow as a result of other hazard events. Hazards secondary to an earthquake may be dam failure, hazardous material spillage, landslide, water pollution, industrial spillage, etc. **Chronic hazards** are hazards that do not stem from one event but arise from continuous

conditions that accumulate over time (e.g. landmine contamination, water pollution and large-scale toxic contamination).

## GLOSSARY OF HUMAN DEVELOPMENT INDICES

**Composite index:** A composite index is unit less number that combines various statistical indicators to convey a larger picture. A composite index is formed when individual indicators are compiled into a single index on the basis of an underlying model. A composite index can measure a multidimensional concept that cannot be captured by a single indicator alone, such as poverty, competitiveness, sustainability and market integration.

**Education Index:** This is one of the three indices on which the Human Development Index is based. During the period 1990-2009, the Education Index was based on the adult literacy rate and the combined gross enrolment ratio for primary, secondary and tertiary education. Since 2010 the Education Index has been measured against the mean of years of schooling and expected years of schooling.

**Gender Inequality-adjusted Index (GII):** The GII measures inequality in achievements between women and men in three dimensions: reproductive health, empowerment and the labour market. The GII has been in use since 2010.

**Human Development Index (HDI):** The HDI is a composite index measuring average achievement

in a country in three basic dimensions of human development: (1) a long and healthy life, measured against life expectancy at birth, (2) knowledge, measured against the mean of years of schooling and expected years of schooling, and (3) a decent standard of living measured against GDP per capita in relation to purchasing power parity (PPP) in US dollars.

**Human Development Index, Inequality-adjusted (IHDI):** The Human Development Index value is adjusted to account for inequalities in the three basic dimensions of human development: education, health and profit. The IHDI accounts for inequalities in HDI dimensions by ‘discounting’ each dimension’s average value according to its level of inequality. The IHDI equals the HDI when there is no inequality across people, but is less than the HDI as inequality rises.

**Life Expectancy Index:** This is one of the three indices on which the Human Development Index is built.

**Multidimensional Poverty Index (MPI):** The MPI is a composite index that determines the fraction of the population that is poor in many dimensions, adjusted for the intensity of deprivation. The MPI defines deprivation at the household level for the same three dimensions as the HDI: standard of living, health and education. It is measured on the basis of ten indicators and the average number of poor people and deprivations faced by poor households.

Source: UNDP publication, 2013.

## ANNEX II: ADDITIONAL TABLES PER CHAPTERS

### CHAPTER I:

#### TABLE 1: LINKAGES BETWEEN THE SDGS AND DRR

Goals	Linkages with DRR
<b>SDG 1: End poverty in all its forms everywhere.</b>	Clear linkages are identified with <b>Target 1.4</b> focusing in particular on the poor and the vulnerable, on equal rights to economic resources, access to basic services, ownership, and control over land and other forms of property, inheritance, natural resources, appropriate new technology, and financial services including microfinance; and with <b>Target 1.5</b> that focuses on building the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate related extreme events and other economic, social and environmental shocks and disasters.
<b>SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.</b>	Linkage is found with <b>Target 2.4</b> , which focuses on ensuring sustainable food production systems and implementation of resilient agricultural practices that increase productivity and production, help maintain ecosystems, strengthen the capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality.
<b>SDG 3: Ensure healthy lives and promote well-being for all at all ages.</b>	DRR is broadly linked to the goal through the aim to reduce vulnerability and the exposure of people and the planet to hazards.
<b>SDG 5: Achieve gender equality and empower all women and girls.</b>	Disasters tend to hit the poorest and most marginalised demographics the hardest. Women and girls are particularly exposed to climate related disaster risk and are therefore more likely to suffer the higher rates of mortality, morbidity and economic damage to their livelihood. Linkages are found with <b>Target 5.1</b> aimed at ending all forms of discrimination against all women and girls everywhere, while <b>Target 5.4</b> relates to the recognition and valuing of unpaid care and domestic work. <b>Target 5.a</b> is aimed reforms to give women equal rights to economic resources as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources in accordance with national laws.
<b>SDG 6: Ensure availability and sustainable management of water and sanitation for all.</b>	Direct linkages exist between DRR and SDG 6 through the promotion of the principle of early warning and addressing disaster risk drivers by aiming to reduce vulnerability and/or exposure of people and the planet to hazards. Direct links exist with <b>Target 6.1</b> , aimed at universal and equitable access to safe and affordable drinking water; <b>Target 6.2</b> , aimed at achieving access to adequate and equitable sanitation and hygiene; <b>Target 6.3</b> , aimed at improving water quality by reducing pollution, eliminating dumping and minimising the release of hazardous chemicals and materials; <b>Target 6.4</b> , aimed at increased water-use efficiency across all sectors and ensuring sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity; <b>Target 6.5</b> , aimed at implementation of integrated water resources management; <b>Target 6.6</b> , aimed at the protection and restoration of water related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes; <b>Target 6.a</b> , aimed at international cooperation and capacity building support to developing countries on water and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies, and <b>Target 6.b</b> aimed at supporting and strengthening the participation of local communities in improving water and sanitation management.

