



**Republic of Bulgaria**

**Advisory Services on a National Climate Change  
Adaptation Strategy and Action Plan**

***Appendix 10:  
Assessment of the  
Disaster Risk Management  
Sector***

*August 17, 2018*

<b>(Project number P160511)</b>	
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## **DISCLAIMERS**

This report was produced by the World Bank team to provide advisory support to the Ministry of Environment and Water (MoEW) and the Ministry of Interior (MoI) in Bulgaria. The findings, interpretations, and conclusions expressed in this report do not necessarily reflect the views of the Executive Directors of the World Bank or of the Government of Bulgaria or its MoEW or MoI.

## **ACKNOWLEDGEMENTS**

Special acknowledgement is made here to the Global Facility for Disaster Reduction and Recovery (GFDRR) for its financial support that made the preparation of this report possible. Furthermore, thanks go to the Government of Bulgaria, in particular Mr. Aleksandar Dzhartov (Director of the MoI's Directorate Critical Infrastructure, Prevention and Control), Mr. Georgi Petrov (Inspector at the MoI's Directorate Critical Infrastructure, Prevention and Control), Ms. Atanaska Nikolova (Deputy Minister of Environment and Water), Ms. Boriana Kamenova (Director of the MoEW's Climate Change Policy Directorate), and Ms. Veronika Dacheva (Expert in the MoEW's Climate Change Policy Directorate), and other experts in government and local institutions. Appreciation also goes to the comments and suggestions that were made, as well as to the open exchange of ideas. The contribution of Antony Thompson (Country Manager) in the preparation and negotiation of the Advisory Program is also acknowledged here.

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## **Abbreviations and Acronyms**

BAS	Bulgarian Academy of Sciences
BD	Basin Directorate
BISE	Biodiversity Information System for Europe
BRC	Bulgarian Red Cross
CCA	Climate Change Adaptation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CIWIN	Critical Infrastructure Warning Information Network
CoM	Council of Ministers
DG	Directorate-General
DRM	Disaster Risk Management
DRMKC	Disaster Risk Management Knowledge Centre
DRR	Disaster Risk Reduction
EC	European Commission
EEA	European Economic Area
EERC	European Emergency Response Capacity
EFDRR	European Forum for Disaster Risk Reduction
EFFIS	European Forest Fire Information System
EM-DAT	Emergency Events Database
EMSA	European Maritime Safety Agency
EPCIP	European Programme for Critical Infrastructure Protection
ERCC	Emergency Response Coordination Centre
EU	European Union
FRMP	Flood Risk Management Plan
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GIS	Geographic Information System
GWP	Global Water Partnership
HFA	Hyogo Framework for Action
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre
LUMP	Land Use Master Plan
MoEW	Ministry of Environment and Water
MoF	Ministry of Finance

## *Climate Change Adaptation – Assessment of the Disaster Risk Management Sector*

MoI	Ministry of Interior
MoRDPW	Ministry of Regional Development and Public Works
MSK	Medvedev–Sponheuer–Karnik macroseismic intensity scale
NCCAS	National Climate Change Adaptation Strategy
NGO	Non-governmental Organization
NIGGG	National Institute of Geophysics, Geodesy and Geography
NIMH-BAS	National Institute of Meteorology and Hydrology at the Bulgarian Academy of Science
NSI	National Statistical Institute
OP	Operational Programme
PDF	Portable Document Format
RBMP	River Basin Management Plan
SG	State Gazette
SPA	Spatial Planning Act
SRSG	Special Representative of the Secretary-General
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNCPUWIL	United Nations Convention on the Protection and Use of Transboundary Watercourses and International Lakes
UNCSICH	United Nations Convention for the Safeguarding of the Intangible Cultural Heritage
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
WISE	Water Information System for Europe
WMO	World Meteorological Organization

## **Introduction - Disaster and Climate Risk Profile of Bulgaria**

During the past two decades, climate-related events such as floods, storms, heatwaves, snowfalls, and drought have accounted for about 90 percent of major disasters. Climate change is expected to increase the frequency and intensity of weather-related hazards, significantly affecting economic and social development, with cascading impacts on poverty, the supply of food and water, urban systems, the spread of disease, people movements and conflicts.

Reducing exposure to weather-related hazards and the vulnerability of people is therefore a critical shared priority for climate change adaptation (CCA) and disaster risk reduction (DRR).

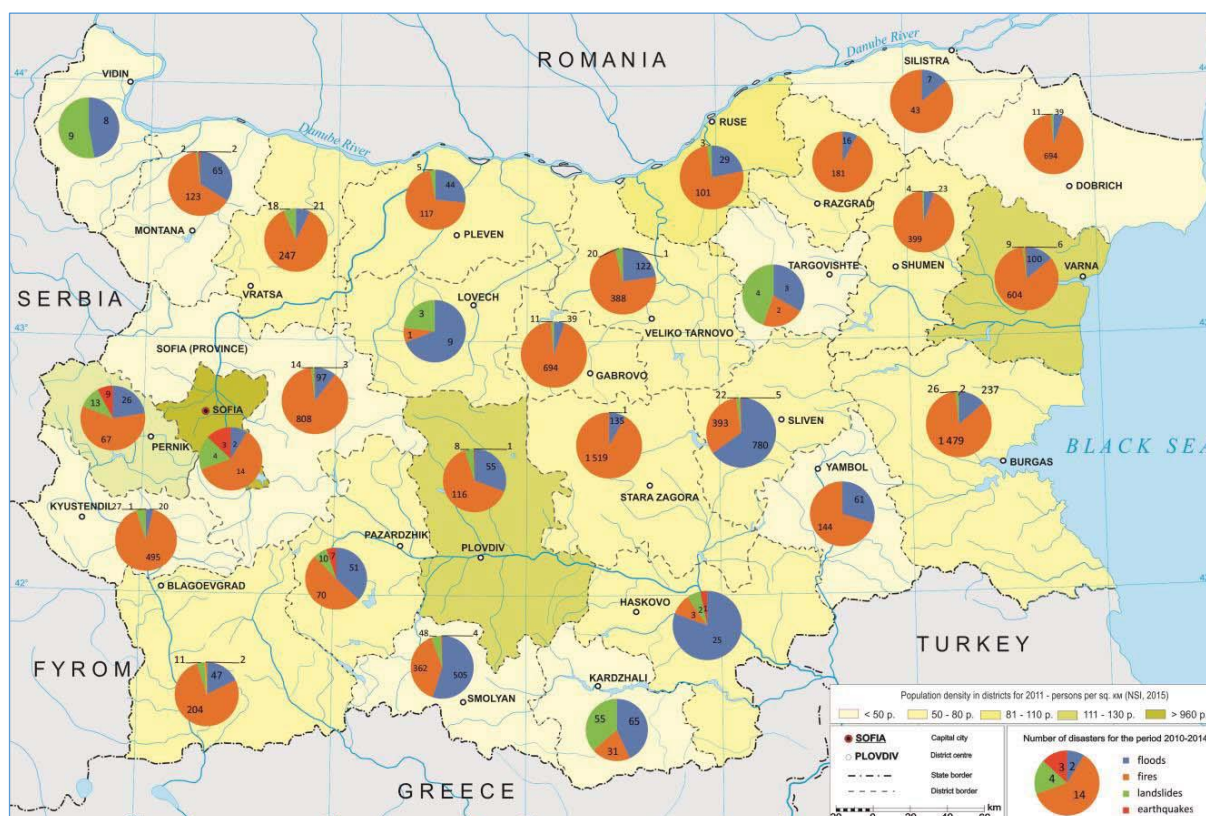
Managing risk, rather than managing disasters as indicators of unmanaged risk, now must become inherent to the art of development, not an add-on to development but a set of practices embedded in its very primary undertaking. Managing the risks inherent in social and economic activities requires a combination of three approaches: *prospective risk management* aiming to avoid the accumulation of new risks, *corrective risk management* seeking to reduce the existing risks, and *compensatory risk management* aiming to support the resilience of individuals and societies in the face of residual risks, which cannot be effectively reduced.

As noted by the United Nations (UN) system for the coordination of disaster reduction, sustainable development cannot be achieved unless significant efforts are devoted to reducing the risk of disasters (UNISDR 2015).

Bulgaria is exposed to a range of natural hazards, such as floods, landslides, earthquakes, wildfires, droughts, strong winds, heavy snowfalls, extreme temperatures, and hail – the first three are the most prominent events in the country. Disasters caused by these events have adverse social and economic impacts on the country. According to the National Statistical Institute (NSI) of Bulgaria, from 2010 to 2016, natural disasters and fires caused damages of almost US\$1 billion. During this period, over US\$600 million was spent on recovery and over US\$100 million was spent on rescue and emergency works. Disaster risks that the country faces are further expected to grow with the increasing urbanization and industrial development and climate change. Because of this, disaster risk management (DRM) plays an important role in the sustainable development of the country and is among the priorities of the government of Bulgaria.

## Climate Change Adaptation – Assessment of the Disaster Risk Management Sector

Figure 1. Different natural hazard events that happened in the Bulgarian districts (oblast) for the period 2010–2014



Source: Pashova, Kouteva-Guentcheva and Badrova, 2016. Based on NSI data.

Table 1. Crisis events occurred (comprising fires, but excluding car accidents, incidents, pollution)

Year	Total number of emergencies	Damages (BGN, thousands)	Damages (US\$ <sup>a</sup> , thousands)	Funds for recovery (BGN, thousands)	Funds for recovery (US\$ <sup>a</sup> , thousands)	Expenditures on rescue & emergency work (BGN, thousands)	Expenditures on rescue & emergency work (US\$ <sup>a</sup> , thousands)
2010	2,582	99,642	60,906	73,956	45,205	7,479	4,572
2011	2,984	486,862	297,593	423,974	259,153	11,666	7,131
2012	4,649	103,669	63,367	34,447	21,056	104,197	63,690
2013	1,554	412,259	251,992	398,778	243,752	21,814	13,334
2014	2,747	189,868	116,056	59,582	36,419	21,629	13,221
2015	2,973	190,915	116,696	23,823	14,562	7,734	4,727
2016	2,837	45,181	27,617	9,766	5,969	2,964	1,812
<b>Total</b>	<b>20,326</b>	<b>1,528,396</b>	<b>934,227</b>	<b>1,024,326</b>	<b>626,116</b>	<b>177,483</b>	<b>108,487</b>

Note: a, Exchange rate of US\$ 1 = BGN 1.636.

Source: NSI, 2017.<sup>1</sup>

<sup>1</sup> See [http://www.nsi.bg/sites/default/files/files/data/timeseries/Crisis1.1\\_EN.xls](http://www.nsi.bg/sites/default/files/files/data/timeseries/Crisis1.1_EN.xls)



### *Historical disasters*

According to the International Emergency Events Database (EM-DAT), since 1977, 45 major disasters were recorded in Bulgaria with more than 85 percent of these events related to weather.<sup>2</sup> These disasters resulted in over US\$1.4 billion of direct damage.<sup>2</sup> Flood and extreme temperature were most frequent, with flood responsible for the greatest direct damage and affected population.

For example, in 2005, floods resulting from heavy rains and storms hit a total of 25 municipalities in Bulgaria. The floods caused severe damage to public and private buildings and cultural heritage; destroyed or damaged bridges, dikes and dams; disrupted water supply systems; activated landslides; and, flooded arable land. The railway lines connecting Sofia with the northern part of the country – Targovishte, Shoumen and Varna – were flooded cutting cross-country rail communication.<sup>3</sup> A state of disaster was declared in a number of municipalities. The floods caused 30 fatalities,<sup>4</sup> left 14,000 homeless, and affected one-quarter of the population. Damage caused in less than three months' time was estimated at approximately US\$600 million.<sup>4</sup> In 2014, another flood in the Northwestern region caused at least 15 deaths and about US\$400 million damages<sup>4</sup> and affected energy, communications, and water and transport infrastructure. About 700 homes and public buildings were flooded. The mayor of Mizia declared a state of emergency and over 800 people had to be evacuated.

In recent years, earthquakes have been relatively rare in Bulgaria. However, looking back 200 years reveals that hundreds of lives have been lost and tens of thousands of buildings have been damaged in earthquakes and Bulgaria has had some of the strongest earthquakes in European history. Of note are the following events. In 1802, the cities of Ruse, Silistra, Varna, and Vidin were almost destroyed in a magnitude 7.9 earthquake. The 1858 magnitude 6.3 earthquake near Sofia left 70–80 percent of the buildings damaged, including several important cultural heritage buildings. In 1928, in Plovdiv, an earthquake caused over 120 fatalities, left more than 45,000 buildings severely damaged or destroyed, destroyed a hospital, and left more than 260,000 people homeless.<sup>4</sup> Two events in 1977 resulted in the collapse of several apartment buildings and further damages. Finally, most recently in 1986, a relatively low magnitude (5.7) earthquake left 80 percent of buildings in the town of Strazhitsa uninhabitable.

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<sup>2</sup> EM-DAT: [www.emdat.be](http://www.emdat.be)

<sup>3</sup> See <https://reliefweb.int/report/bulgaria/bulgaria-flood-dref-bulletin-no-05me047-final-report>

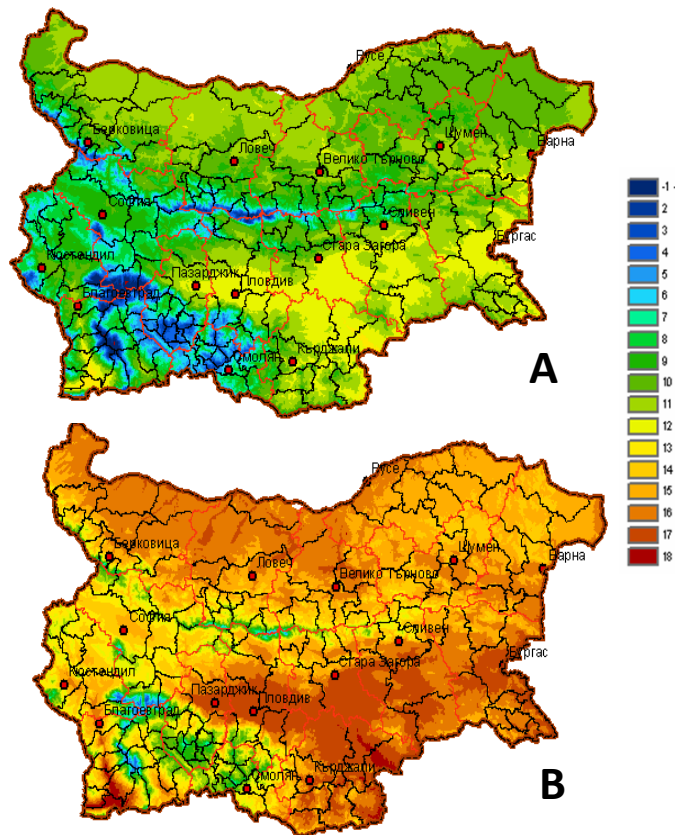
<sup>4</sup> See <https://www.gfdr.org/sites/default/files/Bulgaria.pdf>

*Climate change*

Climate change can significantly increase the occurrence and severity of weather-related disasters in Bulgaria. Research conducted by the Department of Meteorology of the National Institute of Meteorology and Hydrology at the Bulgarian Academy of Sciences (NIMH-BAS) projects an increase in annual air temperature in Bulgaria of between 0.7°C and 1.8°C by 2020. Even warmer temperatures are expected by 2050 and 2080, with projected increases of between 1.6°C and 3.1°C and between 2.9°C and 4.1°C, respectively. Generally, the temperature increase is expected to be more significant during the summer season (from July to September). In terms of the expected changes in rainfall patterns, a reduction in precipitation is likely, leading to a significant reduction in the total water reserves in the country. In this regard, projections suggest a decrease in precipitation by approximately 10 percent by 2020, 15 percent 2050, and up to 30–40 percent by 2080. In most climate change scenarios, rainfall during the winter months is likely to increase by the end of the century but significant decrease in rainfall during the summer months is expected to offset this increase.

According to the available climate change scenarios for Bulgaria, there is a trend toward increased frequency of extreme events and disasters, as demonstrated in more often occurrences of heavy rainfalls, heat and cold waves, floods and droughts, hurricane winds, forest fires, and landslides.

**Figure 2. (A) Average year temperature for the period 1961–1990; (B) Pessimistic climate scenario for average year temperature for 2080**



Source: NIMH-BAS.

## Chapter 1. Risk and Vulnerability Assessment

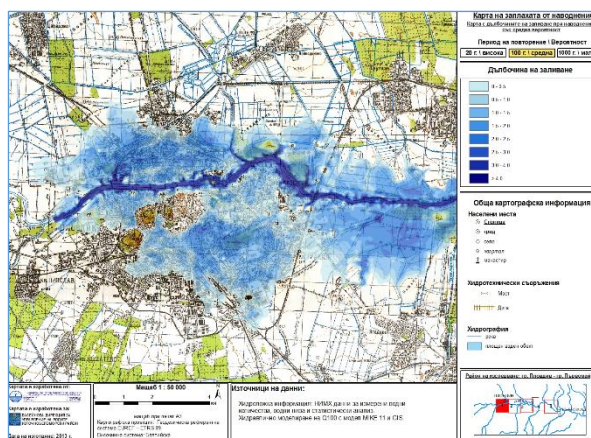
### 1.1. Hydrometeorological Hazards

#### 1.1.1. Floods

According to the NSI, floods happen most often among natural disasters. From 2010 to 2016, floods brought damages of over BGN 661 million (or about US\$440 million).

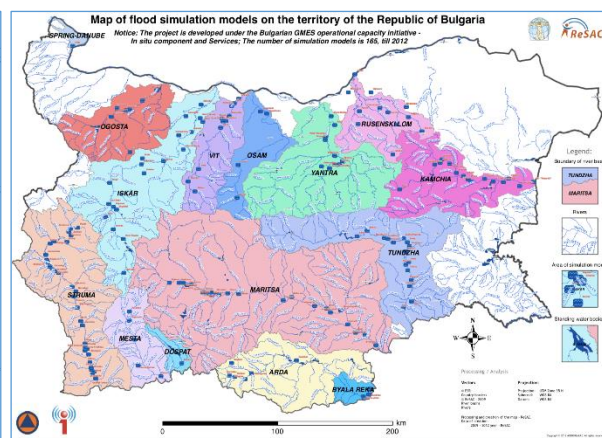
Flood hazard maps were produced by the government of Bulgaria in 2013 for the four river basin management regions as part of the European Union (EU) Floods Directive (see **Figure 3**). Flood simulation models also exist for a number of sites (165 models were developed until 2012) (see **Figure 4**).

Figure 3. Plovdiv Flood hazard modeling



Source: MoEW, 2013.

Figure 4. Map of flood simulation models



Source: ReSAC, 2012.

Further flood risk assessment was undertaken by the World Bank and the Global Facility for Disaster Reduction and Recovery.<sup>5</sup> It highlighted that on average about 80,000 people per year will be affected by flood, with an annual average impact on gross domestic product (GDP) of US\$400 million.<sup>6</sup> The districts with the highest flood risk are Yambol, Plovdiv, and Pazardzhik. In 2015, modeling predicted that 50-year return period floods could affect US\$2 billion of GDP, but by 2080 (considering change in socioeconomic and climate conditions) this may double or even quadruple (depending on the future scenarios selected). Current increases in flood risk are being driven by urbanization and increased exposure of assets and people in flood-prone areas, but in the coming years the influence of climate change will overtake urbanization as the driver of increased flood risk.

Anecdotal evidence also indicates that flash floods and urban floods have increased in Bulgaria. Flash floods in rural and lightly populated areas are driven by more intense precipitation events, perhaps also coinciding with reductions in native vegetation. In urban areas, more intense precipitation and increases in impermeable surfaces (roads, concrete, and so on) have increased the likelihood of urban pluvial flooding as urban wastewater systems designed for lower volume inflows struggle to cope with the higher inflows.

<sup>5</sup> See <http://documents.worldbank.org/curated/en/688381493716849492/pdf/114725-WP-PUBLIC-drp-bulgaria.pdf>

<sup>6</sup> 2015 figures.

### **1.1.2. Drought**

Bulgaria is prone to droughts due to its climatic, geographic, and topographic characteristics. Three significant prolonged droughts occurred in Bulgaria during the 20th century: from 1902 to 1913, from 1942 to 1953, and from 1982 to 1994. In the last 13 years, droughts have become more frequent and intense in many EU Member States, including Bulgaria. For instance, in 2003 one widespread drought affected more than 100 million people and one-third of the EU's land area (World Bank 2014).

Future climate change scenarios indicate that present day mild droughts will probably shift to future severe droughts within less than 60 years.<sup>7</sup> Estimates also suggest that there is a 20 percent chance of drought in the next 10 years, affecting the western and southeastern districts the most, with a likely increase in the number of drought events in the future.

### **1.1.3. Extreme heat**

Extreme heat events have already occurred in Bulgaria and are likely to worsen as the climate warms. For instance, in July 2000, Southeastern European countries, including Bulgaria, faced record-breaking temperatures that caused deaths due to heat stroke, high blood pressure, and heart attacks across the region (McDonald 2003).

### **1.1.4. Wildfire**

Wildfire susceptibility maps have been produced for Bulgaria highlighting areas affected in the past by wildfire. However, given the changing climatic conditions which bring extended dry and hot periods and increased concentrations of more flammable vegetation such as commercial pine plantations, it is expected that wildfire events are likely to intensify in the future and occur in areas not historically prone to wildfire.

### **1.1.5. Storms**

Bulgaria is also subjected to severe storms. For instance, in the beginning of 2018, storms damaged villages in the district of Dobrich, leaving them without electricity. The municipality of Karlovo declared a state of emergency when the local hospital and many roofs were damaged by the storm. Road infrastructure elements got damaged in all of Bulgaria.<sup>8</sup>

## **1.2. Geophysical Hazards**

### **1.2.1. Earthquakes**

The high potential for large earthquakes in Bulgaria, combined with a particularly vulnerable building stock, means that these relatively rare events are expected to have devastating social, physical, and financial impacts. A 250-year return period earthquake event, for example, could approximately result in approximately 5,000 fatalities, 2 million people affected, US\$ 4 billion in damage to capital stock, and US\$ 30 billion of GDP affected (World Bank 2017). Given the concentration of capital, economic activity, and population, Sofia city (and district) faces the highest earthquake risk. However, even though earthquakes are not affected by climate change, urbanization, economic development, and population growth in earthquake-prone areas mean that the risk will continue to grow through time, doubling by 2080, unless urgent action is taken

<sup>7</sup> See <https://www.climatechangepost.com/bulgaria/droughts/>

<sup>8</sup> See <https://sofiaglobe.com/2018/01/19/storms-do-damage-in-parts-of-bulgaria/>

to reduce and manage this risk. According to the NSI, from 2010 to 2016, 51 earthquakes caused damages valued at over BGN 60 million (or about US\$ 37 million).

### **1.2.2. Landslides**

Landslides are another prominent threat in Bulgaria. To date, more than 920<sup>9</sup> have been recorded in 350 settlements, mostly along the Danube shoreline in Northern Bulgaria where 10 catastrophic landslides have occurred for the last 30 years.<sup>10</sup> Many populated, urbanized and rural areas, historical and cultural sites, and transport connections are at risk of landslides, including both Northern and Southern Bulgaria.

Landslides in the country can cause significant adverse economic and social impact. According to the NSI, from 2010 to 2016, 529 landslides caused damages valued at over BGN 568 million (or about US\$ 347 million).

Construction in landslide areas is regulated in the Spatial Planning Act and is of a restrictive nature, in order to minimize the disaster risk. Priority is given to implementing geo-protection measures and to activities to safeguard against landslide processes.

### **1.3. Conclusions**

Considering this history and these forecasts, it is important for any DRM intervention in Bulgaria to consider a range of hydrometeorological and geophysical hazards and how these can change in the future.

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<sup>9</sup> According to information of the Ministry of Regional Development and Public Works, the Landslide Register in Bulgaria (available on the MRDPW website) shows a different number of landslides

<sup>10</sup> See <https://www.climatechangepost.com/bulgaria/avalanches-and-landslides/>



## **Chapter 2. Baseline - Policy Context**

The prevention and reduction of natural disaster risk is a coordinated effort at all levels of global governance – from global and regional to national and local level. For over 20 years, the world community has been working on the establishment and organization of a system to manage the risks of disasters. This chapter presents a review of the EU and Bulgarian legislative, policy, and institutional frameworks. For an analysis at UN-level, see *Annex 3*.

### **2.1. EU Legislative, Policy, and Institutional Framework for DRM**

The EU has played a leading role in the negotiations of the Sendai Framework for Disaster Risk Reduction 2015–2030 (Sendai Framework), and many of the Sendai recommendations are based on existing EU DRM policies and programs, including most of the ongoing civil protection, development cooperation, and humanitarian aid actions. There are also several links to other EU policies, including CCA, critical infrastructure protection, flood risk management, water and biodiversity protection, research and innovation and global health security, food, and nutrition security.

#### **2.1.1. Strategic and legal arrangements at EU level**

The DRR/DRM process is driven and regulated by a set of strategies, directives, regulations, implementing rules, Council conclusions, European Parliament resolutions, and other provisions such as Commission staff working documents and Communications. A selection of the most important of these are reviewed within this section.

Note that the current section does not refer to EU policies concerning developing and/or crises-resilient (third) countries, and measures provided by the EU under different directives such as the Disaster Risk Reduction Implementation Plan (SEC (2011) 215 final) of the EU Strategy for supporting disaster risk reduction in developing countries, Regulation No 375/2014 of the European Parliament and the Council on establishing the European Voluntary Humanitarian Aid Corps (‘EU Aid Volunteers initiative’), the Commission Staff Working Document referring to the Action Plan for Resilience in Crisis Prone Countries 2013–2020 (SWD (2013) 227 final), and other documents laying down terms and procedures for the establishment, organization, and provision of humanitarian aid to third countries.

#### ***Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the Assessment and Management of Flood Risks***

The Directive requires Member States to first carry out a preliminary flood risk assessment by 2011 to identify the regions of the river basins and associated coastal areas at risk of flooding. For such zones, they would then need to draw up flood risk maps by 2013 and establish flood risk management plans (FRMPs) focused on prevention, protection, and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.

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### *Council Directive 2008/114/EC of 8 December 2008 on the Identification and Designation of European Critical Infrastructures and the Assessment of the Need to Improve their Protection*

This Directive establishes a procedure for the identification and designation of European critical infrastructures, and a common approach to the assessment of the need to improve the protection of such infrastructures to contribute to the protection of people.

### *Council Regulation (EU) 2016/369 on the Provision of Emergency Support within the Union*

This Regulation lays down the framework within which EU emergency support may be awarded through specific measures appropriate to the economic situation in the event of an ongoing or potential natural or man-made disaster. Such emergency support can only be provided where the exceptional scale and impact of the disaster is such that it gives rise to severe wide-ranging humanitarian consequences in one or more Member States and only in exceptional circumstances where no other instrument available to Member States and to the EU is sufficient. It determines specific requirements concerning the activation of the emergency support, the eligible actions, the different types of financial intervention and implementing procedures, the eligible costs, and at the same time protection of the financial interests of the EU. The Regulation sets the related monitoring and evaluation criteria and procedures.

### *European Commission Staff Working Document (17.6.2016 SWD (2016) 205 final/2) Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030 A Disaster Risk-informed Approach for all EU Policies*

The European Commission (EC) recognizes that while several policy initiatives already contribute to the implementation of the Sendai Framework in a fragmented way, a more systematic risk-informed approach for all EU policies in order to reach the Sendai objectives does not exist. Therefore, the Commission developed an Action Plan that incorporates the Sendai recommendations and translates them into four concrete key areas related to the four Sendai priorities:

- (1) Building risk knowledge in EU policies;
- (2) An all-of-society approach in DRM;
- (3) Promoting EU risk-informed investments; and
- (4) Supporting the development of a holistic DRM approach.

Building on existing EU policy and legislation, presented in **Annex I**, the Action Plan identifies for each of these key areas a series of measures that could form the backbone of an EU risk-informed policy landscape.

Annex 1 to the Commission Staff Working depicts that achieving the priorities of the Sendai Framework represents the contribution of all EU existing policies and practices to Sendai priorities.

Annex 2 includes a set of priorities with specific activities coordinated by the EC, with a timeline for implementation until 2020. The EC is committed to carry out regular reviews of the Action Plan to assess progress. In implementing the plan, a close work with all stakeholders, including EU Member States, civil society, and private sector is envisaged.

*Decision No. 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism*

The Union Civil Protection Mechanism ('the Union Mechanism') aims to strengthen the cooperation between the EU and the Member States and to facilitate coordination in the field of civil protection to improve the effectiveness of systems for preventing, preparing for, and responding to natural and man-made disasters. The Decision lays down the general rules for the Union Mechanism and the rules for the provision of financial assistance during the period 2014–2020, as well as monitoring and evaluation mechanisms. Specific actions are envisaged for risk assessment, mapping, and DRM planning, including for cross-sectoral.

The Union Mechanism is based on an EU structure consisting of an Emergency Response Coordination Centre (ERCC), a European Emergency Response Capacity (EERC) in the form of a voluntary pool of pre-committed capacities from the Member States, trained experts, a Common Emergency Communication and Information System managed by the EC and contact points in the Member States.

*EU Commission Staff Working Paper SEC (2010) 1626 final - Risk Assessment and Mapping Guidelines for Disaster Management*

The guidelines were developed to assist countries to further develop national approaches and procedures to risk management, taking into account the future impact of climate change. The focus of these guidelines is on the processes and methods of national risk assessments and mapping in the prevention, preparedness, and planning stages, as carried out within the broader framework of DRM. The guidelines take full account of existing EU legislation and Eurocodes (Directives on Flood Risks, Protection of European Critical Infrastructures, Water Framework Directive [drought management], Eurocode 8 on building design standards for seismic risks, and prevention of forest fires).

The EU has a wide range of regulatory tools in each of the potentially affected areas that create preconditions for further development and upgrade with DRR/DRM measures, such as – but not limited to – Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive), Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with European Economic Area (EEA) relevance (Seveso III Directive), Directive 2007/60/EC on the assessment and management of flood risks (Floods Directive), EU Strategy on Green Infrastructure, Covenant of Mayors for Climate and Energy, and EU Framework on Health Security, Work Plan for Culture (2015–2018).

**2.1.2. Institutional arrangements at EU level**

*European Civil Protection and Humanitarian Aid Operations Directorate-General*

The Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO) ensures rapid and effective delivery of EU relief assistance through its two main instruments: humanitarian aid and civil protection. By bringing together the two under one roof in 2010, the Commission has built up a more robust and effective European mechanism for disaster response both inside and outside the EU. The Directorate-General works in four main directions, serviced by:



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- Directorate A, Emergency management;
- Directorate B, Europe, Eastern Neighborhood, Middle East;
- Directorate C, Africa, Asia, Latin America, Caribbean, Pacific; and
- Directorate D, General Affairs.