<b>SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.</b>	DRR and SDG 8 are highly interlinked. With good DRR in place, livelihoods, jobs and productive employment are less likely to suffer the negative effects of disasters. DRR also reduces work and income vulnerabilities of those most at risk. Linkage also exists with <b>Target 8.4</b> , aimed at progressively improving global resource efficiency through 2030 in terms of consumption and production, and endeavouring to decouple economic growth from environmental degradation. The latter is in accordance with the ten-year framework for programmes on sustainable consumption and production, with developed countries taking the lead.
<b>SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.</b>	Clear linkages exist with <b>Target 9.1</b> , which specifically asks for the development of quality, reliable, sustainable and resilient infrastructure, and with <b>Target 9.4</b> aimed at upgrading infrastructure and retrofitting industries to make them more sustainable through increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.
<b>SDG 10: Reduce inequality within and among countries.</b>	Just like with the SDG 8, DRR plays an important role in reducing inequalities within a society and among countries. Disasters directly exacerbate vulnerabilities and social inequalities and marginalised groups are more likely to suffer from the consequences of disasters. Vulnerable groups need to be included in DRR as active agents of change for resilience to be effective and equitable.
<b>SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable.</b>	The strongest link exists between DRR and SDG 11 and in particular <b>Target 11.1</b> , which aims to ensure access to adequate, safe and affordable housing and basic services for all and the upgrade of slums. <b>Target 11.3</b> aims to achieve inclusive and sustainable urbanisation and capacities for participatory, integrated and sustainable human settlement planning and management in all countries. <b>Target 11.5</b> aims to significantly reduce the number of deaths and affected people and reduce economic losses relative to GDP caused by disasters, including water related disasters, with the focus on protecting the poor and people in vulnerable situations. <b>Target 11.b</b> aims to increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, developed and implemented in line with the Sendai Framework for holistic disaster risk management at all levels.
<b>SDG 13: Take urgent action to combat climate change and its impact.</b>	A very strong link exists between DRR and SDG 13 where all of the targets can be linked to the Sendai Framework. Direct links are found with <b>Target 13.1</b> , aimed at strengthen resilience and adaptive capacity to climate related hazards and natural disasters; <b>Target 13.2</b> , aimed at integrating climate change measures into national policies, strategies, and planning; <b>Target 13.3</b> , aimed at improving education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning; <b>Target 13.a</b> , aimed at implementing the commitment undertaken by developed country Parties to the UNFCCC to the goal of jointly mobilising 100 billion USD annually by 2020, from all sources, to address the needs of developing countries within the context of meaningful mitigation actions, and <b>Target 13.b</b> aimed at the promotion of mechanisms for raising capacities for effective climate change related planning and management, in LDCs, including focusing on women, youth, local and marginalised communities.
<b>SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation, and halt the loss of biodiversity.</b>	Clear linkages exist with SDG 15 and DRR. In particular, to the ecosystem related priorities of the Sendai Framework that reinforces the linkages of related international decisions on ecosystems and disaster risk. Links are found with <b>Target 15.1</b> , aimed at conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands; <b>Target 15.2</b> , aimed at promoting the implementation of sustainable management of all types of forests, halting deforestation, restoring degraded forests and increasing afforestation and reforestation; <b>Target 15.3</b> , aimed at combatting desertification and the restoration of degraded land and soil, including land affected by desertification, drought and floods.
<b>SDG 17: Strengthen the means of implementation and revitalise the global partnership for sustainable development.</b>	Broad links exist with SDG 17 and in particular the development, availability and usage of new technologies for information, awareness raising and early warning systems for DRR as well as in relation to improving social networks before, during and after disasters.

Source: Analysis by Envesa Hodzic-Kovac, January 2016.