Directorate A, Emergency management, consist of four units: A/1 - ERCC; A/2 - Emergency Preparedness and Security; A/3 - Disaster Risk Reduction, European Voluntary Humanitarian Corps, and A/4 - Civil Protection Policy, that support, coordinate, and facilitate the work for civil protection.

### *Emergency Response Coordination Centre*

The ERCC supports a coordinated and quicker response to disasters both inside and outside Europe using resources from the countries participating in the EU Civil Protection Mechanism.<sup>11</sup> It collects and analyzes real-time information on disasters; monitors hazards; prepares plans for the deployment of experts, teams and equipment; and works with Member States to map available assets and coordinate the EU's disaster response efforts by matching offers of assistance to the needs of the disaster-stricken country. The ERCC also monitors forest fire risk and incidence across Europe using national monitoring services and tools such as the European Forest Fire Information System (EFFIS). The cooperation and coordination with the European Maritime Safety Agency (EMSA) ensures a uniform and effective level of maritime safety, maritime security, prevention of and response to pollution caused by ships, and response to marine pollution caused by oil and gas installations.

The ERCC also supports a wide range of prevention and preparedness activities, from awareness raising to field exercises simulating emergency response.

### *European Emergency Response Capacity*

The EERC consists of a voluntary pool of resources to be used to respond to emergencies, which are precommitted by the countries participating in the EU Civil Protection Mechanism. The voluntary pool allows for a more predictable, faster, and reliable EU response to disasters. It is intended to facilitate better planning and coordination at European and national levels. The European Medical Corps, launched in 2016, is part of the EERC and aims to provide a rapid European response to emergencies with health consequences both inside and outside Europe.

### *Disaster Risk Management Knowledge Centre*

The Disaster Risk Management Knowledge Centre (DRMKC) is the EC point of reference in strengthening the interface between science and policy. It responds to the Sendai call on existing networks and science organizations to facilitate the use of scientific findings, improved research and technology. The DRMKC provides a coherent interface between science and policy by contributing research on hazard modeling, forecasting and early warning systems, crisis management technology, critical infrastructure protection, risk standard setting (for example,

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<sup>11</sup> The 28 EU Member States and Iceland, Montenegro, Norway, Serbia, the former Yugoslav Republic of Macedonia, and Turkey.

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Eurocodes, disaster loss and damage data, lessons learned), and risk assessment methodologies, often based on research networks within EU Member States.

### *Other institutional arrangements*

The *Water Information System for Europe (WISE)*, the *Biodiversity Information System for Europe (BISE)*, and the *Natural Water Retention Measures Platform* are linking scientists, EU institutions, EU Member States and the general public.

The *Critical Infrastructure Warning Information Network (CIWIN)* is an Internet-based information and communication system foreseen to facilitate the implementation of the European Programme for Critical Infrastructure Protection (EPCIP).

The *Climate ADAPT platform*,<sup>12</sup> developed to improve climate resilience in the EU, provides a wealth of information on risks and vulnerabilities and on DRR.

Ongoing research actions with the EC's in-house scientific centers – *Joint Research Centre (JRC)*, *EU Framework Programmes for Research and Innovation*, and the *Copernicus Programme* cover several of the Sendai Framework recommendations, in particular regarding the role that science and technology play globally in risk reduction and adaptation actions.

A range of research projects has been funded by the EU within the 7th Framework Programme with a direct or indirect support to the previous Hyogo Framework for Action (HFA), while further actions are being developed in the Horizon 2020 Framework Programme for Research and Innovation, which have a direct impact on the Sendai recommendation on the science-policy interaction. The EC coordinated in 2014 the development of a *Community of Users for Crisis Management and Disaster Risk Management* to enhance networks and information sharing around security research. Examples of science-policy interface include the *Global Flood Partnership* network, a cooperation framework between scientific organizations and flood disaster managers worldwide to develop flood observational and modelling infrastructure, leveraging on existing initiatives for better predicting and managing flood disaster impacts and flood risk globally.

The *EU Peer Review Programme* is an initiative of the EC's DG ECHO. The program is a tool aiming to facilitate the exchange of good practices and identify recommendations for improving reviewed countries' disaster management policy and operations. It encourages mutual learning and understanding and facilitates policy dialogue internally, between countries and among experts. The review focused on DRM principles and policies developed at the global level (the HFA, now the Sendai Framework for Disaster Risk Reduction) and European level (the EU Civil Protection Mechanism and EU directives related to specific risks). The general peer review framework covers five broad areas: an integrated approach to DRM, risk assessment, risk management planning, preparedness, and public awareness.

A peer review of Bulgaria has taken place in mid-2015 to assess the country disaster management system.

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<sup>12</sup> <https://climate-adapt.eea.europa.eu/>

## **2.2. Bulgarian Legislative, Policy, and Institutional Framework for DRM**

The national strategic policies, legislative and institutional arrangements are driven by the global processes and measures to reduce the impact of and adapt to the adverse effects of climate change. Bulgaria is party to a number of international conventions (United Nations Framework Convention on Climate Change [UNFCCC], United Nations Convention on Biological Diversity [UNCBD],<sup>13</sup> United Nations Convention on the Protection and Use of Transboundary Watercourses and International Lakes [UNCPUWIL],<sup>14</sup> United Nations Convention for the Safeguarding of the Intangible Cultural Heritage [UNCSICH],<sup>15</sup> Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES],<sup>16</sup> and so on) and as such is committed to comply with their requirements and initiatives for disaster risk reduction and management. Transposing of the EU acquis in this area also imposes commitments and related decisions at the national level.

### **2.2.1. Strategic documents**

#### *National Disaster Risk Reduction Strategy 2014–2020*

The lead policy document on DRR/DRM is the *National Disaster Risk Reduction Strategy 2014–2020*.<sup>17</sup> The strategy is developed in line with the provisions of the Disaster Protection Act and the HFA-based EU policies and decisions. It aims to identify the strategic priorities for DRR and support their implementation at the national, district, municipal and specific subject level. It supports the identification and prioritization of concrete areas for trans-boundary and trans-regional cooperation as well as long-term coordination of DRR.

In line with its strategic goal of “*prevention and/or mitigation of the adverse consequences for human health, socioeconomic activity, environment and cultural heritage in Bulgaria caused by natural or manmade disasters*”, the strategy outlines the following four priorities:

- Development of sustainable national policy and institutional framework for DRR.
- Identification, assessment, and monitoring of disaster risks at the national, district, and local level; expansion and maintenance of effective national systems for forecasting, early warning, and information on disasters.
- Building of a culture on disaster prevention at all governance levels and within society, utilizing available experience, training, scientific research, and innovations.
- Reducing of the underlying risk factors and strengthening of the preparedness for effective response in case of disasters at all governance levels.

The strategy includes a brief analysis of disaster risks affecting all sectors such as floods; landslides; erosion and abrasion; forest fires; unfavorable meteorological events such as droughts, high winds, and wind storms; heavy snowfalls; snow storms; icing; extreme temperatures (cold and heat waves); and hail. Nuclear emergencies and threats from industrial processing and transportation of dangerous materials, substances, and waste are also included in the strategy.

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<sup>13</sup> See <https://www.cbd.int/>

<sup>14</sup> See <http://www.unece.org/env/water/>

<sup>15</sup> See <http://www.unesco.org/culture/ich/en/convention>

<sup>16</sup> See <https://cites.org/>

<sup>17</sup> Council of Ministers Protocol № 15.19/16.04.2014.

The general sources of financing for the implementation of the strategy include the state and municipal budgets through the annual State Budget Act, the Inter-institutional Commission on Recovery and Support to the Council of Ministers (CoM), and the Operational Programmes (OPs) 2014–2020 of the European Structural and Cohesion Funds.

The strategy and its implementation programs are overseen by the CoM, with implementation support provided by the Fire Safety and Civil Protection DG of the Ministry of Interior (MoI). It should be noted, however, that the strategy and its Annex 2, Road Map for the Implementation of the Strategy, based on Annex 1 Natural and Man-made Disasters in the Republic of Bulgaria (identifying potential risks) is based mainly on information before the adoption of the strategy in April 2014.

#### *National Programme for Disaster Protection 2014–2018*

The *National Programme for Disaster Protection 2014–2018*<sup>18</sup> is a key document for policies in the field of disaster prevention, response and recovery that sets out the strategic priorities, objectives and tasks for disaster protection. The main tasks of the program are the following:

- Assessment and mapping of earthquake, nuclear and radiological, and geological risks
- Finalization of the floods risk identification and mapping
- Implementation of the risk reduction measures
- Increasing of the resilience of the critical infrastructure to disasters
- Finalization of the physical auditing of buildings (‘passportization’)
- Preparedness of the institutional bodies and the bodies for reaction to disasters
- Completion of the warning system, part of the national system for early warning and informing the population on the dangers registered by the systems for monitoring of the meteorological, hydrological, seismological, chemical, biological, radiological, nuclear, environmental, and other objects and manifestations

The program identifies and analyzes a certain number of risks on the territory of Bulgaria, such as earthquakes (mapping available), floods (no mapping included but available in the FRMPs as of the end of 2016), radiation (no mapping included), industrial hazards (no mapping included), landslides (mapping included), fires - forest fires, energy sector fires, SEVESO III-related fires, urban areas fires of different type; dangerous meteorological events like drought in all of its demonstrations (no mapping included); snowfalls, snowstorms, and icing (no mapping included); hails (no mapping included); geomagnetic storms (no mapping included); biological contamination (no mapping included); and critical infrastructure (no mapping of risks is included).

The program is implemented through district and municipal programs setting the operational targets and the activities for their implementation. The main responsible bodies and their activities are listed in detail in the program.

The general sources of financing for the implementation of the program include the state and municipal budgets through the annual State Budget Act, the Inter-Institutional Commission on

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<sup>18</sup> Adopted through Council of Ministers Decision № 270/07.05.2014

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Recovery and Support to the CoM, and the OPs 2014–2020 of the European Structural and Cohesion Funds. It is important to underline that according to the Disaster Protection Act (Article 6c), the national program is implemented through annual plans, where the concrete budgeting and financial sources are specified.

The national program does not have a schedule for implementation with clearly identified deadlines and responsibilities.

Though the program is effective until the end of 2018 and according to the Disaster Protection Act, the next five years national program for implementation of the DRR strategy will start in 2019, there is an urgent need to update the current one simultaneously and in line with the amended and supplemented act and with the potential amendment and supplementation of the Disaster Risk Reduction Strategy 2014–2020. Deadlines and responsibilities must be clearly defined.

### *Annual Plan for 2017 for the Implementation of the National Programme for Disaster Protection 2014–2018*

The ***Annual Plan for 2017 for the Implementation of the National Programme for Disaster Protection 2014–2018***<sup>19</sup> consists of a report on the 2015-plan and specific tasks to reduce the risk from disasters in 2017 in tabular form.

The 2015 report concerns 172 activities from different areas, some of which are delivery of firefighting equipment and machinery for the voluntary formations under the MoI, education in fire prevention, update of the sectoral DRR plans, including hydrological objects, rehabilitation of dam walls of significant dams, development of emergency satellite communication system, and so on. Though article 6c, (6), p.3 of the Disaster Protection Act requires mandatory indication of the budget, the report shows only some of the financial resources spent.

The 2017 plan consists of 206 activities, including assessment of the vulnerability risk of the strategic dam walls, cleaning of river beds 500 m after the dam walls, methodological and expert support to district and municipal authorities in disaster protection, and other actions for landslide, erosion and abrasion prevention, awareness raising, capacity building, and so on.

The plan does not contain an explanatory part to identify and clearly distinct priorities in 2017. Though article 6c, (6), p.3 of the Disaster Protection Act requires mandatory indication of the budget, the plan does not indicate any concrete costs of the planned activities except for whether financing comes from the state/municipal budget or EU funds.

### *Strategy on Voluntary Formations for the protection form Disasters, Fires and Other Emergency Situations in the Republic of Bulgaria 2012–2020*

The ***Strategy on Voluntary Formations for the protection form Disasters, Fires and Other Emergency Situations in the Republic of Bulgaria 2012–2020***<sup>20</sup> is developed in accordance with the Ministry of Interior Act and the Disaster Protection Act. It aims to achieve effective interference in the event of disasters, fires, and other emergency situations and to ensure active participation of people for the protection of their lives, health, property and the environment.

<sup>19</sup> Adopted by Council of Ministers Decision № 943/10.11.2016

<sup>20</sup> Council of Ministers Protocol № 39.26 / 17.10.2012

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The strategy recognizes the low level of volunteer activities and proposes measures to ensure financing for the formations to improve the level of education and increase public awareness on the necessity of voluntary actions and organizations.

The document needs to be updated to be in line with the current good international and EU practices and guidelines and the Disaster Protection Act. An action plan or a program for implementation of the strategy should be developed with clearly identified priorities, goals, tasks, responsible bodies, deadlines and especially the costs of the activities and their financing sources.

### *National Programme for Prevention and Limitation of Landslides on the Territory of the Republic of Bulgaria, the Erosion and Abrasion along the Danube and Black Sea Coast 2015–2020*

The ***National Programme for Prevention and Limitation of Landslides on the Territory of the Republic of Bulgaria, the Erosion and Abrasion along the Danube and Black Sea Coast 2015–2020*** aims at prevention and reduction of landslide danger, limitation and fast liquidation of the consequences of these processes, and protection of the population, material assets and environment from their impacts. The program contains detailed analysis of landslide, erosion and abrasion processes and the related impacted sites in the country by April 2014. Specific measures, including legislative initiatives, are planned for the period until 2020. Criteria for the selection of targeted landslides for interventions were developed based on multifunctional analysis for graduating weight factors, including evaluation of the impacts on infrastructure, human health and well-being, and so on. Thus, credible short-, mid- and long-term planning of measures was developed. A precise implementation plan with specific objectives, deadlines, responsible institutions, costs, and sources of financing is part of the program.

Though precisely compliant with the requirements of the Disaster Protection Act and firmly based on scientific analyses, the program needs to be updated with the latest developments on international and EU level and according to the latest amendments and supplements at the national level, including relevance to climate change risks.

### *Flood Risk Management Plans*

To implement a unified national approach to flood risk management and cover the specifics of the four river basin districts, a national catalogue of measures and national priorities for managing the risk of flooding has been prepared. The catalogue was used by the four river basin directorates to map the potential risks and draw up the program of measures as part of the plans to manage flood risk. The four FRMPs were approved by the CoM in December 2016. The plans consider all aspects of risk management, focusing on prevention, protection, preparedness, including flood forecasts, early warning systems, and the characteristics of the river basin management regions (Black Sea Region Basin Directorate [BD], East Aegean Region BD, West Aegean Region BD, and Danube Region BD) for the period 2016–2021. Based on a cost-benefit analysis of measures to prevent 20, 100, and 1000-year return waves, and taking into account the interference on human health, economic activities, environment and cultural heritage, and programs with specific measures were developed.



Following the findings of the Assessment of Pressures and Impacts of Climate Change on Surface and Ground Waters and Evaluation of Water Availability for the Economic Sectors (2014–2016), the impact of climate change was not considered as a factor for the emerging of floods because of the high level of uncertainty and conditionality of the climate models. Still, taking into account the potentially unfavorable climate change consequences, strict monitoring and appropriate update of the FRMPs should be undertaken.

#### *Program for Management of Risks and Crises in Agriculture (2016)*

The ***Program for Management of Risks and Crises in Agriculture (2016)*** identifies potential risks and crises in the agriculture sector due to different factors including climate change. It proposes certain measures to manage risks and crises.

The program is not based on climatic modeling of the country (and the region) and does not include a schedule for implementation with concrete responsibilities, deadlines and budgeting, clear indicators for monitoring and evaluation. The program does not correspond to the requirements set in the Ordinance on the terms, conditions, and bodies to implement analysis, evaluation, and mapping of risks from disasters.

#### *Program for Protection of Forests from Fire (2017)*

The Executive Forestry Agency implements the ***Program for Protection of Forests from Fire (2017)***. The program aims at preparing better coordination, planning, and response capacity to react to the potential increase of forest fires because of climate change.

### **2.2.2. Legislative documents**

#### *Disaster Protection Act*

The central legislative framework for DRM in Bulgaria is based on the ***Disaster Protection Act*** that was adopted in 2006 and most recently amended in 2017.<sup>21</sup> This act includes provisions for disaster risk assessment, preparedness, response and risk reduction, financial and technical support, and clearly defines the roles and responsibilities of relevant authorities at the national and subnational level.

The act also provides for the development of a national DRR strategy and the respective national program for its implementation and outlines their general contents, terms and conditions for adoption. The Disaster Protection Act also outlines the implementation of the annual plans, through which the national program is being realized, as well as their general scope and contents.

Other provisions of the Disaster Protection Act concern the identification, mapping and protection of EU critical infrastructure (see ***Annex 2***), the establishment and functioning of the Unified Rescue System, and the voluntary formations.

Particular attention is paid to DRR/DRM education processes at all levels of the education system and among the population.

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<sup>21</sup> Disaster Protection Act, last amended State Gazette (SG) issue SG 97/05.12.2017

The Disaster Protection Act has been amended and supplemented several times in 2016 and 2017 to respond to significant extent to the commitments under the Sendai Framework, the EC (SWD (2016) 205 final/2) Action Plan on the Sendai Framework for Disaster Risk Reduction 2015–2030 and the recommendations of the 2015 Peer Review.

#### *Ministry of Interior Act*

The **Ministry of Interior Act**<sup>22</sup> concerns the activities of the MoI related to protection of the citizens' rights and freedoms, protection of national security, protection against crimes, fire safety and protection of the population. It assigns specific activities to the DG Fire Safety and Civil Protection.

#### *Defense and Military Forces of the Republic of Bulgaria Act*

The **Defense and Military Forces of the Republic of Bulgaria Act** stipulates that the Ministry of Defense ensures, among others, the maintenance and utilization of the armed forces in condition of disasters, and participation in overtaking and /or remedy of disaster consequences.

The Minister of Defense takes decisions on the participation of military formations based on request from the relevant state body indicated under the plans for implementation of rescue and emergency recovery works. The minister coordinates these activities with state bodies, local authorities and related organizations.

#### *Ordinance on the Terms, Procedures and Bodies to Perform Disaster Risk Analysis, Assessment and Mapping*

The **Ordinance on the Terms, Procedures and Bodies to Perform Disaster Risk Analysis, Assessment and Mapping**<sup>23</sup> stipulates the terms, conditions and government entities responsible for the analysis, assessment and mapping of disaster risks on the territory of the Republic of Bulgaria.

It defines four potential disaster risks: seismic risk, flood risk, nuclear or radiation emergency risk, and geological risk (landslides, rockfalls, active faults, and other geological processes). The period for analysis, assessment and mapping is six years and the competent bodies to perform these actions are the following:

- Ministry of Regional Development and Public Works (MoRDPW) - for seismic (including earthquakes) and geological (including landslides, mudslides, rockfalls) risks
- Ministry of Environment and Water (MoEW) - for flood risks
- Ministry of Agriculture, Food and Forestry – for forest fire risks
- Nuclear Regulatory Agency – for the nuclear and radiological emergency risks

The Ordinance stipulates that methodologies are approved by the responsible ministers and revised when disaster effects differ from those initially evaluated in terms of severity and scope and based on lessons learned from previous disasters.

<sup>22</sup> Last amended SG issue 55/03.07.2018

<sup>23</sup> Last amended SG issue 55/07.07.2017



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The above government institutions typically do not undertake hazard and risk modelling in-house, but instead procure this analysis from the private and academic sectors, with the Bulgarian Academy of Sciences (BAS) being a key provider of disaster risk analytics.

In accordance with the Ordinance, risk analyses should, among others, include the following:

- Identification of dangers and their characteristics
- Mapping of each geographical indication (localization) of territories exposed to danger
- Identification of vulnerability, taking into account all influencing factors, including climate changes
- Evaluation of the disaster risk from any danger, including secondary effects, as the evaluation includes description, probability, and range of the negative consequences on the population's life and health, buildings, facilities and infrastructure, economy, environment, and cultural heritage
- Mapping of disaster risks in terms of spatial identification of endangered territories and mapping the dimensions of the potentially affected territories

The Ordinance stipulates that specialized data-base on disaster risks shall be developed with visualization in geographic information system (GIS). It lays down a number of indicators, excluding those subject to protection of classified information, to be reflected in the maps:

- Approximate number of potentially affected citizens (dead, injured, health-endangered)
- Material losses
- Affected infrastructure
- Affected economic activity in potentially affected area
- Affected facilities according to Appendix 4 to the Environmental Protection Act<sup>24</sup> that could provoke additional contamination due to emergency or disaster
- Zones of water protection listed in Article 119a to the Water Act<sup>25</sup>
- Protected areas identified in Article 6 to the Biological Diversity Act and protected areas potentially vulnerable to being affected
- Level of disturbance of the normal functioning of society
- Objects subject to immovable cultural values status, and any other information responsible competent bodies may consider useful

The Ordinance lays down terms and conditions for the development, adoption and control of the risk assessments.

The Ordinance does not cover all risks identified in the National Programme for Disaster Protection 2014–2018 and even those identified in the Commission Staff Working Paper (SEC (2010) 1626 final) Risk Assessment and Mapping Guidelines for Disaster Management (Eurocodes relevant to different types of natural and industrial disasters).

<sup>24</sup> Last amended SG issue 53/26.06.2018

<sup>25</sup> Last amended and suppl. SG issue 55/03.07.2018

*Healthy and Safe Labor Conditions Act*

The *Healthy and Safe Labor Conditions Act*<sup>26</sup> lays down, among others, the tools for prevention and reaction in case of emergency, including coordination with fire safety and civil protection units, and stipulates for the development of related ordinances (Article 20 to the Act). A number of ordinances regulate safety conditions of labor for all sectors (construction, mining, energy production, metal processing, research, education, and so on) and particular working places, which, among others, include specific rules for reaction in emergency situations - not only activity-specific but also general such as fire, earthquakes, and others. There are no provisions directly related to climate change impacts.

*Spatial Planning Act and Eurocodes*

The *Spatial Planning Act* (SPA) is relevant in its coverage of planning, investment design, and building construction and respective Regulation of Resilience to Hazards.<sup>27</sup>

Article 1, paragraph 2 of the Spatial Planning Act provides the basis for public relations relating to spatial planning, investment design, and construction in the Republic of Bulgaria and for introducing property restrictions for spatial planning purposes.

According to the provisions of art. 169, constructions are designed, built, and maintained in accordance with the basic requirements on technical resistance and stability; safety in case of fire, hygiene, health, and environment; safety and accessibility in use; protection against noise, energy economy, and heat retention; and sustainable use of natural resources defined in Annex I to Regulation (EU) No 305/2011.<sup>28</sup>

In accordance with the provisions of article 169, paragraph 2, item 2 of the SPA, constructions are to be designed, built and maintained in accordance with the regulatory requirements on DRR. The Act specifies that all urban and development plans should consider disaster and climate risk.

The Act identifies the Directorate for National Construction Control to support the Minister of Regional Development and Public Works in controlling the implementation of the Act and subsidiary legislation in the area of construction. It stipulates that the organs of the MoI and other bodies of state and municipal authorities are obliged to support the control activities of the directorate.<sup>29</sup>

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<sup>26</sup> Last amended and suppl. SG issue 97/05.12.2017

<sup>27</sup> Pursuant to the provisions in Article 106, paragraph 5; Article 107, paragraph 6; and Article 112, paragraph 2 of the Regulation of Resilience to Hazards, item 12 of the SPA, only territories at risk of disasters designated in accordance with the maps pursuant to Article 6, paragraph 2 of the Ordinance, and the municipal plans as per Article 9, paragraph 1 of the Disaster Protection Act shall be reflected in the Land Use Master Plans (LUMP) of municipalities and parts thereof, the LUMPs of cities and their lands and the settlements of national importance and the Specific Land Use Plans and the necessary preventive measures, and planning and protection shall be planned.

<sup>28</sup> Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

<sup>29</sup> According to the provisions of Article 220, paragraph 1 of the SPA, the Minister of Regional Development and Public Works shall control the compliance with SPA and its implementing regulations, including the use of quality construction materials and products in order to ensure the security, safety, accessibility and other regulatory requirements for construction. The Minister of Regional Development and Public Works shall control the work of the Directorate for National Construction Control. Pursuant to Article 220, paragraph 3 of the SPA, the Minister of Interior, or officials authorised by the Minister, shall exercise control over compliance with the fire safety requirements and the requirements set out in Article 106, item 5, Article 107, item 6 and Article 112, paragraph 2, item 12 of the SPA. The Directorate for National Construction Control exercises control on the implementation of the SPA and its implementing regulations in the area of construction for first to third category construction

Bulgaria also uses *Eurocodes* as an official standard for building structures design, as laid down in Ordinance # No ПД-02-20-2 from 2012 concerning the design of buildings and facilities in earthquake-prone areas. The Eurocodes include provisions on snow and wind load and thermal actions, as well as seismic resilience. While the initial plan of the government was to leave only Eurocodes in force (with Ordinance amending and supplementing Ordinance No ПД -02-20-19), the last ordinance gave a free choice of all private investment projects to choose which code they would use – Eurocodes or Bulgarian National Codes. Eurocodes are to be used for all construction sites belonging to first and second category of construction as well as all projects being organized according to Public Procurement Act.<sup>30</sup> The current national legislation in force in this domain, that can be applied in parallel with Eurocode 8, is Ordinance No ПД -02-20-2 of 2012 for the design of buildings and facilities in seismic areas. These design standards have been introduced in Bulgaria in 1957 and have, since then, continuously been improved and updated.

Eurocode 8 specifically aims at seismic resilience of structures. Assuming strong enforcement of the ordinance in compliance with the Eurocodes, it is likely that buildings constructed or retrofitted under this code are resilient to earthquakes. According to Article 176a of the SPA, after completion of a new building, reconstruction, major renovation, major refurbishment, or changes to existing construction works, a technical passport of the building shall be issued. No technical passports are required for constructions under chapter 3, sections VII and VII of the SPA. The timelines for issuing technical passports for the different categories of existing buildings, including state and municipal buildings, are set out in Ordinance No 5 from 28 December 2006 concerning technical passports of buildings.

#### *Other legislative documents and remarks*

Further **sectoral legislation** relevant to DRM includes, for instance, the *Environmental Protection Act*, which has transposed Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances; and the *Water Act*, which implements the Floods Directive (2007/60/EC).

Bulgaria has also enacted the *Climate Change Mitigation Act*, adopted by the Parliament in February 2014, which includes a commitment to draw up a National Climate Change Adaptation Strategy (NCCAS) for a period running until 2030.<sup>31</sup>

The current review of the strategic and legal framework covers not only the documents analyzed above, but also most of the related strategies and acts such as the Forests Act, Water Act, Nature Protection Act, Waste Management Act, Safe Use of Nuclear Energy Act, Biological Diversity Act, Plant Protection Act, Protection of Agricultural Lands Act, National System for Emergency Calls on Single European Emergency Number 112 Act, Health Act, Local Self-Governance and Local Administration Act, Primary and Secondary Education Act, and also sectoral Ordinances, strategies, programmes, and action plans. The review aims to identify climate change-related risk analyses and measures and relevant coherence and coordination.

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works, whereas fourth, fifth and sixth category construction works are controlled by the municipal mayor or an official authorized by the mayor.

<sup>30</sup> See <https://www.researchgate.net/publication/282730086>

<sup>31</sup> See [http://dppi.info/sites/default/files/Sendai%20implementation\\_BULGARIA.pdf](http://dppi.info/sites/default/files/Sendai%20implementation_BULGARIA.pdf)

The review of the strategic and legal framework of all different sectors shows that except for the forestry sector, climate change-related risks are not considered, and no specific methodologies are developed. No mapping of climate change-related risks was identified.

Except for the Disaster Protection Act, no other strategic and legal regulations transpose the Sendai Framework, the EC (SWD (2016) 205 final/2) Action Plan on the Sendai Framework for Disaster Risk Reduction 2015–2030 and the 2015 Peer Review recommendations.

Despite the strict requirements of Art. 6 to the Disaster Protection Act on the contents of the DRM annual plans, no clear budgeting of the planned DRM actions is specified.

### **2.2.3. Institutional framework**

According to the Disaster Protection Act, the bodies with functions related to disaster protection include ministries and institutions, district and municipal administrations, first aid centers, other medical healing and health-related bodies, legal entities and entities with limited responsibilities, voluntary formations and formations of the armed forces.

In the event of a disaster, the Act stipulates that all activities for the protection of the population are to be implemented through a *Unified Rescue System* that includes units of: ministries and agencies, municipalities, trade companies and sole traders, first aid centers, other health and medical facilities, non-profit legal entities, including voluntary units and armed forces. The main components of the System are the Fire Safety and Civil Protection Directorate-General at the MoI (coordinator of the system), the district directorates of the MoI, the Bulgarian Red Cross (BRC) and the first aid centers. The CoM is the body responsible for authorizing emergency expenditures in the event of disasters.

The Fire Safety and Civil Protection Directorate-General is the key responsible national entity for DRM, while district governors and mayors have the primary responsibility for disaster protection at the district and municipal levels respectively. Overall, the responsibilities of the governor and mayor include activities in all DRM phases, not only in emergency planning and emergency response.

#### *Fire Safety and Civil Protection Directorate-General*

The ***Fire Safety and Civil Protection Directorate-General*** is a national specialized structure of the MoI and is the key entity responsible for DRM on a national level. It is responsible for performing tasks related to the following:

- Preventive activities
- State fire prevention control
- Coordination of the training and practical preparedness of the central and territorial units of the executive authorities and increasing the disaster protection awareness and preparedness of population
- Support for the activities on analysis, assessment and mapping of disaster risks
- Support for and coordination of the activities on critical structures identification and risk assessment
- Fire suppression and rescue activities

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- Urgent rehabilitation works, operational protection in situations of floods as well as operations for localization and rescuing, and chemical, biological and radiation protection
- Early warning and announcing of disasters and air attacks to executive authorities and population
- Support for the education on protection from disasters in primary, secondary and high education system
- Support for the headquarters, district and municipal main offices under the Disaster Protection Act to implement their functions
- Support the development of programs and projects to reduce the risk of disasters

In accordance with the Rules for Operation of the MoI,<sup>32</sup> by which it is regulated, the Fire Safety and Civil Protection DG performs its activities through two directorates: State Control and Prevention Activities Directorate and Operational Activities Directorate.