## CHAPTER 4

### TABLE 2: THE HUMAN AND ECONOMIC COST OF FLOODS IN THE WESTERN BALKANS 2000-2015

	Number of Deaths		Number of People Affected		Economic Losses		Overall floods impact (territory affected, people evacuated, houses flooded/damaged and sectors affected)	
Country/ Territory	Prior to 2014	2014/ 2015	Prior to 2014	2014/ 2015	Prior to 2014	2014/ 2015	Prior to 2014	2014/ 2015
<b>Albania*</b>	Sept 2002	Feb 2015	Sept 2002	Feb 2015	Sept 2002	Feb 2015	Dec'2009 – Jan'2010 and Dec'2010	Feb 2015
	0	1	66,884	42,000	USD 17 million	USD 125 million	175 km <sup>2</sup> flooded; over 17,000 people evacuated; 7,000 houses flooded/damaged.	9 regions and 53 municipalities affected; 850 families evacuated; 122 km <sup>2</sup> of arable land flooded; approx. 15,000 farming households affected; approx. 100 km <sup>2</sup> of agricultural land damaged.
<b>Bosnia and Herzegovina*</b>	Dec 2010	May 2014	Dec 2010	May 2014	Dec 2010	May 2014	Dec 2010	May, August 2014
	3	25	20,000	Over 1 million people	USD 1 million	USD 2.46 billion	5,000 houses flooded and 6,000 people evacuated.	13,200 km <sup>2</sup> flooded; 90,000 people evacuated; 43,000 homes flooded; over 2,000 totally destroyed with 15 % of GDP in damage and losses.

	June 2010	May 2014	June 2010	May 2014	June 2010	May 2014	June 2010	May 2014
<b>Croatia*</b>	0	3	300	38,000	USD 73.6 million	USD 340 million	112 families were evacuated, 427 houses, cellars and yards were flooded, 682 houses were directly threatened and damaged.	20,000 people evacuated; 7,500 homes damaged.
<b>Kosovo</b>	March 2006	April 2014	March 2006	April 2014	March 2006	April 2014	Mar. 2006	April 2014
	No data	No data	1,200	No data	USD 1.6 million	USD 3.25 million	No data	No data
<b>former Yugoslav Republic of Macedonia**</b>	June 2004	Feb 2015	June 2004	Feb 2015	June 2004	Feb 2015	June 2004	Feb 2015
	0	2	100,000	170,000	USD 3.3 million	USD 35.7 million	No data	No data
<b>Montenegro*</b>	Dec 2010	2014/ 2015	Dec 2010	2014/ 2015	Dec 2010	2014/2015	Dec 2010	2014/2015
	0	None	5,000	none	USD 50 million	None	No data	No data
<b>Serbia*</b>	April 2006	May 2014	April 2006	May 2014	April 2006	May 2014	February 2010	February 2013, Sep., May 2014
	No data	51	No data	1.6 million people	USD 1.6 million	USD 1.7 billion	1,306 houses damaged	<b>181 families evacuated; 9,100 km<sup>2</sup> affected; 38 municipalities/cities affected; 32,000 people evacuated.</b>
<b>TOTAL</b>	<b>3</b>	<b>81</b>	<b>193,384</b>	<b>2,850,000</b>	<b>148.1 million USD</b>	<b>4.63 billion USD</b>		

Sources: EM-DAT with contributions from UNDP country offices.

\* Deaths and People Affected from EM-DAT and Economic Damage from UNDP COs.

\*\* Deaths and economic data from UNDP Cos and People Affected from EMDAT; 1 - no data in EMDAT – UNDP CO provided all data.

\*\*\* EU Flood Prevention and Management Study, 2015; Danube River Basin District: flood events in 2010 (ICPDR flood report 2010), Flood List, ReliefWeb, International Federation of the Red Cross and Red Crescent Societies.

EU study 'Present Situation of Flood Management in the Western Balkans', November 2014. Western Balkans Investment Framework, Infrastructure Projects Facility Technical Assistance 4.



## Notes





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**United Nations Development Programme (UNDP)**  
in Bosnia and Herzegovina

Zmaja od Bosne b.b.  
71000 Sarajevo  
Bosnia and Herzegovina

Tel: +387 (33) 293 400  
Fax: +387 (33) 552 330  
e-mail: [registry.ba@undp.org](mailto:registry.ba@undp.org)  
[www.ba.undp.org](http://www.ba.undp.org)