The Fire Safety and Civil Protection DG is a focal point for the United Nations International Strategy for Disaster Reduction (UNISDR) and the ERCC and, as noted above, is the coordinating body of the Unified Rescue System.

### *Disaster Risk Reduction Council under the Council of Ministers for Supporting the Formation and Implementation of State Policy on Disaster Protection*

The ***Disaster Risk Reduction Council under the Council of Ministers for Supporting the Formation and Implementation of State Policy on Disaster Protection*** serves as a national disaster risk reduction platform in compliance with the Hyogo Framework for Action and Sendai Framework for Disaster Risk Reduction. It is responsible for supporting the CoM in formulating and implementing the state disaster protection policy, including in the adoption of a national DRR strategy, a national program for DRR, and a national plan for disaster protection. It consists of representatives of ministries, agencies, the BAS, the National Association of Municipalities, the BRC, the Bulgarian Chamber of Commerce, and the Bulgarian Industrial Association, as well as representatives from universities, scientific research institutes, non-profit organizations and legal entities.<sup>33</sup>

### *Bulgarian Red Cross*

The BRC is the only national organization of the Red Cross on the territory of the Republic of Bulgaria. It assists the state in increasing the health-related knowledge of the population, training citizens to render first aid, preventing and giving aid in cases of accidents in mountainous and water body regions, and supporting victims of armed conflicts, natural and anthropogenic disasters. The BRC has the capability and resources to assist disaster victims at national and district level. It cooperates with and relies on the assistance of the International Federation of Red Cross and Red Crescent Societies.

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<sup>32</sup> Last amended SG issue 33/25.04.2017

<sup>33</sup> See [http://ec.europa.eu/echo/sites/echo-site/files/bulgaria\\_peer\\_review\\_report\\_-\\_en.pdf](http://ec.europa.eu/echo/sites/echo-site/files/bulgaria_peer_review_report_-_en.pdf)

The Bulgarian Red Cross has a four-level organizational structure with 28 regional organizations. Its main executive and ruling bodies are the General Assembly and the National Council.

*National Association of Volunteers in the Republic of Bulgaria*

The **National Association of Volunteers in the Republic of Bulgaria**<sup>34</sup> was established in 2014. Its members include (a) voluntary formations, registered at municipality-level, aiming at protection against disasters, fires, and other emergency situations and (b) persons and legal associated entities (sports clubs, social groups, and so on).

The review of the institutional setting shows that DRM institutionalization is in place and very clearly determined in the Disaster Protection Act. The Unified Rescue System is in place. Specific responsibilities on prevention, reaction and recovery to each state, district and municipal level as well as the voluntary formations, legal entities and persons are identified and in operation.

The institutional setting could be additionally updated when climate change-related risks are duly identified countrywide.

**2.2.4. Cross-sectoral cooperation on DRM**

In general, institutional and regulatory arrangements on DRM-related data sharing, planning and implementation of policies, agreements and codes among different institutions, and organizations are in place and clearly regulated by the Disaster Protection Act.

However, climate change risks are not clearly identified and addressed in sectoral legal and institutional arrangements.

The cross-sectoral cooperation on DRM is in place but without taking into consideration climate change-related disasters. Despite the availability of climate change risk and vulnerability analysis no initiatives were undertaken to address those in the sectoral strategic and legal framework.

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<sup>34</sup> See <http://navrb.bg/>



### Chapter 3. Assessment of the Current DRM Situation in Bulgaria

To assess the current situation of DRM in Bulgaria, the World Bank Group operational framework for DRM<sup>35</sup> is used both for structuring different components for DRM and for enabling easier comparability of progress and gaps as compared to countries with similar risks and levels of development. Under this framework, five pillars of DRM are identified: (a) *Risk Identification*, covering hazard and risk assessments and their communication; (b) *Risk Reduction*, including structural and non-structural measures; (c) *Preparedness and Early Warning*; (d) *Financial Protection*, which is aimed at assessing and reducing contingent liabilities, ex-ante and ex-post financing instruments and aspects of insurance; and (e) *Response and Resilient Recovery and Reconstruction policies*. All pillars are underpinned by a functioning institutional, political, normative and financial context. These elements align with the 2015 Sendai Framework for Disaster Risk Reduction priorities for action.<sup>36</sup>

In support of the government's efforts to reform the DRM system, a thorough peer-review of the disaster response capacity in Bulgaria was carried out in 2015 (European Commission 2015). It found that there was a well-established civil protection or *emergency and disaster response system* which has clear roles and responsibilities under the *Unified Rescue System*, excellent cooperation with the EU on civil protection, exercises and training, and integration with the Bulgarian Red Cross and civil society for disaster response. Therefore, this aspect is not reviewed further in this document. However, the peer review report clearly pointed out areas that need improvements and gave concrete recommendations to move towards a system that places equal value on prevention, preparedness, response and recovery.

To put in place this new concept, Bulgaria amended the Disaster Protection Act with the aim to:

- Enact priorities from the Hyogo Framework for Action and the Sendai Framework for Disaster Risk Reduction
- Establish Councils for Disaster Risk Reduction to the Council of Ministers, Regional Governors and Mayors which serve as platforms for disaster risk reduction
- Enact disaster risk reduction planning at national, district and municipal level
- Provide guidelines for development and subsequent implementation of the planning documents
- Create possibilities for prioritizing the disaster risk reduction activities

Following the adoption of the Sendai Framework for Disaster Risk Reduction in 2015 and in response to recommendations from the 2015 peer review, Bulgaria drafted a new National Disaster Risk Reduction Strategy for the period 2018–2030 which recently passed public consultations. It outlines the following:

- **Vision** – to ensure a resilient and safe environment for the Bulgarian population
- **Expected Outcome** – prevent new risks and reduce the existing ones in order to achieve resilience

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<sup>35</sup> See <https://www.gfdrr.org/sites/default/files/publication/sendai-report.pdf>

<sup>36</sup> See <http://www.unisdr.org/we/coordinate/sendai-framework>

- **Strategic Goals:**

- 1) Achieving disaster resilience of the society;
- 2) Building disaster risk management capacity at all administrative levels of governance
- 3) Achieving coherence during the implementation of the sustainable development, climate change adaptation and disaster risk reduction policies
- 4) Achieving sustainable financing of disaster protection

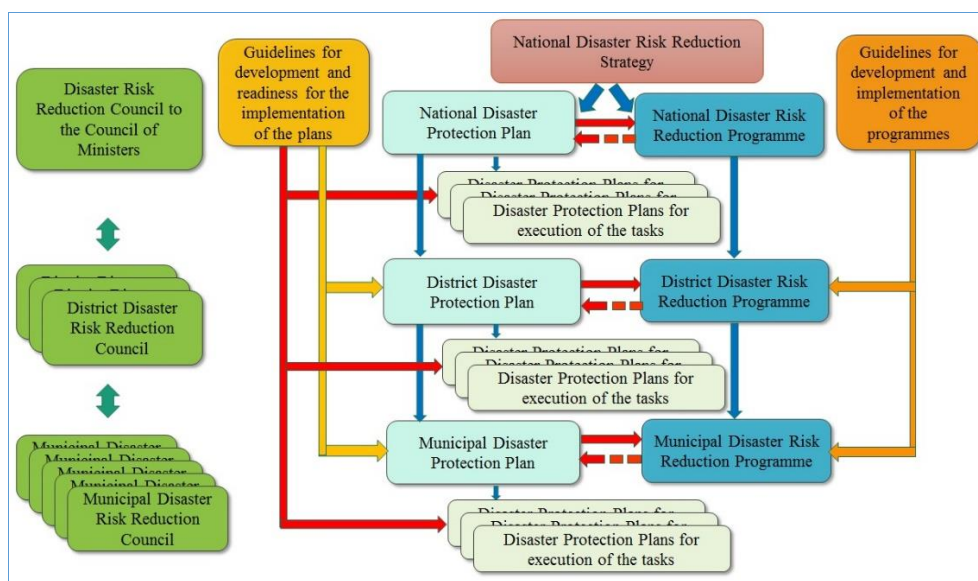
- **Priority Areas:**

- 1) Understanding disaster risk
- 2) Strengthening disaster risk governance
- 3) Investing in disaster risk reduction
- 4) Putting in place policies for financial disaster risk management
- 5) Enhancing disaster preparedness for effective disaster response and to build back better in the recovery phase

According to the Disaster Protection Act, the next steps shall be development and adoption of National, District and Municipal Disaster Risk Reduction Programmes as well as development and implementation of Disaster Protection Plans at the different administrative levels. The Disaster Risk Reduction Council already published guidelines related to the “Development and readiness for the implementation of the plans”. These guidelines shall support the bodies of the central executive authority, district and municipal disaster risk reduction councils and the organisations from the Unified Rescue System in the development of disaster protection plans. Moreover, Disaster Risk Reduction Councils shall follow the instructions when planning disaster protection.

An overview of the current concept of disaster risk management in Bulgaria and the interconnections between strategic and planning documents that shall be implemented at different administrative levels can be found in *Figure 5* below.

**Figure 5. Interconnections between strategic and planning documents related to disaster protection**



Source: CoM, 2017.



Overall, from the legislation, organizational frameworks, and discussions with responsible agencies, there is understanding and undertaken actions for achieving the objective to move toward a comprehensive DRM framework that considers all elements of DRM and which aims to decentralize actions and responsibilities to municipal and district levels. There has been significant progress made in the decentralization with respect to response, noting the circumstances under which municipal, district or national entities assume responsibility. For the other elements of DRM, progress has been patchy with some larger and higher-capacity municipalities being able to more easily assume responsibilities, while for others significant challenges remain.

### **3.1. Risk Identification**

Understanding and quantifying hazard, exposure, vulnerability and risk is a precondition for informed DRM and CCA. Moreover, several EU directives are relevant to disaster risk identification, including the 2007 INSPIRE Directive<sup>37</sup>, the Floods Directive<sup>38</sup> and Eurocode 8.<sup>39</sup> The progress made in meeting their requirements is detailed below.

#### **3.1.1. Floods Directive**

For the implementation of the EU Floods Directive 2007/60/EC,<sup>40</sup> the government of Bulgaria, specifically through the MoEW, has been implementing three main steps: (a) conducting preliminary flood risk assessment, (b) preparing flood hazard and flood risk mapping, and (c) based on this information, producing flood management plans.

A preliminary assessment of flood risk was finalized according to the Flood Risk Assessment Methodology approved by the Minister of Environment and Water for the four river basin management regions by 2012. Flood hazard and risk maps for all areas of potential significant flood risk in Bulgaria were then produced in 2013 for three of the four river basin management regions (Black Sea, East Aegean and West Aegean), while those for the Danube region were prepared in 2015.<sup>41</sup> These maps have been prepared in accordance with the established national methodology for the three flood scenarios with return periods of 20, 100, and 1,000 years. In 2016, four FRMPs were also adopted for each river basin management region (for the period 2016–2021). These plans specify the characteristics of the basins, and cover the different aspects of flood risk management, including prevention, protection, preparedness, flood

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<sup>37</sup> See <https://inspire.ec.europa.eu/inspire-legislation/26>. Under this directive, Member States should design spatial data infrastructures that ensure that spatial data are stored, made available, and maintained at the most appropriate level, allowing data from different sources to be combined and for spatial data to be easily discovered. As this directive covers datasets key to assessing disaster risk – administrative units, cadastral parcels, transport networks, hydrography, elevation, landcover, orthoimagery, geology and so on, - it is key to Pillar 1.

<sup>38</sup> See <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0060&from=EN>. Under this directive, Member States must undertake flood risk assessments using available or readily derivable information to determine areas of heightened flood risk and based on this assessment produce flood hazard and risk maps covering low-, medium- and high-probability floods. Based on these maps, flood risk management plans must be developed articulating all aspects of flood management, focusing on prevention, protection, preparedness, flood forecasts, and early warning systems. These assessments should be made available to the public. Moreover, the preliminary flood risk assessment, flood hazard and risk maps and flood risk management plans should be updated every six years.

<sup>39</sup> Eurocode 8 is the 1998 EU standard related to the design of structures for earthquake resistance and covers buildings, bridges, the assessment and retrofit of buildings, silos, tanks and pipelines, foundations, retaining structures, geotechnical aspects and towers, masts and chimneys. It also articulates buildings' importance classes requiring high levels of earthquake resistance for schools, hospitals, civil protection, and so on and minimum requirements for seismic hazard assessments.

<sup>40</sup> The directive has been transposed into national legislation with the amendment of the Water Act in August 2010.

<sup>41</sup> See <http://www.moew.government.bg/vodi/planove-za-upravlenie/planove-za-upravlenie-na-riska-ot-navodneniya-purn/>

forecasts, and early warning systems. Programmes of measures were also developed as part of the FRMPs. These include proposals for specific measures, as well as measures on river basin management region level or national level.

Although compliant with the Floods Directive and prepared in accordance with the established national methodology, the flood hazard and risk maps were commissioned independently for each basin directorate which limits comparability and climate change effects on rainfall were not considered. While Portable Document Format (PDF) maps are available to stakeholders for each river basin management region, only limited GIS data are available.

The MoEW is currently working on the planning of the development of the FRMPs for the second planning cycle for the period 2022-2027. These will update the preliminary assessment of flood risk together with the flood hazard and risk maps to include climate change effects and to consider new data. Moreover, other types of floods such as flash floods will be analyzed and a greater range of sectorial risks will be covered.

### **3.1.2. Eurocode 8**

In 2006, the BAS produced a new probabilistic seismic hazard map for Bulgaria to provide a basis for recommendations in Eurocode 8 – which provides the basis for building codes considering a 475-year return period (10 percent probability of exceedance in 50 years) and 95 years (10 percent probability of exceedance in 10 years). The study also provided 1,000-year return period analysis for general guidance on the design of long-lived critical infrastructure such as dams. Considering the 475-year return period, Sofia could expect up to Medvedev–Sponheuer–Karnik (MSK) intensity 8.5 earthquake events which could result in the collapse of substandard structures and some damage to well-constructed structures. The cities of Plovdiv, Pleven, Ruse, and Varna have similar hazard potential. Buildings constructed after 2006 are broadly considered to be compliant with the Eurocode 8 stipulations but an assessment of the current code and any needed updates would be valuable for long-term planning.

### **3.1.3. INSPIRE Directive**

It appears that very limited progress has been made in Bulgaria against the INSPIRE Directive which does present some challenges for DRM and, specifically, risk identification in Bulgaria. During discussions with several stakeholders it became clear that fundamental datasets are being collected multiple times by different national institutions – a significant duplication of scarce resources. For example, key datasets are fundamental to the production of most risk maps such as land use and vegetation, soil and geology, topography, river networks, transport, public buildings, critical infrastructure, residential building typologies, demographic information, GDP production, replacement costs, and so on.

The datasets common to risk assessment across all hazards are known as exposure data. These include, among others, national and municipal transport systems; elementary, secondary, and tertiary education facilities; hospital and medical facilities; demographics (age, gender, income, and so on); residential, commercial and industrial buildings (location, year of construction, number of stories, replacement costs, wall and roof type, and so on); and so forth. These datasets stretch across many line ministries at the national level as well as municipal services, and thus the collection of these datasets is a challenge common to countries across the world. However,

without this data – even at a granular level and determined using statistics – it is difficult to predict the social, physical and financial costs of disaster events and to undertake meaningful cost-benefit analysis. These datasets should be collected once and made available to all national and sub-national agencies with responsibilities for DRM, climate change, and urban and development planning.

#### **3.1.4. Beyond the EU Directives**

Beyond the EU Directives, information on disaster risks currently available or planned include the following:

1. Seismic risk to Sofia. The BAS and the National Institute for Geology, Geodesy and Geophysics (NIGGG) undertook a pilot assessment of the seismic risk to one sector of Sofia city. The results are not publicly available.
2. Seismic Risk to Pre-Cast Panel Buildings. The MoRDPW, with the support of the World Bank, has embarked on a comprehensive assessment of pre-cast panel apartment buildings which currently house more than 20 percent of the Bulgarian population. Many of these buildings pre-date current seismic codes, have exceeded their anticipated 50-year life span, and in many cases have been poorly maintained. This assessment which builds on expertise and knowledge from the BAS, available at the end of 2018, will clearly articulate the risk and, if needed, propose measures to improve the seismic safety of these buildings.
3. The EU Joint Research Center and the Agency for Sustainable Development and Eurointegration have embarked on a seismic risk assessment of two cities, including Ruse, to determine the potential damage and losses from earthquake events.
4. The Ministry of Regional Development tasked the National Institute for Geology, Geodesy and Geophysics of the Bulgarian Academy of Sciences to develop a Methodology for Seismic Risk Analysis, Assessment and Mapping in the Republic of Bulgaria. The task was completed in 2017 and the Methodology was approved in May 2018. This is the basis for embarking on mapping the seismic risk which will be finalized by 2025. However, there is an urgent need to understand the full scale of seismic risk in Bulgaria and the localities and sectors most at risk, so this timeline should likely be accelerated, noting that other countries typically undertake similar assessments in two to three years.

Given the changing climate and vegetation in Bulgaria, it may also be appropriate and timely to develop wildfire susceptibility maps that consider slope, vegetation, soil, precipitation, and temperature – as well as past wildfires. This may assist with preventive actions as well as planning for any additional fire response capabilities. There may also be needs to develop higher resolution information on water scarcity and the impact on hydropower, agriculture, urban water requirements, and so on. Moreover, given the high number of smaller earthen dams in Bulgaria, there may be a need for systematic assessment of these dams to determine their resilience to floods (and potential for overtopping) and to earthquakes, as dam breaks may pose significant risk to downstream residents in the flood path.

Beyond the production of new analytics and maps on natural hazards and disasters and climate risks, there is also an urgent need to ensure that this information is available to stakeholders who need it for decision making. For example, private citizens may consider flood and seismic risks in the purchase of property and businesses as this may also have an impact on their ability to get insurance in the longer term. Sectorial agencies at the national level could use this information to develop prioritized risk reduction strategies and investments. At the municipality and district level, this information can inform prioritization of measures and investments in risk reduction and adaptation, as well as ensuring that urban, development and spatial plans consider disaster and climate risks. A centralized information system would also ensure exposure data – as mentioned in the following paragraph – would be collected once for multiple purposes. Finally, streamlined access to this type of data would enable the rapid assessment of disaster damages, affected populations, and likely reconstruction costs when disasters strike – thus providing the CoM more robust information when decisions are being taken on the scale of government response to disaster.

A significant gap in Bulgaria is the systematic collection and integration of data on disaster events that have occurred in the country. For example, the Fire Safety and Civil Protection DG collects data on disasters for which it needs to respond; the MoEW receives data every six months from the national hydrometeorological agency on flood events in the country; and the Ministry of Finance (MoF) has financial data on the amount of financial resources allocated by the Interagency Commission for Relief and Recovery to the Council of Ministers for disaster response and recovery, and what these were spent on by the first-level budget units. It is likely that other agencies also collect data on disaster damage which could be useful – such as the impact of floods and landslides on transport. Integration of this data, and data from municipalities would enable the true cost of disasters in Bulgaria to be quantified and would also enable the government to track its progress toward the achievement of its national strategy for DRR. There are also opportunities to implement national systems for the collection of information regarding disaster damages, noting that many systems operating in other countries could be customized for Bulgaria depending on the granularity of data required.

In general, risk identification is clearly identified in each of the concerned areas and there are related methodologies concerning the identification and assessment of those risks. A number of acts, ordinances, instructions, rules, and standards regulate those areas. However, in the course of the desk research only a few specific *climate change vulnerability* assessment methodologies were identified, and they relate to floods and forestry, and indirectly - to landslides, erosion and abrasion.<sup>42</sup> Of these, flood risk assessment and the assessment of the impacts of climate change on surface water and groundwater, and evaluation of water availability for the economic sectors, consider climatic modeling as uncertain and recommend updates related to CCA to be made later, if in the process of monitoring such needs are registered. The landslides, erosion and abrasion methodology is not based on and/or related to climate change impacts on risks. Only forest-related acts and programs take into consideration potential climate change impacts and risks and provide measures for adaptation with clearly identified tasks, responsible bodies, deadlines, costs, and sources of financing.

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<sup>42</sup> This does not preclude the existence of other related methodologies, yet, these might be identified in the course of stakeholders' consultations under the Reimbursable Advisory Services Agreement.

## *Climate Change Adaptation – Assessment of the Disaster Risk Management Sector*

The risks from disasters, with different levels of relevance to climate change impacts, are identified in different documents developed during the last five years.

- Disaster Protection Act, last amended and supplemented in 2017
- FRMPs, 2016
- Assessment of Pressures and Impacts of Climate Change on Surface and Ground Waters and Evaluation of Water Availability for the Economic Sectors, 2016
- National Climate Change Risk and Vulnerability Assessment for the Sectors of the Bulgarian Economy, 2014
- Strategic Environmental Assessment of the OP Environment 2014–2020, 2014
- Disaster Risk Reduction Strategy 2014–2020 and National Programme for Disaster Protection 2014–2018
- Other sector-specific acts, strategies and strategic action plans and programs for implementation of the plans

The Disaster Risk Reduction Strategy 2014–2020 and the National Programme for Disaster Protection 2014–2018 make analyses and identify risks (though not clearly identified as related to climate change impacts) as follows:

- Earthquakes (not related to climatic changes)
- Nuclear and radiation emergency<sup>43</sup> (potential consequence of some of the climate change impacts)
- Floods
- Landslides
- Fires, including forest fires and different types of fires in urban areas
- Risk of significant and substantially significant meteorological events such as drought, strong snowfalls, snowstorms, icing, and hail
- Threats from industrial processing and transportation of dangerous materials, substances and waste (potential consequences from natural or man-made disasters)
- Geomagnetic storms
- Biological contamination
- Critical infrastructure

The National Climate Change Risk and Vulnerability Assessment for the Sectors of the Bulgarian Economy of 2014 identifies and analyzes risks in the following areas:

- Agriculture and soils
- Forestry
- Water
- Urban environment
- Energy
- Transport

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<sup>43</sup> The title does not correspond to contents and varies in different documents.

## *Climate Change Adaptation – Assessment of the Disaster Risk Management Sector*

- Construction and infrastructure
- Ecosystems and biodiversity
- Human health
- Tourism

Though developed in one and the same year, the documents above are not coordinated and coherent with each other; yet, some indirect links are in place. Data and analyses are not based on one and the same methodological approach. The analyses of the different sectors are fragmented, not cross-related and are not filed in an accumulative document and map of hazards, that is, there is no single document mapping all the identified risks, their geographical distribution and exposure (population, housing, critical infrastructure, social infrastructure, cultural heritage, agriculture, industries, environment, and so on).

It is important to note that though drought has been identified as a potential risk, no strategic document has been developed since 2010 when the Programme on Necessary Measures in the Conditions of Drought Tendencies 2001–2010 has terminated. No assessment of the program's results was made.

In general, except for the aforementioned limited number of documents, there are no sector-related national strategies, strategic programs, and action plans adhered to climate change risk. There are general and sporadic links and statements that are not translated into concrete conclusions, measures and financing. Many aspects are not analyzed at all; crucial data are not collected - there is a lack of national inventories of the existing dams, including small dams, on hydromelioration infrastructure, inventory of forest roads, available access roads to critical infrastructure, and so on.

These gaps lead to a conclusion that a coordinated and synchronized update of the existing data base and strategic and legal framework is urgently needed.

### **3.2. Risk Reduction**

The key tenets of risk reduction include both structural and non-structural measures and actions that focus on the avoidance of the creation of risk and actions that focus on the reduction of existing risk. Risk reduction should also consider public assets and infrastructure, private residential, commercial and industrial assets, as well as amenity of buildings and the urban and rural environment.

Overall, the national legal framework related to basic risks such as floods, landslides, erosion and abrasion, earthquakes, biological contamination are identified and addressed in the related legislative framework, and specific measures for their reduction are provided. The relevant investments are to a certain extent evaluated and embedded in programs and plans at the national, district, and municipal level. Resilience to hazards, without special relation to climate change impacts, is comprehensively addressed in the national legislation.

Under the 2017 Disaster Protection Act, the process for which to apply for government funding for prevention or risk reduction activities that are outside or in addition to the usual sector or municipality budget allocation involves (a) an application that articulates the proposed risk reduction measure and how it aligns with the national DRR strategy and/or the flood



management plan; (b) the application is received by the MoI, as the Secretariat for the Interagency Commission for Relief and Recovery to the CoM and the application assessed against a range of criterion; (c) the CoM approving an annual work plan of risk reduction measures and the associated budget. In principle this process is clearly documented; however, for a municipality to apply for funding they typically need to use their own funds to develop the necessary engineering designs, cost-benefit analysis, and so on. This process does, however, favor municipalities with higher capacity, greater access to funds and/or higher commitment to DRR, and therefore it would be useful to see through time which municipalities are taking most advantage of this program and which are not. Another challenge is that the amount of funds actually allocated under this program is very limited – 15 percent of the Reserve Fund which is typically BGN 70 million per year.

With respect to avoiding the creation of new risk, compliance with Eurocode 8 should ensure new buildings are resilient to earthquakes that will through time reduce risk as urban renewal replaces older buildings with newer more resilient ones. Also, under the Spatial Planning Act, disaster and climate risks should be taken into account in urban and regional development plans. Given the relative inaccessibility of high resolution data on the different hazards in Bulgaria, it is unlikely that this information is included in a meaningful way. However, to determine the level of consideration given to disaster and climate resilience, an audit of plans created since amendments to the act should be undertaken.

Considering the hazard and risk profile of Bulgaria, selected DRR areas are presented below.

### ***3.2.1. Safety and continued use of public buildings***

In the event of a strong earthquake, significant flood, wildfire, or any disaster, it is critical to ensure that hospitals and primary medical facilities remain undamaged and functional with backup electricity and communication to enable the care of injured as well as to sustain key functions such as maternal health. Emergency services (police, ambulance, and fire safety and civil protection) should equally remain functional. Public education facilities, emergency services, and national, district, and municipal government buildings should be located and constructed to ensure life safety (at a minimum) but ideally to ensure minimal damage allowing rapid reoccupation and commencement of services. An assessment should also be made beyond the footprint of the building to determine access routes in the event of a disaster, as well as the resilience of electricity, water, and communication services. An assessment of the resilience of these buildings, especially focused on those constructed before modern building codes and awareness of flood risk, should be undertaken so that risk reduction measures can be prioritized.

Moreover, any effort to undertake improvement to the amenity and/or energy efficiency of buildings constructed during ‘riskier’ time periods should consider seismic resilience of the construction before action is taken. Furthermore, any buildings in high flood areas should consider the safety of citizens accessing the building and should ensure that expensive internal fittings (for example, medical equipment) are kept on higher levels and/or can be moved if flood threatens.

### **3.2.2. Transport infrastructure**

The costs to the transport sector from smaller disasters – such as landslides and rock fall – contribute substantially to recurrent maintenance budgets and after a large event reconstruction in the transport sector represent one of the greatest financial costs for national and sub-national authorities. Detailed digital maps of transport networks, including attributes such as traffic volume, redundancy (how viable alternative routes are and what the additional cost associated with the use during long-term road diversions is), surface type, level of maintenance, together with detailed flood hazard and landslide susceptibility maps and historical landslide/rockfall locations, can support evidence-based decision making on where road closures could be expected after heavy rain and flood and consideration of future transport routing decisions. The location of bridges and their characteristics that could make them vulnerable to collapse after seismic events or to be overtopped by flood is also critical for this type of decision making. Once this information is collected, criticality assessments of transport systems can be combined with their vulnerability, to support prioritization of resilience investments in the sector.

### **3.2.3. Energy, communication, and water services**

An assessment of the vulnerability of these services is critical to ensure that disaster losses are not exacerbated. For example, are there automatic systems to switch off gas supply in an earthquake so that burst gas pipes do not lead to fires? How soon after a major earthquake, storm or flood event could electricity be restored? Do critical services in the community have access to backup generators? Collecting the data and undertaking the analysis to answer these questions is complex and requires strong partnerships with the private sector and government entities responsible so the analysis is robust and that there is willingness by the sectors to act. In some cases, new regulations may be required to ensure that resilience measures are embedded.

### **3.2.4. Residential sector**

After a disaster, the largest damages and reconstruction costs are typically in the housing and residential sector. Without a well-developed and highly functioning insurance market, these costs typically fall on government as an ‘implicit’ liability. In flood-prone areas, governments may decide to reduce risk by buying out home owners at high risk or who have had their homes damaged and provide them land for reconstruction in a less flood-prone area. In accordance with Article 198, paragraphs 3 and 4 of the SPA the Minister of Regional Development and Public Works may impose construction prohibition for clarification of the general stability of the terrain in landslide prone areas for a term of up to two years, and in connection with the implementation of geo-protection measures - till their completion. The order shall be revoked upon a proposal of the local authorities upon accomplishment of the geo-protective measures and activities and reported positive effect from their implementation by carrying out the monitoring under Article 95, paragraph 3. The construction prohibition shall stop the application of the master and specific land use plans entered into force on the part of the territory it refers to. There can also be measures through housing schemes to provide partial or full financial support to homeowners aiming to strengthen the seismic resilience of their homes. Governments may also elect to enforce compulsory house insurance that covers all potential hazards, and if that program is also clearly linked to the vulnerability of the house (risk-based



insurance pricing) then homeowners have additional incentive to make their homes more disaster resilient. However, while these are all options available to the government, currently there is no focused policies aimed at reducing risk in the housing sector<sup>44</sup> and the contribution of insurance to risk reduction and CCA in Bulgaria is still low (World Bank 2014). According to the World Bank (2014), the main reasons include (a) insufficient information available to potential customers, (b) a low level of insurance coverage, (c) the general underestimation of risks, and (d) the lack of associated financial capacity. Furthermore, insurance policies generally do not cover specific climate change risks and while some household insurance policies do include flood protection, only about 10 percent of households are insured. However, facilitated by a broader public awareness, the potential for insurance to play a bigger role in improving disaster risk preparedness could be significantly increased.

### **3.2.5. Other remarks and recommendations**

With regard to agricultural land use, no relation is established to climate change risk evaluation and management and crop insurance from climatic impacts is largely avoided by insurance companies and producers as there are few who buy such policies. There is a need for updated risk evaluation and mapping and then evaluation of needed measures, investments, and long-term planning.

To develop effective risk reduction instruments, it is necessary to establish homogenous, unified, and up-to-date baseline assessment for DRR/DRM and CCA at the national level, including the identified gaps in historical data and the quantified costs of previous disasters. Drawing on a regional-scale climate models or disaster risk modeling is crucial for creating the national risk profile.

The evaluation of the existing DRR strategies and budgeting in line with current developments on the international and EU level is essential for managing climate change risks.

The development and implementation of an intensive public awareness campaign will engage the public sector with the private sector and will commit the government to improve the existing regulatory system on disaster risk reduction and management.

## **3.3. Preparedness and Early Warning Systems**

The *NIMH-BAS* has the responsibility for the collection and analysis of data to assess the potential of heavy rainfall events which could themselves cause a disaster and/or also result in urban flooding (when intensity of rainfall is greater than the urban drainage system's coping capacity), flash flooding, and river flooding. Similarly, they have the responsibility to monitor river systems in case of elevated levels from rainfall in Bulgaria or in upstream countries. They also monitor extreme heat and cold events, as well as conditions that could result in new or exacerbated wildfire situations. The monitoring of earthquakes and the assessment of earthquake magnitude is done by the *NIGGG*. Operational capacity of the *NIGGG* includes National Seismological Service - its network includes 14 stations and observatories and 2 local networks – 'Provadia' and 'Kozloduy' The seismic center in Sofia collects, processes, analyzes,

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<sup>44</sup> The government energy efficiency program for apartment buildings was originally envisaged to have a seismic risk reduction aspect; however, there is no evidence of systematic seismic assessments of buildings or of actions taken to strengthen buildings alongside energy efficiency improvements.

and interprets the information. This is the only system in Bulgaria which determines in real time the earthquake parameters in the country and the neighboring areas. The operative information is immediately submitted to the CoM, different ministries, the public, mass media, and all other interested institutions.<sup>45</sup> *Geological Institute 'Strashimir Dimitrov'* under the BAS is responsible for national research regarding geological hazards, as well as the development of seismic hazard maps – its activities are also directed toward risk reduction.<sup>46</sup>

The Ministry of Environment and Waters performs daily analyses of the data provided by NIMH-BAS related to expected meteorological events and drafts daily forecasts for rainfall, warnings for hazardous events, daily factsheets on the river flow which is sent to the river basin directorates, the regional governments, and other authorities. When necessary, warning letters containing recommendations on the measures to be taken to prevent the adverse impact of waters are sent. When activated, the operational unit is working at 24/7 shifts. In order to improve the operational real-time management of waters, a National System for Real Time Water Management will be developed with the pilot project being in the Iskar river basin.

The information from the hydro-meteorological agency is then provided to the Fire Safety and Civil Protection DG which then shares warnings with its district and municipal units or services as well as other key line ministries. Subnational fire safety and civil protection authorities then disseminate warnings to citizens and relevant local agencies (such as school services).

Through the Fire Safety and Civil Protection DG, there are well-established preparedness and emergency operations functions at the district level with variable progress at the municipal level. There is also a new project aimed at educating 90,000 students and citizens on disaster risk and preparedness. Volunteers also form a key part of preparedness and response, with strong engagement from Bulgarian Red Cross and nongovernmental organizations (NGOs). Finally, there is clarity around the scale and impact of different disaster events and the point at which responsibilities get escalated from municipal level to district level to national level.

### **3.4. Financial Protection**

In the aftermath of disaster, the financial costs of response, recovery, and reconstruction are a significant burden on government finances, both at the national and sub-national level. Often, funding recovery involves results in the delay of key planned development and capital improvements. Following disaster, governments also realize that they have both explicit and implicit contingent liabilities, where explicit liabilities include the reconstruction of public buildings and infrastructure, but implicit liabilities may come from public pressure to partially or fully contribute to the replacement of private housing (for uninsured), emergency housing, medical care, and so on. At the household level, poor and near-poor families may adopt negative coping mechanisms to deal with the cost of the disaster. For many poor and near-poor their major asset may be their home with limited access to savings in financial institutions, so damage or loss of the home represent a severe financial setback.

Ex-ante financial planning is thus critical to manage the financial shock associated with disasters, with planning considering factors such as the frequency and intensity of potential

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<sup>45</sup> See <http://www.niggg.bas.bg/en/about-us/operational-research-activity/>

<sup>46</sup> See <http://www.geology.bas.bg/his.html>

disaster events, timing and flexibility of funds required for the different stages of response, recovery and reconstruction, the balance between risk retention and risk transfer, legislative frameworks, availability and use of insurance and scalable social safety net approaches. This information can be used to develop a comprehensive disaster risk financing and insurance strategy.

For this initial assessment, we focus on the following areas (a) sovereign level mechanisms for funding disaster response, recovery, and reconstruction; (b) insurance of state or municipality owned assets; and (c) household insurance.

### **3.4.1. Sovereign level funding mechanisms for disaster response, recovery and reconstruction**

The government has established an Interagency Commission for Relief and Recovery (ICRR) to the CoM, which is aimed at covering exceptional and unanticipated costs that may come from disasters (natural or man-made) or other events such as the mass migration of refugees in past years. The budget of the ICRR is planned at the start of the financial year – over the past years it was allocated with about BGN 70 million or roughly US\$43 million (although at least 15 percent of this must be invested in prevention). Line ministries, district, and municipal authorities are eligible to apply to the ICRR for reimbursement of costs associated with disaster events. According to the World Bank estimates, even though the budget of the Bulgarian ICRR is the second largest of all in Southeastern European countries (after Slovenia), it can cover only 0.6 percent of damages from an earthquake with a return period of 250 years.<sup>47</sup>

As an EU Member State, Bulgaria can apply to the Solidarity Fund for financial support following major disasters. These funds are intended to help restore vital infrastructure and services, reimburse the cost of emergency and rescue operations, and cover some of the clean-up costs in the disaster-stricken regions. Since 2002, Bulgaria applied five times for support in the recovery of damages estimated at a total of €1.092 billion, and was granted a total of €39.2 million, or 3.6 percent of the direct damage costs of these five disaster events (see **Table 2** below). Furthermore, support from the Fund takes 9-12 months to become available, and is tied to specific reconstruction needs.

**Table 2. EU Solidarity Fund interventions in Bulgaria since 2002**

Occurrence	Nature of disaster	Category	Damage (million €)	Aid granted (million €)
May 2005	Floods	Major	222	9.7
August 2005	Floods	Major	237	10.6
June 2014	Floods	Major	311	10.5
July 2014	Summer Floods	Regional	79	2
January 2015	Severe winter conditions	Major	243	6.4
<b>Total</b>			<b>1,092</b>	<b>39.2</b>

Source: EC, 2018.

<sup>47</sup> See <http://documents.worldbank.org/curated/en/695061493026476693/pdf/114478-WP-PUBLIC-Mobilizing-International-Donors-for-Reconstruction-The-Sudan-Emergency-Flood-Reconstruction.pdf>

There has been some consideration in the MoF of alternative funding mechanisms such as contingent funds, catastrophic pools, or catastrophic bonds. As a measure of comparison for countries with similar exposure to disasters, Serbia has access to €66.1 million in contingent credit, Peru has access to €1 billion in contingent credit, and Romania is exploring access to €400 million in contingent credit.

### **3.4.2. Insurance of state- or municipality-owned assets**

Under the State Property Act,<sup>48</sup> all state (national or subnational) assets must be insured – this is intended to reduce the financial liability of the government in a disaster. However, the act does not specify what must be covered under the insurance and therefore institutions and municipalities can select lower-cost policies with minimal coverage. For example, following the 2012 earthquake, 62 public buildings in the affected area were found to be without earthquake coverage. Similarly, the 2017 floods revealed many government assets did not have flood insurance. There is a need to reform the act to clearly specify the hazards that must be covered, and given the risk profile of Bulgaria – flood, earthquake, storm, and fire should be covered. With regard to floods, based on experiences in other countries, a careful review of policies is necessary to ensure full coverage for riverine flood, flash flood, and urban (*pluvial*) flood. There was some concern raised over the insurance coverage available, with some views held that insurance particularly for flood and earthquake was simply not available. This requires more investigation and discussion with market providers.

### **3.4.3. Household insurance**

In Bulgaria, insuring property against natural hazards is voluntary. Insurance companies offer coverage for most natural hazards either within or as an additional endorsement to the standard homeowner/fire policy, depending on the type of hazard and the insurance company.<sup>49</sup> Property insurance in Bulgaria typically includes flood and storm coverage, although some have a separate provision for flood. Insurance penetration for households is less than 10 percent (World Bank 2014) - there is a general perception that the government will cover any costs and premium costs may be beyond the budget capacity of families. Because of such low insurance penetration, the Bulgarian government has been providing financial assistance to uninsured homeowners following floods in recent times. The provision of assistance is based on eligibility requirements such as: possession of only one home (that is built according to the legislation); income below the poverty line; not being registered as sole traders and not having ownership of companies. However, this is a strategy the Bulgarian state cannot afford, because of scarce financial resources and frequent disasters.<sup>47</sup>

Decision makers may also consider other countries which have developed compulsory insurance systems – New Zealand, United Kingdom, Netherlands, Turkey, Romania, and so on – to determine if compulsory insurance would be appropriate. For instance, in Romania, depending on the type of dwelling insured, the policy amounts to:

- TYPE A dwelling, with a sum insured of €20,000 and an insurance premium of €20 per year;

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<sup>48</sup> See <http://unpan1.un.org/intradoc/groups/public/documents/UNTC/UNPAN016424.pdf>

<sup>49</sup> See <https://www.climatechange.org/bulgaria/insurance-and-business/>

- TYPE B dwelling, with a sum insured of €10,000 and an insurance premium of €10 per year.

In Turkey, the premium to be paid is calculated by means of adding YTL 10-15 (or about US\$ 3-4) to the amount calculated as a result of applying the relevant tariff based on the earthquake zone and the construction type (with minimum premium of YTL 25 or about US\$ 7).

As a first step, a comprehensive assessment of the current financial protection against natural disasters in Bulgaria could be helpful to (a) quantify past disaster damage and losses and the budget required for response, recovery, and reconstruction; (b) review available mechanisms and sources of financing and with timing for mobilization of funds and flexibility of use of the resources; (c) identify challenges associated with insufficient funds at different time periods (immediately – for response, within weeks – for recovery and within months – for reconstruction); (d) look at the institutional structure of the post-disaster financing in Bulgaria and identify levels of responsibility of the government and different public bodies with regard to the post-disaster financing in their respective sectors; (e) estimate levels of coverage for different hazards for state assets and households; (f) provide recommendations on how to improve the post-disaster financing to reduce adverse financial impact of natural disasters.

### **3.5. Recommendations to Strengthen Disaster and Climate Resilience in Bulgaria**

This review has highlighted that there is a strong legislative and institutional basis for DRM in Bulgaria, which will ultimately also support longer-term climate resilience. There have been impressive efforts to decentralize responsibilities for preparedness, prevention, and response to district and municipality level and to build the necessary capacity at these levels so that these roles can be fulfilled. Systems and capacity for early warning, preparedness, and response are well advanced. Among the biggest challenges for Bulgaria in DRM and climate resilience is minimizing the financial shocks associated with disasters, from household to sovereign level, and ensuring that systematic efforts on risk reduction are funded and executed. Therefore, the following recommendations are proposed to be implemented in the short term:

<b>RECOMMENDATIONS TO STRENGTHEN DISASTER AND CLIMATE RESILIENCE</b>	
<b>I. Risk identification</b>	
<b>1.</b>	<i>Coordination and streamlined approaches to assess risk across different ministries – especially for exposure data that was also ideally linked to the inspire initiative</i>
<b>2.</b>	<i>Systematic disaster damage data collection</i>
<b>3.</b>	<i>Information management system for DRM</i>
<b>4.</b>	<i>Acceleration of the earthquake risk assessment in Bulgaria to residential structures, bridges, schools, hospitals, public buildings, and so on<sup>50</sup></i>
This assessment should form the basis of a comprehensive national strategy to reduce the seismic risk to priority high-risk structures and networks, including an investment plan articulating how these risk reduction efforts will be financed and oversights. This could be multi-sector or single sector –	

<sup>50</sup> This would also support analysis of the key datasets to support disaster risk management and response activities in Bulgaria – who has data and under what conditions can it be accessed for example?

## RECOMMENDATIONS TO STRENGTHEN DISASTER AND CLIMATE RESILIENCE

for example, focused on a school improvement program that aims to improve the seismic safety of schools alongside improvements in amenity and energy efficiency.

5. *Assessment of how good flood mitigation under past flood risk management plans was implemented at the local level and by other sectors and whether flood information is systematically integrated into spatial, urban and development plans*

### II. Risk reduction

6. *Considerations for seismic risk reduction actions for existing buildings*

### III. Financial protection

7. *A comprehensive assessment of post-disaster financing in Bulgaria*

This could include, among others, how disaster response, recovery, and reconstruction are financed at the national, district, and municipal levels, explicit and implicit costs borne by the government in past events and expected costs in the future (especially considering the amended acts), relevant policies and legal frameworks, barriers and incentives to deepen household insurance penetration, how prevention and risk reduction is financed, and so forth. This assessment may lead to the development of a national disaster risk financing and insurance strategy and improvement of the post-disaster financing system.

8. *Reform of the legislation to ensure that municipalities have to cover main hazards (storms, floods, and earthquakes) for public infrastructure insurance that have been identified in the Disaster Protection Plans under the Disaster Protection Act*
9. *Discussions with the insurance and public sectors and with the population on how to deepen private insurance coverage*
10. *An assessment of how risk reduction is financed and implemented in Bulgaria to support the development of the 2019 act that will regulate prevention actions and requirements*



## References

- ASDE-ReSAC. 2012. “Map of flood simulation models on the territory of the Republic of Bulgaria.” Available at: [http://bsdi.asde-bg.org/floods\\_en.php](http://bsdi.asde-bg.org/floods_en.php).
- Berov, B. and N. Dobrev. 2002. “Landslides in Bulgaria.” *Journal of the Japan Landslide Society* 38: 34-43. Available at: [https://www.researchgate.net/profile/Boyko\\_Berov/publication/301216028\\_Landslides\\_in\\_Bulgaria/links/570cdf2208aed31341cef6b9/Landslides-in-Bulgaria.pdf](https://www.researchgate.net/profile/Boyko_Berov/publication/301216028_Landslides_in_Bulgaria/links/570cdf2208aed31341cef6b9/Landslides-in-Bulgaria.pdf).
- Council of Ministers. 2017. “Draft National Disaster Risk Reduction Strategy 2017 – 2030”. Available at: <http://strategy.bg/FileHandler.ashx?fileId=11737>.
- European Commission. 2015. “Peer Review Bulgaria: 2015-2016 Programme for peer reviews in the framework on civil protection and disaster risk management.” Available at: [http://ec.europa.eu/echo/sites/echo-site/files/bulgaria\\_peer\\_review\\_report\\_-\\_en.pdf](http://ec.europa.eu/echo/sites/echo-site/files/bulgaria_peer_review_report_-_en.pdf).
- European Commission. 2018. “EU Solidarity Fund Interventions since 2002.” Available at: [http://ec.europa.eu/regional\\_policy/sources/thefunds/doc/interventions\\_since\\_2002.pdf](http://ec.europa.eu/regional_policy/sources/thefunds/doc/interventions_since_2002.pdf).
- McDonald, R. 2003. “Introduction to Natural and Man-made Disasters and Their Effects on Buildings.”
- Pashova, L., M. Kouteva-Guentcheva and T. Badrova, T. 2016. “Towards Mapping Multi-Hazard Vulnerability of Natural Disasters for the Bulgarian Territory”. Proceedings, 6th International Conference on Cartography and GIS, 13-17 June 2016, Albena, Bulgaria. Available at: <https://cartography-gis.com/docsbca/iccgis2016/ICCGIS2016-85.pdf>.
- UNISDR. “Global Assessment Report on Disaster Risk Reduction 2015.” Available at: [https://www.preventionweb.net/english/hyogo/gar/2015/en/gar-pdf/GAR2015\\_EN.pdf](https://www.preventionweb.net/english/hyogo/gar/2015/en/gar-pdf/GAR2015_EN.pdf).
- World Bank. 2014. “Financial Disaster Risk Management and Insurance Options for Climate Change in Bulgaria.” Available at: [http://www.moew.government.bg/static/media/ups/tiny/file/Climate/Insurance\\_Against\\_Climate\\_Change.pdf](http://www.moew.government.bg/static/media/ups/tiny/file/Climate/Insurance_Against_Climate_Change.pdf).
- World Bank. 2017. “Europe and Central Asia - Country risk profiles for floods and earthquakes.” Washington, D.C.: World Bank Group. Available at: <http://documents.worldbank.org/curated/en/958801481798204368/pdf/111015-REVISED-WP-ECA-Country-risk-profiles-PUBLIC.pdf>.

## Annex 1. List of EU Legislative Acts and Provisions

<b>Legislation</b>
Council Regulation (EU) 2016/369 on the provision of emergency support within the Union
Regulation No 375/2014 of the European Parliament and the Council on establishing the European Voluntary Humanitarian Aid Corps
Regulation (EC) No 1257/96 concerning humanitarian aid
Decision No 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism
<b>Implementing rules</b>
Commission Implementing Decision of 16 October 2014, laying down rules for the implementation of Decision No 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism and repealing Commission Decisions 2004/277/EC, Euratom and 2007/606/EC, Euratom
Commission Decision 2010/481/EU, Euratom amending Decision 2004/277/EC, Euratom as regards rules for the implementation of Council Decision 2007/779/EC, Euratom establishing a Community civil protection mechanism
Commission Decision 2008/73/EC, Euratom amending Decision 2004/277/EC, Euratom as regards rules for the implementation of the Mechanism
Commission Decision 2007/606/EC, Euratom laying down rules for the implementation of the provisions on transport
Commission Decision 2004/277/EC laying down rules for the implementation of Council Decision 2001/792/EC
<b>Council conclusions</b>
Council conclusions on the development of the external dimension of the European Programme for Critical Infrastructure Protection (9 and 10 June 2011)
Council conclusions on Integrated Flood Management within the European Union (12 May 2011)
Council conclusions on Further Developing Risk Assessment for Disaster Management within the European Union (11 and 12 April 2011)
Council Conclusions on Host Nation Support (2 and 3 December 2010)
Conclusions on Innovative Solutions for Financing Disaster Prevention (8 and 9 November 2010)
Council conclusion on Psychosocial support in the event of emergencies and disasters (3 June 2010)
Council Conclusions on a Community framework on disaster prevention within the EU (30 November 2009)
Council Conclusions calling for civil protection capabilities to be enhanced by a European mutual assistance system building on the civil protection modular approach (16474/08)
Council Conclusions on Reinforcing the Union's Disaster Response Capacity – towards an integrated approach to managing disasters (16 June 2008)
<b>European Parliament resolutions</b>
EP resolution on Community approach on the prevention of natural and man-made disasters (21.09.2010)
European Parliament resolution on stepping up the Union's disaster response capacity (19.06.2008)
<b>Other documents</b>

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Commission Staff Working Document on EU Host Nation Support Guidelines (SWD(2012) 169 final)
Commission Staff Working Paper on Risk Assessment and Mapping Guidelines for Disaster Management (SEC(2010) 1626 final)
COM(2010)600 Communication Towards a stronger European disaster response: the role of civil protection and humanitarian assistance
COM(2009)82 Communication on a Community approach on the prevention of natural and man-made disasters
COM(2008)130 Communication on Reinforcing the Union's Disaster Response Capacity
Joint Statement (2008/C 25/01) - The European Consensus on Humanitarian Aid
Commission Staff Working Document SEC(2007)1721 Towards Better Protecting Citizens against Disaster Risks: Strengthening Early Warning Systems in Europe

## Annex 2. List of Sectors with Critical Infrastructure in the Republic of Bulgaria

List of sectors with critical infrastructure in the Republic of Bulgaria to the Ordinance on the terms, conditions, and competent bodies to identify the critical infrastructure and their sites and the risk assessment of these.<sup>51</sup>

Sector	Sub-sector	Competent Institution
I. Energy	1. Electrical power	MoEET*
	2. Oil	MoEET*
	3. Gas	MoEET*
	4. Heat energy	MoEET*
II. Transport	1. Automobile transport and road infrastructure	MoRDPW and MoTITC
	2. Rail transport and railway infrastructure	MoTITC
	3. Air transport and airports	MoTITC
	4. Water transport and ports	MoTITC
III. Information and communication technologies	1. Electronic communication networks	MoTITC
	2. Information and communication infrastructure	MoTITC
IV. Mail and couriers' services		MoTITC
V. Environment	1. Environment	MoEW
	2. Water, water supply and sewage	MoEW and MoRDPW
VI. Agriculture and food	1. Agriculture	MoAF*
	2. Food	MoAF*
	3. Forests and hunting units	MoAF*
VII. Health protection	1. Medical and hospital support	MoH
	2. Medications	MoH
VIII. Finances		MoF
IX. Economy		MoEET*
X. Sports objects and facilities		MoPhES*
XI. Education, science and technologies		MoEYS*
XII. Natural resources		MoEET* and MoEW
XIII. Tourism		MoEET*
XIV. Regional development and public works		MoRDPW

<sup>51</sup> Last amended SG issue 27/05.04.2016.

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Sector	Sub-sector	Competent Institution
XV. Defense	1. Defense industry	MoD
	2. Military infrastructure and military formations	MoD
XVI. Justice, public order and security		MoJ, MoI, and SANS
XVII. State and social governance		MoI and MoLSP
XVIII. Disaster protection		MoI
XIX. Cultural heritage	1. Real cultural estate	MoC
	2. Movable cultural estate	MoC

*Note: MoAF = (former) Ministry of Agriculture and Foods; MoC = Ministry of Culture; MoD = Ministry of Defense; MoEET = (former) Ministry of Economy, Energy and Tourism; MoEW = Ministry of Environment and Water; MoEYS = (former) Ministry of Education, Youth and Science; MoF = Ministry of Finance; MoH = Ministry of Health; MoI = Ministry of Interior; MoJ = Ministry of Justice; MoLSP = Ministry of Labor and Social Policy; MoPhES = (former) Ministry of Physical Education and Sport; MoRDPW = Ministry of Regional Development and Public Works; MoTITC = Ministry of Transport, Information Technology and Communications; SANS = State Agency for National Security.*

*\* The last amendment of the Ordinance dates from 2016 (SG issue 27/05.04.2016) where the list including the responsible institutions was not amended according to Decisions of the National Assembly on the adoption of the structure of the Council of Ministers of Republic of Bulgaria (SG issue 93/11.11.2014 and SG issue 37/09.05.2017) according to which: (a) the Ministry of Agriculture and Foods is transformed into Ministry of Agriculture, Foods and Forestry; (b) the Ministry of Economy, Energy and Tourism is split into Ministry of Economy, Ministry of Energy and Ministry of Tourism; (c) the Ministry of Education, Youth and Science is transformed into Ministry of Education and Science; and (d) the Ministry of Physical Education and Sport is transformed into Ministry of Youth and Sport.*

### **Annex 3. UN Legal and Institutional Framework**

Recognizing the increasing frequency of natural disasters, in 1988 the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) set up the Intergovernmental Panel on Climate Change. The initial task for the Intergovernmental Panel on Climate Change (IPCC), as outlined in UN General Assembly Resolution 43/53 of 6 December 1988, was to prepare a comprehensive review and recommendations with respect to the state of knowledge of the science of climate change, the social and economic impact of climate change, and possible response strategies and elements for inclusion in a possible future international convention on climate. Currently the IPCC's role is to assess on a comprehensive, objective, open, and transparent basis the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation. A wide range of representatives from the worldwide scientific community participates in the work of the IPCC. IPCC reports<sup>52</sup> are intended to be neutral with respect to policy, although they may need to deal objectively with scientific, technical, and socioeconomic factors relevant to the application of particular policies.

#### **Policy and Legal Arrangements**

The First World Conference on Natural Disasters was held in Yokohama, Japan in 1994 and the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action, were developed and later endorsed by the UN General Assembly.

The Second World Conference on Disaster Reduction held in Kobe, Hyogo, Japan in 2005 adopted plans to put in place an International Early Warning Programme and agreed on the approval of the 10-year HFA: Building the Resilience of Nations and Communities to Disasters. The Hyogo Framework was the first plan to explain, describe, and detail the work required from all different sectors and actors to reduce disaster losses. The HFA set five specific priorities for action.

- (1) Making DRR a priority
- (2) Improving risk information and early warning
- (3) Building a culture of safety and resilience
- (4) Reducing the risks in key sectors
- (5) Strengthening preparedness for response

Its main goal was to substantially reduce disaster losses by 2015 by building the resilience of nations and communities to disasters.

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework), adopted in 2015 by the UN Member States at the Third UN World Conference on Disaster Risk Reduction, is a voluntary instrument providing a new global approach to DRM policy and operations. It represents a shift in the policy approach at the global level from disaster

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<sup>52</sup> The Fifth Assessment Report was released in the period 2013–2014, the Sixth Assessment Report, taking into account Paris Agreement, is due in 2022.



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management to DRM. Its goal is to prevent new and reduce existing disaster risks, through an all-of-society and all-hazards risk approach across economic, social, and environmental policy areas, with a view to reduce vulnerability and increase the resilience. States with their national and local authorities, regional and international organizations and other stakeholders, are invited to implement the four priorities of the Sendai Framework.

- (1) Understanding disaster risk
- (2) Strengthening disaster risk governance to manage disaster risk
- (3) Investing in DRR for resilience
- (4) Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation, and reconstruction

Seven agreed global targets, most of which should be achieved by 2030, will be measured globally by appropriate indicators to contribute to the implementation of the priorities:

- (1) Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality in 2020–2030 compared to 2005–2015
- (2) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in 2020–2030 compared to 2005–2015
- (3) Reduce direct disaster economic loss in relation to global GDP by 2030
- (4) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among others, health and educational facilities, including through developing their resilience by 2030
- (5) Substantially increase the number of countries with national and local DRR strategies by 2020
- (6) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the framework by 2030
- (7) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030

Translating the Sendai Framework into realistic and achievable actions should be done in coherence with other 2015 and 2016 international agreements and processes, including the 2030 Agenda for Sustainable Development, the Addis Abba Action Agenda, the Paris Agreement adopted under the UNFCCC, the World Humanitarian Summit, and the New Urban Agenda following the third UN Conference on Housing and Sustainable Urban Development - HABITAT III.

Bulgaria supports the initiatives of Hyogo and Sendai to build the resilience of nations and communities to disasters. Through its focal point, the MoI, it makes efforts to contribute to the process and regularly reports on the achieved results. The national progress reports on the implementation of the HFA 2011–2013 and 2013–2015 reflect the progress and also identify bottlenecks.

The *Global Water Partnership (GWP) Guidelines for Preparation of the Drought Management Plans* were launched in September 2015 to support the development and implementation of

risk-based Drought Management Plans in the context of the EU Water Framework Directive – as part of the River Basin Management Plans (RBMPs).

The objectives of the guidelines are to (a) encourage broader commitments to integrated water management systems, according to the Water Framework Directive that provide for a better understanding of how to integrate drought management into the planning and development of RBMPs; (b) use a step-by-step approach to develop Disaster Management Plans in accordance with WMO/GWP Guidelines and EU Guidelines; (c) provide information on other issues related to drought that are included in the directive: quantitative status, prolonged drought, and climate change. The guidelines are based on experience within the conditions of the Central and Eastern European region.

## **Institutional arrangements**

### ***UN International Strategy for Disaster Reduction Office***

The UN General Assembly adopted the International Strategy for Disaster Reduction in December 1999 and established UNISDR, the secretariat to ensure its implementation. In January 2002 the UN General Assembly through its Resolution 56/195 has determined the UNISDR as the focal point for the coordination of disaster reduction and ensuring synergy among the disaster reduction activities of the UN system and regional organizations.

UNISDR is led by the UN Special Representative of the Secretary-General for Disaster Risk Reduction (SRSG). UNISDR has over 100 staff located in its headquarters in Geneva, Switzerland, and five regional offices<sup>53</sup> and other field presences.

Its core areas of work, including ensuring DRR, is applied to CCA, increasing investments for DRR; building disaster-resilient cities, schools, and hospitals; and strengthening the international system for DRR.

UNISDR leads the preparation and follow-up of the Global Platform for Disaster Risk Reduction established in 2006 (UN General Assembly Resolution 61/198). The platform meets once every two years. The global platform has become the main global forum for DRR and for the provision of strategic and coherent guidance for the implementation of the Sendai Framework and to share experience among stakeholders. Other areas of work for UNISDR includes issuing the Global Assessment Report on Disaster Risk Reduction every two years, supporting countries in monitoring risk trends and the implementation of the Sendai Framework, and leading global campaigns on DRR for safer schools, hospitals, and cities.

The Republic of Bulgaria is covered by UNISDR's Europe office with the focal point being the MoI.

### ***Global Water Partnership***

The GWP,<sup>54</sup> founded in 1996 to foster integrated water resources management, is a UN supported global action network with over 3,000 partner organizations in 183 countries. The network has 86 Country Water Partnerships and 13 Regional Water Partnerships. The network

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<sup>53</sup> Headquarters in Geneva, Switzerland; Africa: Nairobi, Kenya, and Cairo, Egypt; Americas: New York, United States of America and Panama City, Panama; Asia: Almaty, Kazakhstan, Kobe-City, Japan and Incheon, the Republic of Korea; the Pacific: Suva, Fiji, Bangkok, Thailand; Europe: Brussels, Belgium.

<sup>54</sup> See <http://www.gwp.org>

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is open to all organizations involved in water resources management: developed and developing country government institutions, agencies of the UN, bilateral and multilateral development banks, professional associations, research institutions, NGOs, and the private sector. Bulgaria is a partner to the GWP.

### ***European Forum for Disaster Risk Reduction***

The European Forum for Disaster Risk Reduction (EFDRR) was built in 2010 as an instrument to forge partnerships, assess the implementation of the international DRR commitments, share DRR practices and knowledge, and promote a more integrated DRM. It is served by UNISDR supported by Council of Europe (EUR-OPA Majors Hazards Agreement<sup>55</sup>). So far it had seven annual meetings as the last one aimed to support and facilitate implementation of the Sendai Framework for DRR in Europe.<sup>56</sup> The Republic of Bulgaria is a member of the forum and participates in its events and initiatives. The EFDRR has developed several papers supporting the CCA process such as Guidelines for EFDRR Survey on Sendai Framework Implementation in Europe 2017 and EFDRR 2015–2020 Roadmap for the Implementation of the Sendai Framework.

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<sup>55</sup> See <http://climate-adapt.eea.europa.eu/metadata/organisations/eur-opa-major-hazards-agreement>

<sup>56</sup> See [https://www.coe.int/en/web/europarisks/news/-/asset\\_publisher/9gIrpwIW82Fm/content/7th-annual-meeting-of-the-european-forum-for-disaster-risk-reduction](https://www.coe.int/en/web/europarisks/news/-/asset_publisher/9gIrpwIW82Fm/content/7th-annual-meeting-of-the-european-forum-for-disaster-risk-reduction)